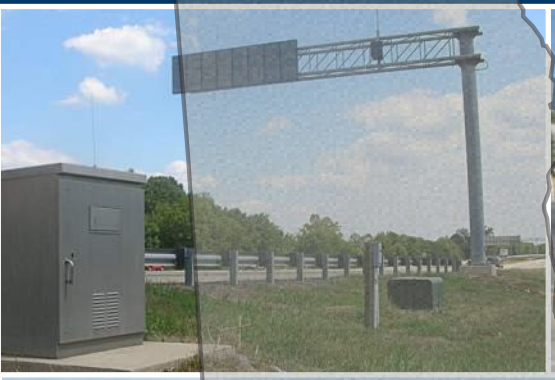
Delaware Department of Transportation

TRAFFIC DESIGN MANUAL

2015 EDITION

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According to Title 17, Chapter 1, § 141 of the Delaware Code, Delaware Department of Transportation has jurisdiction and control of all state highways of the State of Delaware outside of the limits of incorporated cities and towns for the purpose of regulating traffic and for the use and operation of all vehicles thereover, and may adopt any and all rules and regulations respecting the use of such highways and the operation of all vehicles upon the same. Furthermore, according to Title 17, Chapter 1 § 134 of the Delaware Code, with respect to state highways within their corporate limits, incorporated cities and towns in the State may erect and maintain such traffic control signals as shall be authorized by proper ordinance of the city or town and by the Department.

This manual is the result of significant contribution and collaboration by many individuals, primarily those on DelDOT's Traffic Design Manual Committee. The lead consultant for this committee was RK&K Engineers, who provided project management, research and development for the manual. Jim Burnett, PE, PTOE was the consultant Project Manager and Mark Luszcz, PE, PTOE and Monroe Hite, PE were the DelDOT Project Managers. Individuals who contributed significantly to the preparation of this Manual include:

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List of Abbreviations

AASHTO	American Association of State Highway and Transportation Officials
ADA	Americans with Disabilities Act
ADAAG	Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities
ADT	Average Daily Traffic
APS	Accessible Pedestrian Signals
ATC	Advanced Traffic Controller
CADD	Computer-aided Design and Drafting
CCTV	Closed-Circuit Television
CDMA	Code Division Multiple Access
CFR	Code of Federal Regulations
CMF	Crash Modification Factors
CMS	Critical Movement Summation
Construction Group	DelDOT Traffic Systems Construction Group
DE MUTCD	Delaware Manual on Uniform Traffic Control Devices (*citations reflect 2011 edition*)
DelDOT	Delaware Department of Transportation
DelTRAC	DelDOT's Transportation Management Program
Design Group	DelDOT Traffic Systems Design Group
Designer	Developer, Consultant, or DelDOT Traffic Staff Preparing Plans
DMS	Dynamic Message Signs
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
HAWK	High-Intensity Activated Crosswalk
HCM	Highway Capacity Manual
HDPE	High-Density Polyethylene
HIB	Hazard Identification Beacons
HSM	Highway Safety Manual
ICB	Intersection Control Beacons
ISD	Intersection Sight Distance
ITE	Institute of Transportation Engineers
ITMS	Integrated Transportation Management System
ITS	Intelligent Transportation Systems
LOS	Level of Service
Maintenance Group	DelDOT Traffic Systems Maintenance Group
MOE	Measure of Effectiveness
MOT	Maintenance of Traffic
MUTCD	Manual on Uniform Traffic Control Devices
NCHRP	National Cooperative Highway Research Program
NEMA	National Electrical Manufacturers Association
NESC	National Electrical Safety Code
NTCIP	National Transportation Communications for ITS Protocol
OIT	DelDOT's Office of Information Technology
Operations Group	DelDOT Transportation Management Center, or TMC
PR	Public Relations
PROWAG	Draft Public Rights-of-Way Accessibility Guidelines
PS&E	Plans, Specifications and Estimates
PVC	Polyvinyl Chloride
RRFB	Rectangular Rapid Flash Beacons
RTMS	Remote Traffic Microwave Sensors
Safety Group	DelDOT Traffic Safety Group
Studies Group	DelDOT Traffic Studies Group
SSC	Signing, Striping, and Conduit
TIS	Traffic Impact Study
TMC	DelDOT Transportation Management Center
WTMC	Radio Frequency for Traveler Information

List of Common Reference Manuals

All signals and ITS traffic devices designed or modified in the State of Delaware should comply with the following policies, guidelines, and standards. Due to the design flexibility inherent in many of these references, the Delaware Traffic Design Manual has been developed to provide additional guidance regarding preferred design practices in Delaware.

- AASHTO – A Policy on Geometric Design of Highways and Streets
- AASHTO – Highway Safety Manual (HSM)
- AASHTO – Roadside Design Guide
- DelDOT – Traffic Lighting Policy
- DelDOT – Delaware Manual on Uniform Traffic Control Devices (DE MUTCD)
- DelDOT – Road Design Manual
- DelDOT – Standard Specifications for Road and Bridge Construction
- DelDOT – Development Coordination Manual
- DelDOT – Standard Construction Details
- DelDOT – Work Zone Safety and Mobility Procedures and Guidelines
- DelDOT – Accessible Pedestrian Standards Facilities in the Public Right-of-Way
- FHWA – Manual on Uniform Traffic Control Devices (MUTCD)
- FHWA – Railroad-Highway Grade Crossing Handbook
- IEEE – National Electrical Safety Code (NESC)
- National Electrical Manufacturers Association (NEMA) - Codes and Standards
- NFPA – National Electrical Code (NEC)
- ITE – Manual of Traffic Engineering Studies
- TRB – Highway Capacity Manual (HCM)



Delaware Department of Transportation

TRAFFIC DESIGN MANUAL

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Chapter I

INTRODUCTION

I. INTRODUCTION

The guidelines contained in this Traffic Design Manual have been written to define the standards and processes that should be followed in the preparation of design plans for all new or modified traffic system devices owned and/or maintained by the Delaware Department of Transportation (DelDOT). The manual also applies to all projects in which DelDOT is serving in an oversight role.

This introductory chapter outlines the purpose of the Manual and discusses the different types of traffic system devices. This chapter also compares the three primary project types that involve traffic system design and includes some important maintenance of traffic considerations. Finally, this chapter defines the roles and responsibilities of various groups involved in the traffic system design process, both within DelDOT and throughout the state of Delaware.

A. Purpose

This Manual sets forth the latest design concepts and standard practices for engineers and technicians when preparing plans and specifications for traffic system design projects. This manual represents DelDOT's practices, techniques, and procedures that will be applied in developing plans, special provisions, standards, and specifications for any new or modified traffic system devices that will be installed or maintained by DelDOT. The manual also applies to all projects in which DelDOT is serving in an oversight role, regardless of ultimate ownership of the devices.

DelDOT's Traffic Section is responsible for the design, maintenance, and operation of all traffic devices (including signs, pavement markings, ITS devices, and traffic signals) that are on the state system outside of municipalities, and in compliance with town agreements, many traffic devices on state-maintained highways within municipalities. One of the primary objectives in developing this manual is to maintain uniformity and standardization in the use, design, and operation of powered traffic system devices throughout Delaware, regardless of who develops the plans (i.e., in-house designers, consultants, etc.).

It should be noted that this manual does *not* address the design of signs, pavement markings, or lighting, except when associated with powered traffic system devices. For information on the design of signs and pavement markings, refer to the Delaware Manual on Uniform Traffic Control Devices (DE MUTCD). For information on lighting design, refer to the Delaware Department of Transportation's Traffic Lighting Policy. Note that all specific DE MUTCD citations in this Manual refer to the 2011 edition.

B. Traffic System Design Devices

The DelDOT Traffic Section is responsible for designing, reviewing, and/or approving a variety of traffic system devices that are used to monitor and control traffic throughout the State of Delaware. Safety, access, and mobility are all considered during the design process. The most common type of traffic system device is traffic signals. Traffic signals may include standard intersection traffic control signals, hazard identification beacons (HIB), intersection control beacons (ICB), all-way stop controls, emergency vehicle signals, signals at moveable bridges, school signals, pedestrian signals, and temporary signals. The various traffic signal types are described in more detail in Chapter IV of this manual.

While traffic signals are the most common traffic device installed and maintained by DelDOT, the design of all other traffic systems devices follows a similar design process, which is outlined in this Manual. The design process for the following traffic devices is also governed by this manual: communications infrastructure, including underground conduit and some wireless networks; real-time traffic monitoring projects, including system loops and remote traffic microwave sensors (RTMS); closed-circuit television (CCTV) cameras; dynamic message sign (DMS) boards; roadway weather information stations (RWIS); and WTMC repeaters and auxiliary towers. These traffic devices are discussed further in Chapter V of this manual.

C. Project Types

There are four (4) primary project types in Delaware that result in the need for traffic system design elements. Each project type will require a slightly different design process. However, regardless of the project type, all traffic system equipment must be justified by the appropriate level of study and the resulting equipment must be designed to uniform standards.

The four project types are described below:

1. **Capital Projects** – This project type includes all traffic design elements associated with DelDOT capital projects. Capital projects are typically led by the Project Development, Bridge, or Transportation Solutions Sections of DelDOT. Examples of these projects include new roads, corridor improvement projects, sidewalk/multi-use path projects, or other capital improvement projects. The need for traffic control signals and/or other traffic system design elements is often based on projected traffic volumes developed during the DelDOT project development process. The DelDOT Traffic Section serves in a support role on these projects. Capital project traffic system elements may be designed by engineering consultants as part of an overall capital project assigned to a consultant. For consultant projects, the consultant's engineer of record is responsible for the development of the design, cost estimates, etc., and Traffic Systems Design Section

staff serve as reviewers and coordinators. For capital projects designed in-house by DelDOT staff, a DelDOT Traffic Systems Design staff member typically prepares the design plans for the traffic system elements. For in-house projects, the assigned Traffic System Design staff member is an important part of the project design team, and it is critical for the project designer to closely coordinate all relevant aspects of the project with the Traffic Section.

2. **Pavement & Rehabilitation Projects** – Typically these projects include traffic signal design work required to meet Americans with Disabilities Act (ADA) requirements on Pavement & Rehabilitation projects. Due to the limited staff and compressed time frames of these projects, the process followed is significantly different than for other capital projects. Although the Traffic Section is in a support role on these projects, they are the lead on determining the need for and designing pedestrian signal upgrades.

3. **Traffic Section Projects** – These projects are typically associated with traffic signals or other traffic system elements requested by legislative representatives, private citizens, Community Transportation Fund, fire companies, and/or recommendations by Traffic Section staff. These improvements can be a new design, an operational improvement identified as a result of a traffic engineering study, or a safety or equipment improvement identified by DelDOT.

4. **Developer / Subdivision Projects** – These projects are typically associated with private developments including new subdivisions and new or modified commercial properties. The traffic system devices are often requested by the developer or required as part of the Traffic Impact Study or Traffic Operational Analysis approval process to facilitate movement to and from a new roadway or entrance.

D. Maintenance of Traffic Considerations

An important consideration on all DelDOT projects, including traffic system design projects, is the Maintenance of Traffic (MOT) requirements. In response to FHWA's Rule on Work Zone Safety and Mobility (23 CFR 630 Subpart J), DelDOT has developed a work zone safety and mobility policy that stresses DelDOT's commitment to always maintain optimum worker safety while having traffic travel smoothly and safely through work areas. The policy, outlined in DelDOT's 2007 document titled Work Zone Safety and Mobility Procedures and Guidelines, requires DelDOT to perform an evaluation of the broader safety and mobility impacts of work zones throughout project development and also requires that a Transportation Management Plan (TMP) be prepared for "significant" projects.

For Capital Projects and Pavement & Rehabilitation Projects, the traffic systems design is typically only a portion of the overall design effort. These types of projects require either a Type A or Type B Transportation Management Plan (TMP) depending on the level of anticipated traffic impacts-of-which the DelDOT Safety Section will determine. Therefore, the MOT plan is typically, but not always, developed for the final device design. Additionally, the traffic systems designer must coordinate with the project designer and the DelDOT Safety Section to ensure that the work zone impacts associated with the construction of the traffic system devices are properly included in the MOT plans. This is particularly true when construction will be completed in phases, occur at night or when pedestrian, bicycle, or vehicular routes are to be detoured. In all cases, the MOT needs should be addressed on the handoff form as well as in the cost estimate.

For Traffic Section Projects, it is the responsibility of the traffic systems designer to develop MOT plans and ensure compliance with the Work Zone Safety and Mobility (WZSM) Procedures and Guidelines. These types of projects are often considered non-significant in terms of the WZSM Guidelines and therefore, typically require only a Type A TMP, which consists only of the MOT plans. The traffic systems designer must also coordinate with the DelDOT Safety Section to ensure that the work zone impacts associated with the construction of the traffic system devices are properly included in the MOT plans and the TMP. This is particularly true when construction will be completed in phases, occur at night or when pedestrian, bicycle, or vehicular routes are to be detoured. Refer to the WZSM Guidelines for additional details. The MOT requirements for each Traffic Section Project need to be estimated and explicitly documented, including required MOT set-ups, pedestrian and bicycle MOT considerations, detours, and allowable times for lane closures.

E. Roles and Responsibilities

Before discussing the detailed process that should be followed for a DelDOT traffic system design project, it is important to identify all the key stakeholders and personnel, as well as the responsibilities they have in the context of a traffic system design project. The following DelDOT Sections, companies, and organizations can each typically have a role in the planning, design, construction, and operations of traffic system devices owned and maintained by DelDOT.

The **DelDOT Traffic (Engineering and Operation) Sections** are the authority for the approval of all traffic system design projects in the State of Delaware in which the traffic devices will be owned and/or maintained by DelDOT. The Chief of Traffic Engineering must provide “Concurrence of Installation” and sign all traffic signal plans, timesheets, and needed resolutions. The DelDOT Traffic Section consists of two subsections with several groups underneath each: Traffic Engineering, including Traffic Studies, Traffic Systems Design, Traffic

Design Resource/HSIP, Traffic Construction, Traffic Maintenance; Traffic Operations, including Traffic Safety, and the Transportation Management Center.

The **DelDOT Traffic Studies Group (commonly called "Studies")** performs and reviews traffic impact studies and traffic safety and operations studies. They have the responsibility of preparing traffic signal studies and signal justification/warrant analysis and subsequently initiating the signal design process for either new signal projects or modifications to the operations of existing signals.

The **DelDOT Traffic Systems Design Group (commonly called "Design" or "Traffic Design")** is responsible for the design, review, and recommendation for approval of all traffic system design projects to the Chief of Traffic Engineering, including the compilation of the design, specifications, and estimates; review and approval of "as-built" plans for traffic system devices; coordination and review of consultants' designs; coordination with DelDOT Project Development Section and Planning Division; and coordination within the Traffic Section.

The **DelDOT Traffic Design Resource/HSIP Group** is responsible for delivering the Department's Highway Safety Improvement Program (HSIP), including the state's Strategic Highway Safety Plan and other programs and projects to enhance safety on Delaware's roadways. The group is also charged with maintaining the Department's crash data analysis program and fulfilling Departmental requests for crash data. The Department's Railroad Coordination Program is also housed under this group.

The **DelDOT Traffic Field Operations, Signal Construction Group (commonly called "Construction" or "Traffic Construction")** is responsible for the installation, construction coordination, inspection, and acceptance of all constructed statewide traffic system devices. Once a traffic project is awarded or handed off, Construction acts as a liaison for the Traffic Section, coordinating construction activity with the Contractor, the Districts, and utility companies through all phases of construction. They also monitor and coordinate all traffic system device construction activity statewide.

The **DelDOT Traffic Field Operations, Signal Maintenance Group (commonly called "Maintenance" or "Traffic Maintenance")** is responsible for the maintenance and upkeep of all existing DelDOT traffic system devices statewide. They also assist Construction and the TMC by performing minor signal upgrades, including upgrades to wiring, signal head replacement, knock-down repairs, and some relatively minor upgrade projects (such as signal head modifications or installation of Accessible Pedestrian Signal (APS) equipment). They also aid in the construction and implementation of special traffic system devices.

The **DelDOT Traffic Safety Group (commonly called "Safety")**, for the purposes of this manual, is responsible for the review and approval of maintenance of traffic (MOT) plans, work zone safety, monitoring of MOT during construction, approval of temporary traffic control sign resolutions, TMP type designation/approval work hour checklist approval, and reviewing/approving detour plans.

The **DelDOT Transportation Management Center (commonly called "TMC"),** is responsible for the operation of all traffic system devices that are owned and maintained by DelDOT. Signal timings, incident management, corridor-level roadway monitoring, and developing signal corridor timing plans are among the many duties of this group. Some TMC staff focus on signal timings, systems monitoring, conveying information to the public, and running the day-to-day operations of the transportation system. Other TMC staff coordinate closely with the OIT communication group on maintaining and expanding the communications systems for traffic systems devices.

The DelDOT **Project Process Group** is comprised of representatives from the Design, Maintenance and Construction Groups, and the TMC, with occasional input from the Studies Group, Safety Group, HSIP, capital project designers and/or private developers. This group's primary role is to review the design plans at the semi-final stage and provide feedback to the traffic design engineer.

DelDOT's Traffic Support Services Group is responsible for coordinating the financial obligations of the DelDOT Traffic Section with DelDOT's Finance Section.

Consultant: DelDOT or a private developer may request the services of an engineering consultant to prepare traffic system design plans. When a consultant renders services, it becomes the responsibility of the consultant to coordinate all data collection and design activities with the Design Group, Project Development, local governments, and utility companies, through the Plans, Specifications and Estimates (PS&E) submission.

Power Company: The power company has the responsibility of providing electrical service to most new or modified traffic system devices. If the source of power is not obvious, or if conflicts are anticipated between existing aerial lines and proposed traffic equipment, coordination with the power company may be needed early in the design process. All traffic control signals should use hardwire power sources. Most ITS devices will also use hardwire power sources. If hardwire power is not readily available, some ITS devices may use solar power. However, the use of solar power requires prior approval from DelDOT's Traffic Systems Design Group.

MISS UTILITY: MISS UTILITY is a private agency and is responsible for coordinating the location of underground utilities on state and local roads. Generally, the Maintenance & Construction Group and/ or the Design Group will contact MISS UTILITY to verify the locations of underground utilities during the design process and prior to construction of the project. DelDOT will also contact MISS UTILITY after a project is completed, identifying the location of all new or modified underground equipment.

Local Governments: Local governments include cities or towns that may have an operational/safety interest, financial interest or obligation, or other responsibilities for a traffic system design project. Coordination with local governments is required since local guidelines and ordinances may apply to traffic system design projects, especially signal projects, even if both intersecting roads are maintained by DelDOT. Local guidelines and ordinances may dictate streetscape elements and the overall appearance of traffic system equipment. Additionally, town agreements may specify which public entity is responsible for which traffic control devices. For traffic systems that will be owned by local governments, design and specification elements of this Manual may be modified to meet local standards/ preferences, provided overall operational and safety parameters are met. For Traffic System Design Section-led projects within municipal limits, the following guidelines should be followed: 1) Notify the town of any/all projects. Depending on the scope, this could range from simple notification to a design review, to a consideration of different alternatives. This should be completed during design. 2) If the project impacts non-DelDOT equipment, a new town agreement is needed. 3) For any new installations within municipalities, a town agreement is needed whether the signal will be DelDOT or municipal-owned.

F. Traffic Design Manual Updates

The information contained in this manual is current at the time of publishing. It is expected that the guidance contained in this document may be updated periodically. Interim guidance may be published by DelDOT and will be made available on DelDOT's website within the Design Resource Center (DRC). Proposed changes to this manual should be suggested using the Traffic Systems Design Directive form found in **Appendix A** and must be approved by DelDOT's Chief of Traffic Engineering.

Chapter II

THE TRAFFIC DESIGN PROCESS

II. THE TRAFFIC DESIGN PROCESS

This chapter of the DelDOT Traffic Design Manual describes the recommended process for performing traffic design, from the initial request through the installation of the device in the field.

A. Request

The traffic design process begins with a request to install or modify a traffic signal or other traffic device at an existing or proposed location. The request should include information regarding how the proposed traffic device would be expected to improve safety and/or operations at an intersection or along a corridor. The requests may come from a variety of sources, and in general, the source of the request determines which project type will be performed.

Requester	**Typical Project Type**
DelDOT Planning, Traffic, Project Development, Bridge Design	Project Type 1 – Capital Projects
DelDOT Pavement Management	Project Type 2 – Pave & Rehab Projects
Elected Officials, Citizen, Traffic Representative, Fire Companies, Studies	Project Type 3 – Traffic Section Projects
Developer	Project Type 4 – Developer / Subdivision Projects

B. Establish Need for Traffic System Design Elements

Once the request is received, the DelDOT Traffic Section must establish the need for the traffic device before the design process can begin. Need is typically established by conducting a study of current conditions and assessing the potential benefits of the traffic device. For example, to establish the need for a new, modified, or removed traffic control signal, a signal study is required (see Chapter IV-A).

Approval from the Chief of Traffic Engineering is required before a project involving a new traffic control signal, modification of a traffic control signal, or the removal of an existing traffic control signal can advance to the design stage. If it is determined that the traffic device is not needed, the findings should be documented and filed in the case history for future reference.

New Signal or Modification to an Existing Signal for Type 1 (Capital Projects), Type 2 (Pave & Rehab Projects), and Type 4 (Developer / Subdivision Projects):

DelDOT's Traffic Systems Design Group (Design) will coordinate a meeting with the DelDOT Project Process Group, including the Project Consultant (if not in-house design) and others with a specific interest in the project. The purpose of the meeting is to discuss communications, facilities, and signal design. Data about the proposed or modified signals should be obtained and provided at the meeting. An agreement will have to be reached on recommendations for the changes, lane assignments, and other elements such as phasing, system detection, integration, etc. Upon concurrence by the Project Process Group that a new signal is justified, a signal resolution will be drafted for signature by the Chief of Traffic Engineering. A signal agreement may also be required in which the Developer and DelDOT will agree on private funding requirements and/or right-of-way access (For additional information on signal agreements, see **Appendix B**). The project will subsequently be "handed off" to the Design Group or to a Consultant to begin the development of base plans.

New Signal or Modification to an Existing Signal for Type 3 (Traffic Section Projects):

DelDOT's Traffic Studies Group (Studies) Design Resource/HSIP Group will conduct a traffic signal warrant analysis or other traffic engineering study of the location, as outlined in Part III of this manual. If a new signal is justified or if modifications to an existing signal are being recommended, the recommending group will meet with the Chief of Traffic Engineering to review the study, if necessary. If approved by the Chief of Traffic Engineering, a resolution will be drafted and signed, authorizing the new signal. Studies will then meet with the DelDOT Project Process Group. The Studies Group will provide copies of the study and other pertinent data for discussion. Agreements will be reached on the recommended change(s) and other required design elements. The project will be subsequently "handed off" to the Design Group so that they can begin the base plan preparation. Additionally, modifications to existing signals may be initiated by DelDOT's Design Group and/or Signal Maintenance Group. These requests are typically associated with routine traffic equipment life cycle replacement and upgrades.

C. Notify DelDOT Community Relations

Once the need for the new or modified traffic signal, traffic control device (all-way stops), or other traffic systems device has been established, the group initiating the signal project should notify DelDOT Community Relations and Chief Legislative Relations along with the area legislators

that need to be notified of the intended design effort of the intent to commence design. Information that should be provided to Community Relations and the Chief Legislative Relations along with the area legislators that need to be notified of the intended design effort includes project location, scope, proposed baseline schedule, and the potential for MOT impacts. Continued coordination between the DelDOT Traffic Section and DelDOT Community Relations and Chief Legislative Relations along with the area legislators that need to be notified of the intended design effort is important throughout the design process, particularly if there are any changes to the project scope or schedule. Prior to design completion, the Traffic Section Representative should inform Community Relations and Chief Legislative Relations along with the area legislators that need to be notified of the intended design effort of the pending improvement, handoff, and anticipated installation or construction. During the construction phase, DelDOT's Construction Group should keep Community Relations and Chief Legislative Relations along with the area legislators that need to be notified of the intended design effort informed of all lane closures, operational changes, and new activations.

D. Design Process Checklist

At this point in the traffic design process, the designer should begin preparing the design checklist. The checklist is a working document that records the completed project tasks and follows the project from the beginning of design through handoff to Construction or Maintenance. A sample signal design checklist form is provided with this Manual in **Appendix J**.

E. Plan Preparation

The next step in the traffic design process is plan preparation. Prior to beginning plan preparation, the Designer should obtain from the Department all existing data on record pertaining to the proposed location. A thorough on-site inventory/assessment should be conducted, at which time construction and operational constraints should be identified. If the project is located near an airport, port facility, or an at-grade rail crossing, additional coordination with the appropriate agencies (FAA, CSX, etc.) will likely be required. If an existing traffic signal is present, the designer should verify the existing equipment and operation of the signal. If any field issues/irregularities are discovered, the designer should report them to the appropriate group or section in the Department. If utility, right-of-way, geometric, or other required information is indeterminable, a survey of the intersection may be required.

Base plans should be developed at 30-scale and include/identify existing and proposed roadway geometrics, utilities, right-of-way, and clear zone/lateral offset, as well as any physical features that could affect the design of the signal. All existing and proposed signal equipment should be

shown, and the proposed phasing, lane use, intersection/system detection, and system communication requirements should be shown and identified. Further details of base plan preparation are presented in Chapter III of this manual.

F. Design Review

Upon completion of the preliminary design, the Designer should continue coordination with DelDOT Traffic Representative, Signal Construction, or Maintenance throughout the design process to evaluate the design progress. At the semi-final milestone, the Designer is required to attend the DelDOT Project Process Group review. The Designer typically will receive minor additional comments based on the level of prior coordination. Under some circumstances and based on the level of comments received, additional meetings may be required with the Designer and DelDOT's Project Process Group to flush out design issues.

Once all parties have reached a final agreement on the traffic design plan, the Designer will finalize the design and sign and seal the plan. For signal design projects, the Designer should concurrently be working to develop the draft timesheet and provide this information to the TMC Operation Manager for development and approval of the final timing sheet. Once the signed timing sheet is obtained, the Designer should provide the Chief of Traffic Engineering with the final (signed and sealed) signal plan(s), TMC-approved Timesheet, and any additional support documents for signature. While some Capital Projects may not have a completed Timesheet ready for signature at the time of PS&E, the process described above is preferred.

G. Cost Estimate

During the design process, the Designer should generate a cost estimate (i.e., a traffic statement) for the required work for the traffic device installation and/or modification. The cost estimate should include all items to be furnished and installed by the contractor and/or DelDOT to make the traffic device fully operational. The cost estimate should also include a contingency factor (usually 10%) and a maintenance fee (5%) for developer projects. The cost estimate should show the breakdown of cost contribution by any developers, local government, and DelDOT, as determined by the project type.

H. Handoff Package

Upon approval of funding or concurrence of the construction schedule, DelDOT's Traffic Systems Design representative will develop the construction handoff package. The representative will fill

out the handoff form and submit it to construction along with the signed signal plan(s), signed timesheet(s) or timesheet status, traffic statement, a brief summary of the project defining the roles, actions, and responsibilities of each party, quotes or any other project-specific information, MOT checklist self-clearance form, draft press release and any additional documentation. For Type 3 projects (Traffic Section Projects), Traffic Construction controls the schedule. Therefore, priority should be designated as “ASAP,” “High,” or “Normal” on the handoff form, as previously agreed upon during the design process. For other project types, priority should be designated as “Support” on the handoff form, and the anticipated construction start date or anticipated FY spend of the project should also be denoted. Projects that will not proceed to construction immediately or within the same FY may not be handed off until the notification of the preconstruction meeting occurs. Upon submission of the traffic statement, the traffic representative should have all documentation within the project folder ready to send construction. A sample handoff form is provided in **Appendix C**.

I. Construction

Once the handoff package is provided by DelDOT’s Traffic Systems Design Group and funding is verified, DelDOT Signal Construction will issue a Notice to Proceed to the selected Signal Contractor to begin work on the project. The Contractor is responsible for coordinating all assigned construction activities with other projects administered by DelDOT Signal Construction. The Contractor is responsible for notifying MISS UTILITY prior to beginning construction. DelDOT Signal Construction will notify the Power Company at least 30 days in advance of a "turn-on" date.

Generally, a traffic signal project requires 30 to 90 calendar days to complete construction upon NTP. For other types of projects such as signal enhancements and capital projects, the construction of signals is treated as an integral part of the total project and, therefore, may require a longer time to complete. The timetable to complete construction of other traffic systems devices varies by device type and scope of the project.

J. Activation

An important time of the traffic design process is the day the device is activated and put into service. For major projects, one representative of each DelDOT Section should attend the field activation. Typically, a new traffic control signal is operated on “flash” for a minimum of 72 hours prior to converting to stop and go operation. Similarly, portable changeable message signs (PCMS) or static signs if field conditions are limited, are used to provide information to motorists about the pending signal activation approximately 1 week prior to signal activation. Prior to

activation, the construction manager should notify DelDOT Community Relations and Office of the Secretary regarding the “turn-on” date. Community Relations and Office of the Secretary will then inform the public of any changes to traffic patterns in the area.

K. As-Built Plans

Once the project is constructed, completed, inspected and accepted by DelDOT Construction and Maintenance, the construction inspector may provide an "as-built" plan. The "as-built" plan will represent any minor field adjustments that may occur. Any major field change that may be required during the construction phase shall be addressed under standard redline plan revision format. The construction manager will submit the red lined “as-built” plan to the designated Traffic Systems design representative. The Designer will be responsible for updating the record drawings. Additional information on the preparation of “as-built” plans is included in Chapter III of this Manual.



Delaware Department of Transportation

TRAFFIC DESIGN MANUAL

2015 EDITION

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Chapter III

PLAN PREPARATION

III. PLAN PREPARATION

This Chapter of the DelDOT Traffic Design Manual discusses the general steps required for preparing plans for any traffic design project. It includes a discussion of the required contract documents and outlines the process for developing preliminary, semi-final, and final design plans. Additional details regarding specific design elements are presented in Chapter IV (Traffic Signals) and Chapter V (ITS Devices).

A. Required Contract Documents

Traffic Design projects may be prepared in one of five formats:

1. Capital Project
2. Traffic-Only Signal Project (individual)
3. Traffic-Only System Improvement Project
4. ITS-Only Project (individual)
5. Developer / Subdivision Project

Capital Projects include the insertion of traffic devices into highway design, planning projects, and/or bridge projects prepared by DelDOT or consultants for formal advertisement. These types of projects, which require formal advertisement and construction of the entire project, must be coordinated closely with DelDOT's Project Manager and the Design Team.

Traffic-Only Signal Projects typically utilize the services of Statewide On-Call Contractors who have already been selected on a competitive bid basis and are readily available to begin work on new projects. Alternately, some small work tasks with low cost for installation or minor maintenance of material (small phasing change or head replacement) may instead be completed by Traffic Signal Maintenance Group or other DelDOT in-house forces.

Traffic-Only System Improvement Projects may require minor roadway geometric improvements together with the installation of new devices or modifications to existing traffic control equipment. Traffic-Only System Improvement Projects may be developed for a specific corridor or as part of a statewide implementation plan.

ITS-Only Projects typically utilize the services of Statewide On-Call Contractors or Integration Vendors who have already been selected on a competitive bid basis and are readily available to begin work on new projects. Alternatively, some small work tasks with low cost for installation or minor maintenance of material (device swaps, equipment upgrades) may instead be completed by Traffic Signal Maintenance Group or other DelDOT in-house forces.

Developer / Subdivision Projects represent traffic control signal designs that are prepared by the developer or consultant representative, as part of the permit approval plan set. The signal documents are reviewed by DelDOT's Traffic Systems Design Group and the Sub-Division Section prior to "Concurrence for Installation" by the Chief of Traffic Engineering. The Developer is responsible for providing or obtaining the necessary right-of-way easements to construct the signal. Additionally, the Developer is responsible for designing all geometric elements of the signal design plans, including islands and curb ramps, utility relocation, and other associated traffic control devices (signs and pavement markings). Under unique situations, the DelDOT Traffic Systems Design Group may be called upon to complete the signal design, if this request is granted and agreed upon (special priority will not be given). The Developer will be responsible for providing DelDOT with digital files for the preparation of design plans. If plans do not meet DelDOT CADD Standards, additional time may be required as part of the design process. Additionally, it is the Developer's responsibility to continue coordination with DelDOT Traffic, informing of any project schedule changes, and design changes, and providing updated design files, as needed.

Table III-1 identifies the PS&E requirements for each of the contract types from the previous page:

Table III-1
Requirements for Plans, Specifications, and Engineer's Estimate

Contract Documents Required	Capital Projects	Traffic-Only Signal Projects	Traffic-Only System Improvement Projects	ITS-Only Projects	Developer / Subdivision Projects
Title Sheet	Yes(6)	No	Yes	No(5)	Yes
Signal Plan / ITS Device Plan (1)	Yes	Yes	Yes	Yes	Yes
Signing, Striping, and Conduit (SSC) Plan (1) (2)	Yes	No(4)	No(4)	No	Yes
Specifications	Yes	No(3)	No(3)	No(3)	Yes
Traffic Statement / Cost Estimate	Yes	Yes	Yes	Yes	Yes

NOTES:

(1) Signing and marking are typically shown on the signal plan, but may be detailed

separately.

(2) All Traffic Control devices should be integrated in to the State's ITMS Program. Communication plans may be required.

(3) Specifications will need to be written for non-standard items.

(4) While not required, a separate SSC plan may be needed for clarity.

(5) May be needed based on the magnitude of the project.

(6) An overall title sheet is required for the Capital Project. Typically, a separate title sheet for the traffic elements is not required.

1. Title Sheet

A title sheet may be required for some traffic control projects that are part of a proposed system-wide upgrade or as part of a DelDOT Traffic project that is formally advertised. The title sheet shall conform to the latest DelDOT CADD Standards found within the "Design Resource Center" CADD section on the Delaware Department of Transportation website. Typical title sheet elements will identify the project location and limits of work on a location map. The DelDOT contract number and/or Federal-aid contract numbers (as applicable) and project location and project name shall be shown on the top center of the title sheet. The title sheet shall also include a signature block and PE Seal for the responsible lead Designer or Consultant with a signature block for "Concurrence of Installation" for the Chief of Traffic Engineering or Designated Design Manager. If a title sheet is used, an additional signature block may not be required on subsequent individual sheets (unless requested by the Traffic Systems Design Manager). A sample traffic title sheet is included in this Manual in **Appendix D**.

2. Plan Sheet

The major objective of the design plan sheet is to graphically describe how the device is to be constructed and operated. This includes showing the existing and proposed geometrics, the location of all equipment and other pertinent information.

When preparing a traffic control plan, the north arrow should be in the upper right corner of the plan and should generally be oriented above the horizontal axis. The major route should typically be oriented from left to right. However, for Capital and Developer Projects, the orientation should follow the roadway plan set conventions to maintain consistency within the plan set. The Designer should confirm the mainline and side street are the official 911 street names through the Statewide Administrator and/or listed websites in **Appendix P**. Standard signal borders shall be used for signal plans. Depending on signature requirements,

a modified signal or standard construction border may be used for other traffic control devices. The Designer should check with the Systems Design Manager on border requirements during the early stages of plan development.

Signal design border shall include:

- Standard legend
- Signal phasing
- Signal head diagram
- General signal notes
- Project title
- Location
- Permit number
- Contract number
- County location
- Scale
- Addendum/revision block
- Signature blocks
- Other traffic control device design borders shall include:
- Required design specific elements
- General project notes
- Project title
- Location
- Contract number
- County location
- Scale
- Addendum/revision block
- Signature block and permit number as needed

Generally, plan sheet layouts should be as follows: Project-specific and MOT notes should be shown in the top left corner of the plan. The conduit run schedule should be placed in the lower left corner. Notes pertaining to the conduit run schedule should be placed below the schedule. Unless space limitations require an exception, all existing and proposed site-specific signs should be shown in the lower right portion of the plan. Project-specific details and other schedules should be shown where space allows or on a separate sheet. Plan sheet clutter should be avoided to provide a clear and concise design. Fonts, symbols, title blocks, and borders should be in accordance with DelDOT's latest CADD standards. These standards can be found within the "Design Resource Center" CADD section on the Delaware Department of Transportation website.

For minor traffic control modifications, such as head changes, phase changes, or minor pedestrian modifications, a redline plan may be developed upon approval by the System Design Manager. The plan should represent the latest as-built condition and contain any previous revision(s), with the standard revision signature block. The revision block should also include a brief description of the proposed revision along with the date and initials of the Designer. Larger-scale modifications, or where an adequate as-built is not available the development of a new plan sheet shall be required.

Labeling of equipment should follow the following uniformity: mainline vehicular signal heads are numbered first followed by side street signal heads. Signal heads should be numbered by phase from left to right facing each approach. If there are both near-side and far-side signal heads, near-side signal heads are numbered first. Pedestrian signal heads will be numbered next using the same numbering sequence as described above. For retrofits or signal modifications, vehicular and pedestrian indications shall be numbered in accordance with the established sequence of operation chart.

Poles, mast arms, and signs should be numbered with mainline structures being first. If the mainline runs in a north-south direction, structures facing northbound traffic are numbered first followed by southbound. If the mainline runs east-west, eastbound traffic will be numbered first followed by westbound. Poles, mast arms, and signs should be numbered from left to right facing each approach. Side street structures are then numbered using the same northbound, and eastbound rules.

Conduit numbering should follow a linear sequence and begin with CO#1 at the utility service point to meter utilizing CO#1, 1A, 1B… and continuing until reaching the controller cabinet or device tie-in. From the cabinet, the numbering should continue to the lead-in junction well beginning with CO#2, then branching in linear sequences as much as possible.

Sample title sheets (**Appendix D**) and plan sheets (**Appendix E**), including ITS device sheets (**Appendix T** through **Appendix Y**), are provided in the appendices of this Manual.

3. Specifications

Standard Specifications, Special Provisions, and Standard Construction Details for traffic projects have generally been established and standardized by DelDOT and can be found in DelDOT's Design Resource Center. Unless a unique or non-standard item is required, there should be no need to provide any additional specifications (i.e., special provisions). However, on a case-by-case basis, there may be a need to include an additional drawing or details for site-specific geometric and/or construction requirements. It should be noted, however, that non-standard specification usage should generally be avoided, to the extent possible.

4. Traffic Statement (Cost Estimate)

The development of a Traffic Statement, (Traffic established cost estimate), is required for all traffic design projects.

Traffic construction items, supplied, provided, and installed for all traffic control-related items, are broken down into three different categories and vary by project type:

- Project Contractor Items (Capital and Developer/Subdivision projects only)
- Traffic Contractor Items (all)
- Traffic Supply Items (all)

Project Contractor Items (Capital and Developer/Subdivision Projects only)

DelDOT has determined that based on the contracting method, construction schedule, project magnitude, current Traffic Construction workload, and coordination issues, some or all traffic construction items may become the General Contractor's responsibility for Capital and Developer/Subdivision Projects. It shall be determined what the Project Contractor's responsibilities are related to traffic construction items to be supplied, provided, and installed during project initiation. Project Contractor items' unit cost will be determined by the project designer and be based on historical item prices for similar projects for Engineer estimate purposes. These items will become General Contractor bid items for Capital and Developer/Subdivision Projects.

Traffic Contractor Items (All)

These items cover provide, supply, and installation of items by the Traffic Section's Statewide Signal Contractor, as well as the installation of items provided by DelDOT Traffic Signal

Construction that are installed by Statewide Signal Contractor or by DelDOT's Traffic Signal Construction and/or Maintenance Groups. Under unique situations involving Developer Projects, underground installation or other off-site improvements may become the Traffic Section Statewide contractor's responsibilities. This usually is requested by the Developer and shall be defined early in the design process to allow for adequate construction coordination and timing.

Traffic Supply Items (All)

These items account for all items supplied by the Traffic Section to the Statewide Signal Contractor or Project Contractor for installation. These also cover the cost of integration of all equipment into DelDOT's Integrated Transportation Management System (ITMS).

The Traffic Statement shall show the unit and total cost of each item separately, as well as a combined total project cost. The Traffic Statement shall use item numbers and unit costs provided by Traffic for all Traffic Contractor and Supply items. It may be required that a unique bid item not generally covered under the Traffic Open-End contract is needed. It is encouraged to find a comparable bid item to facilitate payment. If one cannot be established, the designer shall work with the Signal Construction Manager to obtain a negotiated price "NIB" with DelDOT On-Call signal contractor(s). Additionally, if non-standard equipment is proposed, it should be assumed a 15% markup may be incurred by the Department. Non-standard items and equipment should only be used upon approval of the Traffic System Design Manager or Chief of Traffic Engineering.

B. Preparation of Design Plans

One of the most fundamental tasks in the traffic design process is the preparation of design plans. Traffic design plans provide the blueprint for all traffic elements installed in the field, and the information provided on the plans must be clear, thorough, and accurate. The preparation of design plans consists of the following activities:

- Collecting preliminary data. This involves researching the existing plan records and gathering items related to the study location, including as-built plans, right-of-way plats, deed research, highway design plans, utility design plans, historical soil borings, timesheets for existing signals, and confirmation of official street names.
- Developing base plans and performing a field survey verification, including verification of existing geometrics, signal timings, above and underground utilities, and other roadway features.
- Preparing preliminary, semifinal, and final design plans and related documents, as necessary, for approval.

- Obtaining concurrence signatures of the final design plans to allow the design to move to the construction phase, activation, and ultimately the operational hand-off of the traffic device.

This chapter of the DelDOT Traffic Design Manual includes a discussion of each of the activities required during the design plan preparation process.

1. Collect Preliminary Data

The first step involved in the preparation of design plans is to collect available preliminary data for the study location. The Traffic Designer should begin by collecting all pertinent data that would help in the development of the base plan. This includes researching DelDOT records for as-built traffic plans, highway design plans, right-of-way plats, official street names, and utility plans. Gathering these items will help provide the Designer a history of the location and assist in the development of base plans. Some of this information may have already been gathered if the project is part of a Capital Project or Developer/Subdivision Project. It is the responsibility of the Traffic Designer to obtain and review these documents prior to any plan development.

For projects initiated by the Traffic Studies or DelDOT Traffic Design Resource/HSIP Group or as part of a Traffic Impact Study agreement with a Developer, additional information related to the study location may also be available. The Designer should coordinate with the applicable Section, as appropriate, to obtain additional background information on the study intersection, such as traffic count data, existing signal timings (timesheet), and recommendations on the proposed lane arrangements and proposed signal operations. This information is often available in the Traffic Signal Study. Chapter IV-A of this Manual provides additional information regarding the data contained in a Traffic Signal Study.

2. Prepare Base Plans

After the Designer has collected all preliminary data, the next step in the process is the development of base plans. A base plan should contain all existing roadway geometrics, as well as the locations of any traffic control devices, signs, markings, lighting, and utilities. An itemized list of the typical base plan features is shown in **Table III-2**.

Table III-2
Typical Traffic Base Plan Features

Roadway Geometrics
• Alignment of intersecting streets • Widths and number of lanes • Physical features (curb and gutter, sidewalks, medians, shoulders, drainage structures, guardrail) • Street lighting • Corner radii • Utility locations including overhead height and underground • Roadway entrances within 150 feet of the intersection • Right-of-way • Clear Zone/Lateral Offset • Any existing sight-distance obstructions • Any railroads or emergency entrances in the vicinity • Building lines, fences, trees, shrubs
Traffic Control Features
• Lane usage and scaled dimensions • Parking restrictions • Location and message of existing signs • Locations and operation of existing traffic signal devices • Location of additional traffic control devices • Existing speed limits • Existing pavement markings • One-way streets • Bus stops and loading zones • Turn restrictions

On a case-by-case basis, a topographical survey may be needed to define geometric improvements such as intersection channelization. When required, a planimetric plan with spot elevations shall be provided as the basis of the base plan.

The Designer shall follow DelDOT's CADD Standards when preparing the base plan sheet. All standard items required in the development of the base plan, including the title block, cell library, seed files, fonts, line styles, and borders, may be obtained from the "Design Resource Center" CADD section on the Delaware Department of Transportation website. All base plans shall be prepared to utilize the current version of MicroStation at a scale of 1 inch = 30 feet. The designer may request an alternate scale drawing based on design requirements upon

approval by the Traffic System Design Engineer. If details are provided with the base plans, the details should be drawn at a defined engineering scale.

3. Perform Field Survey

Before proceeding too far along in the design process, it is important for the Designer to verify that the items contained on the base plan match existing field conditions. This is typically accomplished by performing a field survey. A field survey generally includes either a tape-and-wheel survey at an intersection or field verification of surveyed data. The limits of the survey are usually determined by the device type. For projects involving new or modified signals, the limits on each approach should be chosen to include the length of all existing and proposed turn lanes, all potential advance signing locations, and all possible locations for the placement of detectors. During this survey, the following information should be collected or verified:

- Number of lanes and lane widths for each approach
- Intersection skew
- Medians and type
- Roadway curvature
- Approach grades
- Pavement markings
- Signing
- Number and sizes of conduit and cables/wires for existing traffic signals
- Signal Timing and Phasing
- Lighting
- Sidewalks and curb ramps
- Guardrail
- Driveways and entrances
- Utilities, including proposed electrical feed
- Parking
- Buildings
- Trees and vegetation
- MISS UTILITY (Underground)
- Bus stops

Preliminary device locations and potential power sources should also be identified during the field survey. Overhead utility lines should be measured and documented with photographs. By measuring utility lines at the proposed device location in the field, the Designer can ensure that the locations do not conflict with overhead utility lines and other physical features. Documentation of these measurements can also help resolve future utility disputes, should

the height or location of utility lines change prior to device installation. The Designer should tabulate the locations and clearances of all overhead utilities on the plans where a potential conflict could occur. For locations with existing traffic control signals, the Designer should check that the signal timing and phasing described on the timesheet match both the plan sheet and the actual operations in the field. This requires that the cabinet be opened during the field survey, which must be performed or supervised by DelDOT Traffic staff.

4. Preliminary Design Plans

a. Development

Once the initial field survey is completed, the next step for the Designer is to prepare preliminary design plans. The preliminary design plans should identify the following design elements:

- Proposed device location
- Cabinet location
- Conduit and junction well location and schedule
- Power feed (including pole number)
- Existing and proposed signing and marking improvements
- Communication integration
- Utility clearances
- Clear Zone/Lateral Offset
- Right-of-way
- Official street names found through the Statewide Administrator and/or websites listed in **Appendix P**.

For signal projects, the following additional design elements should also be included in the preliminary design plans:

- Pole type and configuration
- Signal head placement and display
- Signal NEMA Phasing
- Detector configuration
- Signal operation requirements
- Pedestrian facilities

It should be noted that this list is not meant to be exhaustive. Depending on the specific needs of the project, additional design elements may be included in the preliminary design plans, and any unique design elements should be identified at this stage of the

process. Any design constraints or special project requirements should also be denoted in the preliminary design plan to help in the plan review process. Prior to or in conjunction with project process for Traffic lead projects, the designer should look to submit plans for environmental approval and stormwater certification along with a request for soil borings, if needed. For additional detail regarding preliminary design plan elements, refer to Chapter IV-C of this Manual.

b. Review

As part of Traffic lead projects, once the proposed layout for the design elements listed in the previous section has been established, the preliminary design plan review can take place. It is recommended the Designer include as many final design elements as possible under the preliminary design plan submission. The more elements are included, the more accurate the resulting initial traffic statement (engineer's estimate). The preliminary design plan review allows members of the Project Process Group to provide input on the design and ensure quality control.

During the preliminary project process review additional recommendation and/or approval of preliminary design elements will be given. Discussion with Traffic Safety should occur to confirm lane restriction hours per P.I. Number C-09 (Planned Lane Restriction and Road Closure Policy), needed standard or special MOT cases typical applications, TMP determination, and any pedestrian or unique MOT consideration. Additionally, a discussion with the TMC should occur to confirm operational and communication requirements. At this time, the design will move forward to the appropriate stage of submission.

If the proposed preliminary design is part of a Capital Project or Developer/Subdivision Project, it is the assigned Traffic Systems Design representative's responsibility to verify that the plans meet the preliminary plan design requirements as outlined above. During the preliminary plan review, additional recommendations and/or approval of preliminary design elements should be given, at which time the design will move forward to the appropriate stage as outlined by the Project Manager. In certain cases, a review of the preliminary plans may not be needed at this stage and only require coordination with representatives from the TMC and Communication Sections.

Some Traffic lead projects that are relatively small in scale with minimal impacts may forgo the preliminary plan submission upon approval by DelDOT's Traffic Systems Design Manager.

5. Semi-Final Design Plans

For Capital Projects and Developer/Subdivision Projects, the traffic design should follow the plan submission schedule outlined by the Project Manager. In many cases, this requires a semi-final plan submission. Traffic Section Projects generally skip the preliminary phase and proceed to the preparation of final plans following the semi-final plan review.

a. Development

If semi-final design plans are required as part of a Traffic lead project, the Designer should address all comments received from the Project Process Group as part of the overall preliminary plan review before submitting semi-final design plans. If conflicting comments are received, the Designer should work with the representatives who provided comments to determine an appropriate path forward to resolve the discrepancy.

If the semi-final design is part of a Capital Project or Developer/Subdivision Project, the Designer should coordinate with the designated Traffic Systems Design representative to attend a meeting with the Project Process Group prior to semi-final plan submission providing adequate time to address any comments received. The Designer should have addressed all comments received during the preliminary phase. If conflicting comments were received from other support sections, discussions on an appropriate path forward to resolve the discrepancy should have been completed. The Designer should look to include as many final design elements as possible under the semi-final design stage. The more elements included, the more accurate the resulting initial traffic statement (engineer's estimate) will be.

b. Initial Traffic Statement (Cost Estimate)

Once the Designer has addressed all comments and identified the additional design elements to be included in the semi-final design plans, the next step in the process is to prepare the initial traffic statement (see Chapter III-A). The traffic statement identifies the funding method to be used for the project and includes the engineer's estimate of anticipated project costs. Quantity takeoff should be performed following current DelDOT specifications (see Chapter III-A). The Designer should verify that the correct Traffic Statement is being utilized to ensure that up-to-date unit cost and contingencies are applied. The Designer should also coordinate with the Traffic Systems Design representative to determine which items will be considered the contractor's responsibility and which will be the responsibility of DelDOT's Construction Group. This will affect the portion of the total cost for which DelDOT will be responsible.

c. Review

After the semi-final plans have been distributed, the Designer and DelDOT System Design representative shall again coordinate to discuss any project-specific issues that were not addressed or other project changes that may impact the design requirements. If an additional meeting with the Project Process Group is required, one will be scheduled. Following this meeting, additional recommendations may be provided or approval of the semi-final design will be given and the design will move to the final phase of design.

d. 90% Plan Submission

For some projects, the submission schedule developed by the Project Manager will require a "90%" submittal of plans for review, or there may be comments received during the semi-final plan review that necessitate a "90%" submittal. However, in most cases, the DelDOT Traffic Section prefers that the 90% plan submission should be avoided, if possible because it can disrupt the project schedule. In most cases, issues can be addressed during other submittals.

6. Final (PS&E) Design Plans

For Traffic Section Projects, the preparation of final design plans typically follows the preliminary design review. For Capital Projects and Developer/Subdivision Projects, the preparation of final design plans typically follows the semi-final design review. The steps required for preparing final design plans, often referred to as plans, specifications, and estimates (PS&E), are presented in this chapter.

a. Development

During the final design plan stage, the Designer should have addressed all comments received from the Project Process Group throughout the design process and finalized all remaining design elements. All conflicting comments received should have an appropriate path forward to resolve the discrepancy.

Once all comments have been addressed, the following remaining design elements should be finalized for inclusion in the final design plans:

- NEMA phasing (for signal projects)
- Detectors (for signal projects)
- Any required schedules (conduit run, mast arm, span, signing, etc.)
- Construction notes
- Draft Timesheet

Additional design elements that have been identified throughout the design process should also be included in the final design plans. Any design constraints or special project requirements should also be denoted in the final design plans to help in the construction process. For additional detail regarding final design plan elements, refer to Chapter IV-D of this Manual.

b. Final Traffic Statement (Cost Estimate)

Once the Designer has sufficiently addressed all comments and identified the additional final design elements to be included in the final design plans, the next step in the process is to prepare the final traffic statement. As discussed in Chapter III-B.5.b, the traffic statement identifies the funding method to be used for the project and includes the engineer's estimate of anticipated project costs. The final traffic statement should reflect all revisions made during the development of the Final Design plans and include costs for every design element shown in the Final Design plans. An example of a Final Traffic Statement is provided in **Appendix F**.

c. Obtain Signatures

Following completion of the final design plans and final cost estimate, it is necessary for the Designer to obtain signatures to get final approval of the plans. The following steps are required:

1. If the design plans are prepared by a Consultant (for a Developer/Subdivision Project, for example), the consultant should sign and seal the plans and turn them in to DelDOT's Traffic Section along with all supporting documentation including the draft timesheet for review. Following the review, the DelDOT Traffic Systems Design representative should consult with the Traffic Systems Design Manager on the concurrence of design and time sheet.
2. If the design plans are prepared in-house by DelDOT staff (for Traffic Section Projects and Capital Projects, for example), the Traffic Designer should provide the final plan and all supporting documents, including the draft timesheet to the Project Manager or Traffic Systems Design Manager. If acceptable, the Project Manager or Systems Design Manager signs and seals the plans.
3. Upon design concurrence, the draft time sheet should be.

   submitted to the TMC for timesheet approval by the TMC Operations Manager.
4. In the final step, the plans and approved timesheet are sent to DelDOT's Chief of Traffic Engineering for the "Concurrence for Installation" approval signature. In

unique cases, primarily for Capital Projects, the traffic design plans may be signed for "Concurrence for Installation" by DelDOT's Chief of Traffic Engineering while the timesheet is finalized. This is to allow for the signed version of the plan to be included in the PS&E bid package; however, it is the Designer's responsibility to have all documents submitted and approved prior to PS&E.

d. Construction Handoff

Once the Designer obtains the "Concurrence for Installation" signature for the plan sheet(s), they are responsible for completing the construction handoff package. A formal construction hand-off package is required for all Traffic Section Projects. For other project types, the construction hand-off typically occurs after the award and prior to the preconstruction meeting. The hand-off package, and email distribution list are provided in **Appendix C**, and should contain the following items:

- Traffic Systems Design Handoff Form
- Copy of signed plan(s)
- Traffic Statement
- Self-Clearance Letter (Traffic-lead Federal only)
- Funding Source
- Signed Timesheet
- Area legislators to be coordinated with
- Intersection Planning Sheet for APS
- Environmental approval
- Work Hour Restriction Checklist
- Any special MOT requirements
- Any additional construction requirements (signing, marking, and/or lighting)
- Any special construction requirements
- Quotes or special items
- Any agreements
- Press Release
- Any Community Relations and Legislative Relations notification requirements

Once all required documents and coordination have been completed, the Designer shall submit all related documents to all applicable Traffic System Design Handoff designees and address correspondence to all recipients. For Traffic-only projects, an additional section should be added to the body of the email for Legislative Relations where the press release text is shown along with the area legislators that need to be notified of the pending effort.

Once the construction handoff document is received, DelDOT's Construction Manager will place the project on the statewide on-call contractor's construction schedule. If the project is part of a Capital Project or Developer/Subdivision Project, the Traffic Construction Manager will place it on the schedule and coordinate with the appropriate construction inspection staff on the proposed construction schedule. If required, the procurement of any lead time items shall begin. Once construction begins, if any design changes are required, the Traffic Construction Manager will coordinate with the Designer and/or Construction Inspector to verify that a sound construction alternative is chosen. During the construction process, if minor construction changes occur, DelDOT's Traffic Construction Manager will provide DelDOT's Traffic Systems Design Section with an as-built plan showing all plan adjustments or changes. Except on Capital Projects, the Traffic Systems Design Section will be responsible for revising the approved design plans to reflect all construction changes. Therefore, the Designer shall submit to the Traffic Systems Design representative all CADD files for file retention purposes.

Prior to completion of device construction, the Construction Manager should notify DelDOT's Community Relations office informing them of a pending new device activation and/or traffic operation change. Prior to the completion of work in which a signal operational change and/or new traffic pattern is to occur, a message board should be installed on all approaches prior to implementation. For new signal activation, a message board should be installed on all approaches seven (7) days prior to implementation and a minimum 72-hour flash operation shall occur prior to full signal activation. Message board locations will be determined by the Traffic Safety Officer based on field conditions and project needs. All boards should remain in place seven (7) days after activation. For new signal projects and projects involving major phase changes to a signal, representatives from the following DelDOT Sections should be present at the field meeting to activate the device: Design, Construction, Maintenance, and the TMC. A representative from DelDOT's Traffic Studies Section should also visit the site within 24 hours of activation to verify that all traffic control devices are in-place and functioning properly.

Delaware Department of Transportation

TRAFFIC DESIGN MANUAL

2015 EDITION

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Chapter IV

TRAFFIC SIGNALS

IV. TRAFFIC SIGNALS

A. Traffic Signal Justification Study

Prior to initiating the design for the installation, modification, or removal of a traffic signal, it is necessary to conduct an engineering study to establish its purpose and need. The purpose of the study is to evaluate all intersection configurations (with major consideration given to roundabouts), the applicability of a traffic control signal for a given location, evaluate less-restrictive intersection treatments, define the operational requirements for the intersection, and identify key features/ constraints which will influence the design of the selected treatment. This chapter of the Traffic Design Manual defines the required elements of a Traffic Signal Justification Study. A sample study is included as part of this Manual in **Appendix G**.

The process and requirements for a signal modification study may be reduced from that of a new signal study. However, at a minimum, data related to the existing signal should be collected, recent traffic count data should be used, and capacity analysis should be performed. Other studies and data may also be required for a signal modification project on a case-by-case basis depending on the scope of the project, the project budget, and the project schedule.

1. Study Initiation

A Traffic Signal Justification Study is often initiated by DelDOT's Traffic Studies Group following a request for signalization. The request may be from a citizen, elected official, or developer, either due to a desire for signalization or as a requirement associated with the approval of a traffic impact study (TIS). For proposed signals associated with Capital Projects, DelDOT's Project Development Group will typically coordinate with DelDOT's Studies Group or on-site consultants to initiate the study. For proposed signals requested by a developer, the developer is responsible for developing a traffic impact study (TIS) or traffic operational analysis (TOA) according to the guidelines in the Development Coordination Manual, pending review from the DelDOT Studies Group.

2. Traffic Data Collection

Once a Traffic Signal Justification Study has been initiated, the first step is to gather relevant traffic data. An accurate Traffic Signal Justification Study depends on the quality of the traffic data collected, and a thorough understanding of the existing conditions of the intersection. At a minimum, intersection turning movement counts must be collected or obtained, historical crash data should be obtained, a site visit should be conducted, and sight distances should be documented. Additionally, delay studies, queuing studies, spot speed studies, and gap studies may also be required, depending on the specific characteristics of the

intersection. Prior to in-field data collection, the "State of Delaware Highway Right-of-way Use Agreement for Temporary Data Collection Devices" form should be completed by the engineer of record to allow for the deployment of data collection devices. Prior to installation in the field, the engineer shall notify the TMC of the device type and location.

An initial **Site Visit** should be conducted at the study location. The site visit should identify lane configurations, important roadway features, signing, lighting, utilities, pedestrian features, transit stops, adjacent signalized intersections, and information on the surrounding land uses. The site visit should also include written observations of traffic flow during peak and off-peak periods to gain a thorough understanding of the operational characteristics of the intersection and to identify potential safety hazards. Photographs and sketches of the intersection may be useful in documenting the findings of the site visit. During the site visit, **Intersection Sight Distance (ISD)** should be determined. Guidance on calculating intersection sight distance is provided in the AASHTO reference A Policy on Geometric Design of Highways and Streets.

For signal modification projects, existing signal timing and phasing data should also be collected during the site visit. To account for variability in cycle length and phase duration associated with actuated control, multiple signal cycles (typically between 5 and 10) should be observed in the field and compared to timing data obtained from the TMC.

Intersection Turning Movement Counts are a type of directional traffic count typically performed at roadway intersections. These counts quantify the volume of traffic for each movement through the intersection. These counts are typically conducted manually. Since data throughout the day is required to conduct a signal warrant analysis, 12- or 13-hour counts would be ideal. However, in most cases, an 8-hour count covering the morning, mid-day, and evening peak hours are acceptable. For long-term planning projects, counts collected during the AM and PM peak periods (a minimum of two hours of data during each peak period) may be sufficient, since off-peak trip generation is typically not performed. The volume of pedestrians and bicycles crossing each leg of the intersection should be collected during all intersection turning movement counts, even for locations without marked crosswalks. Counts should be conducted for signal modification projects, as well as new signal projects.

There are several other types of traffic volume counts that may also be useful in preparing a Traffic Signal Justification Study. **Total Volume Counts** tabulate the number of vehicles passing a single point along the roadway. These counts can either be bi-directional (total volume in both directions) or directional (total volume in one direction). These counts can be used to estimate Average Daily Traffic (ADT) volumes on each of the intersection approach

legs, and they can also provide useful information regarding the variation in traffic throughout the day. **Classification Counts** identify the number and type of vehicles (passenger cars, buses, single-unit trucks, tractor-trailers) using the roadway network. Classification Counts should be conducted if truck traffic is cited as one of the key contributing factors for the need for signalization, or if trucks represent a significant portion of the traffic at any of the key movements at the intersection. Total Volume Counts and Classification Counts are typically conducted using automatic traffic count devices (typically consisting of pneumatic tubes stretched across the road) and are typically collected for a minimum of 24 to 48 hours.

It is advisable to check for any available traffic data before performing new counts. In general, traffic data should be 2 years old or newer when used in Traffic Signal Justification Studies. All project-specific traffic data should be compared with information provided in DelDOT's Traffic Summary Report to verify the reasonableness of the data. Comparisons should be made with peak hour and/or daily traffic data, as appropriate.

Historical **Crash data** for the intersection for the most recent 3-year period available should be obtained. The crash data should be summarized and evaluated to identify crashes of types that are susceptible to correction by the installation of a traffic control signal or other alternative intersection treatment. Obtaining the individual police reports, in addition to the summary statistics, may provide a better understanding of crash trends.

Crash summaries for applicable projects can be requested through the Statistical Information Supervisor, however, access to individual crash reports is restricted to DelDOT personnel and their contracted consultants and requires the successful completion of a background check performed by the Delaware Department of Safety and Homeland Security. Contact the HSIP Manager or the Statistical Information Supervisor for more information.

There are several other types of traffic engineering studies that may be useful when preparing a Traffic Signal Justification Study depending on the site-specific characteristics of the study intersection. An **Intersection Delay Study** is used to quantify the amount of delay experienced by vehicles stopped at an intersection. A delay study can be used to calibrate intersection analysis software or to determine if an intersection approach meets specific signal warrant thresholds. While typically used to assess the delay of vehicles stopped on the minor street approaches to an intersection, Intersection Delay Studies can also be used to study the delay of left turns from a major street. A **Spot Speed Study** measures the travel speeds of vehicles at a specific location. A speed study may be used to determine 85th-percentile speeds for application in signal warrant analyses, for setting speed limits, and for setting appropriate clearance intervals in signal timing plans. A **Gap Study** is used to measure

the number and duration of available gaps in a traffic stream. A gap is the measurement of time between when the rear bumper of one vehicle and the front bumper of another vehicle pass a given location. Gap studies are useful for evaluating the need for a pedestrian signal and selecting appropriate left-turn phasing at a traffic control signal. Gap Studies may also be used to validate the assumptions used during the capacity analysis of the intersection. **Queuing Studies** are performed to determine the 95th percentile length and duration of queues for an entire approach to an intersection, or within a specific lane. Any spillback into nearby intersections, access points, rail crossings should be noted.

Additional guidance on how to conduct these types of traffic engineering studies can be found in ITE's Manual of Traffic Engineering Studies.

3. Signal Warrant Analysis

A key component of a Traffic Signal Justification Study is a Traffic Signal Warrant Analysis. Chapter 4C of the Delaware Manual on Uniform Traffic Control Devices (DE MUTCD) identifies nine (9) warrants which should be evaluated to determine if the installation of a traffic control signal may be justified at a given location. An additional evaluation based on "IA-19.3-Alternative Signal Warrant 7, Crash Experience – Delaware DOT Statewide" should also be performed.

a. Applicability

For analyses of existing conditions, at minimum, Warrants 1, 2, 3, and 7 should be examined. Actual traffic counts shall be used for determination of hours meeting a warrant's criteria. No average hourly volumes between two counted hours are acceptable for a final determination. For the analysis of future conditions or a projected opening day for proposed developments, at minimum, Warrants 2 and 3 should be examined. Projected future traffic volumes may be calculated using land use and trip generation data.

Warrants 1 and 2 contain criteria based on the major-street speed. If the major-street speed is possibly applicable, a spot speed study should be completed if the posted speed limit is 35 mph or 40 mph.

Satisfaction of Warrant 3 alone is typically only considered justification for a signal in special cases (the unusual nature of which must be documented). However, it should be examined in all cases. Special cases that match Warrant 3 are:

1. **Office Complexes,**
2. **Manufacturing Plants,**

3. **Industrial Complexes,**
4. **Schools** (high schools that have significant numbers of student drivers and any school with a significant number of parent drivers in carpools), or
5. **High-Occupancy Vehicle (HOV) facilities that attract or discharge large numbers of vehicles over a short time.**

Signals installed based solely on Warrant 3 must be operated under actuated control to detect the presence of vehicles on the minor side-street approaches, particularly during off-peak hours.

Warrants 1, 2, and 7 may use the higher major-street left turn volume as the minor approach and the opposing major-street through volume as the major-street volume.

The *Guidance* in Section 4C.01 of the DE MUTCD should be followed. This section also explains the inclusion or exclusion of turn lanes when determining the number of approach lanes to an intersection in a warrant analysis (see Section 4C.01, paragraphs 08, 09, and 10). Generally, if the lane configuration is such that right-turning traffic experiences relatively low amounts of delay, either due to ample gaps in traffic on the major street, or relatively few occasions when they are blocked from proceeding by through or left-turning vehicles, they should not be included in the analysis. If right-turn volumes are included in the minor street approach volume, a supplemental right-turn volume analysis should be conducted based on the methodology, including Figure 2-11, provided in *NCHRP 457, Evaluating Intersection Improvements: An Engineering Study Guide.* That document provides a quantitative means of estimating the volume of right-turning traffic that would not benefit from the provision of a signal. A supplemental analysis utilized by Alabama DOT based on the Pagones Theorem can also be applied to estimate the volume of right-turning traffic that would not benefit from the provision of a signal. Additional information regarding Alabama's methodology for right-turn volume adjustments can be found in the Alabama Department of Transportation's Traffic Signal Design Guide & Timing Manual.

All signals installed by DelDOT should be operational 24 hours per day, even at schools and churches. Special circumstances may justify a partial or time-of-day signal operation but, should only be deployed upon approval by the Chief of Traffic Engineering.

It is important to note that the satisfaction of a traffic control signal warrant or warrants shall not in itself require the installation of a traffic control signal. There are alternatives to traffic control signals that could be implemented that modify the traffic operations and user needs that initially warranted consideration of a traffic control signal. Also, the location of the potential traffic control signal should be evaluated in relation to spacing

with adjacent signals, where it falls in relation to overall planning of future signal locations or access management plans, and what impacts a traffic control signal will have on traffic progression in a coordinated traffic control signal system.

b. Timetable

The timetable for implementation of a traffic control signal that meets warrants and has been approved by the Traffic Section typically differs for each of the different project types. For Capital Projects (project type 1), the implementation of the traffic control signal may occur concurrently with the construction of the major roadway improvement. Alternatively, the intersection may be designed for future signalization but initially be opened to traffic under some form of stop control. Both opening day and design year projections should be analyzed.

Pavement and Rehabilitation Projects (project type 2) are generally not associated with new traffic signals. For Traffic Section Projects (project type 3), the results of the signal warrant analyses are generally applicable to existing conditions. Therefore, the design and construction of the traffic control signal can commence once the signal is approved by the Chief of Engineering and funding is secured for Traffic Section Projects.

The timetable for implementation of a traffic control signal for Developer / Subdivision Projects (project type 4) is more complex, particularly for developments with a phased build-out. The Traffic Impact Studies prepared by the Developer typically evaluate traffic operations for existing conditions and future build-out conditions. Therefore, the signal warrant results often do not reflect near-term conditions, but rather operations at some future year, when the entire development is constructed and fully occupied.

DelDOT will not install a traffic control signal on an existing roadway based on presumed future conditions. If a developer is requesting that a traffic control signal be installed at the year of opening of the development or at an interim phase of development, a signal warrant analysis should be provided to DelDOT for the expected traffic conditions at the time of opening. Committed (background) development trips should not be included in the opening-day traffic projections unless solid evidence can be provided that the committed development is likely to be in full operation for the opening-day time period.

If a location will not meet one or more of the DE MUTCD warrants until subsequent years after additional development occurs, a signal warrant analysis should be provided for the year in which the warrants are first met. In this case, there are several options that can be negotiated between DelDOT and the Developer for the treatment of the intersection before full signalization is justified. These options include 1) installing only the

underground utilities in the opening year to support the future installation of a signal, or 2) putting the signal design on hold until a future year. If a traffic signal is not justified when the facility opens to traffic, interim traffic movement restrictions may be required.

4. Safety Considerations Using the Highway Safety Manual

A Traffic Signal Justification Study should include an assessment of the safety implications of installing a new traffic signal, modifying an existing traffic signal, or removing an existing traffic signal. The Highway Safety Manual (HSM), published by AASHTO, offers a process for conducting quantitative safety analyses based on before and after studies at project sites. The HSM provides methodologies for predicting the expected average crash frequency for existing facilities, alternative designs at existing facilities, or proposed designs at future facilities. The HSM should be consulted to assist in performing the safety assessment.

DelDOT's preferred method for conducting the safety assessment is to use the "predictive method" from the HSM to estimate anticipated crash frequency. The predictive method (discussed in detail in Part C of the HSM) is an 18-step process involving three major components: 1) Safety Performance Functions, 2) Crash Modification Factors, and 3) Calibration Factors.

The **Safety Performance Function (SPF)** is a statistical regression model for estimating the average crash frequency for a facility type with specified base conditions. An SPF is a function of existing or forecasted traffic volumes and roadway characteristics.

Crash Modification Factor(s) (CMF) are used to account for a specific site condition(s) that differs from the SPF base conditions. When necessary, multiple CMFs may be applied to the SPF to account for all specific conditions at the site which vary from the SPF base conditions. However, the combined effect of multiple treatments could be overestimated if those treatments affect the same type of crash and the severity of those crashes. Therefore, engineering judgment must be used in order to determine the independence, or lack of independence, of the various CMFs.

A comprehensive database of available CMFs for different areas, roadways, crashes, and treatment types can be found on the CMF Clearinghouse website at www.cmfclearinghouse.org.

The **Calibration Factor (C)** allows the SPFs to be adjusted to match local conditions. If calibration factors have not been developed, the Calibration Factor is assumed to be 1.0, meaning the site does not vary from the SPF base conditions. It should be noted that at the

time of the publication of this Manual, DelDOT has not developed any state-specific Calibration Factors.

The risk in applying the CMF method is it involves only the observed crash frequency for a site that could potentially be experiencing a particularly high or low crash frequency period. Application of CMFs to historical crash data involves regression-to-the-means bias, meaning a treatment is selected based on short-term trends observed in crash frequency, which could be overestimating or underestimating the safety implications of that treatment. The predictive method, on the other hand, allows for the correction of short-term crash data and reduces the vulnerability of random variations in crash data.

The engineer should consult the DelDOT HSIP Manager for guidance on properly applying the methodologies contained in the HSM.

5. Alternative Intersection Treatments

As noted previously, the satisfaction of one or more of the signal warrants from the DE MUTCD does not necessitate the installation of a traffic signal at a study location. This section of the Traffic Design Manual describes alternative intersection treatments that should be considered as part of the Traffic Signal Justification Study, especially if there are potential safety concerns with the installation of a traffic signal (see Chapter IV-A.4).

It is important to note that a traffic control signal is not always the most-desirable intersection treatment. Every time DelDOT installs a new traffic control signal, additional capital and maintenance costs are incurred. Additionally, the installation of a traffic control signal may result in unintended negative consequences, such as disruption to traffic flow, additional delay to motorists on the major street, or increases in certain types of crashes. **Therefore, the Traffic Signal Justification Study should evaluate the feasibility of providing alternative traffic control that could achieve similar capacity and safety benefits to those provided by a traffic control signal.** Alternative treatments that may be considered include:

- Roundabouts
- Stop control (two-way, three-way, and all-way approach)
- Channelized / restricted turn movements
- Geometric improvements, such as the addition of an exclusive turn lane
- Improved signing, striping, and/or lighting
- Consolidated property access, resulting in fewer, more widely-spaced intersections
- Other innovative intersection treatments

When considering alternative treatments, the Engineer should consult the HSM to determine the expected change in crash frequency caused by the intersection modification, if the required data is available.

6. Capacity Analysis

A Traffic Signal Justification Study should include an analysis of the intersection capacity under both existing conditions and proposed future conditions.

a. Evaluation Methodologies

The methodologies outlined in the appropriate version of the Highway Capacity Manual (HCM), as selected by DelDOT, should be used to conduct capacity analyses of the study intersection. The most recent versions of the Highway Capacity Software and other simulation software packages that utilize the HCM methodology are typically considered acceptable tools for conducting capacity analyses. The use of a Microsimulation tool to supplement the HCM analysis may also be desirable for the analysis of closely-spaced intersections and intersections within a corridor having coordinated signal timings.

DelDOT also requires that all signalized intersections be evaluated using the Critical Movement Summation (CMS) methodology. Guidelines for conducting a CMS analysis are included in this manual in **Appendix I**.

b. Measures of Effectiveness

A Traffic Signal Justification Study should clearly document the projected change in operations at the study intersection due to the proposed improvements based on standard measures of effectiveness (MOEs).

Level of Service (LOS), as defined in the Highway Capacity Manual, is the standard measure of effectiveness to be used in evaluating proposed intersection improvements. For unsignalized and signalized intersections, LOS is based on the average delay per vehicle at the intersection.

Other MOEs may also be used to supplement LOS results, including 95th percentile queue lengths, volume-to-capacity ratios, and overall system delay. Additionally, the study should identify the potential for queue spillback into adjacent intersections or railroad crossings, or the potential blockage of nearby access points. Queue spillback from turn bays into the mainline should also be identified. Network bandwidth using time and space diagrams may also be reviewed to identify the impacts of adding a signal to a signalized corridor.

Operations should be analyzed for existing and future (opening day, if applicable, and full build-out) conditions with and without a signal, and with any alternate form of intersection control. If the installation of a traffic control signal is recommended, a clear improvement in operations should be demonstrated and the disadvantages of less-restrictive traffic control should be documented.

c. Signal Timing / Phasing

The Traffic Signal Justification Study should identify an appropriate preliminary timing and phasing plan for the proposed traffic control signal, which should also be used when conducting capacity analysis for the study. If the intersection is located within an existing signalized corridor, the existing signal cycle length should be used. The selected timing and phasing plan should use appropriate clearance intervals and consider the potential advantages and disadvantages of various phasing options, such as lead/lag phasing and split phasing. The timing plan should also consider coordination with adjacent signals (if needed), the anticipated type of left-turn treatment (permissive, exclusive-permissive, exclusive-only), and if pedestrian crosswalks and signals are included, the pedestrian walk and clearance timings. Refer to Section IV-E of this Manual for additional detail regarding signal timing and phasing.

7. Documentation of Results

The findings of the Traffic Signal Study should be documented in a brief report, as outlined below. A sample report can be found in **Appendix G**. If the Signal Study recommends the installation of a signal, a Signal Design / Modification Request Form (See **Appendix J**) should be initiated to advance the project to the design phase.

a. Technical Memo / Presentation

The report summarizing the Traffic Signal Study should be thorough, yet concise, and include the following elements:

Problem Identification: The technical memo or presentation should include a clear statement of the reason the Traffic Signal Justification Study was initiated, including the source of the request.

Summary of Existing Site Conditions: The technical memo or presentation should briefly summarize the number of approach lanes for each leg of the intersection, the lane configuration at the intersection, the location and length of exclusive turn lanes (storage and taper length should be noted separately, a description of the horizontal and vertical geometry, roadside features, adjacent land use, and an inventory of existing traffic

control devices, including signs and pavement markings. An Existing Conditions Diagram should be presented, along with photographs of the existing site conditions.

Previous Studies: DelDOT files should be reviewed to determine if the location was previously studied, or if signal agreements exist for the intersection. The findings of previous studies or agreements should be documented.

Anticipated Development: The technical memo or presentation should summarize all known future development in the project area that would result in changes in traffic volumes at the intersection. This section is particularly important for studies pertaining to Developer / Subdivision Projects where the signal justification is based on projected traffic volumes.

Traffic Data: A brief summary of the existing traffic counts and future projected intersection traffic volumes (if applicable) should be included in the report, including an identification of the peak hours. Traffic data should be less than two (2) years old.

Crash Data: The technical memo or presentation should summarize the key trends in the crash data obtained for the study and include a crash diagram. At least three (3) years of data should be obtained from DelDOT's Traffic Design Resource/HSIP Group. Individual police reports may be provided in accordance with Delaware Code, if necessary, to establish a better understanding of the crash trends. Highway Safety Manual evaluations, which may include a predictive method analysis, should also be performed.

Observations: The technical memo or presentation should include a brief discussion of significant items noted during field observations related to physical features and/or traffic operations.

Warrant Analyses: A statement identifying which of the nine (9) signal warrants from the DE MUTCD are satisfied at the study location should be included. A detailed summary of the signal warrant analyses should also be included as an attachment.

Operational Analyses: The technical memo or presentation should include a summary of the existing intersection operations, identifying any capacity, delay, or queuing deficiencies. Proposed operations should also be summarized. For locations where signalization is recommended, the results should clearly demonstrate the expected improvements based on the critical measures of effectiveness. Additional information that may be summarized includes the results of spot speed studies, delay studies, and gap studies. Critical Movement Summation (CMS) calculations should also be provided if a signal is warranted (refer to **Appendix I**).

Intersection Sight Distance: A comparison of the available intersection sight distance to the minimum values specified by AASHTO should be included.

Alternative/Short-Term Improvements: The technical memo or presentation should identify any short-term improvements that could be implemented in lieu of signalization.

Recommendation: The report should include a recommendation for improvements based on the findings of the study.

Intended Signal Operations (Phasing / Timing): The technical memo or presentation should include a description of the preliminary signal timing and phasing plan, including left-turn treatments. The final signal timing plan will be developed later in the design phase.

Intended Lane Configurations: The technical memo or presentation should include a description of the intended intersection lane configuration, highlighting proposed changes from existing conditions.

Preliminary Design Considerations: A summary of issues identified during the site visit which may impact the design process should be outlined. Key issues may include utilities, intersection geometry (skew/lane alignment), physical constraints, pedestrian features, and system compatibility.

b. Signal Design Request Form

If a traffic control signal is recommended by the Traffic Signal Justification Study a Signal Design Request Form should be initiated and approved by both the Chief of Traffic Engineering and the Chief of Traffic Operations. The signed Signal Design Request Form serves as a formal handoff between the Studies Group and the Design Group to initiate the design phase. See **Appendix J** for DelDOT's Signal Design Request Form.

8. Signal Phasing Change

Based on the corridor or operational changes, adjustment to signal phasing may be required. Since the need for phasing change can be derived for a variety of reasons, a field observation should be conducted to observe the operational and geometric characteristics. The field observation should occur during the hours of the day when operational problems occur. Based on the field observations, the type of study to be conducted can be determined. The study should clearly demonstrate the safety and operational benefits of the phasing change being implemented.

9. Signal Deactivation

A study is also required in cases where the deactivation of an existing traffic control signal is proposed. The requirements for this type of study are similar to those of a traditional Traffic Signal Justification Study. The study should clearly demonstrate the safety and operational benefits of deactivating the existing signal. Complete guidance on the procedure to be followed for signal deactivation is included with this manual in **Appendix K**.

B. Types of Signal Projects

This chapter of the Traffic Design Manual defines the nine types of traffic control devices most commonly used by DelDOT. Chapters IV-C and IV-D of this Manual outline the specific design elements required to prepare a traffic signal design per DelDOT standards.

1. Traffic Control Signal

A traffic control signal is defined as any highway traffic signal by which traffic is alternately directed to stop and permitted to proceed. Traffic is defined as pedestrians, bicyclists, vehicles, streetcars, and other conveyances either singularly or together while using any highway for purposes of travel. Traffic control signals are DelDOT's most-common type of signal project. Projects may include new signals at an existing or proposed intersection or modifications to an existing signal.

All new signals installed in Delaware must be justified based on an engineering study. The required elements of the study are outlined in Chapter IV.A (Traffic Signal Justification Study) of this Manual.

For additional information regarding traffic control signal design elements, refer to the DE MUTCD, Chapter 4D.

2. Hazard Identification Beacon (HIB)

A Hazard Identification Beacon (HIB) is a type of signal indication used to warn motorists of potentially hazardous conditions downstream. Beacons used for hazard identification should only be used as a supplement to other appropriate warning or regulatory signs and devices except for STOP, DO NOT ENTER, WRONG WAY, and Speed Limit signs. Except for school speed limit signs, beacons should not be included within the border of the sign or device. The use of horizontally aligned beacons with School Speed Limit signs (S5-3-DE, R1-2 with S4-3 and S4-4) is no longer permitted on state-maintained roadways in Delaware for new or retrofitted sign installations. Instead, if used with a new or retrofitted School Speed Limit sign assembly, the signal indications shall be vertically aligned per Section 4L.04 of the DE MUTCD. The exception to this standard is School Speed Limit signs that are longer horizontally than vertically, which is typically the case for overhead installations. In these cases, horizontally aligned beacons are still considered acceptable and consistent with both Parts 4 and 7 of the DE MUTCD.

When used at intersections, beacons should not face conflicting vehicle movements. Warning beacons are yellow in color and should have a circular 12-inch diameter visible face. Two

beacons aligned either horizontally or vertically and flashing alternately can be used for added emphasis. A system of four beacons, flashing alternately between the top left/bottom right and top right/bottom left may also be used, typically mounted overhead.

If the installation is temporary or short-term, the use of solar-powered devices may be considered with monitoring for potential removal in the future. For long-term or undefined usage lengths, hardwire power should be deployed.

Typical applications of Hazard Identification Beacons include alerting motorists of a traffic control signal ahead, warning vehicles of a sharp curve (horizontal or vertical), warning vehicles of inadequate sight distance for side streets, warning vehicles of flood-prone areas, warning motorists of school speed limits, or denoting the end of an expressway. HIBs should only be used when an engineering study shows a demonstrated need because these types of traffic control devices can lose their effectiveness if overused.

3. Intersection Control Beacon (ICB)

Flashing beacons for intersection control may be used at locations where traffic volumes or physical conditions do not warrant traffic control signals, but crash history indicates a possible hazard. These beacons consist of one or more circular yellow or red lenses, typically with 12 inches of visible diameter. They should be used only at intersections to control two or more directions of travel. If multiple red beacons are used on a given approach, they must flash concurrently, because alternately flashing red beacons are reserved for rail crossings and pedestrian hybrid beacons. The application of intersection control beacons should be limited to the following:

- Yellow indication on one route (normally the major), red for the remaining approaches
- Red for all approaches, if a multi-way stop is justified

A stop sign shall be used on any approach with a permanently flashing red beacon. Intersection control beacons are generally suspended over the roadway, but pedestal mounting is acceptable under appropriate conditions (refer to recommended mounting heights described previously under the heading “Hazard Identification Beacon”). When a pedestal mount is used, the pedestal should not be located in the roadway unless within the confines of a traffic or pedestrian island. Refer to the DE MUTCD, Section 4L.02, for additional information on the design of Intersection Control Beacons.

Intersection Control Beacons should only be used when an engineering study shows a demonstrated need for extra emphasis beyond the typical sign control because these types of traffic control devices can lose their effectiveness if overused. For additional guidance,

please refer to the "Intersection Control Beacon Effectiveness Study" (June 2019), https://deldot.gov/Programs/DSHSP/pdfs/otherIntersection/ICB_ResearchReport_20190628_Package.pdf?cache=1666143304303.

4. Emergency-Vehicle Signals and Hybrid Beacons

An emergency-vehicle traffic control signal is a special traffic control signal that assigns the right-of-way to an authorized emergency vehicle. An emergency-vehicle traffic control signal may be installed at a location that does not meet other traffic control signal warrants such as at intersections, entrances, or other locations to permit direct access from a building housing the emergency vehicle.

Some fire and rescue signals currently in use in the State of Delaware do not conform to the current MUTCD standards. Non-compliant fire and rescue signals should be upgraded to meet the current standards if they fall within the limits of a Capital Project.

An alternative to installing a full traffic control signal for emergency vehicles would be the installation of an emergency-vehicle hybrid beacon. An emergency-vehicle hybrid beacon may only be installed if the conditions justifying an emergency-vehicle traffic control signal are met. When new emergency-vehicle or emergency hybrid beacons are requested by emergency service agencies, funding for new installations is typically provided by community transportation funds as approved by area legislators.

Refer to the DE MUTCD, Chapter 4G, for additional information on the design and operation of fire and rescue signals and hybrid beacons.

5. Railroad Crossing

Part 8 of the DE MUTCD provides a detailed description of all the design elements required for Railroad Crossings. Many of the design elements are the responsibility of the railroad company. However, when a traffic control signal is required, the design is performed by the DelDOT Traffic Section.

As noted in Section 8C.09 of the DE MUTCD, traffic control signals may be used instead of flashing-light signals to control road users at industrial highway rail grade crossings and other places where train movements are very slow, such as in switching operations. The appropriate provisions relating to typical traffic control signal design, installation, and operation shall be applicable where traffic control signals are used to control road users instead of flashing-light signals at highway-rail grade crossings. Traffic control signals shall not be used instead of flashing-light signals to control road users at a mainline highway-rail grade crossing.

Exempt railroad crossings require a standard traffic control signal, with green, yellow, and red indications to control traffic, in addition to the standard railroad crossing design elements.

If a highway-rail grade crossing is equipped with a flashing-light signal system and is located within 200 feet of an intersection or midblock location controlled by a traffic control signal, the traffic control signal should be interconnected via "fail safe" (i.e., normally closed) circuits, and the normal operation of the traffic signals controlling the intersection should be preempted to operate in a special control mode when trains are approaching, in accordance with Section 4D.27 of the DE MUTCD. The preemption sequence is extremely important to provide safe vehicular and pedestrian movements. Such preemption serves to ensure that the actions of these separate traffic control devices complement rather than conflict with each other.

If a highway-rail grade crossing is more than 200 feet from an intersection, but an engineering study indicates that queues may extend to the tracks, the Designer should consider the implementation of one or more traffic control treatments, including signal pre-emption, signage (R8-8, "Do Not Stop on Tracks"), or Hazard Identification Beacons, to warn motorists of the railroad crossing. For more information, refer to the *Railroad-Highway Grade Crossing Handbook* developed by FHWA or contact DelDOT's Railroad Coordinator.

6. Movable Bridges

Traffic control signals for movable bridges (often referred to as "draw bridges") are a special type of highway traffic signal installed to notify road users to stop because of a temporary road closure, rather than alternately giving the right-of-way to conflicting traffic movements. The designer should coordinate with the appropriate maintenance district to include other devices such as cameras, sensors, etc., as needed. The signals are operated in coordination with the opening and closing of the movable bridge, and with the operation of movable bridge warning and resistance gates, or other devices and features used to warn, control, and stop traffic.

A movable bridge resistance gate provides a physical deterrent to road users when placed in the appropriate position. The movable bridge resistance gates are considered a design feature and not a traffic control device; requirements for them are contained in AASHTO's "LRFD Movable Highway Bridge Design Specifications." Refer to Section 4J.02 of the DE MUTCD for additional information on the design of traffic control at movable bridges.

7. Temporary Signal

A temporary signal is defined as a traffic control signal that is installed for a limited time period. Temporary signals may be designed and constructed for a specific location or they may be portable signals that can be easily transported and used at multiple locations. If non-portable temporary signals are used, they would typically be designed with wood poles if possible. All temporary signals should be justified by an engineering study, and typically should be designed to provide detection and communication, similar to permanent signals.

Common uses for temporary signals include providing traffic control for haul road access locations and for site access to a location where the permanent access is under construction

Temporary signals may also be used to provide temporary traffic control for two-way traffic using a single travel lane during construction, such as during bridge rehabilitation or replacement. Sight distance across or through the one-lane, two-way facility should be considered, along with the approach speed and sight distance approaching the facility when determining whether traffic control signals should be installed. A traffic control signal may be used if gaps in opposing traffic do not permit the flow of traffic through the one-lane section of the roadway, even if the location does not meet the traditional nine MUTCD warrants for signalization. Temporary traffic control signals may be preferable to flaggers for long-term projects and other activities that would require flagging at night. Additional information regarding the design for temporary signals is provided in Sections 4D.32, 4H, and 6F.84 of the DE MUTCD.

8. Innovative Intersection Safety Treatments

Recently, FHWA has conducted research to identify new technologies and techniques to improve intersection safety. These innovative intersection safety treatments show promise for improving safety, but comprehensive effectiveness evaluations are not currently available.

Two examples of treatments currently under consideration (Rectangular Rapid Flash Beacons and High-Intensity Activated Crosswalks)) are discussed in this section. As other types of innovative intersection safety treatments are developed, they will be considered on a case-by-case basis for use in Delaware, including a review of current Federal guidance, and must be approved by the Chief of Traffic Engineering.

a. Rectangular Rapid Flash Beacons (RRFB)



Rectangular Rapid Flash Beacons (RRFB) are user-actuated amber LEDs that supplement warning signs at unsignalized intersections or mid-block crosswalks. They can be manually activated by pedestrians by a push button or passively by a pedestrian detection system. RRFBs use an irregular flash pattern similar to emergency flashers on police vehicles. They are a lower-cost alternative to traffic signals and hybrid signals and have been shown to increase driver-yielding behavior at crosswalks significantly when supplementing standard pedestrian crossing warning signs and markings.



SR 72 at Farm Lane, Newark

In March 2018, FHWA granted blanket basis approval for all locations in Delaware under the technical conditions contained in IA-21.3 “Rectangular Rapid-Flashing Beacons at Crosswalks – DE DOT (Statewide)” for usage of RRFBs. The approval allows for statewide usage of RRFB as a warning beacon to supplement standard pedestrian crossing warning signs and markings at either a pedestrian or school crossing; usage where the crosswalk approach is not controlled by a yield sign, stop sign, or traffic control signal; or at a crosswalk at a roundabout. As a condition of the approval, a comprehensive list of RRFB locations is required to be maintained. For additional information, refer to the FHWA Report FHWA-SA-09-009 dated May 2009 with update in June 2012, to address modification in RRFB flash pattern.

b. Pedestrian Hybrid Beacon (HAWK)

The pedestrian hybrid beacon uses traditional traffic and pedestrian signal heads but in a non-traditional configuration. It includes an overhead sign instructing motorists to "stop on red"

and an overhead "pedestrian crossing" sign. An example of a pedestrian hybrid beacon is shown to the right.

When not activated, the beacon is dark. The pedestrian hybrid beacon is activated by a pedestrian pushbutton or passive pedestrian sensor, at which time the overhead beacon begins flashing yellow and then solid yellow, advising drivers to prepare to stop. The beacon then displays a solid red indication and shows pedestrians a "Walk" indication. Finally, an alternating flashing red signal indicates that motorists may proceed when safe, after coming to a full stop. During this alternating flashing red phase, the pedestrians are shown a flashing "Don't Walk" indication with a countdown indicating the time left to cross.

As part of the April 2020 “HAWK Pedestrian Signal Compliance Review” (May 2020), http://deldot.gov/Programs/DSHSP/pdfs/OtherPedProjects/HAWK_Study_Report_May2020.pdf?cache=1592402385351, the Department examined both pedestrian and motorist compliance at all HAWK signals in Delaware. Based on the observed findings of motorist behavior, poor pedestrian compliance, and minor changes in pedestrian/bicycle crash rates**, it was recommended that HAWK signals no longer be installed at intersections in Delaware.** It is also recommended that the existing locations be re-evaluated for conversion to full traffic signals or Rectangular Rapid Flash Beacons.

C. Preliminary Design Plan Elements

When developing preliminary signal design plans, there are numerous elements and design factors that should be taken into consideration. The design elements presented in this chapter of the DelDOT Traffic Design Manual represent the minimum that should be incorporated into all preliminary design plans. Additional design elements may also be included, at the discretion of the Designer, DelDOT, or other interested parties, based on project-specific needs.

1. Pole Design

a. Type

The type of signal supports used on a project is a major consideration in the design process. Some factors involved in the selection of an appropriate pole type include the location of overhead utilities, intersection geometrics, the proposed location of traffic signal heads, constructability, aesthetics, and local requirements. The three primary pole types are described below.

Mast Arms

Mast arms allow for a rigid mounting of signal heads and signs. They allow for the far-side deployment of signal equipment and have a more aesthetically pleasing look to the public. Mast arms can also minimize conflicts with overhead utilities because of the lower conflict height. Additionally, mast arms require less maintenance by the Department. Intersections with unusual geometrics may require adjustment of arm angles to align signal heads in the desired position. Mast arms should be considered for all new signal installations and signal reconstructions. Mast arm box designs should be considered first and foremost, with alternative mast arm arrangements looking to achieve box design as secondary options. However, in the selection process, consideration must be given to other pole types if extreme arm angles will be required, if minimum vertical roadway clearance cannot be adhered to, or if the pole placement would be within the active clear zone. Single-arm designs that are placed diagonally across the intersection should only be used as a last resort.

Strain Poles

Strain poles with span wires can provide flexibility in the signal design process at wide intersections and during the construction process when signal heads may require multiple repositionings. Strain poles may also provide more options at locations with unusual geometrics. However, the non-rigid mounting of signal heads tends to cause

more maintenance issues, is not the preferred option of the Department. If used the size of the strain pole chosen should be based on span wire sag to ensure that the signal heads will hang properly between the maximum height for signal housing equipment (25.6 feet) and the minimum 15-foot clearance above the pavement (refer to Chapter IV-C.2.e of this Manual for additional information on the vertical placement of signal heads; a 17-foot minimum clearance to the bottom of the signal head is preferred in Delaware). Sag for new designs should be calculated at 5 percent. For signal rebuilds utilizing existing equipment, a minimum of 3 percent sag may be allowed if the 5 percent cannot be achieved. The Designer must obtain approval from the Chief of Traffic Engineering under these conditions. **Figure IV-1** shows a sample calculation. The Designer shall specify the span length and desired pole mounting height on the design. For a suspended box design, both the pole mounting height and the proposed bull ring mounting heights shall be specified on the design plan. Additionally, a structural analysis may be required to ensure that proper sag is maintained for longer span lengths.

EXAMPLE: HOW TO CALCULATE & MEASURE SAG

Pole-to-Pole Distance: 200 ft
Pole Height: 32 ft
Span Attachment Height: 30 ft
Signal Head Height: 4 ft

5% Sag:
= Pole-to-Pole Distance x 0.05
= 200 ft x 0.05 = 10 ft

Distance Between Bottom of Head at Low Point & Pavement:
= Span Attachment Height - Sag - Signal Hed Height
= 30 ft - 10 ft - 4 ft = 16 ft

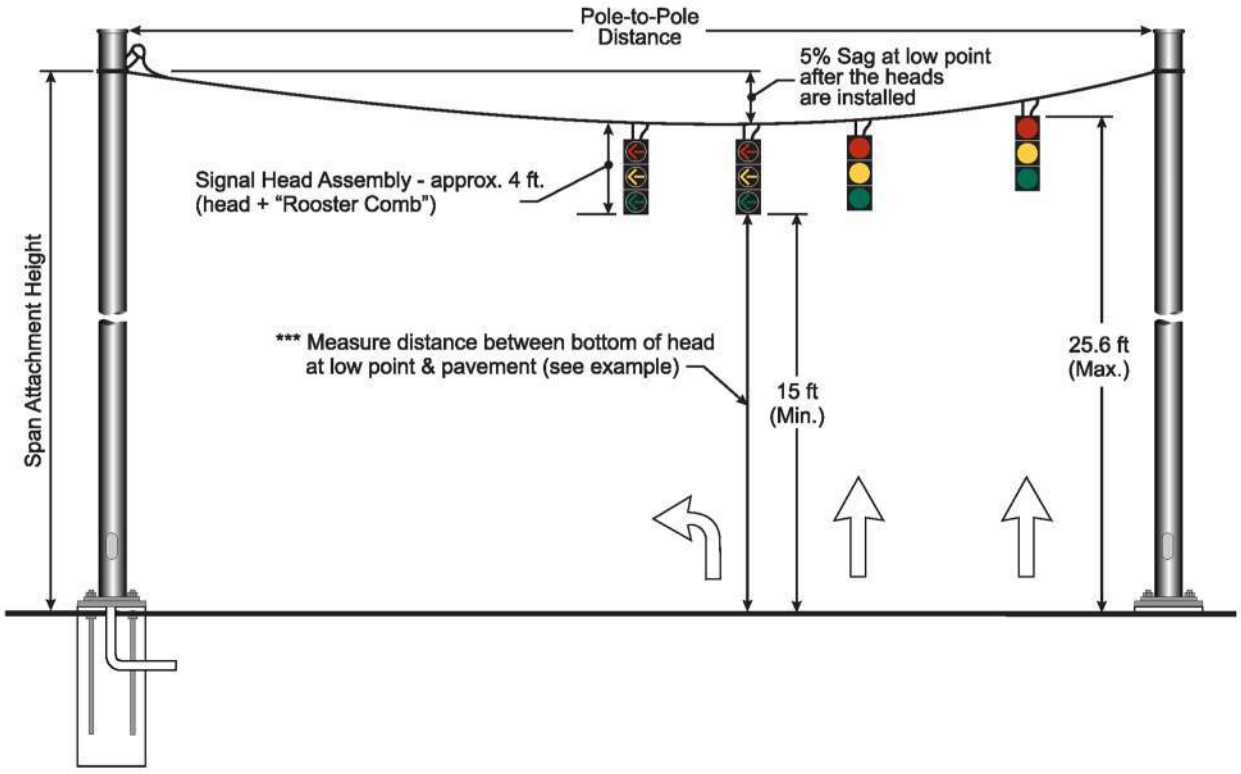


Figure IV-1. Sag Calculation

Pedestal Poles

Pedestal poles with vehicular signal heads may be deployed as a supplemental signal face to enhance visibility in advance or immediately before the signalized location. Pedestal poles' primary usage is for mounting of standard pedestrian signal heads, school flasher assemblies, and additional flasher warning assemblies.

b. Configuration

After the signal support type is chosen, the next step in the signal design process is to determine an appropriate configuration. The most-common layouts and pole choices used by DelDOT are listed below. The "box" design configurations should be considered for all new signal installations and signal reconstructions. However, in the selection process, consideration may be given to other support types and configurations, in order of preference:

- "Box" Design (mast arm)
- Twin Mast Arms (mast arm)
- "Diagonal" (mast arm)
- "Box" Design (span wire)
- "Suspended Box" Design (span wire only)
- "Diagonal" (span wire)
- Pedestal Pole Supports
- Wood Pole Supports (temporary only)

While there are many different alternative configurations that can be applied, **the mast arm box design should be considered first and foremost**, which allows the signal heads to be placed on the far side of the intersection. **Figure IV-2** shows an illustration of the Department's standard box design, as well as some of the other potential layouts for signal poles and signal heads.

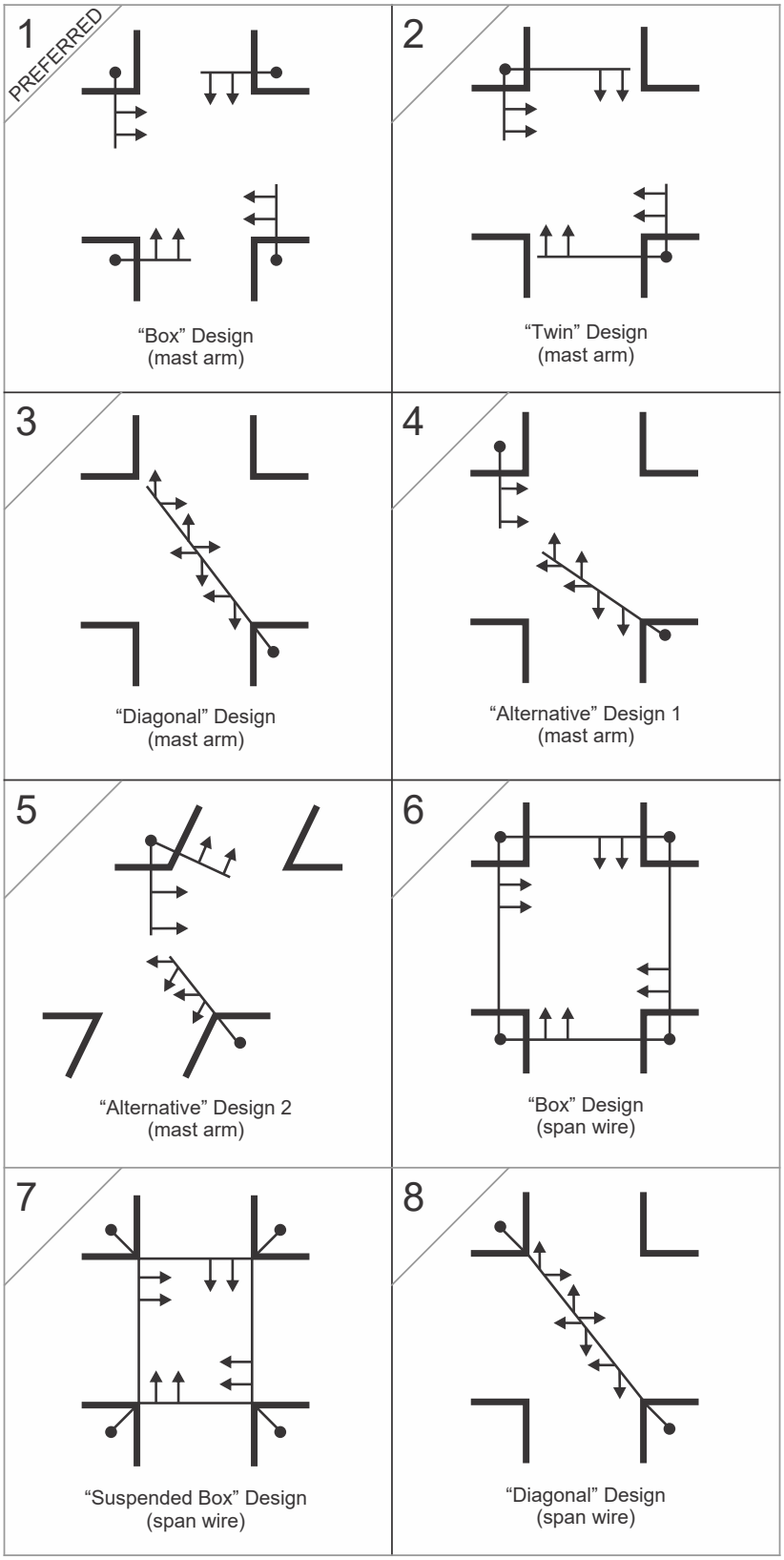


Figure IV-2. Typical Layouts of Signal Poles and Signal Heads

“Box” Design Configuration

The “box” design configurations should be considered for all signal installations and signal reconstructions, as the location allows. The “box” configuration provides excellent lateral placement of signal heads for maximum conspicuity of signal indications, good placement of overhead signs and provides convenient pole locations for supplemental signal head installation.

Mast arms should be considered for all new signal installations and signal reconstructions. Mast arms allow for a rigid mount for signal equipment and signs and provide good lateral support. Mast arm lengths range from 20-foot to 90-foot maximum for single arms with a 60-foot maximum length for twin mast arms. However, for offset intersections and extremely wide intersections, the use of the standard “box” mast arm design may provide challenges. Alternative box designs may be utilized by adjusting the angle of the mast arm or developing twin-arm designs to achieve desired far-side head placement. The Designer should consider all options prior to proposing an alternative mounting type and confirm the proposed configuration falls within the “Mast Arm Loading Configuration Design.” If the configuration exceeds the design load configuration, the Designer shall coordinate with the pole vendor and/or perform structural analysis to verify structural loading is adequate.

Span wires may also achieve a “box” design as an alternative method. If span wires are used, 4 strain poles must be used to achieve the box configuration. Span wires may offer the ability to span wider intersections, but the non-rigid mount of signal equipment and signs can cause additional maintenance concerns. In situations, such as at extremely wide intersections where signal heads are over 180 feet from the stop line reduced visibility can typically be overcome by using the “suspended box” configuration and/or supplemental signal indications.

Where an existing signal is re-designed, typically from a “diagonal X” or “Z” configuration, the preferred “box” design may not be optimal due to the position of the existing strain poles. The resulting signal head placement and/or alignment may not be acceptable. Under these conditions, a “suspended box” may eliminate these constraints.

Other Configurations

If the “box” design cannot be achieved, an alternative configuration may be used. For smaller intersections that have the right-of-way, utility, or geometric constraints, a diagonal configuration may be a suitable alternative. Diagonal configurations can be achieved using a single mast arm or 2-pole span design. Diagonal configurations have a lower installation cost and limit the number of poles required. While the diagonal

configuration will typically allow for adequate head placement, the designer should avoid configurations that may lead to signal head clutter in the middle of the intersection and/or poor visibility of indications from the stop line. The diagonal configuration is typically not suitable for intersections requiring overhead signing. If the configuration exceeds the design load configuration, the Designer shall coordinate with the pole vendor to verify structural loading is adequate.

Other hybrid or unique designs may be required for locations with atypical geometry or significant constraints. However, eliminating signal head clutter, poor visibility from the stop line, and future maintenance issues should be major considerations when proposing alternate design configurations.

c. Placement

1.) Clear Zone

When considering the placement of poles, it is most desirable to have poles located outside of the clear zone. Signal poles may be placed closer to the edge of the roadway if vertical curb is provided and lateral offset guidelines in the AASHTO Roadside Design Guide are met. If a signal pole cannot be located at a sufficient distance from the face of the vertical curb due to geometric or other constraints, the signal pole may be protected using a guardrail or another acceptable form of barrier protection as approved by the Chief of Traffic Engineering. In-house signal plans designed as a part of a capital project should follow the clear zone requirements established by the design engineer of record for the project. Refer to AASHTO's Roadside Design Guide for further information on clear zone and lateral offset requirements in regard to pole placement. For additional information discussing the two roadside concepts, refer to the *Clear Zone, Lateral Offset & Horizontal Clearances Discussion* in DelDOT's Design Resource Center.

Requirements

For safety reasons, all non-breakaway traffic signal supports should be located outside of the clear zone. All traffic control devices over an open travel lane shall be considered non-break-away for the purposes of locating and protecting the support. This is most critical at locations with high-speed traffic, heavy turning movements, no parking lanes or shoulders, and for locations along the outside of a curve. In these cases, it is highly desirable to place the supports outside the designated roadway clear zone.

Locating non-breakaway traffic signal supports outside of the clear zone is not always practical or feasible, especially in urban or constrained environments where right-of-way or lateral offset is not readily available. In situations such as these, refer to the Clear Zone, Lateral Offset & Horizontal Clearances Discussion document in DelDOT's Design Resource Center.

Islands and Medians:

The installation of non-breakaway signal supports in islands and medians is not a preferred option unless the clear zone distance can be met and/or guardrail protection can be provided. Typically, this precludes the placement of signal poles in the median, except in situations where the median/island is very large.

Refer to the AASHTO Roadside Design Guide for additional clear zone information and calculations.

2.) Utility Clearance

Utility clearance is the required distance of signal equipment/components from above and underground facilities. The ability to achieve proper utility clearance, including construction access, will be a major factor in selecting an appropriate signal configuration. The placement of signal equipment shall comply with current local utility companies and National Electrical Safety Code (NESC) clearance requirements. Typically, signal equipment should be at least 10 feet from all primary electric lines, 4 feet from all secondary electric lines, and 2 feet from cable and telephone lines. For underground facilities, a minimum of 2 feet should be maintained for all wet and dry facility feeders. Additional coordination with the DelDOT Utility section or utility companies for underground distribution facilities shall be required.

2. Signal Head Design

a. Number of Signal Heads

A minimum of two signal faces shall be provided for the through movement on each approach to an intersection. If a through movement does not exist on an approach, a minimum of two signal faces shall be provided for the turning movement that is considered the major movement. If there are more than two through lanes on an approach, one signal head per lane should be used.

b. Signal Head Configurations

There are several different signal head configurations that are used by DelDOT. The selection of the appropriate signal head configuration is dependent on the type of signal phasing and the corresponding lane configuration:

- For major and minor street through movements, standard three-section heads with circular indications should be used.
- When protected-permissive left-turn phasing is proposed, a five-section cluster head should be used in combination with a three-section head for the through lanes.
- When protected-only left-turn phasing is proposed, two three-section heads with arrow indications should be used for the turning movement.
- When a right-turn arrow phase is proposed, a five-section cluster head with right-turn arrows should be used in place of the right-hand, three-section head.
- When split-phasing is proposed, a four-section inverted “Tee” head should be used in place of the left-hand or right-hand three-section head to accommodate major movements through the intersection. In cases where there is a double left-turn, or double right-turn, a three-section head with arrow indications is required on the left-hand, or right side, of the inverted “Tee.”
- When flashing red arrow (FRA) phasing is proposed, two 4-section “Tee” heads shall be used for the left/right turning movement in combination with three-section heads for the through lanes**.**

See **Figure IV-3** on the following page showing the typical signal head configurations. Other signal head configurations may also be allowed if they are consistent with the DE MUTCD.

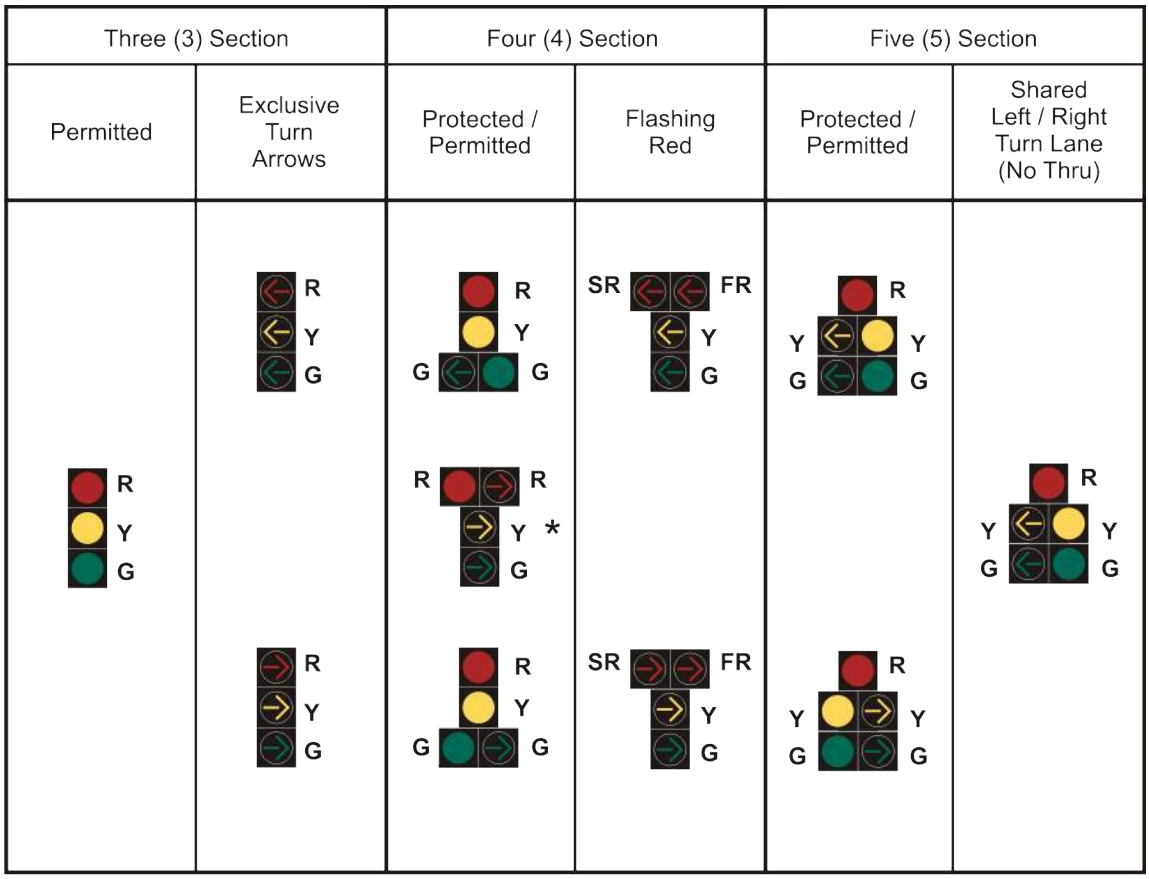


Figure IV-3. Signal Head Displays

c. Signal Indication Size

For all traffic control signals in Delaware, 12-inch signal indications are the standard and shall be used, except under special circumstances, in which 8-inch signal indications may be permitted based on approval by DelDOT's Chief of Traffic Engineering. Special circumstances include locations where required vertical clearance cannot otherwise be provided using standard 12-inch indications. Additionally, at an existing signalized location with 8-inch signal indications, the 8-inch indications may be used for the remainder of their useful life, but they shall be replaced with 12-inch indications at the end of their useful life or as part of any signal modification.

d. Visibility

The signal designer should check the roadway curvature and profile when selecting the placement for traffic signal indications to ensure proper visibility on the approach. The geometry of the intersection, including vertical grades, horizontal curves, skewed approaches, and obstructions, shall be considered in determining the position of signal faces. Refer to Table 4D-2 in the DE MUTCD for a table showing the minimum visibility requirements. When minimum visibility cannot be met, refer to Section 4D.12 of the DE MUTCD for treatment options, including the appropriate use of "Signal Ahead" (W3-3) signs.

e. Signal Head Placement

The following guidelines should be followed when determining signal head placement:

- Where a signal face is meant to control a specific lane or lanes of approach, its position should be unmistakably in line with the path of the movement. Guidance related to the specific vertical and lateral placement of signal heads is provided on the following pages.
- Near side signals should be located as near as possible to the stop line.
- Required signal faces for any one approach must be mounted no less than 8 feet apart, measured horizontally between the centers of the face.
- As outlined in the FHWA MUTCD and the DE MUTCD where possible, at least one and preferably both signal displays that control the major movement traffic should be located a minimum of 40 feet and a maximum of 180 feet beyond the stop line.
- Where the nearest signal face is more than 180 feet beyond the stop line, supplemental signal indications shall be required.
- Where both required signal faces are pole-mounted, they shall be on the far side of the intersection, one on the right and one on the left of the driver. This type of design shall only be considered with the prior approval of the Chief of Traffic Engineering.

1.) Vertical Placement

The bottom of the signal head housing (including any related attachments) of a vehicle signal face located over any portion of the highway that can be used by motor vehicles shall be at least 15 feet above the pavement (a minimum of 17 feet is preferred in Delaware). The top of the signal housing for a vehicle signal face located

over a roadway shall not be more than 25.6 feet above the pavement. When the signal head is located between 40 feet and 53 feet from the stop line, the maximum mounting height to the top of the signal housing shall be as shown in **Figure IV-4** below.

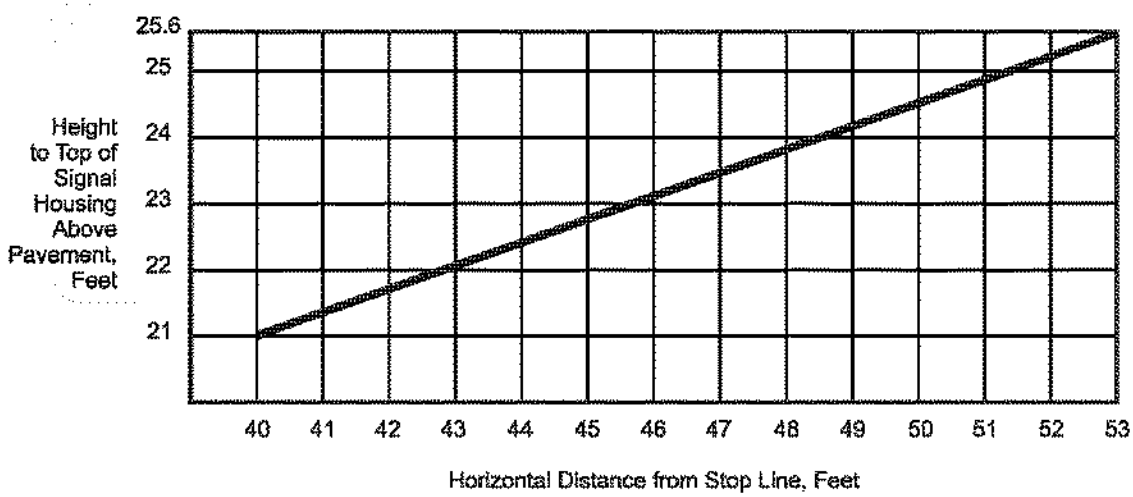


Figure IV-4. Maximum Mounting Height of Signal Housings

The bottom of the signal housing (including brackets) of a vehicular signal face that is vertically arranged and not located over a roadway:

- Shall be at least 8 feet, but not more than 19 feet, above the sidewalk or above the pavement grade at the center of the roadway, if there is no sidewalk.
- Shall be at least 4.5 feet, but not more than 19 feet above the median island grade of a center median island, if located on the near side of the intersection.

The bottom of the signal housing (including brackets) of a vehicular signal face that is horizontally arranged and not located over a roadway:

- Shall be at least 8 feet, but not more than 22 feet above the sidewalk or above the pavement grade at the center of the roadway, if there is no sidewalk.
- Shall be at least 4.5 feet, but not more than 22 feet, above the median island grade of a center median island, if located on the near side of the intersection.

For all span wire designs with backplates and/or signs, under-span tether wires shall be installed.

2.) Lateral Placement

The lateral placement of signal heads depends on the number of lanes on the approach as well as the signal phasing. Some typical configurations for the lateral placement of signal heads are shown in **Figures IV-5a through IV-5o** on the following pages:

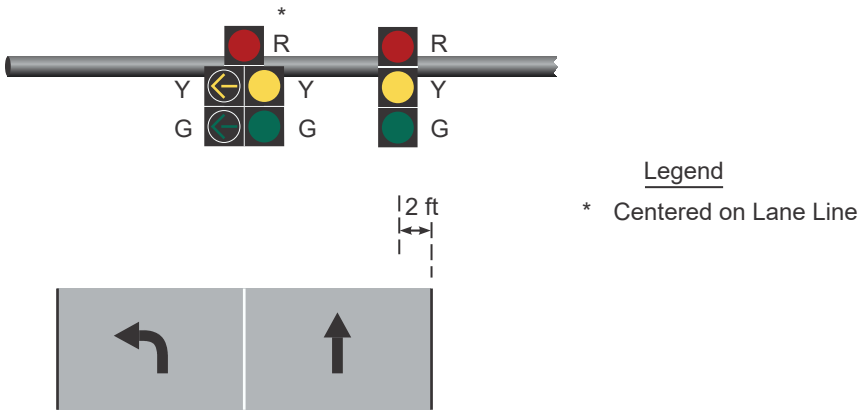


Figure IV-5a. One Through Lane with One Left-Turn Lane (Protected-Permissive Left-Turn Phasing)

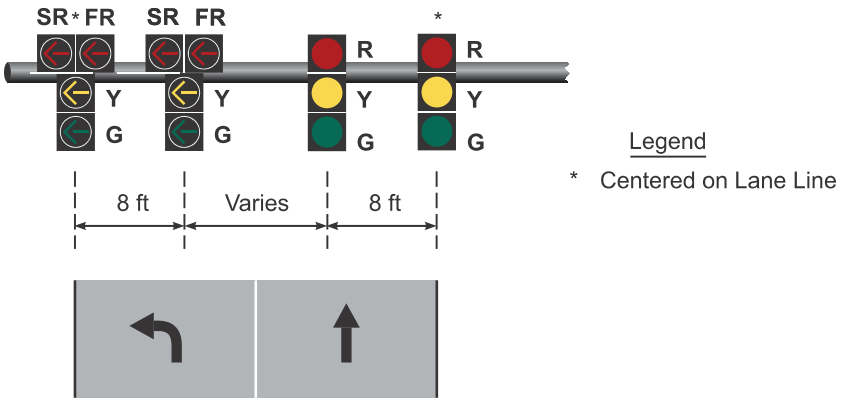


Figure IV-5b. One Through Lane with One Left-Turn Lane (Protected-Permissive Left-Turn Phasing FRA)

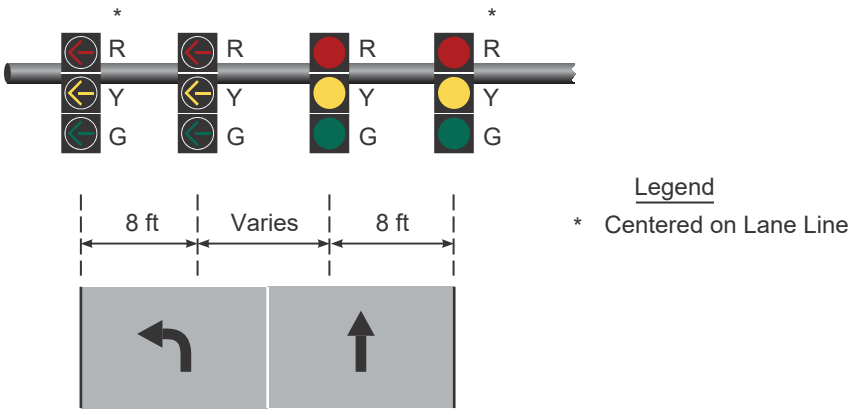


Figure IV-5c. One Through Lane with One Left-Turn Lane (Protected-Only Left-Turn Phasing)

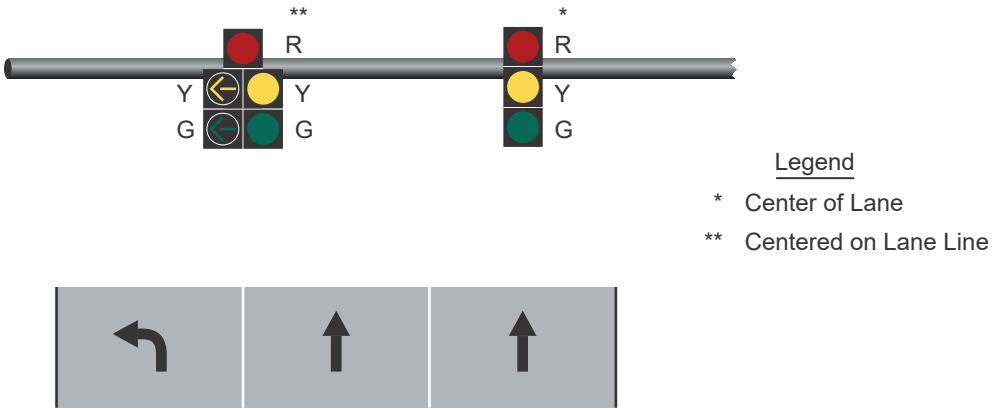


Figure IV-5d. Two Through Lanes with One Left-Turn Lane (Protected-Permissive Left-Turn Phasing)

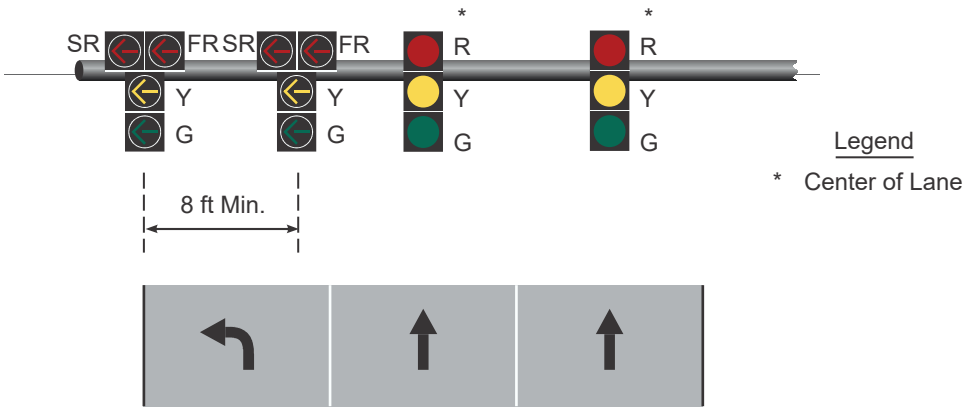


Figure IV-5e. Two Through Lanes with One Left-Turn Lane (Protected-Permissive Left-Turn Phasing FRA)

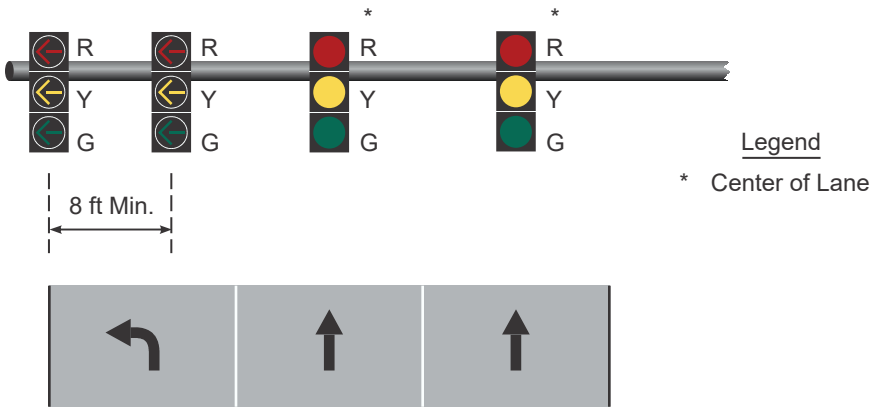


Figure IV-5f. Two Through Lanes with One Left-Turn Lane (Protected-Only Left-Turn Phasing)

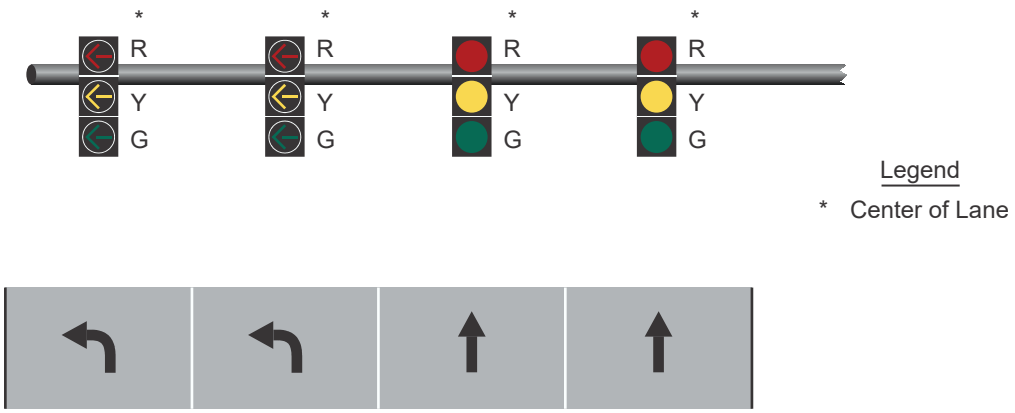


Figure IV-5g. Two Through Lanes with Two Left-Turn Lanes
(Protected-Only Left-Turn Phasing)

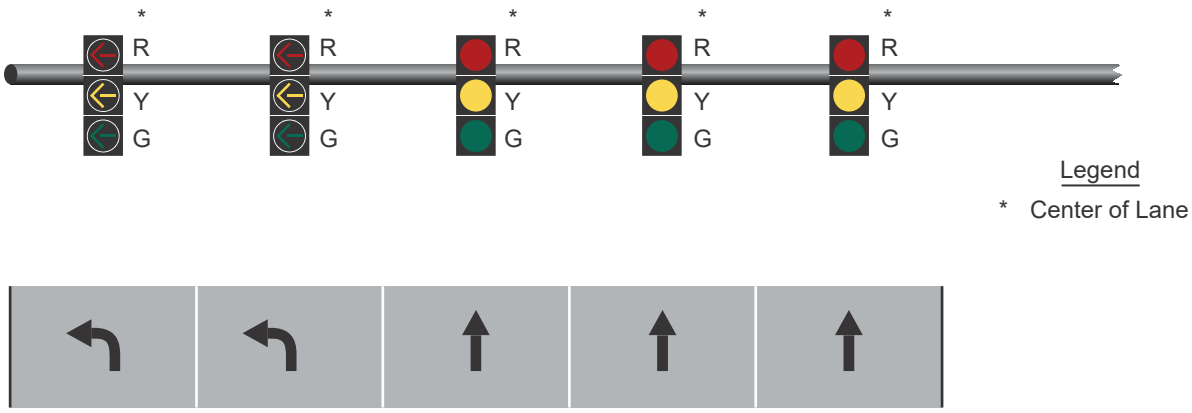


Figure IV-5h. Three Through Lanes with Two Left-Turn Lanes
(Protected-Only Left-Turn Phasing)

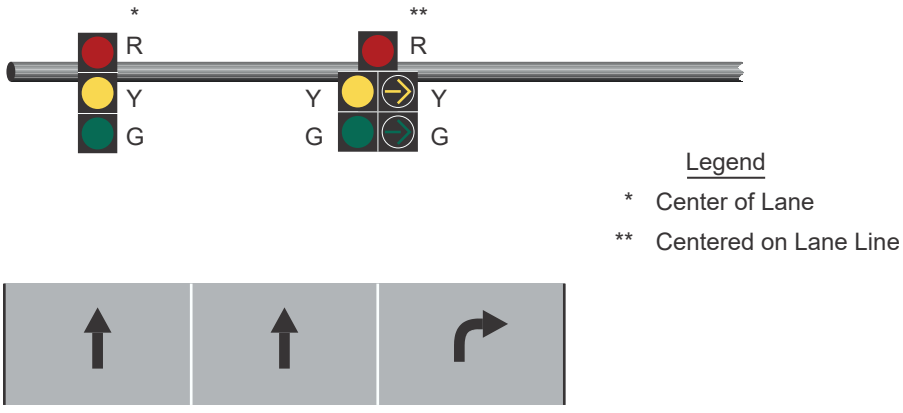


Figure IV-5i. Two Through Lanes with One Right-Turn Lane
(Protected-Permissive Right-Turn Phasing)

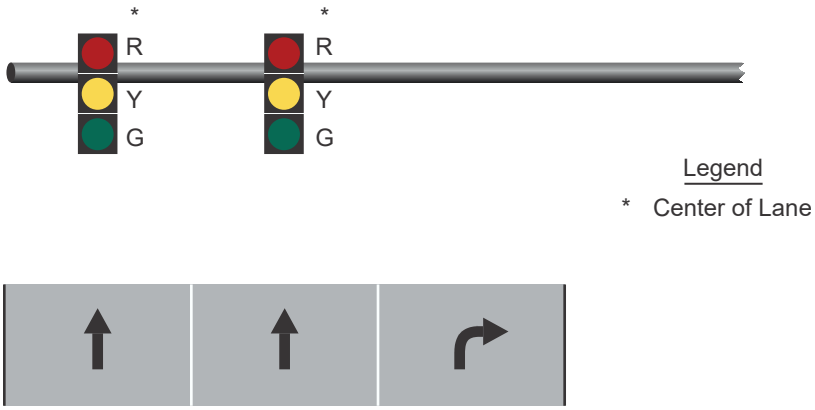


Figure IV-5j. Two Through Lanes With One Right-Turn Lane (Permissive Right-Turn Phasing)

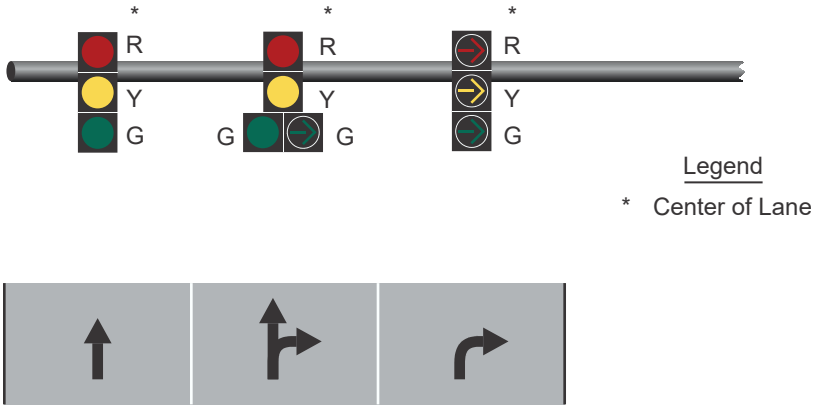


Figure IV-5k. One Through Lane, One Shared Through/Right Lane, and One Right-Turn Lane (Protected-Permissive Right-Turn Phasing)

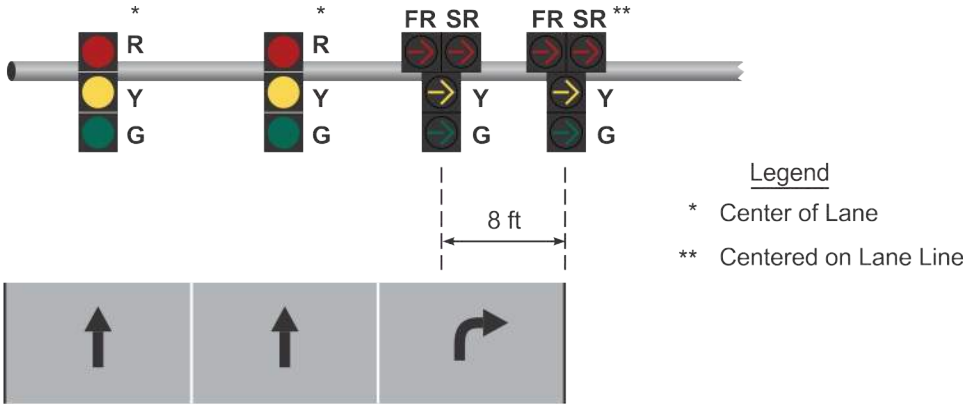


Figure IV-5l. Two Through Lanes with One Right-Turn Lane (Protected-Permissive Right-Turn Phasing FRA)

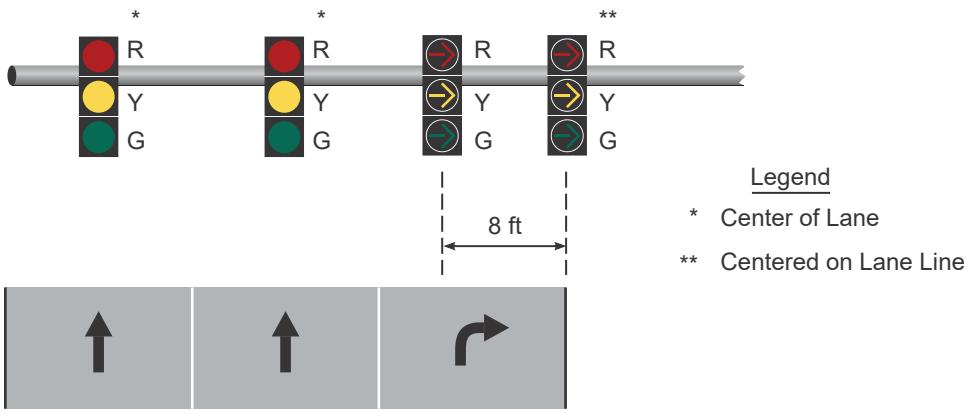


Figure IV-5m. Two Through Lanes With One Right-Turn Lane (Protected-Only Right-Turn Phasing)

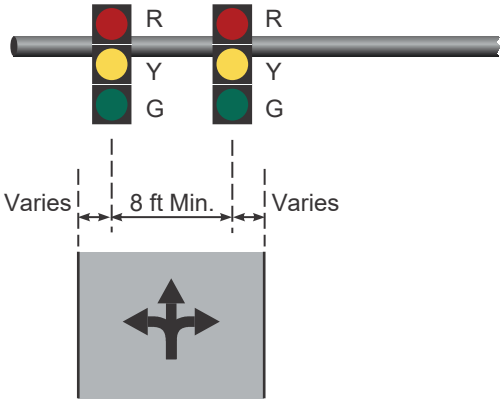


Figure IV-5n. One Shared Left/Through/Right Lane (Permissive Left-Turn Phasing)

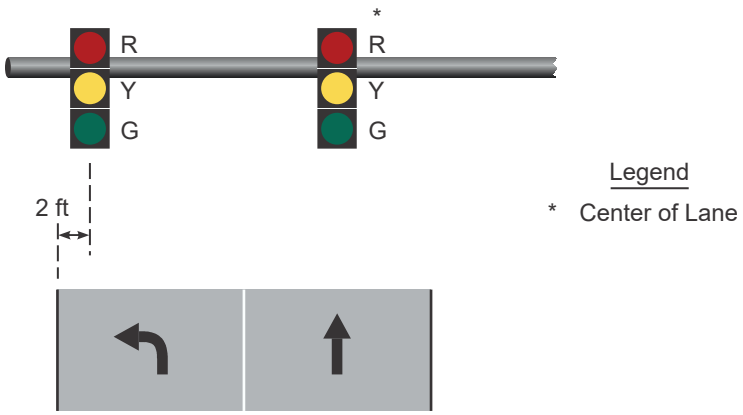


Figure IV-5o. One Left-Turn Lane With One Through Lane (Permissive Left-Turn Phasing)

Split Phasing

For a signalized intersection operating under split phasing, opposing approaches receive green indications separately without running concurrently. Typically, this occurs on side streets with combination lanes and heavy turning movements. When split phasing is used, the signal head arrangements shown in **Figures IV-6a through IV-6f** below should be used. Refer to Chapter IV-E.3.d of this Manual for additional information regarding the appropriate use of split phasing.

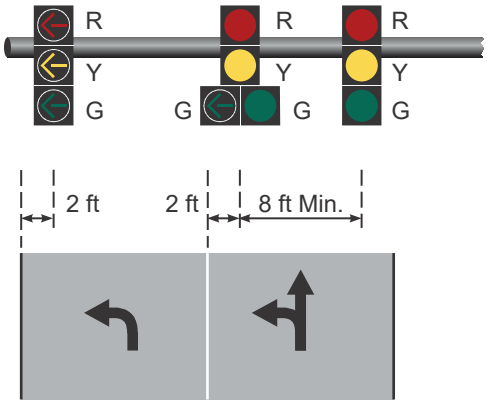


Figure IV-6a. One Left-Turn Lane with One Shared Left/Through Lane (Split Phasing)

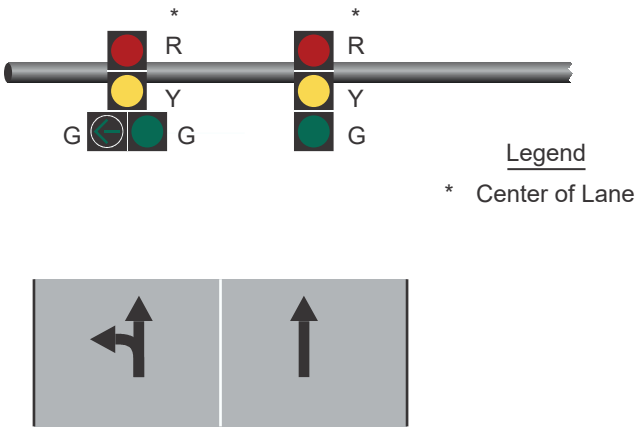


Figure IV-6b. One Shared Left/Through Lane With One Through Lane (Split Phasing)

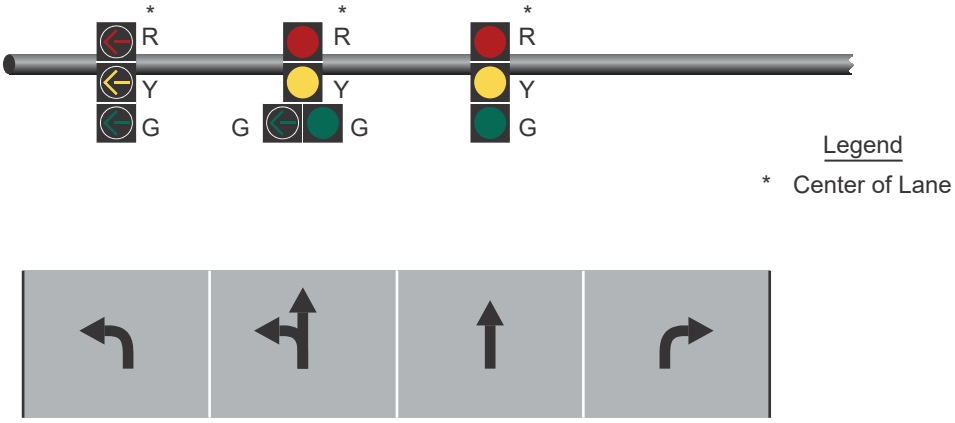


Figure IV-6c. One Left-Turn Lane, One Shared Left/Through Lane, One Through Lane, and One Right-Turn Lane (Split Phasing)

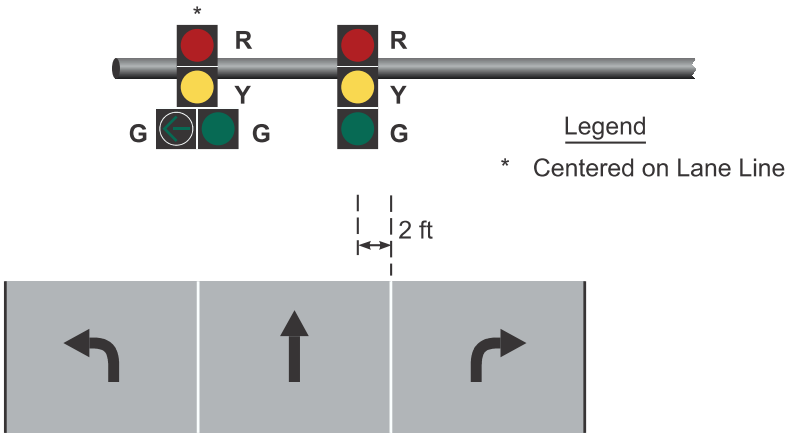


Figure IV-6d. One Left-Turn Lane, One Through Lane, and One Right-Turn Lane (Split Phasing)

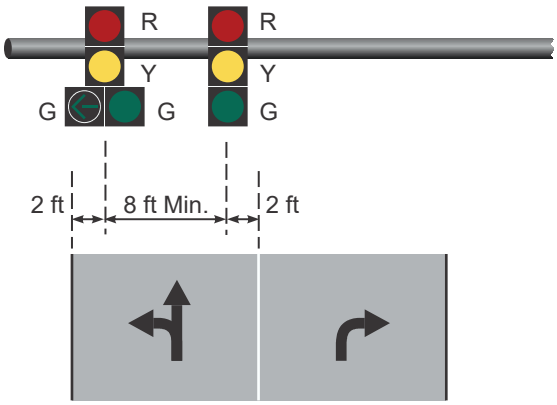


Figure IV-6e. One Shared Left/Through Lane and One Right-Turn Lane (Split Phasing)

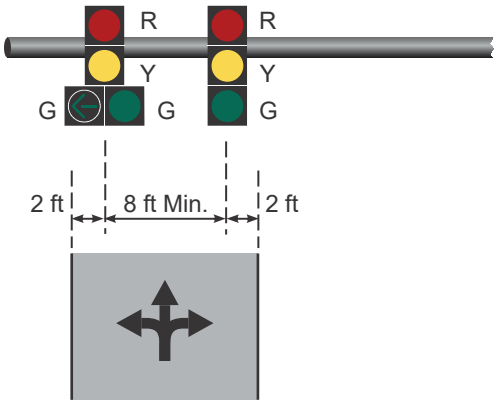


Figure IV-6f. One Shared Left/Through/Right Lane (Split Phasing)

Near Side Signal Heads

When used for left turns, near side signal heads should be located adjacent to the far-left lane of the approaching driver. When used for through movements, near side signal heads should be located adjacent to the far-right lane. Per Section 4D.12 of the DE MUTCD, near-side signal faces should be located as near as practical to the stop line.

f. Shielding of Signal Faces

The primary goal in the placement of signal head indications is to optimize the visibility for approaching drivers. Road users approaching a signalized intersection should have a clear sightline to the signal face controlling their movement, and the signal heads should be placed to avoid driver confusion. However, in some cases, geometric constraints at the intersection may force multiple signal indications to be visible by drivers at the same time. In these cases, visors can be used to enhance the visibility of the desired signal head, while obscuring the visibility of other heads.

Visors

A visor should be used on all signal faces to:

- Aid in directing the signal indication specifically to approaching traffic.
- Shade the signal lens from sun, sky, and other conditions which tend to make a lens look illuminated when it is not.
- Shield the lens from motorists on other approaches who might be confused if they were to see the lens.

There are three types of visors; cut-away, tunnel, and full circle. Cut-away visors should typically be used; however, the other types may be necessary in certain cases to further restrict the signal's visibility.

Backplates

Backplates should be used to supplement all vehicular signal heads mounted on mast arms. Backplates should only be used for span wire locations where an engineering study indicates their need to resolve a problem such as where sun glare, bright sky, and/or complex or confusing backgrounds indicate a need for enhanced signal face conspicuity. Backplates shall include a two-inch wide yellow retro-reflective border. If used on span wire, a tether wire shall be used.

g. Optically Programmed Signal Heads

An optically programmed signal head is a signal head that contains optical units which project an indication that is selectively masked so as to be visible only within desired viewing boundaries. Optically directed lenses can provide an optical cut-off of the indication both vertically and horizontally, as needed.

Although optically-programed signal heads are currently deployed within the state, they are not the preferred shielding method and should only be used upon approval by the Traffic Systems Design Manager and/or Chief of Traffic Engineering. If approved, they shall only be deployed utilizing a mast arm mount.

3. Cabinet Placement

The signal cabinet is an aluminum enclosure that provides housing and protection for signal controller equipment from all forms of outdoor elements.

There are two types of mounting methods for signal cabinets, ground-mounted and pole-mounted. The Department's preferred method is a ground-mounted cabinet which is installed on a concrete base. The typical size cabinet base used by the Department is "Type P". For more information, refer to DelDOT's Standard Construction details in the Design Resource Center. Additional sizes may be used to address specific design needs but all alternate designs shall be pre-approved by the traffic design representative prior to their usage. All proposed or retrofitted ground-mounted cabinets shall include a cabinet base extension unless there is a specific reason (e.g., limited sight lines) why the cabinet base extension should not be used. Pole-mounted cabinets are attached to either a mast arm or strain pole and are typically smaller in size and used in urban areas. Pole-mounted cabinets may only be used with advance approval from DelDOT's Traffic Systems Design Manager.

Cabinets should be located as far off the travel edge as possible, outside of the clear zone, to provide protection from errant vehicles. During the design process, coordination shall occur between design, operation, and maintenance on the need for deployment of uninterruptible power system (UPS) design and deployment. Additional factors to consider when determining the location include:

- Safe access by maintenance personnel and maintenance vehicles
- Sufficient right-of-way to permit ready access
- Orientation of cabinet and door (which should be clearly shown on the plan sheet)
- Pedestrian access and ADA compliance (maintaining acceptable sidewalk width and vertical clearance)
- Clear view of the intersection from the cabinet
- Ability to see two conflicting signal indications from cabinet location
- Convenience to power source
- Convenience to communication equipment
- Driver visibility (i.e., intersection sight distance across the corner)
- Clear zone/Lateral Offset
- Need for UPS battery back-up system
- Drainage
- Proximity to low-lying areas
- Door opens away from traffic
- Full-size concrete base for maintenance purposes and to prevent damage by lawn mower equipment

The Designer should also review DNREC Inundation Map, DelDOT Map of Frequently Flooded Roadways, and FEMA Floodplain Maps to assist in determining if the cabinet is in an area that frequently floods or may reasonably be expected to flood more frequently in the future. (Note: Map of Frequently Flooded Roadway currently shows roadway segments that are often closed but not the specific flood area). If further information is needed, staff familiar with the area should be consulted. If a cabinet is planned in an area that currently floods or may flood more frequently in the future, the designer should consider one or more of the following options:

- Relocate the cabinet to a location near field equipment that is least likely to flood (e.g., if one corner of the intersection is at a higher elevation than another corner, consider using the higher elevation corner).
- Use a pole-mounted cabinet

4. Pedestrian Considerations

a. Pedestrian Signal Guidelines

At signalized intersection crosswalks, associated pedestrian traffic signals and accessible landing areas should be provided across all intersection approaches. Where physical conditions (e.g., guardrail, geometric constraints, pedestrian vehicular conflict, etc.) make the presence of pedestrians improbable or a crosswalk would cause undesirable conditions, the crossing at the applicable leg of the intersection may be omitted. The Designer shall exhaust all potential options prior to omittance and provide supporting documentation and analyses to the DelDOT Traffic Section for review and concurrence.

The following crossing designs are undesirable and should be used with caution and only where physical constraints and/or major operational issues would otherwise result:

- Pedestrian signal phases that are designed for pedestrians to stop in the median area
- Diagonally or exceedingly skewed crossings

All new and retrofitted pedestrian signals shall include a countdown timer.

b. ADA Compliance

During the field survey, special consideration should be given to identifying the potential impacts of the installation of new pedestrian signals and/or the modification of the existing facility. All impacts should be identified on preliminary design plans and consideration should be given to how improvements will impact the construction sequence. All proposed crossings should be installed, and all existing crossings should be retro-fitted, to comply with current ADA standards. For information on the design, construction, and maintenance of pedestrian facilities within the public right-of-way, refer to the Delaware Department of Transportation's Pedestrian Accessibility Standards Manual.

The placement of push buttons shall be within reach of pedestrians who are intending to cross and provide clear guidance on which push button is intended for each crossing by positioning the face of the push button parallel with the pedestrian crossing. For placement criteria, refer to Section 4E.08 of the DE MUTCD.

Where feasible, the placement of ramps should take into consideration the installation of future accessible pedestrian signals (APS). APS devices provide non-visual pedestrian timing information in non-visual form through audible tone, verbal message, and

vibrating surface. For more information on APS, refer to Chapter 4 of the DE MUTCD. Requests for APS may be made to DelDOT using the application form provided in **Appendix L**. Requests for APS are addressed by DelDOT on a first-come-first-serve basis and depending on the overall evaluation score.

5. Signal System Interconnection

During preliminary design, consideration should be given to how the proposed or existing signal could be integrated into the ITMS network. All new signals shall be on system. Typically, retrofit designs should also bring signals on system. This may be accommodated by tying into any existing fiber system or building pathway to an adjacent system. However, consideration should be given to avoid significant downtime to the system by the proposed integration. If an existing fiber system is not readily present or cost prohibits the linking to an adjacent pathway, a wireless connection may be a viable option. This could be achieved by a CDMA, 4.9 GHz, or other wireless solution. For all integration into DelDOT's ITMS, the designer shall work with the TMC and the DelDOT Telecommunications Committee on integration solutions and cost.

6. Power Source

New electric service points should be verified early in the design process through coordination with the applicable power companies. For additional information, refer to the DGM 1-27 dated April 7, 2020 included with this Manual in **Appendix M**.

D. Final Design Plan Elements

Final design plans must include all elements necessary to fully construct all components of the traffic signal. During final design, the Designer must update and finalize all elements included in the preliminary design plans and must also include several more-detailed elements to the plan set. The design elements presented in this chapter of the DelDOT Traffic Design Manual should be incorporated into the final design plans.

1. Conduit Design

A conduit acts as a pathway for electrical and fiber-optic communication cables placed between junction wells, signal pole bases, and the controller cabinet. The DelDOT Traffic Section uses Schedule 80 polyvinyl chloride conduit (PVC) or high-density polyethylene (HDPE) for all signal and ITS pathways. Rigid galvanized steel conduit will be used for electrical service and loop lead-ins, where applicable.

a. Sizes

DelDOT Traffic's typical conduit sizes are selected based on the following:

- All proposed signal conduit shall be 4" Schedule 80 PVC when installed by trench or open cut
- All proposed signal conduit shall be 4" HDPE SDR-13.5 when installed by bore. If hand bore is required conduit size may be reduced upon approval by a Traffic Systems Design representative.
- All proposed signal electrical service shall be provided by a single 2" (or larger, as determined by maximum fill capacity) rigid conduit. Rigid conduit is preferred for all conduit when installed above ground. When conduit is installed underground for long distances, Schedule 80 PVC or HDPE may be deployed upon approval of the Traffic Systems Design representative.
- Where applicable, the proposed loop detector lead-in conduit shall be 1 1/2" rigid conduit. See standard construction detail T8 for additional guidance.
- All pole base conduits shall be as outlined in Standard Construction Detail T-5. Once a tie into a junction well has occurred, the remainder of the pathway shall be as stated above.
- 4" Schedule 80 PVC or 4" HDPE SDR-13.5 conduit shall be used for fiber-optic pathways.

For minor signal improvements, smaller conduit sizes may be used upon approval by a Traffic System Design representative.

b. Installation Methods

There are four (4) typical methods for installing signal conduit:

- Trenched – Installation of conduit in grass or dirt
- Bored – Installation of conduit under roadway, pavement or concrete surfaces
- Open Cut – Installation of conduit in roadway, pavement or concrete surfaces where it cannot be bored.
- Banded – Conduit may also be banded to poles and structures, where applicable.

Boring is the preferred alternative to open cutting of roadway, pavement or concrete surfaces. Boring helps to minimize interruption to traffic and damage to surfaces/structures. The installation cost is typically also lower than open cutting. If boring is recommended for the conduits, the Designer must ensure that there will be sufficient room and right-of-way (approximately 10 feet in the direction of the conduit) to place machinery performing the boring operation. If boring beneath pavement or concrete surfaces is found to be infeasible, open cutting the pavement may be the only feasible option. Open cutting also provides the advantage of avoiding conflicts with underground utilities. If open cutting is proposed, the designer should coordinate with District Maintenance staff regarding the issue and any required patching design.

c. Conduit Fill Capacity

The National Electrical Code (NEC) limits the portion of the conduit's cross-section that can be occupied by conductors.

For traffic signal installations, the conduit fill should be limited to **26%** for new conduit and should be limited to **35%** for existing conduit. This will compensate for a potentially large number of conductors, the length of run, and the number of bends. Cross-sectional areas of cables typically used for signal installations are listed in **Table IV-1**, while fill capacities used by DelDOT Traffic are shown in **Tables IV-2** through **IV-2B**.

As an example, if an existing 2.5" PVC Schedule 80 conduit consists of three #14/9 cables and two #18/4 cables, the total area (0.989 sq. in.) would fall under the 35% allowable fill capacity of 1.44 sq. in., with 0.451 sq. in. still available.

Table IV-1
Cross-Sectional Areas of Electrical and Fiber Optic Cables

No. of Conductors/Wire Size	Area (Sq. In.)
#8/2 UFWG Strand. Bare Copper Ground. Wire	0.250
#18/4	0.049
#14/1	0.049
#14/2	0.091
#14/4	0.119
#14/5	0.139
#14/9	0.297
#14/16	0.389
#6 AWG Stranded Copper	0.051
6 Count Fiber	0.132
24 Count Fiber	0.132
48 Count Fiber	0.132
144 Count Fiber	0.302
CAT	0.102

Table IV-2
Fill Capacities of Typical PVC Schedule 80 Conduit Sizes Used by DelDOT Traffic

Conduit Size	Allowable Fill Capacity	Area (Sq. In.)
1.0”	26% (new)	0.18
	35% (existing)	0.24
1.5”	26% (new)	0.45
	35% (existing)	0.60
2.0”	26% (new)	0.75
	35% (existing)	1.00
2.5”	26% (new)	1.07
	35% (existing)	1.44
3.0”	26% (new)	1.67
	35% (existing)	2.25
4.0”	26% (new)	2.93
	35% (existing)	3.94

Table IV-2A
Fill Capacities of Typical HDPE Conduit Sizes Used by DelDOT Traffic

Conduit Size	Allowable Fill Capacity	Area (Sq. In.)
2.0”	26% (new)	0.86
	35% (existing)	1.15
2.5”	26% (new)	1.22
	35% (existing)	1.64
3.0”	26% (new)	1.89
	35% (existing)	2.54
4.0”	26% (new)	3.26
	35% (existing)	4.39

Table IV-2B
Fill Capacities of Typical Rigid Conduit Sizes Used by DelDOT Traffic

Conduit Size	Allowable Fill Capacity	Area (Sq. In.)
1.0”	26% (new)	0.23
	35% (existing)	0.31
1.5”	26% (new)	0.54
	35% (existing)	0.73
2.0”	26% (new)	0.89
	35% (existing)	1.19
2.5”	26% (new)	1.27
	35% (existing)	1.70
3.0”	26% (new)	1.95
	35% (existing)	2.63
4.0”	26% (new)	3.35
	35% (existing)	4.51

2. Junction Wells / Junction Boxes

Junction wells are pre-cast structures placed underground with steel frame lids (Type 1, 4, and 5) or composite lids (Type 7). Junction boxes are placed within concrete barriers with NEMA 4X frames and lids. They act as a point of access to reach cable, to provide a change of direction for a conduit run, or to provide a cable splice location.

a. Types & Sizes

DelDOT Traffic uses four (4) types of junction wells: precast concrete with steel frame and lid (types 1, 4, 5), and precast polymer concrete frame and lid (type 7). The preferred junction well types used by DelDOT Traffic are listed below (see DelDOT's Standard Construction Detail T-1 for additional information):

- Type 1 – 20"x 20": typically used for signal access points beyond the signal cabinet.
- Type 4 – 20"x 42½": typically used for a signal project as a tie-in point for entering the signal cabinet. Also used for pull points for the fiber optics pathway.
- Type 5 – 24"x 16": typically used for signal access points beyond the signal cabinet within narrow medians or constrained right-of-way locations.
- Type 7 – 36"x 60": typically used for the fiber optics pathway as splice points or device tie-in locations.
- NEMA 4X – Size determined by National Electric Code (NEC) requirements.

Under most design projects, the impacted existing steel frame and lid junction wells should be retrofitted to be bonded and grounded. Refer to DelDOT's Standard Construction Detail T-2 for more guidance. For certain signal projects with a small scope of work and with the approval of a Traffic Systems Design representative, there may be no need to modify existing junction wells.

Additional junction well types may be used but would require prior approval from the Traffic Field Operations Manager or Chief of Traffic Engineering.

b. Location

Junction wells for signal design projects should be placed near each signal pole, loop detection splice point, change of direction, roadway crossing of pathway, traffic control device tie-in, and near the cabinet. The maximum spacing between junction wells for signal design projects is 300 feet. The maximum spacing between junction wells for ITS (fiber) pathway is 600 feet. Refer to Chapter V of this Manual for additional details regarding ITS design elements.

3. Detection

Signal detection provides the signal controller with information on the current traffic conditions at the intersection and on the approaches and departures to/from the intersection. Detection should be included in the design of all new and modified signals.

a. Function

The six (6) basic operational functions provided by detection are: 1) Presence, 2) Passage, 3) Sampling, 4) Emergency Vehicle Detection, 5) Pedestrian Detection, and 6) Bicycle Detection.

Presence detection provides the controller information on when a vehicle is present within the designated detection zone. These detectors are typically placed on side streets and left-turn bays prior to the stop line.

Passage detection provides the controller information on when a vehicle has passed through a detection zone. Passage detectors are located at a calculated distance behind the stop line, based on the speed of vehicles approaching the intersection and the grade.

Sampling detection provides the controller with presence and occupancy readings to help aid in determining which signal timing operation should be deployed based on the amount of traffic volume currently within the corridor. Sampling detectors are placed on the departure side of the intersection at a point where vehicles reach free-flowing speeds. Sampling detectors should be strategically located to best serve the system, based on coordination with DelDOT Traffic.

Emergency Vehicle Detection alerts the controller of approaching emergency vehicles, which allows the signal to extend the current green time or to change the signal indications to allow for a green indication to be displayed for the emergency vehicle(s) on the required approach. Typically, all approaches should be designed with emergency vehicle detection.

Pedestrian Detection: is typically accomplished with push buttons located adjacent to a crosswalk that complies with Section 4E.08 of the DE MUTCD. More detail on Pedestrian signal design is provided in Chapter IV-C of this Manual.

Bicycle Detection: is typically accomplished by using vehicle detectors in a designated bicycle lane. When present, bicycle detectors should be placed in bicycle lanes on side streets prior to the stop line. If bicycle lanes are not provided, detector settings should be adjusted to properly detect bicycles.

b. Design

While DelDOT Traffic currently utilizes multiple types of vehicle detection devices, **inductive loop detectors are the Department's standard**. Inductive loop detectors are used for presence, passage, and sampling detection. The loops are formed by saw cutting the surface of the roadway, placing a No 14 AWG wire encased in flexible tubing detector wire into the saw cut, which is then sealed and run to the nearest junction well.

DelDOT Traffic typically utilizes two sizes of inductive loop detectors (see DelDOT's Standard Construction Detail T-9 for additional information):

- Type 1 Loop Detector – Typically a 6-foot by 6-foot loop that can be used for both passage and sampling detection. When used as passage detection, the loop is placed in each of the through travel lanes in advance of the stop line to detect a vehicle approaching the intersection. The placement of the loop is determined by the approach roadway posted speed (refer to **Table IV-3** on the following page). When used as a sampling detector, the detector should be placed on the departure side of the intersection where traffic is expected to reach free flow conditions; however, placement may be adjusted based on field conditions or locations of existing JWs.
- Type 2 Loop Detector – Typically a 6-foot by 25-foot loop is used for presence detection. Type 2 detectors are generally placed at the stop line on minor street approaches and in left-turn lanes, to detect and/or extend green time for the movement being served. The face of the detector is typically placed 2 feet behind the stop line, but placement may be adjusted to address field requirements.

Other types of detection utilized by DelDOT Traffic include Wireless and Non-Intrusive Detectors, which are typically utilized during MOT staging when inductive loops cannot be maintained or require multiple adjustments between stages. Other applications include locations where field conditions do not allow for "intrusive" installations, such as at intersections adjacent to bridge decks or other transitional areas. Non-Intrusive detectors used by DelDOT currently include optical detection and video detection.

Table IV-3 Detector Setbacks	
Speed (MPH)	Detector Setback (feet)
25	90
30	125
35	160
40	200
45	250
50	300
55	350
60	410

NOTES:
Detector setback distances are calculated using the following equations/assumptions:

Deceleration Rate, d = 12.0 feet per second^2
Reaction Time, r = 1.00 second
Detector Setback = Deceleration Distance + Reaction Distance

$$= \frac{V^2}{2d} + Vr$$

where V = speed (in feet per second)

Optical Detection is typically used for emergency vehicle detection. Optical detection consists of two primary components: an emitter installed in the emergency vehicle that produces a high-intensity light pulse, and a detector located on the signal. Upon activation, the detector sends a message to the control cabinet to begin a pre-programmed pre-emption sequence. Alternatively, emergency preemption can also be accomplished by the installation of a push button, typically installed within an emergency station. The push button activates an emergency vehicle signal via a hardwired connection.

Video Detection uses a video camera mounted to the signal upright, mast arm, or strain pole to create a digitized detection zone. As vehicles pass through or wait in the zone, a detector call is recorded. For best results, a rigid mount is preferred. Wide approaches with multiple lanes may require more cameras. The Designer shall coordinate with the vendor of the specified video detection equipment to ensure that the proposed layout covers all the required detection zone.

Other detection systems are also available for use in special cases. **Wavetronix, Fisheye, and Microwave Detection** may be used in special circumstances where the use of in-pavement sensors is not feasible or if non-metallic objects need to be detected. In instances, where existing inductive loop detectors are impacted by proposed construction work, **temporary detection** shall be provided as part of the project, unless otherwise approved by the Chief of Traffic Engineering and the Chief of Traffic Operations.

The type of temporary detection shall be based on the need for advance, system, and/or presence detection and consider best fit, system accuracy/reliability, and cost. Temporary detection shall be included as part of a proposed signal plan or as a markup of the most recent archive signal plan on file. The plan or markup together with the traffic statement/cost estimate shall identify and quantify the type, number, and location of detectors, detection zones, procurement cost, installation/removal cost, and maintenance of traffic cost, etc. If a project has multiple construction phases, temporary detection shall be provided during all phases of construction, which may require that the designer submit construction timesheet packages for different phases of construction to the TMC.

After presenting the plan or markup at Project Process, the designer shall coordinate with the vendor/manufacturer to finalize the proposed temporary detection and request a quote for the procurement of the equipment, including any spare units.

Upon notification that a project has been awarded, the designer shall coordinate with Finance that funding is available to purchase the temporary detection equipment, before distributing the handoff with signal plans, traffic statement/cost estimate, quotes, etc. For intersections without proposed signal plans, the designer shall distribute the handoff to the Signal Construction, Signal Maintenance, Design, Finance, and TMC/Operations sections only.

DelDOT's Traffic Contractor shall install the temporary detection ahead of the project's start of construction and shall remove the temporary detection after the permanent detection has been installed by the project. The temporary detection equipment shall be returned to DelDOT Traffic, Dover, Delaware.

4. Wiring

Electrical wiring is an integral component of a signal system. Well-designed electrical wiring systems assure proper signal operation and facilitate maintenance and expansion of the

signal system. The amount and type of electrical wire required for each design is shown in the conduit run schedule on the plan sheet. This schedule shows the wire routing for all related signal equipment back to the controller. The following section of the report outlines DelDOT's preferred standard practices for wiring. The most common types and sizes of cable used by the department are listed below in **Table IV-4**. For all new construction projects, the designer should update all wiring to comply with current DelDOT electrical standards. For minor retrofit projects, existing wiring may be retained if deemed adequate by a DelDOT Traffic Representative.

Table IV-4
Wiring Diagram Supplemental Information

Device	Cable Type	Size	Volt. (AC)
HIB, Jumper Wire	4-Conductor Electrical Cable	No. 14 AWG (2)	600
Pedestrian Signal Head and Push Button (1 way) per direction	5-Conductor Electrical Cable	No. 14 AWG (2)	600
1- & 2-Section Signal Heads, 3-Sect. Head w/Arrows & Jumper Wire (mast arm)	4-Conductor Electrical Cable (1)	No. 14 AWG (2)	600
4- and 5-Section Signal Heads (mast arm)	9-Conductor Electrical Cable (1)	No. 14 AWG (2)	600
Signal Heads (span wire)	16-Conductor Electric Cable	No. 14 AWG (2)	600
Loop Wire Lead-In Cable	1-Conductor (Aluminum shielded)	No. 14 AWG	600
Loop Detector Home-Run Cable	2-Conductor (Aluminum shielded)	No. 14 AWG	600
Opticom Detector	4-Conductor Detector Cable	No. 18 AWG	300
Grounding	Strand. Bare Cop. Gnd. Wire	No. 6 AWG (2)	----
Power Feed (disconnect to cabinet)	2-Conductor Electrical Cable	No. 8/ 2 UF w/G (2)	110/220
Electrical Service (transformer to disconnect)	1-Conductor Electrical Cable	No. 8 THHN w/G(3) or No. 6 Triplex Service Cable (2) (3)	110/220

(1) – Consideration should be given to increasing the number of conductors needed in mast arm installations for spare and future use.
(2) – For longer runs, a heavier gauge cable may be required to reduce voltage drop.
(3) – Cable determined by power company providing service.

a. Mast Arm Pole Cabling

The signal cables connecting the signal cabinet and each mast arm pole should be designed as follows:

- **Single Mast Arm with a Single Phase:** Use one (1) 9-conductor for the signal head, one (1) 5-conductor for each pedestrian indication and pushbutton, and one (1) 4-conductor for pre-emption devices.
- **Single or Dual Mast Arm with 2 to 3 Phases:** Use one (1) 16-conductor for the signal head, one (1) 5-conductor per each pedestrian indication and pushbutton, and one (1) 4- conductor for each pre-emption device installed.
- **Single or Dual Mast Arm with 4 Phases:** Use two (2) 16-conductors for signal head, one (1) 5-conductor for each pedestrian indication and pushbutton, and one (1) 4-conductor for each pre-emption device installed.

The above-listed signal head cable configurations will serve as the "home run" between the controller and the base of the mast arm pole. At that point, the cable will be spliced with the individual cables that connect with each signal head:

- One (1) 9-conductor shall be run to each five (5)-section signal head
- One (1) 5-conductor shall be run to all signal heads with four (4) or fewer signal indications.

Pre-emption cable and pedestrian signal head indication cable shall be installed as a single continuous run with no splice from each device installed back to the signal cabinet. Jumper (4-conductor) wire should also be included in quantity calculations. Additional wiring configurations may be required for unusual signal designs including near-side and auxiliary signal heads. See **Appendix N** for additional wire cabling design considerations.

b. Span Wire Cabling

The signal cables connecting the signal cabinet and the primary strain pole in a span wire configuration should be designed with two (2) 16-conductor cables. One of these 16-conductor cables will be used to serve two approaches (one major street approach and one minor street approach) while the other 16-conductor cable will be used to serve the remaining approach(es). These two cables typically provide all the conductors necessary to serve all of the signal heads used for most span wire configurations.

Additionally, one (1) 4-conductor cable must be run between the signal cabinet and each pre-emption device. One (1) 5-conductor cable must also be run from the signal

cabinet to each pedestrian indication per corner of the intersection requiring a pedestrian indication. This cable may either be run underground (preferred) or overhead, if necessary. Additional wiring configurations may be required for unusual signal designs including near-side and auxiliary signal heads. See **Appendix N** for additional wire cabling design considerations.

c. Pedestrian Signal

Pedestrian signals in Delaware require one (1) 5-conductor cable spliced in the base per each pedestrian indication(s) and push button(s). Additionally, (1) 4-conductor cable shall run within the pole between the pedestrian head and the pushbutton to the 5-conductor in the base of the pole.

d. Detector Wiring

For detector wiring, a single 2-conductor aluminum shield home-run cable is spliced into each loop detector and run from the junction well to the controller cabinet in a continuous run. No additional splices shall be permitted. All other detection methods should follow the recommended manufacturer requirements to maintain maximum output.

e. Overhead Cabling

Overhead cabling is used with span wire signal installations. Cables installed overhead shall be supported by span wires strung between signal poles. Attachment of signal cables to the span wire shall be by standard lashing methods with galvanized lashing wire. Attachment of cable to the span wire shall be by application of a minimum of five (5) wraps of plastic tape (black in color) at intervals of not more than 24 inches.

The vertical runs of cable to the overhead installation should be routed in conduits with a weather head or routed inside the steel pole. Drip loops shall be formed where the cable enters the weather head to prevent water from running down the cable into the conduit or pole.

In some cases, primarily for interconnection with other intersections or to provide power to the intersection, overhead cabling may also be used. Utility companies typically own existing poles that are located along roadways and joint usage of these poles can usually be arranged with the utility company. There are safety requirements to maintain certain clearances from other utility lines and attachment agreements may be required.

Cables installed overhead between existing poles shall be supported by messenger wires strung between poles. The messenger may be a separate wire used to support the cabling or may be combined with an electrical cable in a common jacket. When combined, the cable has a figure 8 cross-section profile and is therefore termed a "figure 8" cable (see DelDOT's Standard Construction Details T-11 and T-12 for additional information).

f. Interconnect

Interconnect provides coordination between traffic signals allowing the ability to establish a time relationship between the signals. All signals should be interconnected through DelDOT's TMC. This allows the TMC to implement a standard clock, provides the ability to adjust timings, facilitates troubleshooting, and provides real-time traffic data. Coordination between adjacent signals has proven to be effective in improving the flow of vehicles and reducing vehicle delay and fuel consumption.

Coordination is accomplished through several different methods. Options include a fiber-optic connection (for signals near existing or proposed fiber pathways), CDMA, 4.9 GHz, and 900 MHz wireless connection.

There are some basic principles to be followed when installing coordination interconnect cables:

- All cables shall be terminated inside of an enclosure (control cabinet, splice case, or computer building). This allows for easy termination on terminals and convenient testing points.
- Intermediate splices, other than at junction wells or cabinets, should be avoided.
- Interconnect cables should not be placed into the same conduit with cables that carry secondary line voltage or higher.

Consultation with the Telecommunications Group is required to finalize the design.

g. Grounding

A single No. 6 AWG stranded copper ground wire shall run through all pathways between the cabinet and junction wells and the bases of all pole structures to ensure proper grounding of all wires.

h. Power Feed

DelDOT's traffic signals typically draw power from existing, nearby utilities. The signal designer should identify potential sources of power as early in the design phase as possible and coordinate the location, service wire size, and any other specific

requirements with the power provider. For additional guidance on the next steps in the process, refer to DGM 1-27. DelDOT Traffic Signal Construction with the support of the designer will prepare and deliver power service applications.

The standard signal service for DelDOT shall be as follows:

Overhead or underground service should be tapped from the nearest utility pole, transformer, or electrical manhole able to provide, 120/240 Volt, single-phase, three-wire service.

A meter, breaker panel, and/or disconnect switch, in weather-rated enclosures, shall be installed on the line side of the service typically within 5 feet (10 feet max) of the utility pole (refer to DelDOT's Standard Construction Detail T-17 for additional guidance). For designs where the control cabinet is located more than 50' from the power source or where a disconnect is not easily accessible, an additional secondary disconnect, or breaker panel shall be required. Underground conduit shall transition to Rigid Galvanized Steel (RGS) before transitioning up to the service. The designer should provide the pole number for utility poles used as power sources.

5. Phasing

Signal phasing assigns the right-of-way to one or more movements during a signal cycle. The phase numbering and sequencing are shown in a diagram in the upper right-hand corner of the signal plan sheet and shall follow the NEMA phasing conventions as adopted by DelDOT Traffic. For detailed information on phasing, refer to Section IV-E.3 of this Manual.

If the side street phasing is split, the side streets use Phases 3 and 4 only. If the side streets run concurrently, phase 4 and 8 shall be utilized. At a "T" intersection, the side street is typically Phase 4. In a box under the NEMA phasing diagram, the following note should be inserted:

1. Phases associated by a solid line will not operate concurrently.
2. Phases associated by a dashed line may operate concurrently.

On the plan sheet, the Designer should connect the phase circles by the appropriate line type.

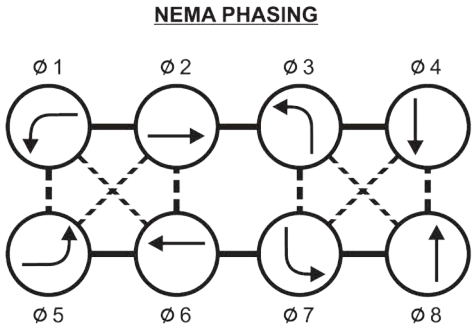
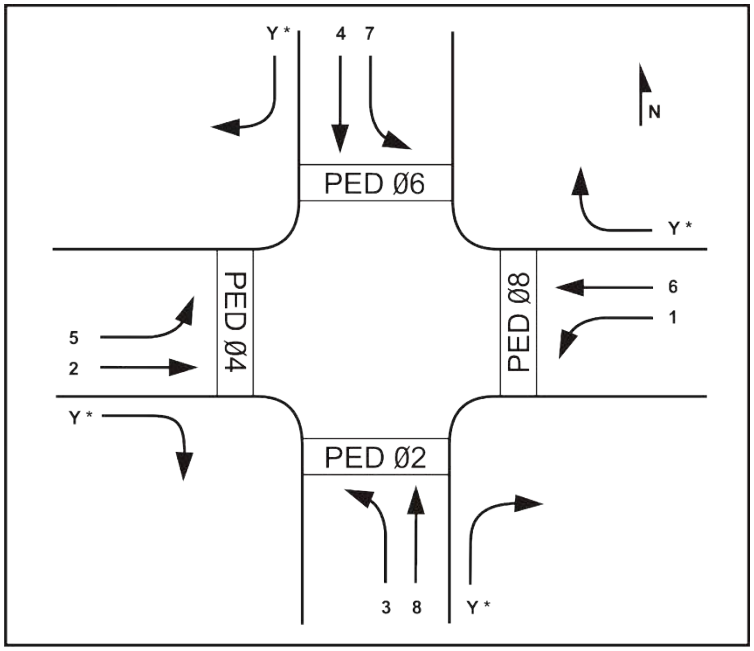


Figure IV-7. Standard NEMA Phasing Convention

The NEMA phasing diagram shown in **Figure IV-7** corresponds with the following intersection movements shown below in **Figure IV-8**. Atypical phasing requires coordination between the designer and TMC.



* Only shown when right turns are YIELD-controlled

Figure IV-8. Typical Intersection Movements and Corresponding NEMA Phasing Convention

6. Control Cabinet

Types

For all signal projects, a 16-phase, fully actuated signal controller will be used. For all retrofits and/or signal modification projects, signal controllers should be upgraded unless otherwise agreed to by the TMC. Controllers will typically be housed in a based-mounted cabinet with base extension, unless there is a specific reason (e.g., limited sight lines) why

the base extension should not be utilized. In situations where there is insufficient space, the potential for flooding, or other geometric or environmental constraints, a pole-mounted cabinet may be used. On the signal plan, the cabinet type shall be shown inside the cabinet symbol. All cabinets should be connected to the DelDOT TMC. The preferred method of connection is via a fiber line, but if a fiber line is not feasible due to the location of the signal, then a CDMA, 4.9Ghz, or other wireless connection should be considered. See Chapter V Section A.2 for additional guidance.

Conduits

All proposed Type P signal cabinet bases (refer to DelDOT's Standard Construction Detail T-4) shall have a minimum of four (4) conduits access points. The typical layout shall be as follows. All proposed Type P signal cabinet bases shall be connected directly to a type 4 junction well with a minimum of four (4) 4" Schedule 80 PVC conduits providing direct access. Additionally, a single 2" (or larger, as determined by maximum fill capacity) service conduit, rigid galvanized steel preferred, shall provide direct access to the base or via a type 1 junction well (preferred) from the electrical service pedestal (refer to DelDOT's Standard Construction Detail T-17) into the cabinet base.

Typical conduit access point designation should be as follows:

- Conduit 1: 120-volt cables (signal heads, remote services, etc.)
- Conduit 2: low voltage cables (detectors, opticom, etc.)
- Conduit 3: shall be for fiber optic applications.
- Conduit 4: shall be a dedicated spare.

7. Pole & Cabinet Base

Pole Base

DelDOT utilizes a Pole Base, Type 4A with drop-in anchors to support conventional, aluminum pedestrian signal (pedestal) poles. A Pole Base, Type 4B with breakaway couplings is used to support ornamental steel pedestrian signal (pedestal) poles.

DelDOT utilizes a Pole Base, Type 6B to support Rectangular Rapid Flashing Beacons (RRFB), Signal Ahead beacons, and Stop Ahead beacons.

For all designs with new traffic signals (i.e., mast arm uprights and strain poles), CCTV cameras, and/or vehicle detector poles, the signal designer should first consult DelDOT's Geotechnical Engineer to determine if soil information is readily available for the project

location. If historical soil data is unavailable, the signal designer should submit a soil boring request form (see **Appendix O**). For Traffic-Only projects, all soil boring requests should go through the Traffic Systems Design Manager to DelDOT's Materials & Research Manager, and Geotechnical Engineer. For all other projects, requests should be coordinated with the Project Manager and Group Engineer. Developers are responsible for obtaining soil borings and providing the Traffic Systems Design Manager with a signed and sealed report that includes the pole base recommendations. At a conventional four-legged intersection, the initial soil boring request should generally consist of two borings on diagonal corners or all affected corners, at the discretion of DelDOT's Geotechnical Engineer. The anticipated project cost associated with soil borings is about $10,000 per intersection, which the signal designer should include in preliminary engineering estimates and developer funding requests.

Following the soil analysis, DelDOT's Geotechnical Engineer will recommend one of twelve soil condition "cases" for each pole base location for the signal designer to utilize as shown in **Table IV-5**.

Table IV-5
Pole Base Type Selection for Varying Soil Condition

	"Poor" Soil Conditions						***"Medium" Soil Conditions***					
	Case 1 Sand over sand	**Case 2** Sand over clay	**Case 3** Sand over rock	**Case 4** Clay over sand	**Case 5** Clay over clay	**Case 6** Clay over rock	**Case 7** Sand over sand	**Case 8** Sand over clay	**Case 9** Sand over rock	**Case 10** Clay over sand	**Case 11** Clay over clay	**Case 12** Clay over rock
Up to 40-ft mast arm	3A	3C	3	3B	*	3	3A	3A	3	3A	3A	3
40-ft to 60-ft mast arm	3B	3C	3	3C	*	3A	3A	3B	3	3A	3B	3
70-ft to 90-ft mast arm	3B	3C	3A	3C	*	3A	3A	3B	3	3A	3B	3
75-ft camera pole	3	3A	3	3A	3C	3	3	3	3	3	3	3
40-ft detector pole	3	3B	3	3B	3C	3	3	3	3	3	3	3
32-ft strain pole	3C	*	3A	3C	*	3B	3B	3C	3A	3B	3C	3A
37-ft stain pole	3C	*	3A	3C	*	3A	3B	3C	3A	3B	3C	3A

* Consultation with DelDOT's Geotechnical and Bridge Sections is required

In some cases, it may be necessary to also calculate the dead load for signal heads on mast arm or span wire before selecting the appropriate pole base. The signal designer shall refer to DelDOT's Bridge Design Manual. For additional resources, refer to the AASHTO LRFD Specification for Structural Supports for Highway Signs, Luminaires, and Traffic Signals for guidance.

Type 3, 3A, 3B and 3C pole bases shall have two (2) 3" Schedule 80 PVC conduit elbows with one providing a connection from the pole base to the nearest junction well and the other being capped, unless otherwise required. Type 4A and 4B pole bases shall have one (1) 2.5" Schedule 80 PVC conduit elbow connecting to the nearest junction well. All new signal pole bases shall tie directly into a junction well (unless otherwise approved by a Traffic Systems

Design representative). No signal pole shall have direct access to the signal cabinet unless the cabinet is directly mounted to the pole.

Type 3C pole bases require specialized foundation drilling equipment and unique mobilization. DelDOT's Traffic Construction Section should be consulted in advance of the construction handoff to review constructability and determine a project-specific cost.

Cabinet Base

There are four common cabinet base types used by DelDOT Traffic.

- Cabinet Base Type P – Signal, Lighting
- Cabinet Base Type F – Fiber
- Cabinet Base Type M – Intersection Lighting
- Cabinet Base Type P/R – Interchange Lighting

Refer to DelDOT's Standard Construction Detail T-4 for additional information. Any modification to the construction detail must be pre-approved by the Chief of Traffic Engineering prior to installation.

8. Signing

Signing removal or improvements may be required in conjunction with a new or modified signal design project. All proposed or removed signs shall be in accordance with the DE MUTCD for proper application and installation. Signs typically installed as part of a signal design include overhead regulatory and street name signs, signal ahead (W3-3) signs with advance street name plaques (W16-8P or W16-8aP), and/or other lane control, regulatory and warning signs as part of the signal design.

a. Overhead

All new and significantly retrofitted traffic control signals should include overhead street name signs (SNS). All SNS's on mast arms and span wires should have the following characteristics:

- Be dual-sided (except for one-way streets)
- Be hung below the span wire or mast arm
- Have a maximum width of 120 inches (10 feet)
- Have an initial upper-case height of 8" and lower-case height of 6", Highway Gothic D lettering. If the legend does not fit within 120 inches, use narrow letter kerning to fit the legend on the panel before downsizing the letter height by 0.5" increments.

- Have 17’ minimum clearance from the roadway surface to the bottom of the sign
- Be installed only when the angle of the mast arm or span wire perpendicular to the direction of travel is less than 30 degrees.

Additionally:

- Overhead SNS may incorporate a route shield when the roadway meets the conditions set out in the DE MUTCD Section 2D.43 paragraph 02.
- Should match County 911 Center’s official street name.
- Overhead SNS with two lines of lettering is not permitted.
- Single line overhead SNS should not be tethered.
- Regulatory signs mounted on mast arms should be rigidly mounted to the mast arm (not hanging).
- Span-mounted signs will not be tethered unless special circumstances, such as size dictate.

The combination of possible geometric intersection designs and signal designs makes it impractical to develop a specific policy that will show exactly where every sign should be located. For additional guidance refer to DelDOT’s guidance memo on Overhead Street Signs Mounted on Traffic Signals in **Appendix P**.

b. Ground Mounted

An advance SIGNAL AHEAD (W3-3) sign with advanced street name plaques (W16-8P or W16-8aP) shall be installed for all approaches. For a new signal, a NEW (W16-15P) supplemental plaque shall be mounted above the Signal Ahead sign and remain in place for no longer than 6 months. Additionally, if an operational change is occurring, a NEW TRAFFIC PATTERN (W23-2P-DE) supplemental plaque shall be mounted below the Signal Ahead sign and remain in place for 90 days. Any additional required signs shall be displayed in accordance with the DE MUTCD.

Signs to be removed shall be clearly depicted in the plan sheet. For a stop-controlled intersection being converted to a signal, the “STOP” R1-1 and “STOP AHEAD” W3-1 shall be removed concurrently with the signal becoming operational.

9. Pavement Markings

A signal plan may require the installation or modification of existing pavement markings. All markings shall be designed in accordance with the DE MUTCD and may include crosswalks, stop lines, message/arrow markings, lane lines, channelizing and auxiliary lines, and edge lines. All new pavement markings shall be designed and detailed to a point where they can

be transitioned into the existing markings. All proposed markings shall be identified and quantified on the plans in accordance with DelDOT CADD standards. Quantities should be rounded up to the next 10-foot increment for estimating purposes. Removal of existing markings that conflict with new markings shall also be identified on the plans and quantified.

10. Maintenance of Traffic

The Traffic Designer needs to determine the maintenance of traffic (MOT) setups required to construct the project. Typical MOT requirements can be found in Chapter 6 of the DE MUTCD, primarily utilizing typical applications. Coordination with the Traffic Safety Section shall occur during the design process to determine allowable lane closure hours, pedestrian access, and any additional MOT requirements. If signal projects are part of capital projects, pavement rehabilitation projects, or developer projects, the signal construction MOT will fall under the overall project MOT and the Designer should coordinate with the project team developing the Transportation Management Plan (TMP).

The cost estimates prepared for Traffic-led projects should include all MOT items. Time restrictions, night work requirements, MOT checklist, and pedestrian access should be denoted on the plan and in the handoff form. For capital projects, pavement rehabilitation projects, and developer projects, the time restrictions set for the main contractor will typically also apply to the Traffic contractor.

11. Timesheet

The Designer should prepare and submit a draft timesheet to the TMC with the final plan set (the Traffic Systems Design representative is responsible for submitting the timesheet package to the TMC for developer's projects). The TMC is then responsible for finalizing the timesheet and obtaining the necessary signatures. Additional information related to preparing the timesheet can be found in Chapter IV-E of this Manual and **Appendix Z**.

The following information should be submitted to the TMC along with the draft timesheet:

1. A full-size signal plan with the official County 911 Center's street names. Historic intersection names should be denoted in parentheses where necessary.
2. Plan with critical movements showing Ws and Ds
3. Photographs documenting the posted speed limits on all approaches
4. Crosswalk distances*
5. Approach grades
6. Additional support material, as needed

**Note: Crosswalk distances can be shown in the plan view on the signal plan or in a separate document that details either or both of those plan elements.*

One copy of the latest version of the timesheet should be placed in the signal cabinet. Other copies should also be retained by the TMC and the District office.

12. Supplemental Equipment

In most cases, the design elements outlined above comprise all elements required for a complete signal design. However, in special circumstances, supplemental equipment may be required (such as HIBs, cameras, etc.) All supplemental equipment included in the final traffic signal design plans should be approved by the Traffic Systems Design Engineer before being included in the plans.

Separate ITS devices, such as cameras, wireless equipment, or Bluetooth readers may also be included in a signal design project. The design of these elements is covered later in this Manual in Chapter V.

13. Traffic Statement

DelDOT Traffic is responsible for developing the engineer's estimate for stand-alone Traffic Section Projects. For In-House Capital Projects, DelDOT Traffic will develop the Traffic Statement. For Consultant-led Capital Projects, and/or Developer / Subdivision Projects DelDOT Traffic will review and provide comments on the consultant-developed Traffic Statement. The Traffic Statement compiles an overall cost for all signal, signing, ITS, and lighting work to be completed as part of the project by either the on-call traffic and/or general contractor work. Each discipline is broken down into the following breakout sections:

Project Contractor Items – These are items associated with Capital Projects (i.e., bid items) or Developer / Subdivision Projects only. These are items or tasks the general contractor would perform as part of his required work for signal and ITS associated with the overall contract. The estimate should include the supply and installation and/or removal of roadway signing associated with the project, and furnishing, installing and testing of roadway and highway lighting systems.

Traffic Contractor Items – As part of Capital Projects or Developer / Subdivision Projects, these items would cover the cost of providing, installing, and removing of traffic-related equipment by DelDOT Traffic's on-call contractor. This cost would be associated with all the

wiring, connection, and integration required for signal and ITS work required under the scope of the project.

As part of Traffic Section Projects, these items would cover the cost of providing, installing, and removing traffic-related equipment, along with the cost to complete all underground work for signal and ITS projects. Also included would be the installation and/or removal of roadway signs associated with the project and the installation of all roadway lighting systems.

Traffic Supply Items – These are items to be supplied by DelDOT Traffic for all types of projects.

Unit Cost - The cost for contractor items is determined as part of the overall bid of the contract. For the engineer's estimated item cost, the designer shall determine the unit cost based on the latest DelDOT price index or historical data. Traffic contractor and supply item costs are based on agreed-upon on-call contractor prices.

Quantity Take-off - Many items are directly measured or counted as an actual number, such as junction wells, pole bases, poles, signal indications, cabinets, controllers, and devices. For other items, the following are the standard practices for quantity take-off:

Conduit – Use the total measured point-to-point in plan view. If additional footage is needed due to grade or elevation change, it should be denoted on the plan in the conduit run schedule.

Cable – Use the total measured quantity from all required underground pathway and pole height, mast arm length, and span wire distance to the underground pathway plus 10% to account for the excess required in junction wells, pole foundations, slack, and connections at the cabinet, and splices points.

Signs – Cost for each sign shall be provided, using the latest cost breakdown for signing.

Test Pit Excavation – Use one cubic yard for every two pole foundations.

Pavement Markings – Measure the actual quantity rounding to the next 10-foot increment for quantities under 150 feet or to the next 50-foot increment for quantities greater the 150 feet.

E. Signal Timing & Phasing

This chapter of the Traffic Design Manual discusses fundamental concepts and techniques involved in calculating the initial timing for various types of signal control. The focus of this chapter is on timing parameters related to design issues (phasing, loop placement, etc.) and basic signal timing considerations (yellow clearance interval, all-red, etc.) This chapter is not intended to address detailed timing practices, philosophy, etc.

In the past, signal timing was generally considered an operational responsibility rather than a part of the design activities. However, developing a recommended initial signal timing plan is an important design responsibility. Before a new signal can be activated for operation, a basic timing program must be established. Additionally, signal timing assumptions establish design details such as the number, type, and position of signal heads. Once a signal is constructed, signal timings should be reviewed for adequacy and updated as necessary to meet current demands.

The timing strategies that may be applied are a function of the type and capacity of the controller and the operational (traffic) requirements of the intersection. Pre-timed and actuated controllers are timed differently because of the inherent differences in operational philosophy and functional characteristics. Timing strategies also differ for isolated intersections, intersections along an arterial, and intersections within a system network.

The timing parameters for new or improved signalized intersections are frequently based on timing settings that have proved effective for similar types of intersections, traffic conditions, and equipment. These timing settings are implemented, and traffic flow is observed after the signal is activated. If, after the traffic has stabilized, excessive stops or delays occur, the timing is adjusted accordingly, and the rationale documented.

1. General

The functional objective of signal timing is to alternate the right of way among the various traffic and pedestrian movements in such a way as to:

- Provide for the orderly movement of traffic
- Minimize average delay to vehicles and pedestrians
- Reduce the potential for crash-producing conflicts
- Maximize the capacity of each intersection approach
- Maximize bandwidth on signalized arterials

Unfortunately, these desirable attributes are generally not compatible. For example, using as few phases as possible and the shortest practical cycle length may maximize approach capacity and minimize delay, while using multiple phases and longer cycles may reduce the number of conflict points and therefore improve safety. Accordingly, it is necessary to

exercise engineering judgment to achieve the best possible compromise among these objectives.

2. Timing Parameters

This section of the Traffic Design Manual describes the calculations required to determine appropriate values for various timing parameters, including cycle length, phase length, yellow change interval, and clearance (all-red) time. Before these calculations are presented, the following definitions of common terms related to signal timing are presented:

- **Cycle:** One complete sequence of signal indications (phases).
- **Phase:** That part of a signal cycle allocated to any combination of one or more traffic movements simultaneously receiving the right of way during one or more intervals.
- **Interval:** A discrete portion of the signal cycle during which the signal indications remain unchanged.
- **Offset:** The time difference (in seconds or in percent of the cycle length) between the start of the green indication at one intersection as related to the start of the green indication at another intersection or from the system time base (for signals on system).
- **Split:** The percentage of a cycle length allocated to each of the various phases in a signal sequence.

a. Cycle Length

The time required to complete a prescribed sequence of phases is known as the cycle length. For isolated, actuated intersections, cycle length varies from cycle to cycle based on traffic demand and signal timing parameters. For coordinated intersections, a background cycle length is used to achieve consistent operation between consecutive intersections. DelDOT typically uses a cycle length of 60 to 180 seconds. A shorter cycle length is typically used at low-volume rural intersections while a longer cycle length is typically used at intersections with heavy volumes on multiple approaches.

Selecting a cycle length is an iterative process that is initially performed during the second step of the critical movement summation (CMS) analysis (see **Appendix I**) or using Synchro models. CMS analysis focuses on “raw” intersection capacity, that is, the ability of an intersection to serve the demand for given lane configurations and signal phasing. This analysis is a fundamental tool for calculating green times and evaluating signal phasing schemes because it identifies movements that are “critical” to the signal

operations. Specifically, the results provide a baseline for determining signal timing parameters such as splits and cycle length.

According to ITE's *Traffic Signal Timing Manual*, "The amount of time in an hour is fixed, as is the fact that two vehicles (or a vehicle and a pedestrian) cannot safely occupy the same space at the same time. Critical movement analysis identifies the set of movements that cannot time concurrently and require the most time to serve demand." Additionally, CMS analysis incorporates the following basic assumptions for intersection geometrics and traffic flow:

- Lane widths and grades on the intersection approaches are "typical." No adjustments are made for specific widths or grades.
- Adjustments are not made for the specific composition of traffic. The proportion of trucks, motorcycles, bicycles, and buses does not affect analysis results.
- Pedestrians do not conflict with turning vehicles.
- Right-turning and left-turning vehicles discharge through the intersection at the same rate as through vehicles.
- Traffic does not equally distribute amongst multiple lanes on an approach.

Additional information regarding DelDOT's specific CMS procedures and guidelines can be found in Figure CMS-4 (formerly Appendix P) of the *Critical Movement Summation (CMS) How-to-Guide* in DelDOT's *Development Coordination Manual*.

Synchro is a proprietary traffic analysis and optimization software that can be used to determine signal timing parameters, including cycle length and splits. Synchro inputs include lane configurations and traffic volumes, similar to CMS. However, Synchro also takes into account additional variables including:

- Grades
- Traffic composition
- Peak hour factors
- Pedestrian volumes
- Right-turning and left-turning vehicle discharge rates
- Type of signal control (pre-timed, actuated, coordinated, etc.)
- Signal phasing
- Vehicle clearance intervals
- Placement of signal detectors and other features

Although Synchro can be used to optimize cycle lengths and splits, users will need to input additional data compared to CMS.

b. Vehicle Clearance Interval

On March 2, 2020, ITE revised and publicized its Recommended Practice on Guidelines for Determining Traffic Signal Change and Clearance Intervals. These new guidelines recommend a new way to calculate change intervals for left-turn movements – the "extended kinematic equations" – which is theoretical and lacks collaborative peer reviews, field implementations, and research. A distinguished panel of industry leaders and subject matter experts are expressing concerns regarding the change interval length (7 seconds) for left turns, especially along higher-speed roads. Many local and state agencies are postponing the adoption of the revised Recommended Practice, pending resolution of the concerns of industry leaders and/or further research and reporting on the topic. DelDOT will continue to utilize the procedures described in this section, which are based on research and guidelines published in the former ITE Recommended Practice, NCHRP Reports, and ITE Journal articles.

The vehicle clearance interval (or "change period") consists of a **yellow change interval** (section 4E.2.c) and a **red clearance interval** ("all-red time") (section 4E.2.d). The function of the vehicle clearance interval is to warn traffic of an impending change in the right-of-way assignment and then provide time to safely allow conflicting movements to proceed. The engineer must take care not to use excessively long change intervals because of the loss in efficiency and capacity at the intersection. Similarly, if the clearance interval is too short, crashes may increase. The following two sections discuss the typical DelDOT methodology for calculating the yellow change interval and the red clearance interval. It should be noted that clearance intervals may be adjusted based on field conditions, crash problems, or if observed speeds along a corridor are found to differ from the vehicle speeds assumed in the calculations.

c. Yellow Change Interval

The yellow change interval is the interval following a steady green or flashing red arrow interval during which a steady yellow signal is displayed. The purpose of the yellow change interval is to warn traffic of an impending change in the right-of-way assignment. The DE MUTCD states that "the duration of the yellow change interval shall be determined using engineering practices." The Institute of Transportation Engineers (ITE) recommended method for calculating the yellow change interval is:

$$YCI = t + \frac{V}{2(a + Gg)}$$

where:
YCI = yellow change interval (s)
t = perception-reaction time (s)
V = approach speed, (ft/s)
a = deceleration rate (ft/s^2)
G = gravitational acceleration (ft/s^2)
g = approach grade (ft/ft)

Discussion of each of these variables is presented below:

Perception-Reaction Time (t)

A study of driver perception-reaction time was performed and incorporated into recommendations presented in *NCHRP Report 731*: "Guidelines for Timing Yellow and All-Red Intervals at Signalized Intersections." The results of the study showed that the average reaction time was 1.0 second and the 85th-percentile reaction time was 1.33 seconds and recommends the use of 1.0 second. DelDOT has adopted a value of 1.2 seconds for all yellow change interval calculations, which is greater than the NCHRP Report 731 recommendation, but less than the 85th percentile.

Approach Speed (V)

The 85th-percentile approach speed is suggested as the conservative basis from which the yellow interval should be calculated. Because conducting speed studies at all signals is cumbersome, an accurate approximation of the 85th-percentile speed is required. *NCHRP Report 731* recommends using the posted speed limit on the approach to the signal plus a constant value of 7 mph. DelDOT has adopted this recommendation, which was determined through extensive field data collection for the report.

Deceleration Rate (a)

For stopping sight distance and other roadway calculations, DelDOT has adopted the AASHTO Green Book methodology for calculating deceleration rate, which recommends 11.2 ft/sec^2 as the comfortable deceleration rate. AASHTO Green Book noted studies that show most drivers decelerate at a rate greater than 14.8 ft/s^2 and 90 percent of all drivers decelerate at rates greater than 11.2 ft/s^2. These decelerations are within the driver's capability to stay within his or her lane and maintain steering control during the braking maneuver on wet surfaces. Studies conducted for *NCHRP Report 731* also found that this recommended value falls within the mean and 85th-percentile deceleration rates of actual drivers.

Gravitational Acceleration (G)

Acceleration due to gravity is a constant value of 32.2 ft/s^2.

Approach Grade (g)

Maximum approach downgrade *within the stopping sight distance* should be measured and included in the yellow change interval calculation. Any upgrade should not be included in the calculation. The stopping sight distance can be determined from Table 3-1 of the AASHTO Green Book.

Significant Figures and Rounding

When calculating the yellow change interval, the result is reported to two significant figures. The value implemented in the controller is rounded up to the next whole second. For example, if running the equation yields a calculation of 4.0488 – report to two significant figures (4.0), and no rounding is needed. If the equation yields a calculation of 4.0529 – report to two significant figures (4.1), and round up to the next whole second (5.0).

Left Turns and Split Phasing

Yellow change intervals for non-permissive left-turn movements should match the adjacent through movement on the same approach.

Other Requirements

Yellow change intervals for main-street movement pairs (phases 1, 2, 5, 6 as shown in **Figures IV-7 and IV-8**) should match in each direction. Side street movements may have different yellow change intervals. For example, if phase 2 required yellow is 4.0 seconds and phase 6 required yellow is 5.0 seconds, field-implemented yellow intervals should be 5.0 seconds for both phases 2 and 6 (typical main-street through movement phase numbers). If phase 4 required yellow is 3.0 seconds and phase 8 required yellow is 4.0 seconds, field-implemented yellow intervals can be 3.0 seconds for phase 4 and 4.0 seconds for phase 8. The maximum yellow change interval is 6.0 seconds.

d. Red Clearance Interval (All-Red)

The red clearance interval is the interval that follows the steady yellow interval during which a steady red signal is displayed to potentially conflicting traffic movements at an intersection. The purpose of the red clearance interval is to provide additional time before conflicting traffic movements are released. The DE MUTCD states that “when used, the duration of the red clearance interval shall be determined using engineering practices.”

The method selected by DelDOT for timing red clearance intervals at signalized intersections is the one described in the *ITE Journal* article "A Rational Method for Setting All-Red Clearance Intervals" (Fitch, et. Al; February 2011). The proposed method calculates how long a vehicle legally entering the intersection at the end of the yellow change interval takes to clear the farthest conflict point with a conflicting vehicle legally entering the intersection at the beginning of the next green interval. The calculation can be summarized as follows:

$$RCI = t_c - t_{min}$$

where: RCI = red clearance interval (s)
t_c = maximum clearance time (s)
t_{min} = minimum conflicting time (s)

To complete the calculation, a "worst-case" conflict point must be identified for each movement. A conflict point is any point where the clearing vehicle's path is crossed by the path of a conflicting movement. The "worst-case" conflict point, therefore, is the farthest conflict point from the stop line along the driving path of the clearing vehicle. **Figure IV-9** below depicts the "worst-case" conflict points for the through and left-turn movements at an example intersection.

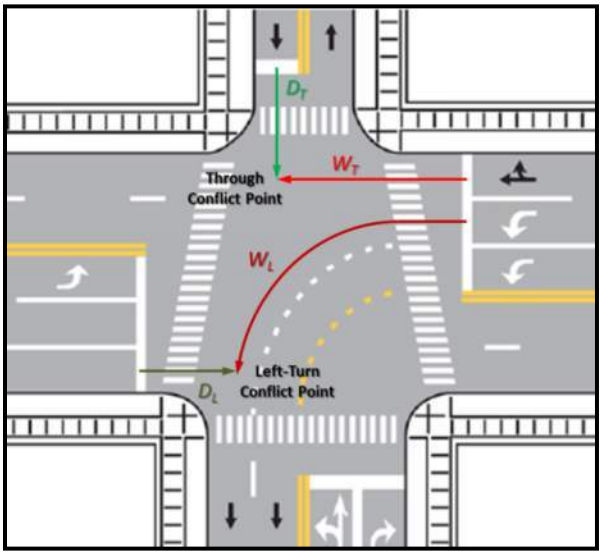


Figure IV-9. Intersection Conflict Points

Maximum Clearance Time (t_c)

A reasonable expectation for a signal timing policy is to account for drivers who enter the intersection on the last instant of the yellow indication because such behavior is both legal and commonly observed. The "worst-case" scenario is therefore presented by a

vehicle entering the intersection on the last moment of yellow change and traveling at the low end of the speed distribution because a slow vehicle will occupy the intersection longer than a faster one. The 10th-percentile speed is recommended. The 10th-percentile speed can be estimated by subtracting a differential speed value from the 85th-percentile speed, which is estimated as the posted speed limit plus 7 mph (see yellow change interval calculation) per *NCHRP Report 731*. The *ITE Journal* recommends subtracting 10 mph from the 85th-percentile speed for speeds 45 MPH and below and subtracting 15 mph for speeds above 45 mph, with a floor of 30 mph. **Table IV-6** below summarizes the estimated 10th-percentile speeds for each posted speed limit.

Table IV-6
10th Percentile Speed Estimate

Posted Speed Limit (mph)	10th Percentile Speed (mph)
25	25
30	30
35	32
40	32
45	37
50	42
55	47

Based on this estimate, the maximum clearance time is:

$$t_c = \frac{W}{1.47 \times S_{10}}$$

where: t_c = maximum clearance time (s)
W = clearing width, stop line to conflict point (ft)
S_{10} = 10th percentile speed (mph)

This time represents the latest time, following the end of the clearing phase's yellow, that a vehicle on that phase could be reasonably expected to occupy the conflict point.

Minimum Conflicting Time (t_{min})

A reasonable expectation for drivers seeing a red indication change to green is that they will simply accelerate into the intersection if no traffic is obviously in conflict. The critical "worst-case" combination scenario is observed when a vehicle approaches an intersection without coming to a complete stop as a red indication changes to green. If no other vehicle is stopped at the intersection as an impediment, then a realistic

expectation is that the driver of this vehicle should be decelerating at a rate that would allow a stop at the stop bar for the red (because the driver cannot know when a green indication will be displayed) but, upon seeing the green, will accelerate at a comfortable rate. This vehicle will exhibit a "rolling start" and will cross paths with traffic clearing the intersection sooner in time than if it had started from a complete stop at the intersection stop bar. While deceleration and acceleration rates can vary greatly, *ITE Journal* (Fitch, et. al) made a conservative assumption of -10 ft/s^2 deceleration and 15 ft/s^2 acceleration, which has been adopted by DelDOT. The minimum conflicting time calculation thus simplifies to:

$$t_{min} = 0.283\sqrt{D}$$

where: t_{min} = minimum conflicting time (s)
D = conflicting distance, stop line to conflict point (ft)

This time represents the minimum amount of time, following a new green light, for a driver to accelerate (at 15 ft/s^2) to a conflict point D feet beyond the stop bar, assuming that the driver had been decelerating at a rate (-10 ft/sec^2) that would have resulted in a safe stop at the stop bar.

Left Turns and Split Phasing

Red clearance intervals for non-permissive left-turn movements shall be calculated in the same manner as each through movement – determining a worst-case conflict point and measuring the two conflicting distances (*W* and *D*). The only change is the estimated 10th-percentile speed (S_{10}) used in the equation to calculate t_c is 20 mph as suggested by NCHRP Report 731 and *ITE* guidelines.

Minimum Red Clearance Interval

Due to a long historical precedent in Delaware of using 2.0 second all-red clearance intervals, and driver expectation of this standard value, DelDOT recommends a minimum red clearance interval of 2.0 seconds for all signalized movements.

Significant Figures and Rounding

When calculating the red clearance interval, the result is reported to two significant figures. The value implemented in the controller is rounded up to the next whole second. For example, if running the equation yields a calculation of 2.0497 – report to two significant figures (2.0), and no rounding is needed. If the equation yields a calculation of 2.0513 – report to two significant figures (2.1), and round up to the next whole second (3.0).

Other Requirements

Red clearance intervals for main-street through movements (phases 2 and 6 as shown in **Figures IV-7 and IV-8**) shall match in each direction. Side street movements may have different red clearance intervals. For example, if phase 2 required all-red is 2.0 seconds and phase 6 required all-red is 3.0 seconds, field-implemented all-red intervals shall be 3.0 seconds for both phases 2 and 6 (typical main-street through movement phase numbers). If phase 4 required all-red is 2.0 seconds and phase 8 required all-red is 3.0 seconds, field-implemented all-red intervals can be 2.0 seconds for phase 4 and 3.0 seconds for phase 8.

3. Phasing

The DE MUTCD defines a signal phase as the right-of-way, yellow change, and red clearance intervals in a cycle that is assigned to an independent traffic movement or combination of traffic movements. Signal phasing is the sequence of individual signal phases or combinations of signal phases within a cycle that defines the order in which various pedestrian and vehicular movements are assigned the right of way. This section of the *DelDOT Traffic Design Manual* includes descriptions of the different possible phasing options and provides general guidance on selecting appropriate phasing. Refer to the DE MUTCD for additional rules for determining controller phasing, selecting allowable signal indication combinations for displays on an approach to a traffic control signal, and determining the order in which signal indications can be displayed.

a. NEMA Phasing

Signal phasing at most intersections in Delaware should use the standard National Electrical Manufacturers Association (NEMA) ring-and-barrier structure. This structure organizes phases to prohibit conflicting movements (e.g., eastbound and southbound through movements) from operating concurrently while allowing nonconflicting movements (e.g., northbound and southbound through movements) to operate together. In the phasing diagram, phases associated with dashed lines are compatible and may operate concurrently. Phases associated with solid lines are conflicting and will not operate concurrently.

If the side street phasing is split, the side streets use Phases 3 and 4 only. If the side streets run concurrently, phase 4 and 8 shall be utilized. At a "T" intersection, the side street is typically Phase 4.

The NEMA phasing diagram was presented earlier in this Manual as **Figure IV-7** in Chapter IV-D.5.

While the standard NEMA ring-and-barrier structure allows most of the signal phasing patterns in use in the State of Delaware to be achieved, there are some special cases where an alternative structure may be used, such as for five-leg intersections and some lead-lag operations.

b. Selecting Appropriate Phasing

The simplest form of phasing is a two-phase sequence in which NEMA Phases 2 and 6 run concurrently to allocate the right of way to the main street followed by NEMA Phases 4 and 8 running concurrently to transfer the right of way to the cross street. In this two-phase sequence, the major cross (through) movements are separated, but the left-turn movements must yield to opposing traffic, turning only when there is an adequate gap in traffic.

In determining the number of phases required at an intersection, the goals of safety and capacity may conflict. For example, in many situations, protected left-turn phases are safer for left-turning vehicles than protected-permitted left turns. However, the added phases may result in longer cycle lengths, reduced progression in systems and increased delay and percent of vehicles stopped. These factors adversely impact traffic performance, capacity, and fuel consumption, and may tend to reduce safety for all traffic by increasing rear-end crashes.

The following **general rules for acceptable intersection phasing** should be followed:

- The Main Street through movement should be phase 2 for North or East, and phase 6 for South or West.
- The Main Street left-turn movement should be phase 5 for North or East, and phase 1 for South or West.
- Side Street through movements should be phase 4 and phase 8.
- Side Street left-turn movements should be phase 3 and phase 7.
- For Split Phasing, the lower volume cross street approach should be phase 3 and the higher volume cross street approach should be phase 4.

c. Left Turn Treatment

An important consideration in developing an appropriate signal phasing plan is determining the left-turn phase type at the intersection. The most basic form of control for a four-legged intersection is “permissive only” control, which allows drivers to make left turns after yielding to conflicting traffic or pedestrians and provides no special protected interval for left turns. However, for most high-volume intersections, “permissive-only” left-turn phasing is generally not practical for major street movements.

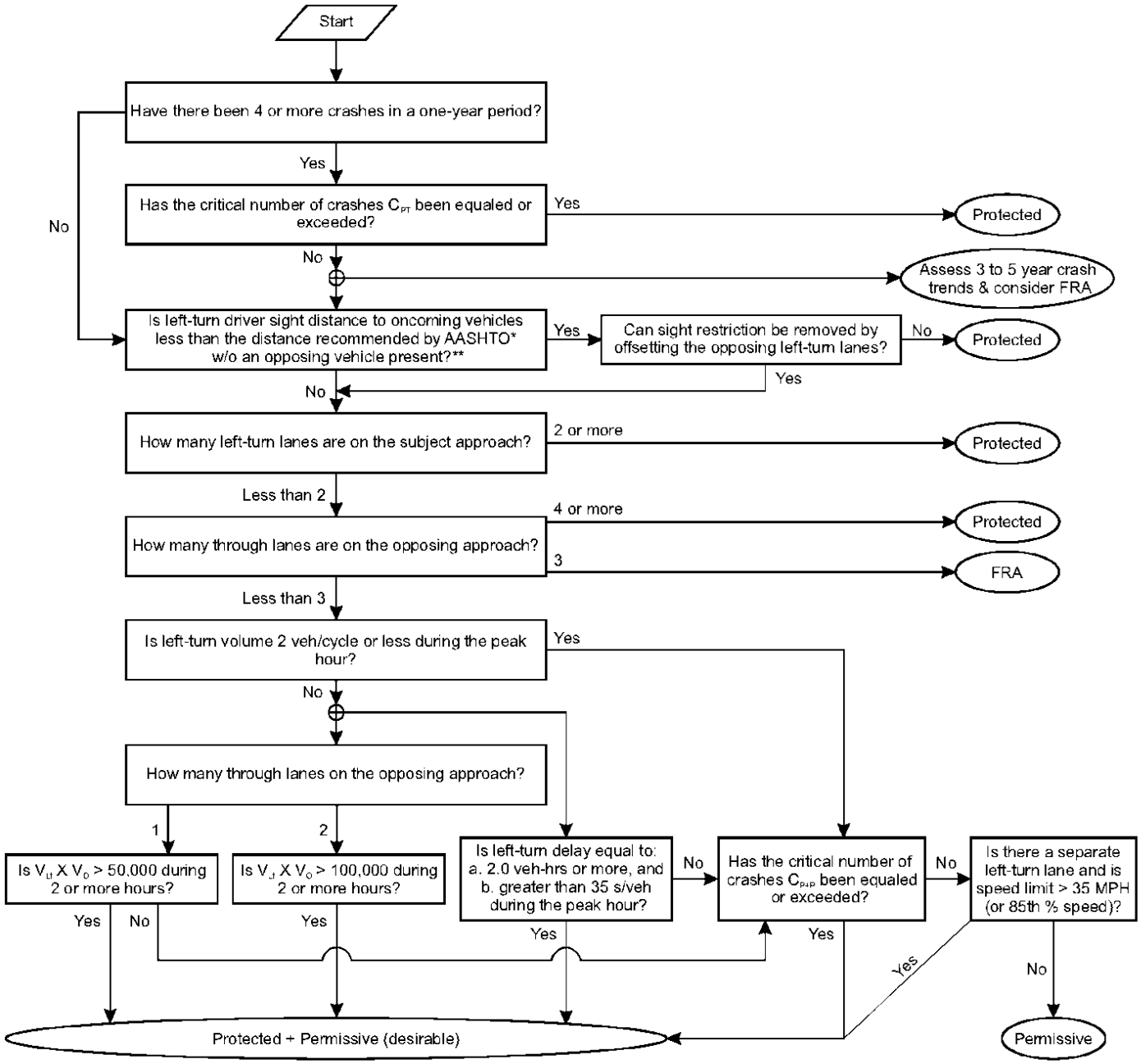
Therefore, some type of “exclusive” (protected) control is typically provided once traffic volumes or the number of crashes at the intersection exceed established thresholds. The various types of left-turn treatments and the guidelines for selecting them are presented in the following section.

1.) Separate Left-Turn Lanes

Before considering the implementation of an exclusive left-turn phase, the designer should first consider the benefits of providing a separate left-turn lane while maintaining “permissive only” phasing. In most cases, intersections considered for signalization in Delaware should have at least two lanes on each approach, including separate left-turn lanes on the mainline. The lane configuration for the side street approaches can vary, but typically at least two lanes should be provided.

2.) Left-Turn Phasing

The type of left-turn phasing operation chosen for a signalized intersection is one of the most critical traffic signal design and operational issues considered. There is typically a trade-off between safety and efficiency in this decision. **Figure IV-10**, which DelDOT adapted from FHWA’s Signal Timing Manual, provides guidelines for determining the appropriate left turn treatment. The list on the pages following **Figure IV-10**, in generic terms, is in order of least delay/least restrictive to most delay/most restrictive for left-turning traffic. Note that for any traffic movement with any type of signal operation, drivers are required to cautiously enter the intersection, and must yield to other vehicles and pedestrians who are lawfully within the intersection.



*AASHTO, A Policy on Geometric Design of Highways and Streets, 2011 (or current).
Chapter 9, 9.5.3 Intersection Control, Case F - Left Turn From the Major Road.
Calculated based on Equation 9-1 and Table 9-13, adjusted for number of lanes, as needed.

**If left-turn driver sight distance is temporarily obstructed by an opposing left-turning vehicle and consequently temporarily less than AASHTO recommendations, consideration should be given to the obstruction's frequency and the potential for and severity of crashes (e.g., consider opposing left turn phasing, opposing through speeds and volumes).

Variables:
V_{Lt} = left-turn volume on the subject approach, veh/h
V_O = through plus right-turn volume on the appoach opposing the subject left-turn movement, veh/h

Source:
Adapted from FHWA's Signal Timing Manual

Number of Left-turn Movements on Subject Road	Period During Which Crashes are Considered (years)	Critical Left-Turn-Related Crash Count: When Considering Protected-only, C_{pt} (crashes/period)	When Considering Prot.+Perm., C_{p+p} (crashes/period)
One	1	6	4
One	2	11	6
One	3	14	7
Both	1	11	6
Both	2	18	9
Both	3	26	13

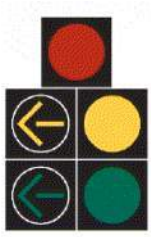
Figure IV-10. Guidelines for Determining Left-Turn Lane Signal Phasing Treatment

Permissive



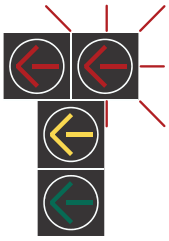
This type of operation never provides a separate left-turn arrow. Drivers turn left on a green ball when they can find a gap in opposing traffic. This type of operation is often used on relatively low-volume side streets, and sometimes in urban areas with relatively low speeds and low left-turning volumes. Specifically, permissive left-turn phasing for DelDOT's signals should only be used when there is a single left-turn lane opposed by one (1) or two (2) through lanes. Permissive left-turn phasing should also only be implemented if the sight distance to oncoming traffic is greater than the minimum distances recommended by AASHTO, and the volume, speed, and crash thresholds are below those established in **Figure IV-10**.

Protected-Permissive



This type of operation is typically implemented in Delaware with the "doghouse" signal head. Normally a left-turn green arrow is displayed first (protected part of phase), followed by a yellow left-turn arrow, and finally a green ball (permitted part of phase). Protected-Permissive phasing for DelDOT's signals should only be used when there is a single left turn lane that is opposed by one (1) or two (2) through lanes. Protected-permissive left-turn phasing should also only be implemented if the sight distance to oncoming traffic is longer than the minimum distances recommended by AASHTO (see **Figure IV-10**). **Figure IV-10** provides specific volume and crash thresholds, one or more of which should be met to implement protected-permissive phasing.

Special Protected-Permitted (Flashing Red Arrow)



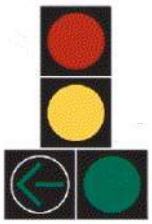
Protected-permitted operation with a flashing red arrow has been implemented at numerous signalized intersections in Delaware with great success. Normally, a left-turn green arrow is displayed first (the protected phase), followed by a yellow arrow, then a red arrow, and finally a flashing red arrow (the permitted phase). Legally, drivers are required to completely stop and then proceed during the flashing red arrow interval. DelDOT can adjust the amount of time of the solid red arrow period prior to the flashing red arrow phase based on the conditions at the intersection. This type of left-turn operation can be operated with variable, time-of-day settings to accommodate left turn demand (or lack thereof) in order to reduce vehicular delay.

Protected-Only



Protected-only left-turn phasing allows left-turning vehicles to proceed only on a green arrow indication, eliminating the need for motorists to judge gaps in traffic in order to execute their turn. This type of left-turn operation is often implemented on multilane and/or divided highways with both heavy left-turning and opposing through traffic, and also where there has been a pattern of left-turn crashes. Protected-only left turn phasing shall be used on all approaches with more than one left turn lane. Vehicle speeds, sight distance restrictions, and motorist expectancy are additional criteria that should be taken into consideration when evaluating the need for protected-only operations, according to the guidelines presented in **Figure IV-10**.

Split Phasing



This is a form of protected-only operation where all movements on an approach get green, yellow, and red indications with no opposing traffic. This type of operation is occasionally used on side streets with shared left/through lanes and relatively heavy left-turn volumes. Depending on the number/type of lanes and traffic volumes, this type of operation may be optimal for side street movements, but often requires additional time which must be taken away from main street movements. For more information, refer to Chapter IV-E.3.d of this Manual.

3.) Lead / Lag Lefts

There are two primary alternatives for the timing of a protected-only left-turn phase in a cycle sequence. When the protected-only left-turn phase precedes the through movement in the same direction, it is called “lead” left. When the protected-only left-turn phase follows the through movement in the same direction, it is called “lag” left. While used on an infrequent basis in Delaware, lag lefts can be combined with a lead left in the opposing direction. This sequence is commonly called “lead-lag” phase sequencing. While these different left-turn sequences have advantages and disadvantages, the most common practice in Delaware is to provide lead left-turn phases on all approaches.

In a small number of situations, a lag left-turn phase may be beneficial. These include:

- Where both opposing left-turn lanes are protected-only and there are left-turn storage bay issues, particularly where the left-turn lane may be frequently blocked by queues in the through lanes.

- Where both opposing left-turn lanes are protected-only and a lag left turn benefits bandwidth
- Where there are no left turn lanes and a relatively even number of left turns in both directions.
- Where both opposing left-turn lanes are protected-only and the AASHTO Green Book minimum clear distance of 10 feet between the turning vehicles is not feasible.

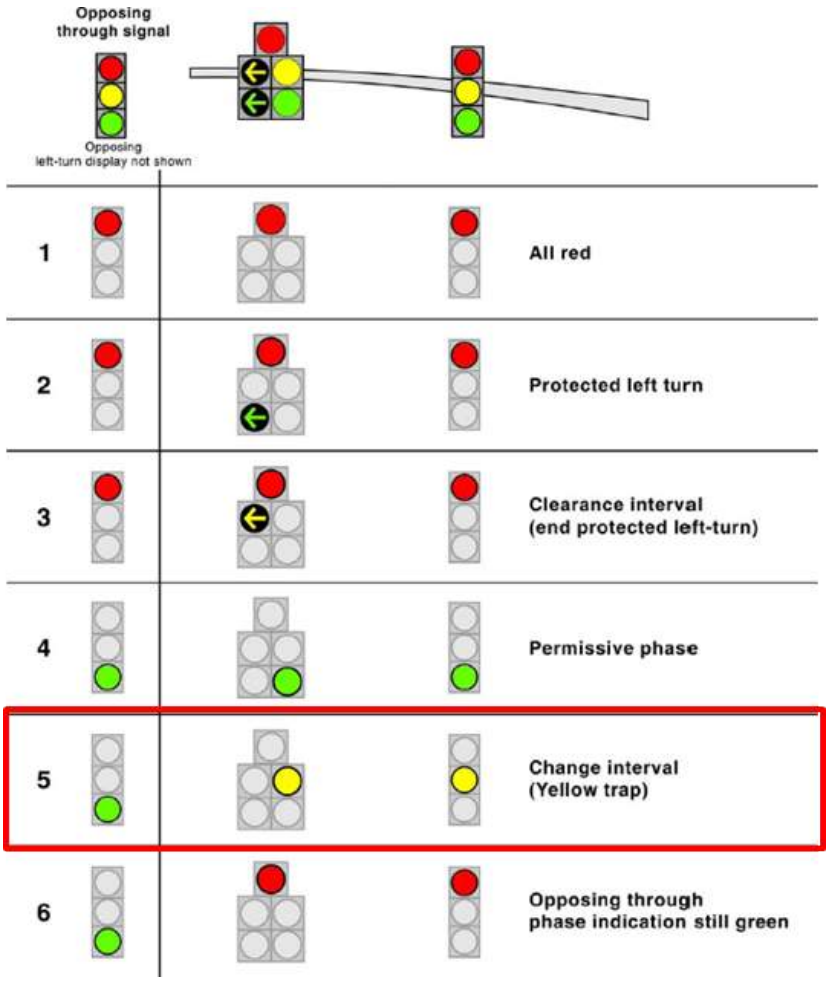
While lag left turn phasing may improve operations, care should be taken to avoid the "yellow trap", as discussed in the following section.

4.) Yellow (Left-Turn) Trap

The combination of a permissive left-turn phase and an opposing lag phase can lead to a situation commonly referred to as the "yellow trap." As shown in **Figure IV-11** on the following page.

If this scenario is permitted, a left-turning vehicle, present at the end of the through phase (i.e., still awaiting a gap when the "yellow ball" is displayed), may incorrectly presume that the opposing through phase also is ending. When the signal turns red, the left-turning vehicle may get "trapped" in the intersection or attempt to complete the turn into oncoming traffic.

To mitigate the yellow trap phenomenon either created by a preset signal sequence (e.g., lead/lag protected/permissive left-turn phasing) or by unique cycle-by-cycle traffic characteristics, such as low side-street demand or emergency vehicle preemption, DelDOT has developed yellow trap guidelines for over 20 scenarios (see **Appendix Q**). Based on these guidelines, DelDOT's most common yellow trap countermeasure is to program a protected/permissive controller with a special sequence to omit left-turn calls during the adjacent through phase; however, there are also warning sign options per Sections 2C.48 and 4D.05 of the DE MUTCD.



Source: FHWA's Signalized Intersection Guide

Figure IV-11. Yellow Trap with Protected/Permissive Left-Turn Phasing

5.) Flashing Red Arrow

DelDOT is one of the few agencies in the country that utilizes a flashing red arrow left turn phase. In 2008, DelDOT formally reviewed the safety and operational characteristics of all flashing red arrow intersections in Delaware. Some locations have been modified to protected-only operations due to moderate crash issues or concerns about intersection sight distances. An updated evaluation of all locations has been conducted twice since 2008, and DelDOT presently has a statewide assessment program to study both variable (time-of-day) and full-time flashing red arrow requests/designs.

With flashing red arrow (FRA) left-turn phasing, there is an opportunity to subsequently operate with "safer" protected-only left-turn phasing during specific times of day. Turning movement counts (and resulting queues and delays), crash

history, and left-turning sight distance (both with and without queued opposing traffic present) should be evaluated further when considering a time-of-day option, where vehicles are allowed to turn after stopping. A relatively common implementation of time-of-day FRA phasing utilizes protected-only phasing during relatively high-crash, high-volume time periods (e.g., weekday AM through PM peaks) and then operates with FRA during all other "off-peak" periods, including 24/7 on weekends.

Given the relatively successful use of flashing red arrows in Delaware, DelDOT intends to ensure that all existing locations will remain compliant with revised federal guidelines and may install them at additional intersections after reviewing the guidelines for determining left turn lane signal phasing treatments (see **Figure IV-10**). For additional discussion regarding the use of a flashing red arrow compared to other left-turn phasing treatments, refer to Chapter IV-E.3.c.2 of this Manual.

For additional information regarding signal indications for permissive mode left turns, including flashing arrows, refer to Section 4D.18 of the DE MUTCD.

6.) Flashing Yellow Arrow

Flashing yellow arrow has not been fully adopted as a left turn treatment by DelDOT. The use of flashing yellow signal indications should be approved by the Chief of Traffic Engineering.

7.) Other

Refer to the current version of the DE MUTCD, Section 4D.17, for guidance on additional acceptable left-turn treatments that could be considered.

d. Split Phasing

Split phasing consists of having two opposing approaches run consecutively rather than concurrently (i.e., all movements originating from the west followed by all movements originating from the east). **Split phasing should be used infrequently because a more-efficient conventional phasing plan can usually be found.** However, the following conditions could indicate that split phasing might be an appropriate design choice:

- There is a need to accommodate multiple turn lanes on an approach, but adequate width is not available to provide separate lanes so a shared through/left lane is required. An operational analysis should be performed to ensure this option is superior compared to a single turn lane option under various phasing scenarios.

- The left-turn lane volumes on two opposing approaches are approximately equal to the through traffic lane volumes on the same approach but the total approach volumes are significantly different on the two approaches. Under these somewhat unusual conditions, split phasing may prove to be more efficient than conventional phasing.
- A pair of opposing approaches is physically offset such that the opposing left turns could not proceed simultaneously or a permissive left turn could not be expected to yield to the opposing through movement.
- The angle of the intersection is such that the paths of opposing left turns of errant turning motorists could easily overlap.
- The safety experience indicates an unusual number of crashes (usually sideswipes or head-on crashes) involving opposing left turns. This may be a result of unusual geometric conditions that impede the visibility of opposing traffic.
- A pair of opposing approaches each has only a single lane available to accommodate all movements and the left turns are heavy enough to require a protected phase.
- One of the two opposing approaches has heavy demand and the other has minimal demand. Under this condition, the signal phase for the minimal approach would be skipped frequently and the heavy approach would function essentially as the stem of a “T” intersection. For this condition, it is important that the signal be designed with actuation on the minor volume approach and the controller be programmed to skip the phase entirely if no vehicles are present.

For additional discussion regarding the use of split phasing compared to other left-turn phasing treatments, refer to Chapter IV-E.3.c.2 of this Manual.

4. Types of Control

Traffic control signals operate in either pre-timed or actuated mode. Pre-timed signals operate with fixed cycle lengths and green splits. Actuated signals vary the amount of green time allocated to each phase based on traffic demand. Either type may be used in uncoordinated (isolated) or coordinated operations (see Chapter IV-E.5 of this Manual). There is no universal "best" method of determining the optimum type of control for a given local intersection. Each type of control has its unique advantages and disadvantages.

- Pre-timed controls may feature multiple timing plans, with different cycle, split, and offset values for different periods of the day. The timing plans are generally established based on historic and/or anticipated traffic demand, and the signal splits and cycle lengths do not change as a result of real-time traffic flow. When used in a

system, adjacent intersections operate on the same signal cycle and have fixed controller offsets. Because pre-timed control does not recognize or accommodate short-term fluctuations in traffic demand, it can cause excessive delays to vehicles and pedestrians where a high degree of variability in the traffic flows exists. DelDOT rarely installs or operates signals with pre-timed control. Rather, pre-timed control is typically applied in urban grid networks, and/or at locations where grid coordination is desired.

- Actuated control provides variable lengths of green timing for phases. The time for each movement depends on the characteristics of the intersection and timing parameters. Actuated control does not rely on a fixed cycle length unless the intersection is in a coordinated system or under adaptive control. This type of control assigns the right of way on the basis of actual traffic conditions (demand) within given limitations.

    1) **Fully-actuated** ("system free") control requires detectors for all phases, with each phase timed according to preset timing parameters.

        In a fully actuated application, the controller unit operates on continuously variable cycle lengths. For all phases, the number of vehicles detected on the various controlled approaches determines green times. Fully actuated operation is generally used when the intersection operates independently and where demands on all approaches vary throughout the day.

    2) **Actuated-coordinated** control requires detectors on the minor-street approach and main street left-turn lanes, and is especially effective in systems and at intersections where the major street has a relatively uniform flow and the minor street has low volumes with random peaks.

        The non-actuated phase is the phase that is coordinated with adjacent intersections, whereas actuated phases are allowed to respond to detected demand.

        With the actuated-coordinated control application, one phase (usually the major street) operates in the non-actuated mode. Vehicular and/or pedestrian detection is required on the phase(s) that is (are) actuated. This type of operation is often used where the controller is incorporated into a coordinated system. The non-actuated phase is the phase that is coordinated with adjacent intersections, whereas actuated phases are allowed to respond to detected demand.

a. Selection Considerations

From a signal timing perspective, selecting the best type of control for a location requires full knowledge of local conditions, but, in general, can be based on:

- Variations in peak and average hourly traffic volumes on the major approaches
- Variations in morning and afternoon hourly volumes
- Percentage of volumes on the minor approaches
- Usage by large vehicles, pedestrians, and bicycles

1.) Volume Characteristics

The volume of vehicle traffic on the minor approaches will frequently indicate the type of control needed. For example, if traffic on the minor approach arrives at the intersection in low volumes and/or with random arrival patterns at a steady rate for most hours of the day, but the mainline volume is typically more uniform, semi-actuated, or pre-timed control usually operates effectively.

In general practice, the rule of thumb is: for predictable traffic, use semi-actuated; for unpredictable traffic, use fully actuated control. Another form of this general rule can be stated in terms of the warrant satisfied. The minimum vehicular warrant (Warrant 1) requires a steady volume for 8 hours on the minor approach, thus suggesting semi-actuated control. Interruption of continuous traffic (Warrant 2) usually involves the sporadic arrival of traffic on the minor approaches, thus indicating fully actuated control.

2.) Other Characteristics

In addition to the volume consideration discussed above, other factors may exert an influence on this determination. Specifically, if the intersection is part of a traffic control system, the type of control selected must be compatible with the system. Maintenance capabilities may also influence the selection in that the more advanced control hardware requires a much higher level of maintenance expertise.

b. Elements of Control

1.) Pre-timed Control

There are several fundamental aspects of developing timing settings for signal control. The essential elements include:

- Number of timing plans

- Phase change intervals (yellow change plus all-red clearance)
- Pedestrian timing requirements (including the decision on whether or not to use pedestrian indications)
- Cycle length calculations
- Split calculations
- Flashing operation

To function effectively, signal operations must take into account a number of local intersection variables and hardware characteristics. It is difficult to establish comprehensive guidelines to fit all possible situations. In many situations, it is desirable to monitor the initial operations and adjust the timing settings to reflect the unique character of the intersection and traffic flow. The following discussion is intended to provide a conventional approach to establishing initial timing settings and reasonable ranges of values for the various parameters.

"Time-of-Day" Signal Timing Plans

A timing plan may be defined as a unique combination of cycle length (commonly ranging from 60 to 180 seconds), split, and, in system operations, offset. Most controllers today have the capability of numerous timing plans. Timing plans may differ by phase length, cycle length offset, phase arrangement, or any combination thereof.

Traffic demand at the intersection is the critical determinant of the number of timing plans required. For example, for a two-phase intersection that is heavily loaded on one phase during the morning peak, heavily loaded on the opposite phase during the evening peak, and lightly loaded on both phases during the remainder of the day, it is obvious that three plans would be required. Traffic demand patterns typical of a majority of locations may be categorized as:

- A.M. peak period
- Average day (midday) period
- P.M. peak period
- Night (low-flow) period
- Weekend or special function periods

DelDOT's time-of-day patterns (i.e., "coordination data") are typically programmed in the TMC's signal system database and operate based on a time-based coordination (TBC) schedule. Each individual signal pattern should be generated using CMS analysis

and the time-based data should be developed using hourly and diurnal traffic volume data, which is typically available via Traffic's signal system detection or Planning's automatic traffic recorders.

The most common method for implementing signal timing patterns is through time-of-day and day-of-week schedules, which change timing patterns at specific, predetermined time periods (e.g., AM, mid-day, and PM peak periods). When traffic conditions vary significantly within these time periods, or when traffic is inconsistent on a day-to-day basis, time-of-day schedules are not as effective in reducing delays and queues. Traffic-responsive operation is an alternative to time-of-day control. It uses vehicle detection to monitor real-time traffic conditions – volume (or headways) and density (or spacing) – to select a timing pattern that is best suited for the current traffic conditions.

Traffic-responsive systems use system detectors to monitor and control the signal system. The system detectors are capable of categorizing data based on the following functions:

- Congestion level – cycle length selection
- Major versus minor-street demand – split selection
- Arterial travel direction (inbound, outbound) – offset selection

Real-time traffic data is collected by system detectors, analyzed, and then compared to predefined data profiles for timing patterns with unique cycle lengths, splits, and offsets. When a profile match is identified, the corresponding timing pattern is implemented.

Because traffic-responsive systems are only capable of selecting timing parameters not modifying them, this type of operation still requires transportation professionals to determine timing patterns and develop a "library" that is best suited for varying traffic conditions.

There is a transition period along a signal system when timing plans change, and coordination is temporarily interrupted as the cycle length and/or offsets are adjusted. Therefore, the "sensitivity" of a traffic-responsive system should be considered when developing a selection matrix to avoid frequently changing timing plans.

2.) Basic Timing Parameters

Minimum Green Interval

The minimum green interval is the shortest time a called phase can receive a green indication. For main-street through phases, DelDOT typically utilizes a 10-second or 15-second minimum green time. For all other phases, a 5-second minimum green interval is often used.

Passage Time

The green time for an actuated phase can be extended via the passage interval (or extension/gap). For left-turn phases, DelDOT's general standardized value is 3-second passage time. Split side-street phases and all through phases typically utilize a 4-second passage interval.

Maximum Green Interval

The maximum green interval is the longest time a called phase can receive a green indication. For main-street through phases, DelDOT typically operates with a 60-second maximum green time. For side-street through or split phases, DelDOT typically defaults to a 30-second maximum green time and a 20-second maximum green interval is often used for left-turn phases. It should be noted that the maximum green interval may get overridden by system data when the signal operates as part of a coordinated system.

c. Controllers

DelDOT has standardized with NEMA-structured, dual-ring controllers that must be compatible with the current signal system at DelDOT's TMC.

Dual-ring controller unit: A controller unit containing two interlocking rings that are arranged to time in a preferred sequence and to allow concurrent timing of both rings, subject to the restraint of the barrier (compatibility line). The phases within the two timing rings shall be numbered as illustrated in **Figure IV-12**. It should be noted that DelDOT's typical signal controllers allow additional phases to be added, if needed, for special circumstances.

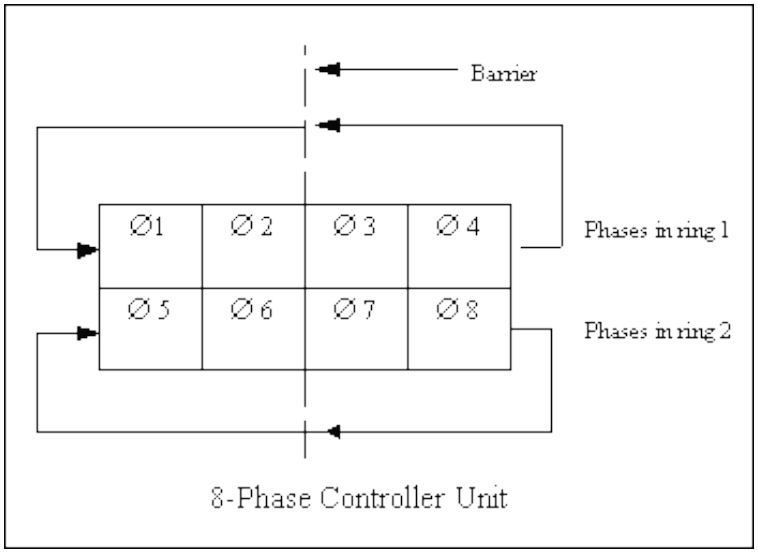


Figure IV-12. Sequence of Phases for Dual-Ring 8-Phase Controller Unit

Barrier (compatibility line): The Barrier is a reference point in the preferred sequence of a dual-ring controller unit at which both rings are interlocked. Current NEMA equipment has more than two barrier capability with two barriers as the NEMA standard. Two reference points or barriers assure that there will be no concurrent selection and timing of conflicting phases for traffic movement in different rings, as illustrated in Figure IV-12. Both rings cross the barrier simultaneously to select and time phases on the other side.

Dual entry: A mode of operation (in a dual-ring controller unit) in which one phase in each ring must be in service. If a call does not exist in a ring when it crosses the barrier, a phase is selected in that ring to be activated by the controller unit in a predetermined manner. For example, referring to **Figure IV-12**, in the absence of calls on Phases 7 and 8, Phase 2 and Phase 6 terminate to service a call on Phase 3. Programming determines whether Phase 7 or Phase 8 will be selected and timed concurrent with Phase 3. DelDOT's current best practice is to operate Phases 2, 4, 6, and 8 with dual entry at "8-phase" (concurrent) intersections.

5. System Compatibility

a. Uncoordinated Signals

This is a form of signal control in which an individual signalized intersection has neither control relationships between intersections nor any data flow between intersections. The individual isolated intersection may have local actuated control or Time of Day/Day of

Week changes based on historical traffic flows. This category has also been called isolated signal control and totally isolated systems.

b. Coordinated Signals

The potential benefits to be derived from the coordinated operation of two or more signalized intersections are directly related to the platoon arrival characteristics at the downstream intersection. If approaching vehicles arrive at the stop bar as a well-defined compact platoon, the coordinated operation can provide a significant reduction in stops and delays. The DE MUTCD suggests that signals spaced less than 1/2 mile apart should be coordinated because the cohesion of the platoon can be maintained for this distance.

The question of whether or not to coordinate a series of intersections is a complex decision. The prime objective is to assemble those intersections requiring similar timing strategies (i.e., cycle lengths and traffic flow patterns) into groups of reasonable size. The factors that need to be considered include:

- **Geographic relationship:** Distance between intersections; natural and artificial boundaries such as rivers and controlled-access facilities should be considered. Generally, signals within ½ mile of one another along a major route should be coordinated.
- **Storage:** The storage length between intersections is a very critical factor in the decision to interconnect traffic control signals. Closely spaced intersections should always be coordinated unless an engineering study recommends otherwise. In cases where queues extend from one intersection to another, signal coordination should be provided.
- **Volume levels:** The larger the mainline volume, the greater the need for coordination between signals.
- **Traffic flow characteristics:** If traffic arrivals are uniform throughout the cycle, the red portion of the cycle would produce the same stops and delays regardless of its position. On the contrary, platooned arrival enhances the benefits of coordination. When systems operating on different cycle lengths are adjacent to or intersect each other, changes to provide a uniform cycle length appropriate for both systems should be considered, so that the systems can be unified, at least for certain portions of the day. Half-cycles or double cycles should also be considered for some locations if that facilitates coordination.
- **Permissive Left Turns and Safety:** Drivers may have difficulty making permissive turning maneuvers at signalized intersections (e.g., permissive left turns, right turn

on red after stop) because of lack of gaps in through traffic. This can contribute to both operational and safety problems. Left-turning vehicles waiting to turn can block through traffic, even if a left-turn lane is provided. This can lead to rear-end crashes between turning and through vehicles. Crashes may also occur when left-turning drivers become impatient and accept a gap that is smaller than needed to complete a safe maneuver. Such crashes could be minimized if longer gaps were made available.

One method of providing longer gaps is to coordinate adjacent traffic control signals to promote platooning of vehicles. Signal progression can help improve driver expectancy of changes in right-of-way assignment due to signal changes. Increased platooning of vehicles can create more defined gaps of increased length for permissive vehicle movements at intersections and can result in improved intersection operation. Increased platooning of vehicles may also result in a decrease in rear-end crashes. Effective coordination of signals should reduce the required number of stops for the higher priority movements (presumably the major street through movement).

Table IV-7 below lists the potential benefits and drawbacks associated with providing signal coordination.

Table IV-7
Signal Coordination Benefits and Drawbacks

Characteristic	Potential Benefits	Potential Drawbacks
Safety	Fewer rear-end and left-turn crashes.	May promote higher speeds.
Operations	Improves traffic flow.	Usually longer cycle lengths.
Multimodal	May reduce pedestrian-vehicle conflicts.	May result in longer pedestrian delays due to longer cycle lengths.
Physical	No physical needs.	None identified.
Socioeconomic	Reduces fuel consumption, noise, and air pollution.	None identified.
Enforcement, Education, and Maintenance	May result in less need for speed enforcement.	Signal timing plans need periodic updating.

Apart from its operational benefits, signal coordination is known to reduce vehicle conflicts along corridors where traffic control signals are coordinated. Largely, it reduces the number of rear-end conflicts, as vehicles tend to move more in unison from

intersection to intersection. Studies have proven the effectiveness of signal coordination in improving safety. The ITE *Traffic Safety Toolbox: a primer on Traffic Safety* cites two studies of coordinated signals with intersection crash frequencies that dropped by 25 and 38 percent. Selected findings of safety benefits associated with signal coordination are shown in **Table IV-8** on the following page.

Table IV-8
Safety Benefits Associated with Signal Coordination or Progression

Treatment	Finding
Signal Coordination	• 3 to 18% estimated reduction in all crashes along corridor • 14 to 43% estimated reduction in rear-end crashes along corridor
Provide Signal Progression	• 10 to 20% estimated reduction in all crashes along corridor

Once the decision is made to coordinate a series of intersections, there are a variety of ways to interconnect the controllers, using different forms of communication infrastructure. Coordination interconnection is typically accomplished using either fiber optic communication cables or telephone type cables with multiple conductors (6 pair, 12 pair, 18 pair, 25 pair).

There are some basic principles to be followed when installing coordination interconnect cables.

i. All cables shall be terminated inside of an enclosure (control cabinet or computer building). This allows for easy termination on terminals and convenient testing points.
ii. Intermediate splices should be avoided.
iii. Do not place interconnect cables into the same conduit with cables that carry secondary line or higher voltage.

Grouping the signals to be coordinated is a very important aspect of design of a progressive system. Factors that should be considered include geographic barriers, volume-to-capacity ratios, and characteristics of traffic flow (random versus platoon arrivals).

c. Signal Pre-Emption / Priority

Section 4D.27 of the DE MUTCD discusses signal preemption, standards for the phases during preemption, and priorities for different vehicle types that might have preemption capabilities. A specific vehicle often targeted for signal preemption in Delaware is the emergency vehicle. Signal preemption allows emergency vehicles to disrupt a normal signal cycle to proceed through the intersection more quickly and under safer conditions. The preemption systems can extend the green on an emergency vehicle's approach or replace the phases and timing for the whole cycle. While several types of emergency vehicle detection technologies are available, the most commonly used preemption systems in Delaware consist of an emitter mounted on an emergency vehicle that sends an infrared pulse toward a detector mounted at the traffic signal, which is wired into the signal controller. Signal preemption detectors should be designed and installed on all approaches of DelDOT-owned and maintained signals. The optical detectors should face "outside the box" – i.e., typically nearside closest to the stop line and facing approaching traffic (**Figure IV-13**).

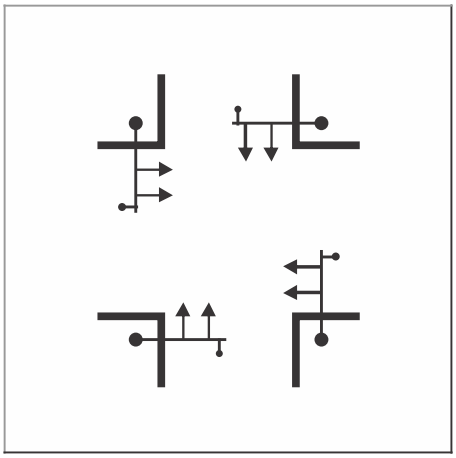


Figure IV-13. Placement of Optical Detectors

Sections 4D.27 and 8C.09 of the DE MUTCD include requirements and recommendations associated with traffic control signals located in the vicinity of grade crossings and, subsequently, railroad preemption. Because railroad preemption may cause excessive vehicular delays and/or abnormal traffic control signal operations for extended periods of time, the decision to install railroad preemption should not be made without consideration of other safety and operational alternatives. If an engineering study determines that railroad preemption is an appropriate countermeasure for a specific location, then the right-of-way transfer time, queue clearance time, and maximum

preemption time should be based on the TxDOT's *Guide for Determining Time Requirements for Traffic Signal Preemption at Highway-Rail Grade Crossings* (see **Appendix R**).

Where traffic signals at movable bridges are interconnected with signals at adjacent intersections, the traffic signals at the adjacent intersections should be preempted by the operation of the movable bridge. See Sections 4J.03 and 4D.27 of the DE MUTCD for additional guidance.

6. Pedestrians

a. Signal Guidelines

According to Section 4E.03 of the DE MUTCD, pedestrian signal heads **must** be used in conjunction with vehicular traffic control signals under any of the following conditions:

- If a traffic control signal is justified by an engineering study and meets either Warrant 4 - Pedestrian Volume or Warrant 5 - School Crossing (see DE MUTCD, Sections 4C.05 and 4C.06).
- If an exclusive signal phase is provided or made available for pedestrian movements in one or more directions with all conflicting vehicular movements being stopped.
- At an established school crossing at any signalized location.
- Where engineering judgment determines that multiphase signal indications (as with split-phase timing) would tend to confuse or cause conflicts with pedestrians using a crosswalk guided only by vehicular signal indications.

Pedestrian signals **should** be used under the following conditions:

- If it is necessary to assist pedestrians in making a reasonably safe crossing or if engineering judgment determines that pedestrian signal heads are justified to minimize vehicle-pedestrian conflicts.
- If pedestrians are permitted to cross a portion of a street, such as to or from a median of sufficient width to wait during a particular interval but are not permitted to cross the remainder of the street during any part of the same interval.
- If no vehicular signal indications are visible to pedestrians, or if the vehicular signal indications that are visible to pedestrians starting or continuing a crossing provide

insufficient guidance for them to decide when it is reasonably safe to cross, such as on one-way streets, at t-intersections, or at multiphase signal operations.

Pedestrian signals **may** also be installed under the following condition:

- When pedestrians cross part of the street, to or from an island, during a particular interval where they should not be permitted to cross another part of that street during any part of the same interval.

The DE MUTCD provides specific guidance on the type and size of pedestrian signal indications (Section 4E.04). As noted in the DE MUTCD, all new pedestrian signals should use the UPRAISED HAND (symbolizing DON'T WALK) and WALKING PERSON (symbolizing WALK) indications.

b. Timing Requirements

Pedestrian movements across signalized intersections are typically accommodated by one of the following options:

- Pedestrians cross the street with the parallel vehicular green indication (no pedestrian signal display). While this type of pedestrian accommodation may still be present at some older signals in Delaware, it should not be used for new signals or signal upgrades.
- Pedestrian movements are controlled by a concurrent separate pedestrian signal display. This is DelDOT's preferred method of accommodating pedestrians at signals.
- Pedestrians move on an exclusive phase while all vehicular traffic is stopped.
- A leading pedestrian interval to give the pedestrian(s) the opportunity to enter the roadway before traffic begins to move.

The essential factor in any of these options is to provide adequate time for the pedestrian to enter the intersection (walk interval) and to safely cross the street (pedestrian clearance interval). In cases where there are no separate pedestrian displays and the pedestrian moves concurrently with vehicular traffic on the parallel street, the time allocated to vehicular traffic must consider the time required for pedestrians to react to the vehicular green indication and move across the street.

When separate pedestrian displays (WALK, DON'T WALK) are used, the minimum WALK interval preferred by DelDOT is 7 seconds. This allows the pedestrian ample opportunity to leave the curb before the pedestrian clearance interval commences. Various research

studies have indicated that when there are fewer than 10 pedestrians per cycle, a WALK interval as short as 4 seconds may be used.

1.) Walking Speeds

Pedestrian walking speeds generally range between 2.5 ft/s and 6.0 ft/s. The DE MUTCD uses a walk speed of 3.5 ft/s for determining crossing clearance times. There are, however, various categories within the general population that walk at a slower rate. For example, very young children, the elderly, and people with disabilities may walk at a slower rate. Research on pedestrian characteristics verifies that 15% of all pedestrians walk at or below 3.5 ft/s. In general, to accommodate users who require additional time to cross the roadway, especially in lower speed areas where there are concentrations of children and or elderly persons, the minimum walk interval of 7 seconds may be increased to account for the need of slower pedestrians at known locations.

A general rule of thumb indicates that pedestrians at crossings are willing to wait only 30 seconds, at which point they will begin to look for opportunities to cross, regardless of the walk indication and the crossing location (reference 7, Chapter 18 of *HCM 2000).* Shorter cycle lengths benefit pedestrians, particularly where pedestrians often need to cross two streets at a time to travel in a diagonal direction, as well as drivers, who experience generally shorter delays.

2.) Minimum Clearance Times

Pedestrian timing requirements include a WALK interval and a flashing DON'T WALK interval. The WALK interval gives pedestrians adequate time to perceive the WALK indication and depart the curb before the clearance interval (flashing DON'T WALK) begins.

The DE MUTCD mandates that a pedestrian clearance interval always be provided and displayed long enough to allow the pedestrian who left the curb/edge of road (if no curb exists) during the WALK indication to travel from the curb/edge of road (if no curb exists) to the far curb or to a median of sufficient width for pedestrians to wait. Generally, the flashing DON'T WALK should be terminated and a steady DON'T WALK displayed at the onset of the yellow vehicular change interval. The minimum clearance interval is calculated by dividing the crossing distance (curb to curb) by the "normal" walking speed of 3.5 ft/s, as shown in the top equation of **Figure IV-14**.

Additionally, the sum of the walk interval and clearance time should allow a pedestrian walking at 3.0 ft/s to travel from the pedestrian detector to the far face of the curb/edge of road (if no curb exists). The equation to calculate this time is shown at the bottom of **Figure IV-14**. For additional information, refer to Section 4E.06 of the DE MUTCD.

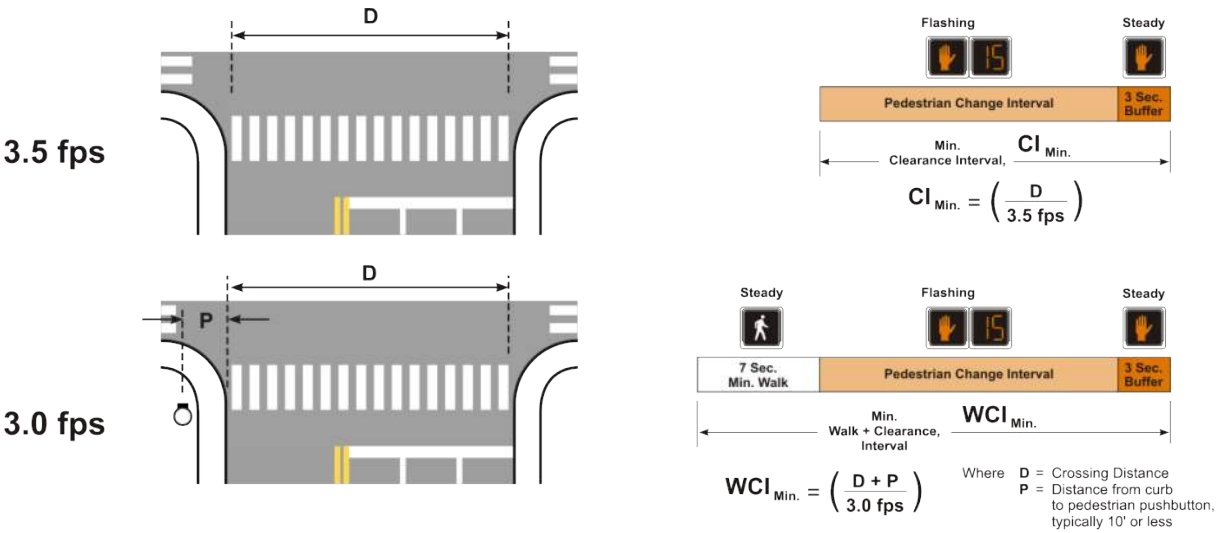


Figure IV-14. Clearance Interval Time Calculations

The recommended practice is for the pedestrian clearance time to be accommodated completely within the flashing DON'T WALK time.

During the transition to preemption, the WALK interval may be shortened or omitted.

c. Rest in Walk

When in a coordinated system, pedestrian phases operating concurrently with the major street through phases are programmed to "rest" in the corresponding walk interval. This operation allows the pedestrian walk interval to be extended to reduce the frequency of "jaywalking;" however, it adversely affects preemption transition times because shortening the pedestrian clearance interval is prohibited in Delaware.

d. Accessible Pedestrian Signals (APS)

Some signalized intersections have factors that may make them difficult for pedestrians who have visual disabilities to cross safely and effectively. As noted in the DE MUTCD (section 4E.09), these factors include:

- Increasingly quiet cars

- Right turn on red (which masks the sound of the beginning of the through phase)
- Continuous right-turn movements
- Complex signal operations (e.g., protected-permissive phasing, lead-lag phasing or atypical phasing sequences)
- Roundabouts
- Wide streets

To address these challenges, accessible pedestrian signals have been developed to provide information to the pedestrian in a nonvisual format such as audible tones, verbal messages, and/or vibrating surfaces. Detail on these treatments can be found in the DE MUTCD and in several references sponsored by the U.S. Access Board and the National Cooperative Highway Research Program (NCHRP).

When used, accessible pedestrian signals shall have an audible tone(s) during the WALK interval.

DelDOT will install APS upon request at a signalized intersection. Request forms are available online at DelDOT's webpage. To access the form, click on "Online Services" from the homepage, then select from the "A" column "Audible Pedestrian Traffic Signal Request."

e. Countdown Pedestrian Signals

All new and reconstructed traffic signals in Delaware will incorporate countdown pedestrian signals. See **Appendix S** for specific DelDOT timing guidelines. Redundancy in information to pedestrians benefits all pedestrians.

Countdown signals display the number of seconds remaining before the end of the DON'T WALK interval. Countdown displays shall not be used during the WALK interval, nor during the yellow change interval. The WALKING person symbol and flashing and steady UPRAISED HAND symbol still appear at the appropriate intervals, unless federally approved. The countdown signals do not change the way a signal operates; they only provide additional information to the pedestrian.

If the pedestrian change interval is interrupted or shortened as part of a transition into a pre-emption sequence, the countdown display should be discontinued and go dark immediately.

f. Alternative Pedestrian Phasing Options

Three options beyond standard pedestrian signal phasing are:

- The leading pedestrian interval
- The lagging pedestrian interval
- The exclusive pedestrian phase

A leading pedestrian interval entails retiming the signal splits so that the pedestrian WALK signal begins a few seconds before the vehicular green. As the vehicle signal is still red, this allows pedestrians to establish their presence in the crosswalk before the turning vehicles, thereby enhancing the pedestrian right-of-way.

A lagging pedestrian interval entails retiming the signal splits so that the pedestrian WALK signal begins a few seconds after the vehicular green for turning movement. The 2001 ITE guide, *Alternative Treatments for At-Grade Pedestrian Crossings*, indicates that this treatment is applicable at locations where there is a high one-way to one-way turning movement and works best where there is a dedicated right-turn lane. This benefits right-turning vehicles over pedestrians by giving the right turners a head start before the parallel crosswalk becomes blocked by a heavy and continuous flow of pedestrians.

An exclusive pedestrian signal phase allows pedestrians to cross in all directions at an intersection at the same time, including diagonally. It is sometimes called a "pedestrian scramble" phase. Vehicle signals are red on all approaches of the intersection during the exclusive pedestrian signal phase. The objective of this treatment is to reduce vehicle turning conflicts, decrease walking distance, and make intersections more pedestrian-friendly. However, exclusive pedestrian phases generally have a significant impact on intersection capacity and should be considered only in exceptional circumstances. The 2001 ITE guide refers to research that indicates that leading pedestrian phases were more effective treatments than exclusive pedestrian phases.

Leading pedestrian phasing may be considered where:

- There is moderate to heavy pedestrian traffic.
- A high number of conflicts/crashes occur between turning vehicles and crossing pedestrians.

Lagging pedestrian phasing may be considered where:

- There is moderate to heavy pedestrian traffic.

- There is right-turn channelization that is heavily used by vehicles.
- A high number of conflicts/crashes occur between right-turning vehicles and crossing pedestrians.

Exclusive pedestrian phasing (scramble) may be considered where:

- There is very heavy pedestrian traffic on all or most approaches.
- Delay for vehicular turning traffic is excessive due to the heavy pedestrian traffic.
- There is a large number of vehicle-pedestrian conflicts involving all movements.

Note that for any of the three treatments, the use of accessible pedestrian signals is recommended to give people with visual disabilities information of the walk phase in the absence of predictable surging traffic.

In rare circumstances, a 4-section T-shaped signal head with a solid red right turn arrow can be used in locations where right turns may be prohibited during certain phases per Sections 4D.22 of the DE MUTCD.

Delaware Department of Transportation

TRAFFIC DESIGN MANUAL

2015 EDITION

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Chapter V

ITS DEVICES

V. ITS DEVICES

A. Types of Devices

This chapter of the Traffic Design Manual provides information on the design of many of the ITS (Intelligent Transportation Systems) Traffic Devices that are currently deployed in Delaware and designed by DelDOT's Traffic Section. ITS devices are connected to DelDOT's Integrated Transportation Management System (ITMS).

Sections V-B and V-C of this Manual outline the specific design elements required when preparing an ITS design per DelDOT standards. While the technology associated with many ITS devices is continually evolving, the design plan elements of most current ITS devices are similar and may also be applicable to future devices.

1. General

ITS Traffic Devices installed by the Department are used to help manage recurring congestion and minimize non-recurring congestion as part of the "Delaware Integrated Transportation Management Strategic Plan." These devices are used to increase safety, reduce delays, and improve operations by providing the necessary infrastructure to allow DelDOT to collect, monitor, and disseminate real-time, accurate traveler information. DelDOT may use this information to respond to changing travel conditions by modifying signal timing patterns, and deploying DelDOT staff, and may also provide this information to motorists, allowing the public to make informed decisions about route choice, mode choice, and the timing of their travel. Projects may include the installation or upgrade of communication infrastructure, or the installation or upgrade of monitoring and/or reporting devices. Projects may consist of a single device installation/upgrade, the installation/upgrade of multiple devices at a single location, or the installation/upgrade of multiple devices through a corridor-wide deployment as part of a CIP or Traffic-only project.

2. Communication Infrastructure

The ITMS Communication Infrastructure is the foundation of the data and communication system of DelDOT's Traffic Management Center (TMC). Without power and communication, the usefulness of an ITS device is severely limited. In Delaware, all ITS devices shall communicate with DelDOT's Transportation Management Center (TMC). The current ITMS system utilizes both hardwire and wireless connections. Typical hardwire connections are achieved using a single mode fiber optic cable, a twisted copper pair cable, or a T1 connection. Typical wireless connection is achieved via CDMA, 4.9GHz, or 900 MHz connections. Both

hardwire and wireless systems provide connectivity between the TMC and the devices deployed in the field. Hardwire connections are typically underground pathways connecting to individual devices or linking multiple devices along a corridor back to a central hub location or directly to the TMC. There are several advantages and disadvantages of each type of connection.



Fiber optic cable (fiber) is commonly used by DelDOT. The primary benefit of fiber is its capacity to carry large amounts of data. Fiber optic cable is also less bulky than copper wire, avoids the monthly charges by the phone company associated with a T1 or CDMA connection, and may provide a more-reliable connection during critical events than wireless communication. However, it is not practical or cost-effective to install fiber in remote locations. Wireless communication may be the preferred method of connectivity with devices in locations where existing hardwire communication options are unavailable or where it would be cost-prohibitive to install the necessary infrastructure to connect the device(s) with existing communications lines. Wireless communication can also be used effectively during construction phasing as a temporary means of communication until proposed or existing infrastructure is installed or reconnected.

At junction points of major fiber pathways, the installation of a fiber mini-hub or a traditional hub building may be used. The purpose is to not only provide an access point to combine and increase the signal strength of the fiber optic cable, but to also allow for the ability to provide slack in an already overloaded corridor. Both full hub buildings and fiber mini-hubs require a power source.

See **Appendix T** for a sample plan for a fiber pathway.

3. System Detection

Real-time traffic monitoring devices allow the TMC to collect speed data and traffic volume data along highways and other key travel corridors within Delaware. These devices can also be deployed to monitor locations with recurring congestion and to assist in monitoring work zones. Real-time traffic monitoring provides the TMC with information necessary to appropriately adjust signal timing along affected routes and/or deploy necessary personnel

or equipment to a site. Real-time traffic data is used in Delaware to inform motorists of current travel conditions via several different methods of communication, including CMS boards, websites, mobile device applications (DelDOT "app"), traveler advisory radio, and other information portals. Along major corridors, data received from real-time traffic monitoring devices can be the first alert to the TMC of severe congestion or the presence of a traffic-related incident.

The current techniques used by DelDOT to collect real-time traffic data are:

- System loops utilized along signalized corridors
- Real-time traffic monitoring stations (RTMS) along highways or major corridors where signal spacing cannot accurately provide real-time monitoring
- Automatic Traffic Recorder (ATR) stations that collect traffic volume data throughout the state.
- Bluetooth detection

System Loops

To collect real-time traffic data along signalized corridors, an inductive (6'x6') loop is placed downstream within each departure lane at a point where vehicles have reached free-flow speed. These loops are typically referred to as "system loops." The information collected by the system loops provides the TMC and the signal controller unit with current traffic volumes along the corridor and can be used to determine the appropriate signal-timing operation to be deployed in a traffic-responsive signal system based on current travel conditions. The data collected by system loops can also be used to supplement or replace manually-collected traffic data, typically turning movement counts or pneumatic tube counts.



US 13 at Llangollen Blvd, New Castle

In some cases, it may be necessary to place an additional loop on the departure side of a free right turn movement from the side street. The free right loop should only be placed where a full acceleration lane is present and at a position where traffic has reached free-flow speed, if possible.

Real-time Traffic Monitoring Stations (RTMS)

To collect real-time traffic data along highways and major unsignalized corridors, RTMS units are typically deployed. These devices collect information through the use of fixed low reference frequency and are capable of measuring traffic volume, vehicle classification, average speed, individual vehicle speeds, and volumes by lane. In order to collect travel time information, multiple units will be required at various points along the roadway segment. Using vehicle speed measured at each location and the distance between the units, reasonable assumptions can be made regarding average travel time and/or traffic delays along the corridor. Since accuracy and reliability is dependent on the number and placement of units, a minimum spacing of ½ mile is recommended. Bluetooth Monitoring Devices (see following page) can also be deployed in conjunction with RTMS units to improve data accuracy along major corridors.



I-95 SB at SR 273 On Ramp, Newark

When RTMS units are placed in the field, they are generally rigid mounted on their own breakaway pole. Mounting height and offset from roadway varies based on the number of lanes to be monitored and the manufacturer's design specifications. A cabinet should be installed at each unit location for controller and communication equipment. See **Appendix U** for a sample plan of an RTMS design.

Automatic Traffic Recorder (ATR) Stations

ATR stations are traffic volume counter stations permanently installed throughout Delaware covering all functional classifications of highways except local streets. ATR stations count the number of vehicles passing each location continuously, 24 hours per day, seven days per week, and transmit the recorded data back to DelDOT's Office of Information Technology (OIT) headquarters for electronic data processing. Some of the Department's ATR stations are also equipped with weigh-in-motion (WIM) equipment that records the weight of every vehicle passing over the station.

Bluetooth Monitoring Stations

Every Bluetooth-equipped (and enabled) device, including cellular phones, mobile GPS systems, wireless telephone headsets, in-vehicle navigation systems, laptop computers, and hands-free systems, emits an electronic signal containing a unique electronic address. These addresses, known as MAC addresses, can be detected within a few hundred feet of the device (source). Many transportation agencies, including DelDOT, are installing equipment to detect these signals that are being emitted from Bluetooth devices within vehicles as the vehicles pass by a Bluetooth monitoring station. By comparing data gathered at multiple stations, DelDOT can cost-effectively garner a variety of real-time travel information, including average travel times, average travel speeds, and travel patterns.



SR 1 at DelDOT TMC, Smyrna

The MAC addresses read by DelDOT's Bluetooth monitoring station do not contain any personal data or information that could be used to identify an individual. Additionally, users who have privacy concerns are also able to turn off the Bluetooth discovery function of their respective device(s) to prevent them from being detected.

4. CCTV Cameras

Closed Circuit Television (CCTV) is primarily used for monitoring current traffic conditions and verifying roadway incidents (crashes, disabled vehicles, and/or construction and maintenance activity). CCTV cameras also provide security surveillance of DelDOT roadway, bridge, and toll facilities, providing first-response information.



I-95 NB at SR 896, Newark

When placing a CCTV, the location should provide a clear line of sight of the roadway with minimal obstructions and provide as much upstream and downstream roadway coverage as possible. During the Initial Design Phase, a field visit with Traffic System Design, Traffic System Construction, and Traffic System Operations should be coordinated. During this field visit, a bucket truck or drone should be used to approximate the view of the proposed camera to ensure that the desired sightlines can be achieved. During or after the field visit, additional coordination with the local Maintenance District may also be necessary to identify possible conflicts. CCTV cameras typically have a view radius of 315 degrees with a 45-degree blind spot. The blind spot should be oriented to a location that is non-critical for viewing and should be depicted on the plan sheet. Care should be taken when CCTV cameras are placed in a residential or populated area to minimize impacts to the adjacent community by aligning the blind spot with residential areas, where possible. In these locations, additional shielding may be required to expand the blind spot, thereby reducing the view radius. Where feasible, CCTV cameras should also be located to provide a line of sight to view other nearby traffic control devices, such as CMS board messages or traffic signal heads. This allows for visual verification of device status to the TMC and can reduce the need for additional monitoring devices. Cameras located along a highway or major roadway corridor should provide as much continuous coverage as possible.

Cameras should be placed as high as possible over a roadway. They may be placed on their own pole, but consideration should be given to mounting cameras onto proposed and existing signal poles with a davit arm as a cost-effective solution, when possible. Where applicable the Designer should coordinate with nearby airports and FAA before placing tall camera poles (See Chapter 2 for more information). A low mounting height may also be necessary in constrained areas or to avoid community impacts. Typically, CCTV cameras should be installed with lowering devices to facilitate maintenance. See **Appendix V** for a sample plan of a CCTV camera design.

5. CMS Boards

Changeable Message Signs (CMS), also referred to as "dynamic message signs" or DMS, are used to provide motorists with current information on traffic conditions, crashes, incidents, hazardous roadway conditions, travel times, and construction and maintenance activities. CMS boards can be attached to permanent structures, or they can be portable units that are moved to different locations during construction activities or special events, as needed. All CMS message displays shall comply with the DE MUTCD.



SR 1 NB South of SR 30, Milford

Ideally, CMS boards should be located on a tangent roadway section with few roadside distractions to avoid driver hazards and provide maximum driver visibility. They should also be placed reasonably far enough away from downstream decision points to give motorists sufficient time to read and comprehend the sign message and take appropriate action. Permanent CMS boards should typically be placed on a butterfly overhead structure where feasible and conform to the sign spacing requirements outlined in the DE MUTCD. When determining the appropriate strategic placement of the CMS boards, consideration should be given to locations that allow drivers the ability to access alternative routes to circumvent potentially congested areas and avoid delays when a message is displayed. See **Appendix W** for a sample design plan for a permanently mounted CMS board.

6. Weather Stations



SR 1 at DelDOT TMC, Smyrna

Road Weather Information Systems (RWIS) provide the TMC, DelDOT maintenance personnel, and public and other agencies with real-time weather and pavement data. They assist in the decision-making process of deploying labor, equipment, and materials as cost-effectively as possible during a weather-related event.

RWIS units gather current air temperature, amount and type of precipitation, visibility, and wind speed. The RWIS units can also include roadway-embedded devices that provide information related to pavement temperatures, surface conditions, chemicals on the roadway, and the freezing point of the road surface.

RWIS stations are typically placed near bridges and overpasses or within other environmentally-sensitive areas. The main controller unit, wind sensor, and rain gauge are typically located on a pole near the base of a roadway structure, outside the clear zone, in an area accessible by maintenance crews. Roadway sensors are typically cored into the roadway surface within the travel lane(s) near the main controller unit. The roadway sensors may communicate with the controller via either a wireless sensor or a hardwired connection. See **Appendix X** for a sample plan of a weather station design.

Delaware has numerous rivers, dams, creeks, and intercoastal waterways that have the potential to flood, causing damage to roadways and surrounding infrastructure, thereby serving as a threat to public health and safety. DelDOT and the United States Geological Service (USGS) have begun an initiative to deploy numerous Hydrological Monitoring Sites statewide at critical flood locations. This equipment will be utilized by both parties to provide real-time flood management information during and after major storm events. Currently, the

devices being deployed contain a rain gauge, water level sensors, a bubbler gauge, submerged pressure transducers, microwave depth sensors, and fluid velocity sensors.

7. WTMC

DelDOT uses its designated AM radio frequency (1380 AM, WTMC-AM) to update travelers on roadway and transit conditions so they can make informed decisions regarding their travel patterns and avoid congestion. The main transmission tower is located near the City of Wilmington. Due to the limited signal strength of the current tower, the Department deploys numerous repeater sites strategically placed throughout the state. These sites allow for the expansion of the broadcast range of the WTMC. Each repeater site receives a weak or low-level signal and re-transmits the signal at a higher level so the signal can cover a broader area without degradation. See **Appendix Y** for a standard detail of a WTMC repeater site.



Sign Shop Rd, Dover

8. Variable Speed Limit Signs

Variable Speed Limit (VSL) signs allow the TMC to adjust the posted speed along a corridor based on a variety of factors, including adverse weather conditions, traffic congestion, construction/maintenance activities, or during incidents. The speed limit can be changed remotely from the TMC. Variable speed limit signs shall be placed in accordance with the DE MUTCD and follow the same standards required for static SPEED LIMIT (R2-1) signs. At the entrance to a roadway or corridor where variable speed limit signs are deployed, a NOTICE: CHANGEABLE SPEED LIMIT ZONE AHEAD (W3-5-DE) sign shall be posted in advance of the VSL signs, alerting motorists to changing posted speeds.



I-495 NB North of I-95, Newark

9. New Technology

DelDOT continuously seeks to improve its monitoring and data collection techniques and is constantly reviewing the latest state-of-the-art technologies as they are developed. DelDOT will review each new technology on a case-by-case basis and may choose to add new ITS devices to the Delaware ITMS program if they are deemed appropriate and effective. Designers should coordinate with the DelDOT Traffic Section for design guidance on new technologies not specifically addressed in this Manual.

B. Preliminary Design Plan Elements

When developing preliminary ITS device design plans, there are several elements and design factors that should be taken into consideration. The design elements presented in this chapter of the DelDOT Traffic Design Manual represent the minimum that should be incorporated into all preliminary design plans. Additional design elements may also be included at the discretion of the Designer, DelDOT, or other interested parties, based on project-specific needs.

1. Location

First and foremost, when selecting an appropriate location for ITS devices, consideration should be given to the type of information the device will be generating and transmitting back

to the TMC, as well as the needs of the other interested parties that may utilize the information gathered from the device.

The device should be placed to allow for safe access by authorized personnel and adequate protection for maintenance crews. The location should also provide adequate accessibility for equipment required to maintain and/or repair the device. Devices should be located outside of the clear zone or be adequately protected by a guardrail, barrier, or breakaway device. Additionally, particularly within medians of high-speed roadways, care should be taken to place ITS devices in locations that have safe access for maintenance purposes.

All equipment should meet the same utility clearances required for traffic signals as outlined in Chapter IV-C of this Manual. Utility clearance is the required distance between overhead and underground utilities. The ability to achieve proper utility clearance is often a major factor in selecting an appropriate location. The placement of the device(s) should comply with current local utility companies and National Electrical Safety Code (NESC) clearance requirements. Typically, all devices should be at least 10 feet from all primary electric lines, 4 feet from all secondary electric lines, and 2 feet from cable and telephone lines. For underground facilities, a minimum of 2 feet should be maintained for all wet and dry facilities.

2. Power

ITS devices typically draw power from existing, nearby utilities. The Designer is responsible for identifying potential sources of power and leading coordination efforts with DelDOT forces and the utility company to finalize specific design details regarding the power connection. This effort to discuss viable options should occur during the preliminary design process. For additional information, refer to the DGM 1-27 dated April 07, 2020 included with this Manual in **Appendix M.** DelDOT's standard process for designing power feed should be followed with the power company's wire being brought to the device cabinet. Preferably, this should be an underground wire, but may be an overhead wire, if needed.

Due to the need to install ITS devices in remote locations, in areas where power is not readily available, or simply as a means to reduce long-term energy costs, some devices,based on power needs, may use solar power upon approval by the Traffic Systems Design Manager. Some devices, such as RTMS and Bluetooth devices, may have power needs that are low enough to rely completely on solar power. Other devices may still require connection to a hardwired power source in addition to solar power due to the critical nature of the information being gathered.

3. Communication

During preliminary design, the Designer is required to meet with DelDOT's Telecommunications Committee to discuss the communication requirements for the integration of the proposed device. Prior to meeting with the Telecommunications Committee, the Designer should have a draft idea of the communication needs of the project. All proposed devices should be shown and accounted for to provide an accurate scope of the project. Also, the Designer should have an idea of other significant projects in the area and/or long-range TMC communication plans. The Telecommunications Committee will provide the Designer with an integration strategy and will identify the required pathway and equipment needed to integrate the proposed devices into the ITMS system. The Telecommunications Committee will also provide the Designer with equipment and integration costs to be added to the traffic supply items listed in the traffic statement.

C. Final Design Plan Elements

Final design plans must include all elements necessary to fully construct all components of the ITS device. During the final design, the Designer must update and finalize all elements included in the preliminary design plans and must also include several more-detailed elements to the plan set. The design elements presented in this chapter of the DelDOT Traffic Design Manual should be incorporated into the final design plans.

1. Conduit Design

A conduit acts as a pathway for electrical and fiber-optic communication cables placed between junction wells, ITS devices, and the controller cabinet. The DelDOT Traffic Section uses Schedule 80 polyvinyl chloride conduit (PVC) or high-density polyethylene (HDPE) for ITMS and electrical pathways. For more information, refer to the chapter on conduit design for traffic signals of this manual (Chapter IV-D.1).

a. Sizes

For ITS devices, conduit sizes are typically selected based on the following:

- All proposed conduit shall be 4" Schedule 80 PVC when installed by trench or open cut
- All proposed conduit shall be 4" HDPE SDR - 13.5 when installed by bore. If hand bore is required conduit size may be reduced upon approval by a Traffic Systems Design Representative.

- All proposed electrical service shall be provided via a single 2" (or larger, as determined by maximum fill capacity) rigid conduit. Where conduit is installed underground for long distances, Schedule 80 PVC or HDPE may be deployed upon approval of the Traffic Systems Design representative.
- Where applicable proposed system loop detector lead-in conduit shall be 1 ½" rigid conduit. See standard construction detail T8 for additional guidance.
- All pole base conduits shall be as outlined in the section below. Once a tie-in to a junction well has occurred, the remainder of the pathway shall be as stated above. See standard construction detail T5 for additional guidance.

For pathway on structures, smaller conduit sizes may be used based on device deployment requirements. Additionally, galvanized conduit should be used for pathway exposed to the outside elements.

b. Installation Methods

There are four (4) typical methods for installing conduit:

- Trenched – Installation of conduit in grass or dirt
- Bored – Installation of conduit under roadway, pavement, or concrete surfaces
- Open Cut – Installation of conduit in roadway, pavement, or concrete surfaces where it cannot be bored
- Banded – Conduit may also be banded to poles and structures, where applicable

Boring is the preferred alternative to open cutting of roadway, pavement or concrete surfaces. Boring helps to minimize interruption to traffic and damage to surfaces/structures. The installation cost is typically also lower than open cutting. If boring is recommended for the conduits, the Designer must ensure that there will be sufficient room and right-of-way (approximately 10 feet in the direction of the conduit) to place machinery performing the boring operation. If boring beneath pavement or concrete surfaces is found to be infeasible, open cutting the pavement is generally an acceptable alternative installation method. Open cutting also provides the advantage of avoiding conflicts with underground utilities.

There shall not be more than the equivalent of four quarter bends (360 degrees total) between pull points, for example, hand holes, junction wells, etc.

c. Conduit Fill Capacity

The National Electrical Code limits the portion of the conduit's cross-section that can be occupied by conductors. Like traffic signal conduits, the conduits for ITS devices should be limited to the following maximum allowable fill:

	Maximum Allowable Fill
• One Conductor	53%
• Two Conductors	31%
• Three or More Conductors	40%

However, for ITS device installations, the conduit fill should be limited to **26%** for new conduit and **35%** for existing conduit. This will facilitate installation through bends, installation of long runs, and potentially large numbers of conductors and help minimize installation damage. Cross-sectional areas of cables typically used for ITS installations are listed in **Table V-1** below.

Table V-1
Cross-Sectional Areas of Electrical and Fiber Optic Cables

No. of Conductors/Wire Size	Area (Sq. In.)
#8/2 UFWG Strand. Bare Copper Ground. Wire	0.250
#18/4	0.049
#14/1	0.049
#14/2	0.091
#14/4	0.119
#14/5	0.139
#14/9	0.297
#14/16	0.389
#6 AWG Stranded Copper	0.051
6 Count Fiber	0.132
24 Count Fiber	0.132
48 Count Fiber	0.132
144 Count Fiber	0.302
CAT	0.102

2. Junction Wells

Junction wells are pre-cast structures placed underground or within concrete barriers (junction boxes) with composite or steel frames and lids. They act as a point of access to reach cable, to provide a change of direction for a conduit run, or to provide a cable splice location.

a. Types & Sizes

ITS devices typically use three (3) types of junction wells; precast concrete with steel frame and lid (Type 1 and 4), and precast polymer concrete (Type 7). Additional junction well types may be used but would require prior approval from the Traffic Systems Design Engineer or Chief of Traffic Engineering. Sizes of the preferred junction well types used by ITS devices are as follows (see DelDOT's Standard Construction Detail T-1 for additional information):

- Type 1 – 20"x 20": typically used for connecting multiple devices to a power source or connecting power sources with the device cabinet.
- Type 4 – 20"x 42½": typically used for pull points for the fiber optics pathway. Also used as a tie-in point for entering the device cabinet.
- Type 7 – 36"x 60": typically used for pull and/or splice points for fiber optics pathway and/or device tie-in locations.

b. Location

For a communication pathway, the maximum spacing between Type 4 junction wells for ITMS (fiber) pathway shall not exceed 600 feet with every fourth well (maximum 2,400 feet) being a Type 7 junction well. For all underground splice locations, a Type 7 junction well shall be installed. A Type 4 junction well shall be placed at all ITS device tie-in points and at the cabinet location. A Type 4 well should also be placed near each pole, change of direction, and roadway crossing of the pathway. The maximum spacing between junction wells for power supply for ITS devices is 300 feet. Refer to Chapter IV-D.2 of this Manual for additional details regarding junction well design elements.

3. Wiring

For ITS devices, the required wiring is specific to the type of device being deployed and is typically provided by the device vendor. Refer to the vendor cut sheet and/or specification for specific information and wiring requirements. For the integration of devices into the ITMS system, the fiber group will determine the type and count of fiber to be utilized. Refer to Chapter IV-D.4 of this Manual for additional details regarding wiring design elements.

4. Control Cabinet

a. Types

For all ITS devices, the unit's controller should be housed in a base-mounted cabinet Type P & F (see DelDOT's Standard Construction Detail T-4 for dimensions and additional support information), except in special circumstances where there is insufficient space, or other geometric or environmental constraints are present. In those cases, a pole-mounted NEMA-rated Size 4 cabinet, typically referenced as K Cabinet, may be used once approved by The Chief Traffic Engineer. On the ITS device plan sheet, the cabinet type shall be shown inside the cabinet symbol. The cabinet should be equipped with a fan to provide adequate cooling of the controller unit.

b. Location

Like control cabinets for traffic signals, ITS control cabinets should be placed to allow for clear visibility of the devices. Cabinets should be located outside of the clear zone or a minimum of 2 feet beyond vertical curb and as far off the travel edge as possible, to provide protection from errant vehicles. Additional factors to consider when selecting the location include:

- Safe access by maintenance personnel and maintenance vehicles
- Sufficient right-of-way to permit ready access
- Should be traffic facing
- Clear view of the device from the cabinet
- Convenience to power source
- Convenience to communication equipment
- Areas prone to flooding
- Driver visibility

c. Cabinet Base and Conduits

All proposed ITS device cabinet bases Type P (see DelDOT's Standard Construction Detail T-4-2 for dimensions and additional support information) shall have a minimum of 4 conduit access points. The typical layout shall be as follows:

- All new cabinet bases shall be connected directly to a type 4 junction well with a minimum of four (4) 4" Schedule 80 PVC conduits providing direct access.
- There shall also be a single 2" (or larger, as determined by maximum fill capacity) rigid Service conduit providing direct access or via type 1 junction well from the power source into the cabinet base.

Fiber Minihub cabinet bases Type F (see DelDOT's Standard Construction Detail T-4-1 for dimensions and additional support information) shall have a minimum of 6 conduit access points. The typical layout shall be as follows:

- All new cabinet bases shall be connected directly to a Type 7 junction well with six (6) 4" Schedule 80 PVC conduits providing direct access.
- There shall also be a single 2" (or larger, as determined by maximum fill capacity) rigid Service conduit providing direct access or via type 1 junction well from the power source into the cabinet base.

Any modification to the standard construction detail must be pre-approved by the Chief Traffic Engineer prior to installation.

5. Pole / Structure

a. Types

The types of poles/structures used to mount ITS devices vary by the device type, as follows:

- CCTV cameras are typically standalone pole-mounted devices. The poles are typically 75 feet tall but can range from 50 to 75 feet in height depending on need and site constraints. CCTV cameras can also be mounted on signal strain poles or signal mast arms using a mounting adapter.
- RTMS devices are typically mounted on a 40-foot breakaway pole. Device mounting height is based on roadway offset and device manufacturer recommendations.
- CMS boards are typically mounted on an overhead sign structure or cantilever sign structure. Refer to DelDOT's Bridge Design Manual. For additional resources, refer to the AASHTO LRFD Specification for Structural Supports for Highway Signs, Luminaires, and Traffic Signals.
- RWIS devices and hydrology beacon poles are typically 40-foot breakaway pole.

For other ITS devices, refer to the specification or manufacturer recommendations for mounting requirements.

b. Pole Bases

For all designs with CCTV cameras, and/or vehicle detector poles, the designer should first consult DelDOT's Geotechnical Engineer to determine if soil information is readily available for the project location. If historical soil data is unavailable, the designer should submit a soil boring request form (see **Appendix O**). For Traffic-Only projects, all soil

boring requests should go through the Traffic Systems Design Manager to DelDOT's Materials & Research Manager and Geotechnical Engineer. For all other projects, except Developer projects, requests should be coordinated with the Project Manager and Group Engineer. Following the soil analysis, DelDOT's Geotechnical Engineer will recommend one of twelve soil condition "cases" for each pole base location for the signal designer to utilize as shown in **Table IV-5** in Chapter 4D. For unique or other foundation requirements, the designer shall refer to AASHTO LRFD Specification for Structural Supports for Highway Signs, Luminaires, and Traffic Signals.

Because Pole Base, Type 3C requires specialized foundation drilling equipment and unique mobilization, DelDOT's Traffic Construction Section should be consulted in advance of the project handoff to advise of project-specific cost estimate and constructability constraints.

c. Conduits

Type 3, 3A, 3B, and 3C pole bases shall have two (2) 3" Schedule 80 PVC conduit elbows with one providing a connection from the pole base to the nearest junction well (or cabinet; see previous sections) and the other being capped unless otherwise required. All new ITS device pole bases shall tie into a junction well unless otherwise approved by a Traffic Systems Design Representative.

For any devices requiring a non-standard foundation design, the designer should accommodate the necessary number of conduits required by the manufacturer, or as requested by the Department.

6. Maintenance of Traffic

The Traffic Designer shall determine the required maintenance of traffic (MOT) setups that will be required to construct ITMS systems. Typical MOT requirements can be found in Chapter 6 of the DE MUTCD utilizing typical case applications. Coordination with the Traffic Safety section shall occur during the design process to determine allowable work hours, pedestrian access, and any additional MOT project requirements. If the project is part of a capital project, pavement rehabilitation project, or developer project, the Designer should coordinate with the project team developing the Transportation Management Plan (TMP).

The cost estimates prepared for Traffic lead projects should include all MOT items. Time restrictions, night work requirement, and pedestrian access should be denoted on the plan in the handoff form. For capital projects, pavement rehabilitation projects, and

developer projects, the time restrictions set for the main contractor will also typically apply to the Traffic contractor.

7. Traffic Statement

DelDOT Traffic System Design is responsible for developing the engineer's estimate for stand-alone ITMS Projects including coordination with DelDOT Telecommunication committee on communication cost. For In-House Capital Projects, DelDOT Traffic System Design Staff will ensure all needed items are included in the Traffic Statement. For Consultant-led Capital Projects, and/or Developer / Subdivision Projects DelDOT Traffic System Design Staff will assist in the coordination of obtaining Telecommunication communication cost and in the review and comment on the consultant-developed Traffic Statement.

Delaware Department of Transportation

TRAFFIC DESIGN MANUAL

2015 EDITION

Revision 1, January 2024

Appendices

APPENDIX A

DelDOT Traffic Systems Design Directive

Traffic Systems Design Directive

169 Brick Store Landing Road, Smyrna, DE

Number (Year - #)
_____

Requestor Name: _____

Date Submitted: _____

Applicable Chapter / Section / Page / Figure in current manual: _____

Requires modification to Traffic Design Manual?
☐ Yes
■ No

Description of Current Practice: _____

_____

_____

_____

Recommended Change: _____

_____

_____

_____

Date Received: _____ Received By: _____

Based upon the conditions presented, it is recommended that this be approved as an updated Traffic Systems Design Practice and included as a revision to the Traffic Design Manual (if applicable).

Recommended By: _____ Date: _____
Requestor

Recommended By: _____ Date: _____
Design / Construction / Safety / Studies Manager

Approved By: _____ Date: _____
(Signature)

Status / Date Completed: _____

Form Date: 09/15/2014

APPENDIX B

Memo – Signal Agreements (March 30, 2012)

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
800 BAY ROAD
P.O. BOX 778
DOVER, DELAWARE 19903

SHAILEN P. BHATT
SECRETARY

MEMORANDUM

TO: Traffic Studies, Design and Administrative Staff

FROM Donald Weber

DATE: March 30, 2012

SUBJECT: Signal Agreements

As many of you are aware, we have been working on changes to the signal agreement process including updates to language as well as the process used in getting signal agreements approved. The modified language is based on coordination between DelDOT's Traffic, Legal, Engineering Support, Planning and Real Estate Sections. The modified language includes some additional legal protection to DelDOT, as well as ensures that the agreements are in conformance with all applicable state and federal laws related to real estate acquisition. There are three types of basic signal agreements:

- **Type A – Off-Site Developer Agreement.** This agreement is typically used when a developer is required to contribute to the cost of a new or upgraded traffic signal or ITS device that is not located directly on the development's property.
- **Type B – On-Site Developer Agreement.** This agreement is typically used when a developer is required to contribute to the cost of a new or upgraded traffic signal or ITS device that is located on or directly adjacent to the development's property.
- **Type C – Right of Entry Agreement.** There is no cost component of this agreement. It simply allows DelDOT right of entry onto the property to install, operate and maintain

TEAM DelDOT

signal and ITS devices. Property owners must willingly enter into this agreement without compensation. If the property owner would like to receive compensation, then this agreement is not applicable and the full DelDOT right of way process must be followed, or the design must be redone to avoid the property impact. These agreements require a graphical representation of the area of the property in question (see attached for an example).

Each of the basic agreements are attached. Agreement language should not be modified. In the event there is need to consider modifications based on some unique condition, a draft of the modifications will need to be sent to the Chief Engineer through the Traffic Studies or Systems Design Manager, and the Assistant Director for Traffic. Prior to issuing the memorandum, the Department's assigned Deputy Attorney General should review the proposed modifications and "approve as to form."

Note that this memorandum does not address agreements that will be required for the Traffic Signal Revolving Fund. The Traffic Signal Revolving Fund basic agreement and process is currently being finalized and will be covered in a separate memorandum.
Additional tracking mechanisms are being introduced to the signal agreement process as well. Please follow the process noted below:

1. Upon notification of the need for an agreement, and receipt of property owner information, fill out the appropriate basic agreement and forward to Traffic's Administrative Specialist III. Two original copies are required. Please provide the project name and/or number when applicable.
2. Traffic's Administrative Specialist III will log the agreement and send to Department's assigned Deputy Attorney General for his signature.
3. Department's assigned Deputy Attorney General will return to Traffic's Administrative Specialist III, who will then log the agreement and return to the Studies or Systems Design staff member who initiated it.
4. Mail or hand-deliver the agreements to the developer/property owner.
5. When the agreements are returned, deliver to Traffic's Administrative Specialist III who will log them and send them to the Chief Engineer for signature.
6. The Chief Engineer will sign with the Director of Technology & Support Services attesting.
7. Finance takes one of the two original agreements.
8. The remaining original agreement will be returned to Traffic's Administrative Specialist III who will log it. At this point, the agreements are officially executed. A developer's requirement to enter into an agreement is now satisfied, and DelDOT and its contractors are allowed access onto property as noted in the agreement.

9. Traffic's Administrative Specialist III will transfer the executed agreement to Traffic's Administrative Specialist II, who once a month will record all agreements in each of the three respective counties (as necessary).
10. Upon recordation, the County will return the recorded agreements to Traffic's Administrative Specialist III, who will log them for the final time and distribute copies to the initiating staff member, the developer/property owner, and Department's assigned Deputy Attorney General.

Enclosure/attachments
cc: Natalie Barnhart
Fritz Schranck
Rob McCleary
Bill Brockenbrough

SIGNAL AGREEMENT A

Tax Parcel No.
_____

Prepared by/Return to:
State of Delaware
Department of Transportation
Traffic Section
169 Brick Store Landing Road
Smyrna, DE 19977

TRAFFIC SIGNAL INSTALLATION AND MAINTENANCE AGREEMENT

THIS TRAFFIC SIGNAL INSTALLATION AND MAINTENANCE AGREEMENT ("**Agreement**") is made as of this _____ day of _____, 20___, by and between the **Delaware Department of Transportation** ("**DelDOT**"), an agency of the State of Delaware and _____ ("**Owner**"), **a Delaware [or other state] [insert limited liability company, limited partnership, corporation, partnership, sole proprietorship or other name of entity or person]**. DelDOT and _____ shall also individually be referred to as "**Party**" or collectively as "**Parties**".

WITNESSETH THAT:

WHEREAS, the Parties in the interest of traffic safety are willing to enter into this Agreement to **[describe the scope of improvements in as much detail as possible]** at **[describe the location of where the improvements are to be made and then define that area as, for example, "Intersection" or "Entrance" or "Property" and then be consistent with the definition throughout this Agreement. The term "Intersection" is being used for purposes of this base Agreement document]** as shown on Exhibit "A"**. [If an exhibit is available. There may not be an exhibit if the anticipated improvements are future improvements]**

NOW, THEREFORE, in consideration of the sum of one dollar ($1.00) and other good and valuable consideration the receipt and sufficiency of which are hereby acknowledged, the Parties agree to the terms and conditions set forth herein.

1. Traffic Signal. DelDOT, when justified by an approved engineering study, shall install, operate, maintain, modify and/or remove (collectively "**install and maintain**" or "**installation and maintenance**") a traffic control signal ("**Signal**") at the Intersection. The decision as to the need of a signal at a particular location shall be determined by DelDOT in its sole discretion.

2. Owner's Property. Owner is developing [or has developed] a development or project located at _____ for [residential or commercial] purposes ("**Owner's Property**"). The traffic generated by this development or project shall contribute [or has contributed] to DelDOT's determining of the need to install and maintain the Signal at the Intersection.

3. Design, Operation and Timing. The design, operation, and timing of the installation of the Signal shall all be determined by DelDOT in its sole discretion.

4. DelDOT's Ownership of Equipment. All equipment, components, appurtenances, and accessories necessary for the installation and maintenance of the Signal some of which may be located upon the Owner's Property from time to time shall remain the property of DelDOT.

5. Determination of Pro Rata Share. The Owner shall pay its pro rata share as determined by the Owner's site-generated average daily traffic calculated using the Institute of Transportation Engineer's publication entitled *Trip Generation*, as amended, or by an alternate method of measuring daily traffic flow which has been approved by the DelDOT Development Coordination Section.

   The proration shall be of the total cost related to the installation and a one-time fee to cover the long term maintenance costs of the Signal and any additional right-of-way which may need to be acquired in connection with the installation and maintenance of the Signal. The pro-rata share shall also be based on the planned development of other developments or projects in the area where the owner and/or developer of these other developments or projects whose developments or projects would benefit from the Signal have also entered into an agreement with DelDOT.

6. Payment of Pro Rata Share. If the Owner is the only party developing a particular development or project in the area, the Owner entering into this Agreement shall have responsibility for one-hundred percent (100%) of the total cost related to the installation

and/or maintenance of the Signal and any additional right-of-way which DelDOT may need to acquire in order to conduct its installation and maintenance as outlined above. Owner shall pay to DelDOT its pro rata share within thirty (30) days of receipt of an invoice from DelDOT or its contractors. Upon completion of the installation, and depending upon the actual cost, DelDOT shall either submit a supplemental invoice to the Owner for the difference between the estimated total cost and the actual total cost or, upon request by the owner in writing, DelDOT shall reimburse the Owner for any overpayment. Refund requests must be received by DelDOT within 60 days of the completion of the project.

7. Remedies. Each Party shall have all remedies available at law or at equity.

8. Notice. Any notice, request, demand or other communication required or permitted hereunder must be in writing and shall be deemed to have been given, upon receipt or refusal of delivery, if sent by registered or certified mail, postage prepaid, return receipt requested, by hand delivery or by delivery by a courier service. All notices to a Party shall be sent to the addresses set forth below or to such other address or person as such Party may designate by notice to each other Party.

If to (Owner):

_____

_____

_____

_____

With a copy to (optional):

_____

_____

_____

_____

If to:
Delaware Department of Transportation
Division of Transportation Solutions
800 Bay Road
PO Box 778
Dover, DE 19903
Attn: Assistant Director, Traffic

With a copy to:
Delaware Department of Transportation
800 Bay Road
PO Box 778
Dover, DE 19903
Attn: Legal Counsel

With a copy to:
Delaware Department of Transportation
Division of Transportation Solutions, Right-of-Way
800 Bay Road
PO Box 778
Dover, DE 19903
Attn: Assistant Director, Right-of-Way

9. Recordation. This Agreement shall be recorded in the Office of the Recorder of Deeds in and for _____ County, Delaware.

10. Delaware Law. This Agreement shall be governed by and be construed in accordance with the laws of the State of Delaware; the Parties shall subject themselves to the jurisdiction and venue of the appropriate court or other forum in _____ County in the State of Delaware to settle any disputes.

11. Covenants Running with the Property. The covenants set forth in this Agreement shall be covenants running with and binding upon Owner's Property.

12. Binding Nature. The terms and conditions set forth in this Agreement shall be binding upon and shall inure to the benefit of the Parties hereto and their respective heirs, executors, personal representatives, administrators, successors or assigns.

13. Entire Agreement. This Agreement constitutes the entire agreement between the Parties, and any prior understanding or representation of any kind preceding the date of this Agreement shall not be binding on either Party.

14. Amendments. This Agreement shall not be modified, changed, or supplemented, nor may any of the obligations and rights be waived, except by a written instrument signed by both Parties.

15. Incorporation. The Preamble and any exhibits referenced in this Agreement shall be incorporated herein as substantive provisions.

[Signature page to follow.]

IN WITNESS WHEREOF, the Parties hereto have affixed their hands and seals as of the day and year aforesaid.

SIGNED, SEALED AND DELIVERED IN THE PRESENCE OF

DELAWARE DEPARTMENT OF TRANSPORTATION

Attest:

_____
Charlanne A. Clymer
Director of Finance

Date _____

_____
Shanté A. Hastings
Director of Transportation Solutions

Date _____

GRANTOR

_____
Witness

Date _____

_____
[*GRANTOR NAME*]
[*GRANTOR TITLE*]

Date _____

Concur As To Form:

_____
George T. Lees
Deputy Attorney General

STATE OF DELAWARE)
) ss.
COUNTY OF _____)

BE IT REMEMBERED, that on this _____ day of _____, 20_____, personally appeared before me, the Subscriber, a Notary Public for the State and County aforesaid, _____, _____ of the State of Delaware, Department of Transportation, and acknowledged this Agreement to be his/her act and deed, and the act and deed of the said state agency.

GIVEN under my Hand and Seal of Office, the day and year aforesaid.

_____
Notary Public
My Commission Expires: _____

STATE OF DELAWARE)
) ss.
COUNTY OF _____)

BE IT REMEMBERED, that on this _____ day of _____, 20_____, personally appeared before me, the Subscriber, a Notary Public for the State and County aforesaid, _____ of _____, and acknowledged this Agreement to be his/her act and deed, and the act and deed of the said _____.

GIVEN under my Hand and Seal of Office, the day and year aforesaid.

_____
Notary Public
My Commission Expires: _____

SIGNAL AGREEMENT B

Tax Parcel No. _____

Prepared by/Return to:
State of Delaware
Department of Transportation
Traffic Section
169 Brick Store Landing Road
Smyrna, DE 19977

TRAFFIC SIGNAL INSTALLATION AND MAINTENANCE AGREEMENT

THIS TRAFFIC SIGNAL INSTALLATION AND MAINTENANCE AGREEMENT ("**Agreement**") is made as of this _____ day of _____, 20___, by and between the **Delaware Department of Transportation** ("**DelDOT**"), an agency of the State of Delaware and _____ ("**Owner**"), **a Delaware [or other state] [insert limited liability company, limited partnership, corporation, partnership, sole proprietorship or other name of entity or person]**. DelDOT and _____ shall also individually be referred to as "**Party**" or collectively as "**Parties**".

WITNESSETH THAT:

WHEREAS, the Parties in the interest of traffic safety are willing to enter into this Agreement to **[describe the scope of improvements in as much detail as possible]** at **[describe the location of where the improvements are to be made and then define that area as, for example, "Intersection" or "Entrance" or "Property" and then be consistent with the definition throughout this Agreement. "Owner's Property" is being used for purposes of this base Agreement] as shown on Exhibit "A". [If an exhibit is available]**

NOW, THEREFORE, in consideration of the sum of one dollar ($1.00) and other good and valuable consideration the receipt and sufficiency of which are hereby acknowledged, the Parties agree to the terms and conditions set forth herein.

1. Traffic Signal. DelDOT, when justified by an approved engineering study, shall install, operate, maintain, modify and/or remove (collectively "**install and maintain**" or "**installation and maintenance**") a traffic control signal ("**Signal**") on a portion of Owner's Property as shown on Exhibit "A". The decision as to the need of a signal at a particular location shall be determined by DelDOT in its sole discretion.

2. Design, Operation and Timing. The design, operation, and timing of the installation of the Signal shall all be determined by DelDOT in its sole discretion.

3. DelDOT's Ownership of Equipment. All equipment, components, appurtenances, and accessories necessary for the installation and maintenance of the Signal some of which may be located upon the Owner's Property from time to time shall remain the property of DelDOT.

4. Owner's Waiver of Compensation. The Owner hereby knowingly waives its right to receive compensation in lieu of the benefit to be received pursuant to this agreement and grants to DelDOT the right to enter upon the Owner's Property at the location specified above in order to install and maintain, any components, appurtenances and accessories necessary to the operation of the signal, together with all rights necessary or convenient for the full and complete use and exercise of the rights herein granted, including the right of ingress and egress thereto and there from, for the sole purpose of exercising the aforesaid rights thereof, but subject to all easements and rights of way of record or now in use across the Owner's property.

5. Determination of Pro Rata Share. The Owner shall pay its pro rata share as determined by the Owner's site-generated average daily traffic calculated using the Institute of Transportation Engineer's publication entitled *Trip Generation*, as amended, or by an alternate method of measuring daily traffic flow which has been approved by the DelDOT Development Coordination Section.

   The proration shall be of the total cost related to the installation and a one-time fee to cover the long term maintenance costs of the Signal and any additional right-of-way which may need to be acquired in connection with the installation and maintenance of the Signal. The pro-rata share shall also be based on the planned development of other developments or projects in the area where the owner and/or developer of these other developments or projects whose developments or projects would benefit from the Signal have also entered into an agreement with DelDOT.

6. Payment of Pro Rata Share. If the Owner is the only party developing a particular development or project in the area, the Owner entering into this Agreement shall have responsibility for one-hundred percent (100%) of the total cost related to the installation and/or maintenance of the Signal and any additional right-of-way which DelDOT may

need to acquire in order to conduct its installation and maintenance as outlined above. Owner shall pay to DelDOT its pro rata share within thirty (30) days of receipt of an invoice from DelDOT or its contractors. Upon completion of the installation, and depending upon the actual cost, DelDOT shall either submit a supplemental invoice to the Owner for the difference between the estimated total cost and the actual total cost or, upon request by the owner in writing, DelDOT shall reimburse the Owner for any overpayment. Refund requests must be received by DelDOT within 60 days of the completion of the project.

7. Remedies. Each Party shall have all remedies available at law or at equity.

8. Notice. Any notice, request, demand or other communication required or permitted hereunder must be in writing and shall be deemed to have been given, upon receipt or refusal of delivery, if sent by registered or certified mail, postage prepaid, return receipt requested, by hand delivery or by delivery by a courier service. All notices to a Party shall be sent to the addresses set forth below or to such other address or person as such Party may designate by notice to each other Party.

If to (Owner):

_____

_____

_____

_____

With a copy to (optional):

_____

_____

_____

_____

If to:
Delaware Department of Transportation
Division of Transportation Solutions
800 Bay Road
PO Box 778
Dover, DE 19903
Attn: Assistant Director, Traffic

With a copy to:
Delaware Department of Transportation
800 Bay Road
PO Box 778
Dover, DE 19903
Attn: Legal Counsel

With a copy to:
Delaware Department of Transportation
Division of Transportation Solutions, Right-of-Way
800 Bay Road
PO Box 778
Dover, DE 19903
Attn: Assistant Director, Right-of-Way

9. Recordation. This Agreement shall be recorded in the Office of the Recorder of Deeds in and for _____ County, Delaware.

10. Delaware Law. This Agreement shall be governed by and be construed in accordance with the laws of the State of Delaware; the Parties shall subject themselves to the jurisdiction and venue of the appropriate court or other forum in _____ County in the State of Delaware to settle any disputes.

11. Covenants Running with the Property. The covenants set forth in this Agreement shall be covenants running with and binding upon Owner's Property.

12. Binding Nature. The terms and conditions set forth in this Agreement shall be binding upon and shall inure to the benefit of the Parties hereto and their respective heirs, executors, personal representatives, administrators, successors or assigns.

13. Entire Agreement. This Agreement constitutes the entire agreement between the Parties, and any prior understanding or representation of any kind preceding the date of this Agreement shall not be binding on either Party.

14. Amendments. This Agreement shall not be modified, changed, or supplemented, nor may any of the obligations and rights be waived, except by a written instrument signed by both Parties.

15. Incorporation. The Preamble and any exhibits referenced in this Agreement shall be incorporated herein as substantive provisions.

[Signature page to follow.]

IN WITNESS WHEREOF, the Parties hereto have affixed their hands and seals as of the day and year aforesaid.

SIGNED, SEALED AND DELIVERED IN THE PRESENCE OF

DELAWARE DEPARTMENT OF TRANSPORTATION

Attest:

_____
Charlanne A. Clymer
Director of Finance

Date _____

_____
Shanté A. Hastings
Director of Transportation Solutions

Date _____

GRANTOR

_____
Attest

Date _____

_____
[*GRANTOR NAME*]
[*GRANTOR TITLE*]

Date _____

Concur As To Form:

_____
George T. Lees
Deputy Attorney General

STATE OF DELAWARE)
) ss.
COUNTY OF _____)

BE IT REMEMBERED, that on this _____ day of _____, 20_____, personally appeared before me, the Subscriber, a Notary Public for the State and County aforesaid, _____, _____ of the State of Delaware, Department of Transportation, and acknowledged this Agreement to be his/her act and deed, and the act and deed of the said state agency.

GIVEN under my Hand and Seal of Office, the day and year aforesaid.

_____
Notary Public
My Commission Expires: _____

STATE OF DELAWARE)
) ss.
COUNTY OF _____)

BE IT REMEMBERED, that on this _____ day of _____, 20_____, personally appeared before me, the Subscriber, a Notary Public for the State and County aforesaid, _____ of _____, and acknowledged this Agreement to be his/her act and deed, and the act and deed of the said _____.

GIVEN under my Hand and Seal of Office, the day and year aforesaid.

_____
Notary Public
My Commission Expires: _____

SIGNAL AGREEMENT C

Tax Parcel No. _____

Prepared by/Return to:
State of Delaware
Department of Transportation
Traffic Section
169 Brick Store Landing Road
Smyrna, DE 19977

TRAFFIC SIGNAL INSTALLATION AND MAINTENANCE AGREEMENT

THIS TRAFFIC SIGNAL INSTALLATION AND MAINTENANCE AGREEMENT ("**Agreement**") is made as of this _____ day of _____, 20___, by and between the **Delaware Department of Transportation** ("**DelDOT**"), an agency of the State of Delaware and _____ ("**Owner**"), **a Delaware [or other state] [insert limited liability company, limited partnership, corporation, partnership, sole proprietorship or other name of entity or person]**. DelDOT and _____ shall also individually be referred to as "**Party**" or collectively as "**Parties**".

WITNESSETH THAT:

WHEREAS, the Parties in the interest of traffic safety have entered into this Agreement to allow DelDOT to install a traffic control signal and/or related improvement and appurtenances on a portion of the Owner's Property as shown on Exhibit "A" ("**Owner's Property**").

NOW, THEREFORE, in consideration of the sum of one dollar ($1.00) and other good and valuable consideration the receipt and sufficiency of which are hereby acknowledged, the Parties agree to the terms and conditions set forth herein.

1. Traffic Signal. DelDOT, when justified by an approved engineering study, shall install, operate, maintain, modify and/or remove (collectively "**install and maintain**" or "**installation and maintenance**") a traffic control signal ("**Signal**") on a portion of the

Owner's Property as shown on Exhibit "A". The decision as to the need of a signal at a particular location shall be determined by DelDOT in its sole discretion.

2. Design, Operation and Timing. The design, operation, and timing of the installation of the Signal shall all be determined by DelDOT in its sole discretion.

3. DelDOT's Ownership of Equipment. All equipment, components, appurtenances, and accessories necessary for the installation and maintenance of the Signal some of which may be located upon the Owner's Property from time to time shall remain the property of DelDOT.

4. Owner's Waiver of Compensation. The Owner hereby knowingly waives its right to receive compensation in lieu of the benefit to be received pursuant to this agreement and grants to DelDOT the right to enter upon the Owner's Property at the location specified above in order to install and maintain, any components, appurtenances and accessories necessary to the operation of the signal, together with all rights necessary or convenient for the full and complete use and exercise of the rights herein granted, including the right of ingress and egress thereto and there from, for the sole purpose of exercising the aforesaid rights thereof, but subject to all easements and rights of way of record or now in use across the Owner's property.

5. Remedies. Each Party shall have all remedies available at law or at equity.

6. Notice. Any notice, request, demand or other communication required or permitted hereunder must be in writing and shall be deemed to have been given, upon receipt or refusal of delivery, if sent by registered or certified mail, postage prepaid, return receipt requested, by hand delivery or by delivery by a courier service. All notices to a Party shall be sent to the addresses set forth below or to such other address or person as such Party may designate by notice to each other Party.

If to (Owner):	With a copy to (optional):
_____	_____
_____	_____
_____	_____
_____	_____

If to:
Delaware Department of Transportation
Division of Transportation Solutions
800 Bay Road
PO Box 778
Dover, DE 19903
Attn: Assistant Director, Traffic

With a copy to:
Delaware Department of Transportation
800 Bay Road
PO Box 778
Dover, DE 19903
Attn: Legal Counsel

With a copy to:
Delaware Department of Transportation
Division of Transportation Solutions, Right-of-Way
800 Bay Road
PO Box 778
Dover, DE 19903
Attn: Assistant Director, Right-of-Way

7. Recordation. This Agreement shall be recorded in the Office of the Recorder of Deeds in and for _____ County, Delaware.

8. Delaware Law. This Agreement shall be governed by and be construed in accordance with the laws of the State of Delaware; the Parties shall subject themselves to the jurisdiction and venue of the appropriate court or other forum in _____ County in the State of Delaware to settle any disputes.

9. Covenants Running with the Property. The covenants set forth in this Agreement shall be covenants running with and binding upon Owner's Property.

10. Binding Nature. The terms and conditions set forth in this Agreement shall be binding upon and shall inure to the benefit of the Parties hereto and their respective heirs, executors, personal representatives, administrators, successors or assigns.

11. Entire Agreement. This Agreement constitutes the entire agreement between the Parties, and any prior understanding or representation of any kind preceding the date of this Agreement shall not be binding on either Party.

12. Amendments. This Agreement shall not be modified, changed, or supplemented, nor may any of the obligations and rights be waived, except by a written instrument signed by both Parties.

13. Incorporation. The Preamble and any exhibits referenced in this Agreement shall be incorporated herein as substantive provisions.

[Signature page to follow.]

IN WITNESS WHEREOF, the Parties hereto have affixed their hands and seals as of the day and year aforesaid.

SIGNED, SEALED AND DELIVERED IN THE PRESENCE OF

DELAWARE DEPARTMENT OF TRANSPORTATION

Attest:

_____
Charlanne A. Clymer
Director of Finance

Date _____

_____
Shanté A. Hastings
Director of Transportation Solutions

Date _____

GRANTOR

_____
Attest

Date _____

_____
[*GRANTOR NAME*]
[*GRANTOR TITLE*]

Date _____

Concur As To Form:

_____
George T. Lees
Deputy Attorney General

STATE OF DELAWARE)
) ss.
COUNTY OF _____)

BE IT REMEMBERED, that on this _____ day of _____, 20_____, personally appeared before me, the Subscriber, a Notary Public for the State and County aforesaid, _____, _____ of the State of Delaware, Department of Transportation, and acknowledged this Agreement to be his/her act and deed, and the act and deed of the said state agency.

GIVEN under my Hand and Seal of Office, the day and year aforesaid.

_____
Notary Public
My Commission Expires: _____

STATE OF DELAWARE)
) ss.
COUNTY OF _____)

BE IT REMEMBERED, that on this _____ day of _____, 20_____, personally appeared before me, the Subscriber, a Notary Public for the State and County aforesaid, _____ of _____, and acknowledged this Agreement to be his/her act and deed, and the act and deed of the said _____.

GIVEN under my Hand and Seal of Office, the day and year aforesaid.

_____
Notary Public
My Commission Expires: _____

APPENDIX C

Traffic Systems Design Handoff Form

Traffic Systems Design Handoff Form

169 Brick Store Landing Road, Smyrna, DE

Project Name: _____

Contract/Project No.: _____ **Maximo No.:** _____

Designer Name: _____ **Date:** _____

Handoff To: ☐ Traffic Construction ☐ Power Company _____
☐ Traffic Maintenance ☐ Other: _____

Project Type: ☐ Capital ☐ Traffic ☐ Pave & Rehab
☐ Pavement Markings ☐ Signing ☐ OIT
☐ Power Company Lighting ☐ Developer ☐ Other: _____

Permit Number(s): _____ **New Signal:** Yes ☐ No ☐

Description: _____

Project Justification: _____

Funding Approval: ☐ Yes ☐ No

Funding Notes: _____

Priority: ☐ ASAP ☐ High ☐ Normal
☐ Support Expected Start: _____

Communication/ITS Needs: (i.e., fiber, CDMA, etc.) _____

Fiber Quote?: ☐ Yes ☐ No OIT Quote?: ☐ Yes ☐ No

Special MOT Notes: (Time Restrictions, Ped MOT, etc.) _____

Pedestrian MOT Required?: ☐ Yes ☐ No **By? (initials)** _____

Overhead Signing: ☐ Yes ☐ No

Timesheet Status: ☐ Complete ☐ Pending ☐ Not Required

Public Relations: DelDOT PR lead: _____
☐ PCMS ☐ Press Release ☐ None
☐ Other: _____
☐ Affected Legislators: _____

Version: ☐ Original ☐ Revision Number: _____

Comments: (e.g. special order items, decorative poles, APS, etc.) _____

Soil Boring (s) complete: ☐ Yes ☐ No **Completed By:** _____

Attachments: Plans: ☐ Yes ☐ File Location: _____
Estimates: ☐ Yes ☐ File Location: _____
MOT Checklist: ☐ Self-clearance form: ☐ Draft Press Release: ☐
Mast Arm Review: ☐ Union Metal ☐ TST **Date:** xcvb

Project Files Added to Respective Folder in Y\traffic\Signals or Lighting: Yes ☐ No ☐

Verify Traffic Signal Resolution Exists: ☐ Yes ☐ File Location:
☐ No, coordinate with Traffic Studies Manager

Form Date: 08/07/2023

Traffic Systems Design Handoff Form

169 Brick Store Landing Road, Smyrna, DE

Handoff Email Distribution List

Signal Construction
- Mark Luszcz ☐
- Mark Harbeson ☐
- Mike Havel ☐
- Jack Hardy ☐
- Will Newcomb ☐
- Catherine Weishaupt ☐
- Cody Waters ☐
- Peter Haag ☐
- Maureen Kelley ☐
- bamartine@kleinfelder.com ☐

Signal Maintenance
- Rob Kern (NCCo only) ☐
- Erin Remus (Kent and Sussex only) ☐
- Dan Schmeusser ☐

Design
- Max Saintil ☐
- Scott Neidert ☐
- Naa-Atswei Tetteh ☐

Finance
- Sandra Marra ☐
- Amanda Davis ☐

Safety
- Robert Johnson (Kent) ☐
- Curtis Davis (NCCo Canal) ☐
- Dan Thompson (Sussex only) ☐
- Justin Sauble (North District) ☐
- Aaron Hickman (all) ☐
- Jerry Nagyiski (all) ☐
- Vacant (all) ☐
- James Osborne (all) ☐

TMC/Operations
- Gene Donaldson ☐
- Beth Anthony ☐
- Rodney Mullnack ☐
- Chris Marsh ☐
- Jeff Van Horn ☐
- Kerry Yost ☐
- Cory Parson ☐
- Jonathan Weishaupt ☐

Legislative Relations
- Aimee String ☐ & Meaghan Barna** ☐

M & O
- Geri C. Larson++++ ☐

Architectural Accessibility Board
- Jennifer Lieber ☐

Bridge Design
- Jason Hastings* ☐
- Jason Arndt* ☐
- Matt Mortensen* ☐

Business Management
- Gloria Bryans# ☐
- Carla Godwin# ☐
- Rick Tracy# ☐

** Bridge review for all non-breakaway poles*
*** For Press Release related to Traffic Only projects*

HazMat
- Jeff Leonard ☐

Signing
- Nick Mogle ☐
- Erik Ball ☐
- Lee Benningfield (NCCo only) ☐
- Tim Weishaupt (Kent only) ☐
- Denise Coulbourne (Sussex only) ☐
- Don Ziegler ☐
- Vacant ☐

North District
- Bret Martine## ☐
- Stewart Douglass# ☐

Canal District
- Wayne Conte# ☐
- Robert Greybill### ☐
- Brian Schilling# ☐

Central & South District
- Jason McCluskey# ☐
- Alastair Probert# ☐
- Scott Rust (South)### ☐
- Erin Osborne (Central) ### ☐

 # for District lighting projects only
for all lighting projects statewide
for Developer projects only

OIT+
- Dave Gray+ ☐
- Dan Akeme+ ☐
- Daryl Harris+ ☐
- Denise Ksiazek++ ☐
- Jason Rashid ☐
- Travis Hewitt+ ☐
- Scott Sieg+ ☐
- Ron Galbreath+++ ☐
- George (Scott) Smith+ ☐

Public Relations
- Laurie Yanacek (all) ☐
- Brittany Klecan (Kent) ☐
- Brittany Klecan (Sussex) ☐
- Robin Bryson (New Castle) ☐

+ only when project has ITMS communications involvement
++ only when project has fiber involvement
+++ only when project requires ITMS data circuit coordination with Verizon
++++ only when project involves CTF funds

Rail
- Richard Sinegar ☐
- Brian Kisner ☐

ADA
- Tom Nickel ☐

Traffic Studies
- Sonya LaGrand^ ☐
- Initiating Staff Member ^ ☐

Utilities
- Eric Cimo ☐

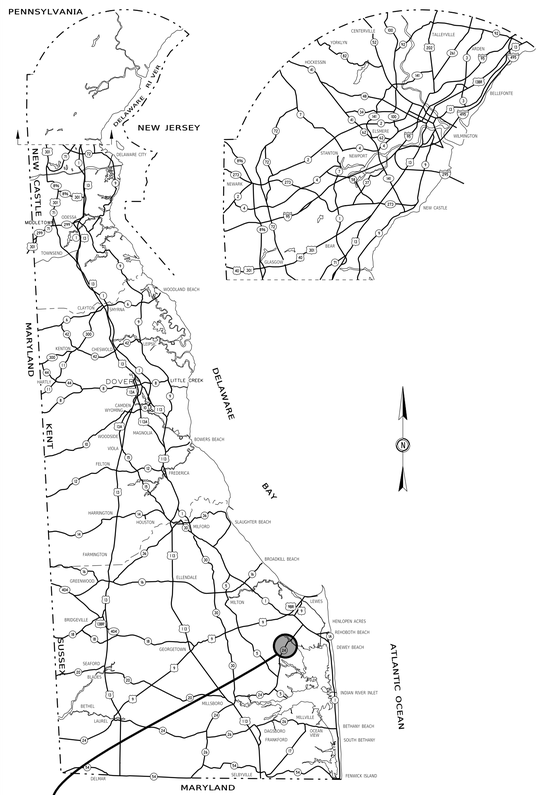
^ only for projects initiated by Traffic Studies

General Note:
Power company lighting projects only need to be handed off to the Power Company, Design, Finance, Business Management, and District.

Form Date: 08/07/2023

APPENDIX D

Standard Traffic Title Sheet



GENERAL LOCATION OF CONTRACT

THE STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION

U.S. CUSTOMARY UNITS

SEMI-FINAL PLANS

CONSTRUCTION PLANS FOR:

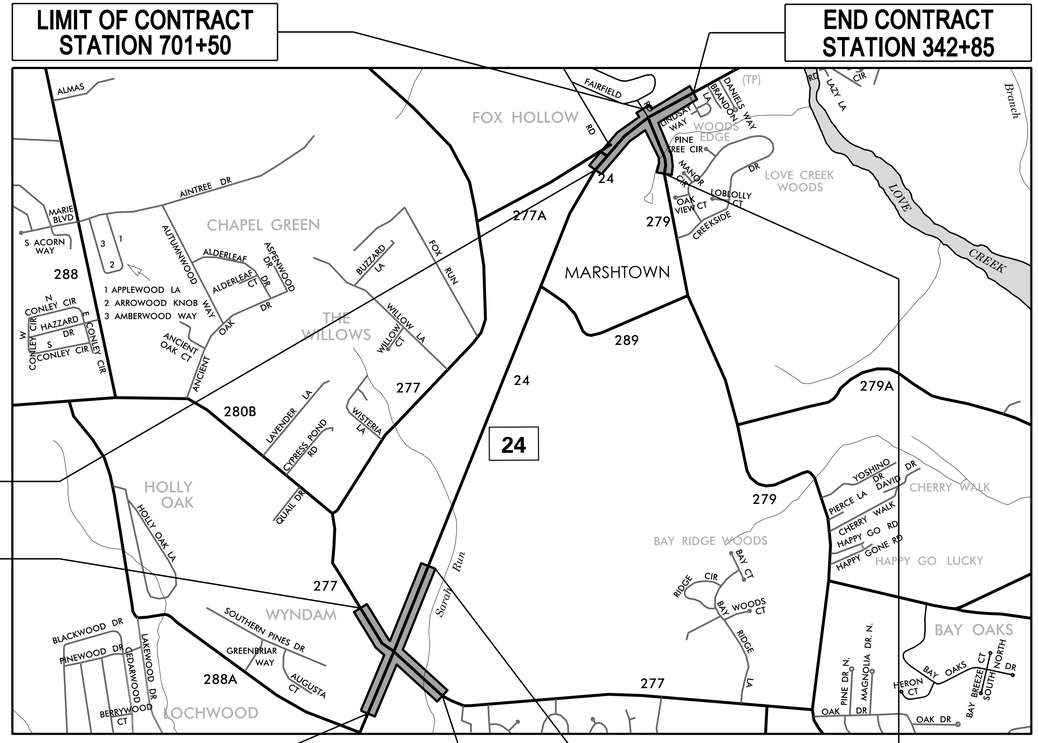
HSIP SC, SR24 AT CAMP ARROW HEAD ROAD AND SR24 AT ANGOLA ROAD

CONTRACT NUMBER: T201200902

FEDERAL AID PROJECT NUMBER: ESTP-S024(21)

COUNTY: SUSSEX

M.R. #: S024, S277, S277A, S279



LOCATION MAP

NOT TO SCALE

DESIGN DESIGNATION

MRD #: S024	ROAD NAME: SR 24 (ANGOLA)		
FUNCTIONAL CLASS: MAJOR COLLECTOR		D.H.V. PROJECTED: 1585	YEAR: 2041
TYPE OF CONSTRUCTION: INTERSECTION IMPROVEMENT		DESIGN SPEED: 55 M.P.H.	
A.A.D.T. CURRENT: 19868	YEAR: 2017	TRUCKS: 8 %	
A.A.D.T. PROJECTED: 25000	YEAR: 2041	DIRECTION OF DISTRIBUTION: 60 %	
MRD #: S277	ROAD NAME: ANGOLA ROAD / ROBINSONVILLE ROAD		
FUNCTIONAL CLASS: LOCAL		D.H.V. PROJECTED: 165	YEAR: 2041
TYPE OF CONSTRUCTION: WIDENING		DESIGN SPEED: 40 M.P.H.	
A.A.D.T. CURRENT: 3309	YEAR: 2017	TRUCKS: 7 %	
A.A.D.T. PROJECTED: 5000	YEAR: 2041	DIRECTION OF DISTRIBUTION: 57 %	
MRD #: S024	ROAD NAME: SR 24 (CAMP ARROW HEAD)		
FUNCTIONAL CLASS: MAJOR COLLECTOR		D.H.V. PROJECTED: 1585	YEAR: 2041
TYPE OF CONSTRUCTION: INTERSECTION IMPROVEMENT		DESIGN SPEED: 40 M.P.H.	
A.A.D.T. CURRENT: 19868	YEAR: 2017	TRUCKS: 8 %	
A.A.D.T. PROJECTED: 25000	YEAR: 2041	DIRECTION OF DISTRIBUTION: 60 %	
MRD #: S279	ROAD NAME: CAMP ARROW HEAD ROAD		
FUNCTIONAL CLASS: LOCAL		D.H.V. PROJECTED: 285	YEAR: 2041
TYPE OF CONSTRUCTION: WIDENING		DESIGN SPEED: 40 M.P.H.	
A.A.D.T. CURRENT: 5748	YEAR: 2017	TRUCKS: 7 %	
A.A.D.T. PROJECTED: 8000	YEAR: 2041	DIRECTION OF DISTRIBUTION: 57 %	

APPROVED DESIGN EXCEPTIONS

DESIGN PARAMETER	REQUIRED	PROVIDED	DATE

ADDENDA / REVISIONS

ASSOCIATED CONTRACTS

CONTRACT NO.	CONTRACT NAME
CS61	HARMON SCHOOL - ANGOLA EC INDIAN MISSION
643	HARMON SCHOOL - MIDWAY
1395	RD. 277 (RD. 275 TO RD. 24) VIA CONLEY CHAPEL
69-01-005	ROUTE NO. 24 BRIDGE NO. 516 TO ROUTE NO. 14
88-063-06	SR 24 S277A TO S279, PEDDLERS VILLAGE

APPROVED FOR ADVERTISEMENT

DIRECTOR OF TRANSPORTATION SOLUTIONS — DATE

PREPARED BY
DELDOT - TRANSPORTATION SOLUTIONS
PROJECT DEVELOPMENT

THIS SEAL APPLIES TO ALL SHEETS BEARING THE "PD" SECTION DESIGNATION. — DATE — SEAL

DISCLAIMER:
THIS EXAMPLE PLAN SET IS INTENDED TO BE A GUIDELINE FOR PREPARING A SET OF PLANS AND BASIC GUIDANCE FOR THE GENERAL APPEARANCE OF A SET OF PLANS. IT IS NOT INTENDED TO BE A SET OF CADD STANDARDS OR TO PROVIDE DESIGN GUIDANCE. PLEASE REFER TO THE DESIGN RESOURCE CENTER (DRC) FOR THE LATEST CADD UPDATES AND VARIOUS OTHER DOCUMENTS FOR DESIGN GUIDANCE.

LAST REVISED: 11/26/2018
27-MAR-2020
15:54
\\DOTFS08\cadd\Active_Designs\SUSSEX\024\road\T201200902\Plans\MODEL PLANS ONLY\tc00.dgn

APPENDIX E

Sample Traffic Control Signal Plan Sheets

Sequence of Operation Chart

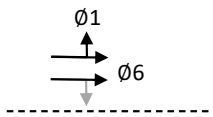
Delaware Department of Transportation
Transportation Management Center

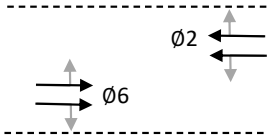
Permit No.: W771

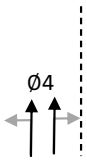
Timesheet Rev: B.1

Intersection: 4th Street & Church Street







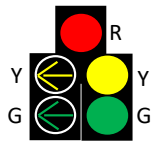
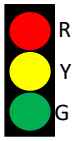
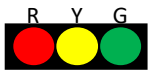


Phase	1+6				2+6					4														FLASH
Signal # \ Int	1	2	3		4	5	6	7	8	9	10	11	12	13										
1	G/<G-	G/<Y-	G		G	G	G	Y	R	R	R	R	R	R										Y
2	G	G	G		G	G	G	Y	R	R	R	R	R	R										Y
3	FY	FY	FY		FY	OFF	FY	FY	FY	FY	FY	FY	FY	FY										OFF
4	FY	FY	FY		FY	OFF	FY	FY	FY	FY	FY	FY	FY	FY										OFF
5	R	R	R		G	G	G	Y	R	R	R	R	R	R										Y
6	R	R	R		G	G	G	Y	R	R	R	R	R	R										Y
7	R	R	R		G	G	G	Y	R	R	R	R	R	R										Y
8	R	R	R		G	G	G	Y	R	R	R	R	R	R										Y
9	FY	FY	FY		FY	FY	FY	FY	FY	FY	OFF	FY	FY	FY										OFF
10	FY	FY	FY		FY	FY	FY	FY	FY	FY	OFF	FY	FY	FY										OFF
11	R	R	R		R	R	R	R	R	G	G	G	Y	R										R
12	R	R	R		R	R	R	R	R	G	G	G	Y	R										R
13	R	R	R		R	R	R	R	R	G	G	G	Y	R										R
14	R	R	R		R	R	R	R	R	G	G	G	Y	R										R
15	R	R	R		R	R	R	R	R	G	G	G	Y	R										R
16	W	W	W		W	W	FDW	DW	DW	DW	DW	DW	DW	DW										OFF
17	W	W	W		W	W	FDW	DW	DW	DW	DW	DW	DW	DW										OFF
18	DW	DW	DW		W	W	FDW	DW	DW	DW	DW	DW	DW	DW										OFF
19	DW	DW	DW		W	W	FDW	DW	DW	DW	DW	DW	DW	DW										OFF
20	DW	DW	DW		DW	DW	DW	DW	DW	W	W	FDW	DW	DW										OFF
21	DW	DW	DW		DW	DW	DW	DW	DW	W	W	FDW	DW	DW										OFF

Legend:	
R	RED
Y	YELLOW
G	GREEN
DW	DON'T WALK
W	WALK
F	FLASHING
←	ARROW

Notes:

Red signal ahead signs flash 7 seconds before signal display yellow and flashes until 10 seconds after signal display green
Signal displays 3 & 4 are located on westbound "red signal ahead when flashing" signs
Signal displays 9 & 10 are located on northbound "red signal ahead when flashing" signs

	SIGNAL HEAD INDICATIONS							
Signal No.:	1	2,5,8, 11,12,15		6,7,13,14	16,17,18, 19,20,21	3,4,9,10		
Total:	1	6		4	6	4		
Signal Head Type:								
Notes: Optically limited, tunnel visor, louvers, etc.								
Lens / Symbol:	12" Lenses	12" Lenses		12" Lenses	9" Symbol	12" Lenses		

PREPARED BY: _____ DATE: _____

CHECKED BY: _____ DATE: _____

EMERGENCY PREEMPTION	
PREEMPT 1	PHASE 2+6
PREEMPT 2	PHASE 2+6
PREEMPT 3	PHASE 4+8
PREEMPT 4	PHASE 4+8

CONDUIT RUN SCHEDULE

CO*	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
1*	1	1.5 IN	32 FT	-	<REMOVE EX. (1) 2/*8 U.F. W/ GROUND>
2*	1	1.5 IN	55 FT	-	<REMOVE EX. (1) 2/*8 U.F. W/ GROUND, EX. (1) 16/*14, EX. (1) 9/*14>
3*	1	1.5 IN	16 FT	-	<REMOVE EX. (1) 2/*8 U.F. W/ GROUND, EX. (1) 16/*14, EX. (1) 9/*14>
4*	1	2.5 IN	4 FT	-	<REMOVE EX. (1) 2/*8 U.F. W/ GROUND, EX. (2) 16/*14>
5*	2	1.5 IN	ON POLE	-	<REMOVE EX. (1) 4/*14>
		2.5 IN			<REMOVE EX. (1) 2/*8 U.F. W/ GROUND, EX. (1) 16/*14, (1) 9/*14, (1) COMM.-DISCONNECTED>
6*	1	4.0 IN	128 FT	-	<REMOVE EX. (1) 4/*14>
7*	1	1.5 IN	10 FT	-	<REMOVE EX. (1) 9/*14>
8*	1	1.5 IN	39 FT	-	<REMOVE EX. (1) 9/*14>
9*	1	1.5 IN	3 FT	-	<REMOVE EX. (1) 9/*14>
10*	1	1.5 IN	40 FT	-	<REMOVE EX. (1) 9/*14>
OH-11	-	AERIAL	73 FT	-	<REMOVE EX. (1) 16/*14, (1) COMM.-DISCONNECTED>
OH-12	-	AERIAL	63 FT	-	<REMOVE EX. (1) 16/*14, (1) COMM.-DISCONNECTED>
OH-13	-	AERIAL	81 FT	-	<REMOVE EX. (1) 9/*14, (1) 4/*14>
14**	1	2.0 IN	14 FT	T	[NEW (3) 1/*8 THHN - LINE SIDE]
15**	2	2.0 IN	6 FT	T	[NEW (3) 1/*8 THHN - LINE SIDE, (1) 2/*8 U.F. W/GROUND - LOAD SIDE]
16	1	2.0 IN	106 FT	B	[NEW (1) 2/*8 U.F. W/ GROUND - LOAD SIDE]
17**	1	2.0 IN	9 FT	T	[NEW (1) 2/*8 U.F. W/ GROUND - LOAD SIDE]

* DENOTES EXISTING CONDUIT
** GALVANIZED STEEL CONDUIT
B = BORE, T = TRENCH, O = OPEN CUT

CONDUIT RUN SCHEDULE

CO*	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
18	4	4.0 IN	5 FT	T	[NEW (3) 9/*14, (7) 5/*14, (7) 4/*14, (4) *6 GROUND, (1) CCTV CABLE]
19	1	3.0 IN	35 FT	T	[NEW (1) 9/*14, (1) 4/*14, (1) *6 GROUND]
20	1	4.0 IN	85 FT	B	[NEW (1) 9/*14, (2) 5/*14, (1) 4/*14, (1) *6 GROUND, (1) CCTV CABLE]
21	1	3.0 IN	8 FT	T	[NEW (1) 9/*14, (1) 4/*14, (1) *6 GROUND, (1) CCTV CABLE]
22	1	2.5 IN	14 FT	T	[NEW (1) 5/*14, (1) *6 GROUND]
23	1	2.5 IN	5 FT	T	[NEW (2) 5/*14, (1) *6 GROUND]
24	1	4.0 IN	78 FT	B	[NEW (1) 9/*14, (3) 5/*14, (3) 4/*14, (1) *6 GROUND]
25	1	2.5 IN	7 FT	O	[NEW (2) 5/*14, (1) *6 GROUND]
26	1	2.5 IN	21 FT	O	[NEW (1) 4/*14, (1) *6 GROUND]
27	1	4.0 IN	31 FT	B	[NEW (1) 9/*14, (1) 5/*14, (2) 4/*14, (1) *6 GROUND]
28	1	3.0 IN	21 FT	T	[NEW (1) 9/*14, (1) *6 GROUND]
29	1	2.5 IN	10 FT	T	[NEW (1) 5/*14, (1) 4/*14, (1) *6 GROUND]
30	1	4.0 IN	180 FT	B	[NEW (1) 4/*14, (1) *6 GROUND]

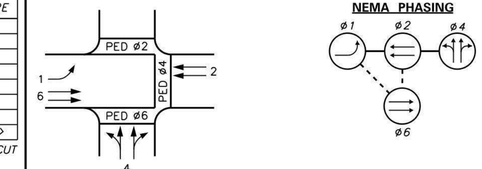
* DENOTES EXISTING CONDUIT
** GALVANIZED STEEL CONDUIT
B = BORE, T = TRENCH, O = OPEN CUT

CONDUIT RUN SCHEDULE

CO*	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
31	1	2.5 IN	5 FT	O	[NEW (1) 4/*14, (1) *6 GROUND]
32	1	4.0 IN	131 FT	B	[NEW (1) 4/*14, (1) *6 GROUND]
33	1	2.5 IN	6 FT	T	[NEW (1) 4/*14, (1) *6 GROUND]
34	1	2.5 IN	8 FT	T	[NEW (1) 4/*14, (1) *6 GROUND]
35	1	4.0 IN	95 FT	B	[NEW (1) 5/*14, (1) *6 GROUND]
36	1	2.5 IN	7 FT	O	[NEW (1) 5/*14, (1) *6 GROUND]
37**	1	2.0 IN	31 FT	T	EMPTY - FUTURE CoW COMM CABLE
OH-38	-	AERIAL	23 FT	-	<REMOVE EX. (1) COMM.-DISCONNECTED>

* DENOTES EXISTING CONDUIT
** GALVANIZED STEEL CONDUIT
B = BORE, T = TRENCH, O = OPEN CUT

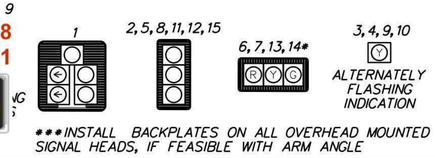
SIGNAL PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM

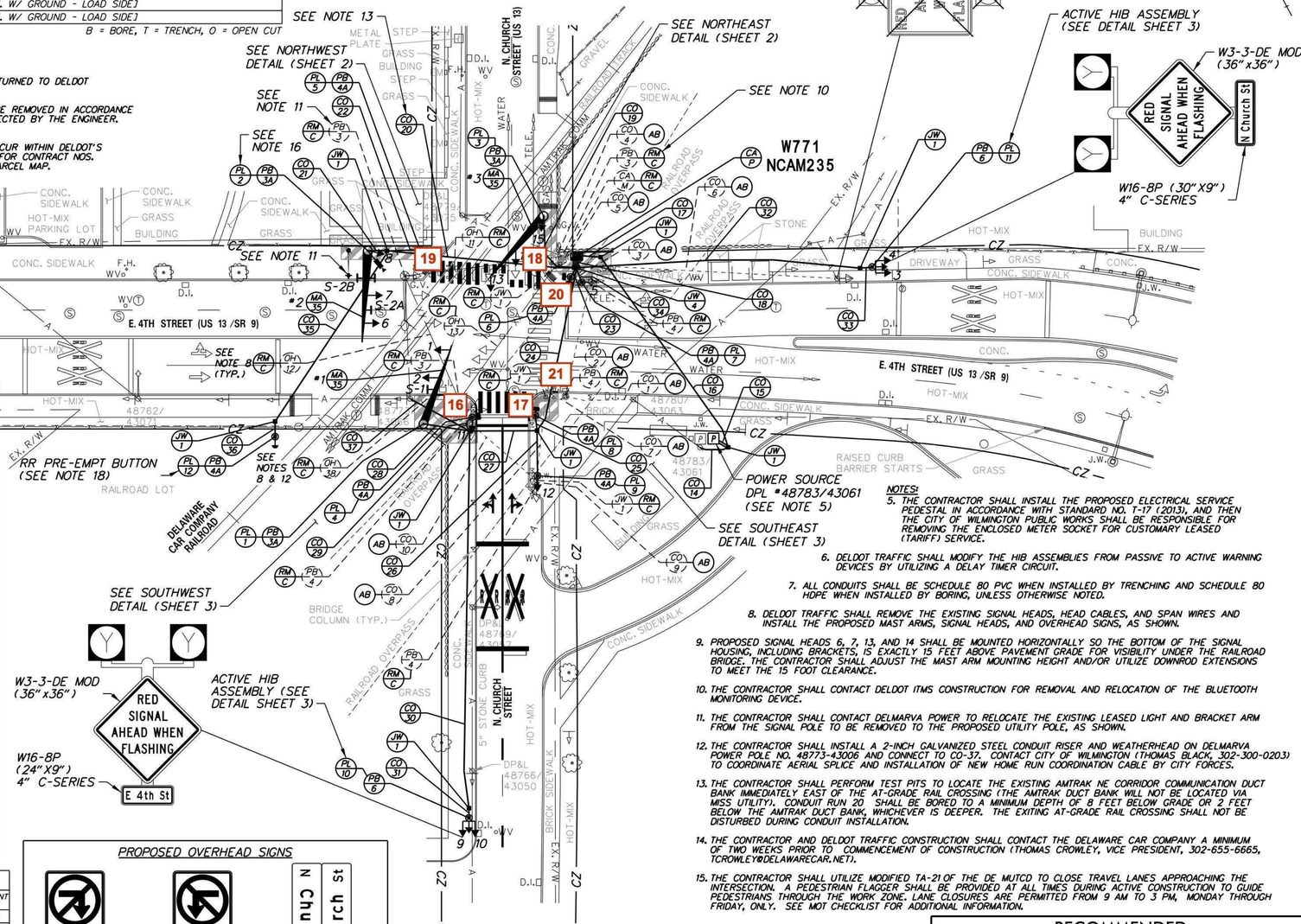


***INSTALL BACKPLATES ON ALL OVERHEAD MOUNTED SIGNAL HEADS, IF FEASIBLE WITH ARM ANGLE

LEGEND

AB	ABANDON	OH-X	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA-X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH-X	PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA-X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB-X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO-X	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PB-X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO-X	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PL-X	EXISTING POLE IDENTIFIER (# OF POLE)
JW-X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL-X	PROPOSED POLE IDENTIFIER (# OF POLE)
JW-X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM-C	REMOVE BY CONTRACTOR
MA-XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM-O	REMOVE BY OTHERS
MA-XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM-TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL		P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
CCTV CAMERA		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION		



POLE SCHEDULE

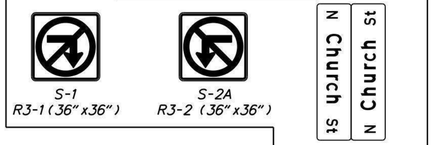
NO.	TYPE
1	PROPOSED 35' MAST ARM & (2) VEHICLE SIGNAL HEADS, 21'-6" POLE W/ TYPE 3A BASE
2	PROPOSED 35' MAST ARM, (2) VEHICLE SIGNAL HEADS, (1) SUPPLEMENTAL POLE-MOUNTED VEHICLE SIGNAL HEAD, & (1) DAVIT ARM CCTV CAMERA 21'-6" POLE W/ TYPE 3A BASE
3	PROPOSED 35' MAST ARM, (2) VEHICLE SIGNAL HEADS, & (1) SUPPLEMENTAL POLE-MOUNTED VEHICLE SIGNAL HEAD 21'-6" POLE W/ TYPE 3A BASE
4	PROPOSED (1) PEDESTRIAN SIGNAL HEAD & (1) SUPPLEMENTAL POLE-MOUNTED VEHICLE SIGNAL HEAD 14' POLE W/ TYPE 4A BASE
5	PROPOSED (1) PEDESTRIAN SIGNAL HEAD 10' POLE W/ TYPE 4A BASE
6	PROPOSED (2) PEDESTRIAN SIGNAL HEADS 10' POLE W/ TYPE 4A BASE
7	PROPOSED (1) SUPPLEMENTAL VEHICLE SIGNAL HEAD 10' POLE W/ TYPE 4A BASE
8	PROPOSED (2) PEDESTRIAN SIGNAL HEADS 10' POLE W/ TYPE 4A BASE
9	PROPOSED (1) SUPPLEMENTAL VEHICLE SIGNAL HEAD 10' POLE W/ TYPE 4A BASE
10	PROPOSED (1) ACTIVE HIB ASSEMBLY 14' POLE W/ TYPE 6 BASE
11	PROPOSED (1) ACTIVE HIB ASSEMBLY 14' POLE W/ TYPE 6 BASE
12	PROPOSED (1) RR PRE-EMPTION PUSHBUTTON 10' POLE W/ TYPE 4A BASE

MAST ARM SCHEDULE*

MA*	HEIGHT OF POLE	LENGTH OF ARM	# OF HEADS	# OPTICOM RECEIVERS	SF OF SIGNING	ARM MOUNT HEIGHT
1	21'-6"	40 FT	2	-	9.0 SF	20'-0"
2	21'-6"	40 FT	2	-	18.0 SF	16'-0"
3	21'-6"	40 FT	2	-	-	16'-0"

*SEE NOTE 17

PROPOSED OVERHEAD SIGNS



NOTES:

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
2. POLE BASES, CABINET BASE AND CONDUIT JUNCTION WELLS TO BE REMOVED IN ACCORDANCE WITH SECTION 211 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY THE ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.
3. ALL WORK PERFORMED UNDER THIS PROJECT IS INTENDED TO OCCUR WITHIN DELDOT'S EXISTING RIGHT-OF-WAY BASED ON THE ARCHIVED SIGNAL PLAN FOR CONTRACT NOS. 71-10-001 AND 82-071-07 AND THE NEW CASTLE COUNTY TAX PARCEL MAP.
4. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.
5. THE CONTRACTOR SHALL INSTALL THE PROPOSED ELECTRICAL SERVICE PEDESTAL IN ACCORDANCE WITH STANDARD NO. T-17 (2013), AND THEN THE CITY OF WILMINGTON PUBLIC WORKS SHALL BE RESPONSIBLE FOR REMOVING THE ENCLOSED METER SOCKET FOR CUSTOMARY LEASED (TARIFF) SERVICE.
6. DELDOT TRAFFIC SHALL MODIFY THE HIB ASSEMBLIES FROM PASSIVE TO ACTIVE WARNING DEVICES BY UTILIZING A DELAY TIMER CIRCUIT.
7. ALL CONDUITS SHALL BE SCHEDULE 80 PVC WHEN INSTALLED BY TRENCHING AND SCHEDULE 80 HDPE WHEN INSTALLED BY BORING, UNLESS OTHERWISE NOTED.
8. DELDOT TRAFFIC SHALL REMOVE THE EXISTING SIGNAL HEADS, HEAD CABLES, AND SPAN WIRES AND INSTALL THE PROPOSED MAST ARMS, SIGNAL HEADS, AND OVERHEAD SIGNS, AS SHOWN.
9. PROPOSED SIGNAL HEADS 6, 7, 13, AND 14 SHALL BE MOUNTED HORIZONTALLY SO THE BOTTOM OF THE SIGNAL HOUSING, INCLUDING BRACKETS, IS EXACTLY 15 FEET ABOVE PAVEMENT GRADE FOR VISIBILITY UNDER THE RAILROAD BRIDGE. THE CONTRACTOR SHALL ADJUST THE MAST ARM MOUNTING HEIGHT AND/OR UTILIZE DOWNROD EXTENSIONS TO MEET THE 15 FOOT CLEARANCE.
10. THE CONTRACTOR SHALL CONTACT DELDOT ITMS CONSTRUCTION FOR REMOVAL AND RELOCATION OF THE BLUETOOTH MONITORING DEVICE.
11. THE CONTRACTOR SHALL CONTACT DELMARVA POWER TO RELOCATE THE EXISTING LEASED LIGHT AND BRACKET ARM FROM THE SIGNAL POLE TO BE REMOVED TO THE PROPOSED UTILITY POLE, AS SHOWN.
12. THE CONTRACTOR SHALL INSTALL A 2-INCH GALVANIZED STEEL CONDUIT RISER AND WEATHERHEAD ON DELMARVA POWER POLE NO. 48773-43006 AND CONNECT TO CO-37. CONTACT CITY OF WILMINGTON (THOMAS BLACK, 302-300-0203) TO COORDINATE AERIAL SPLICE AND INSTALLATION OF NEW HOME RUN COORDINATION CABLE BY CITY FORCES.
13. THE CONTRACTOR SHALL PERFORM TEST PITS TO LOCATE THE EXISTING AMTRAK NE CORRIDOR COMMUNICATION DUCT BANK IMMEDIATELY EAST OF THE AT-GRADE RAIL CROSSING (THE AMTRAK DUCT BANK WILL NOT BE LOCATED VIA MISS UTILITY). CONDUIT RUN 20 SHALL BE BORED TO A MINIMUM DEPTH OF 8 FEET BELOW GRADE OR 2 FEET BELOW THE AMTRAK DUCT BANK, WHICHEVER IS DEEPER. THE EXITING AT-GRADE RAIL CROSSING SHALL NOT BE DISTURBED DURING CONDUIT INSTALLATION.
14. THE CONTRACTOR AND DELDOT TRAFFIC CONSTRUCTION SHALL CONTACT THE DELAWARE CAR COMPANY A MINIMUM OF TWO WEEKS PRIOR TO COMMENCEMENT OF CONSTRUCTION (THOMAS CROWLEY, VICE PRESIDENT, 302-655-6665, TCROWLEY@DELAWARECAR.NET).
15. THE CONTRACTOR SHALL UTILIZE MODIFIED TA-21 OF THE DE MUTCD TO CLOSE TRAVEL LANES APPROACHING THE INTERSECTION. A PEDESTRIAN FLAGGER SHALL BE PROVIDED AT ALL TIMES DURING ACTIVE CONSTRUCTION TO GUIDE PEDESTRIANS THROUGH THE WORK ZONE. LANE CLOSURES ARE PERMITTED FROM 9 AM TO 3 PM, MONDAY THROUGH FRIDAY, ONLY. SEE MOT CHECKLIST FOR ADDITIONAL INFORMATION.
16. THE CONTRACTOR SHALL INSTALL A DAVIT ARM CCTV CAMERA ON POLE *2.
17. THE PROPOSED MAST ARMS SHALL BE INSTALLED TO PROVIDE A 15-FOOT MINIMUM HORIZONTAL CLEARANCE FROM THE CENTERLINE OF THE AT- GRADE RAILROAD CROSSING.
18. THE PROPOSED PUSHBUTTON SHALL BE LOCATED 20 FEET FROM THE ACTIVE RAILROAD TRACK CENTERLINE AND NO MORE THAN 4 FEET FROM THE FOURTH STREET FENCE LINE.

RECOMMENDED

Thomas Black, via 10/18/2021 Field Meeting

CITY OF WILMINGTON, DEPT. OF PUBLIC WORKS — DATE

RECOMMENDED

Thomas Crowley, via email dated 9/20/2021

DELAWARE CAR COMPANY — DATE

PREPARED BY

Whitman, Requardt and Associates, LLP
Engineers • Architects • Environmental Planners Est. 1915

10/13/2021

THIS SEAL APPLIES TO ALL SHEETS BEARING THE "WRA" SECTION DESIGNATION. — DATE

KYLE O. CLEVENGER, LICENSE No. 18723, DELAWARE PROFESSIONAL ENGINEER — SEAL

CONCURRENCE FOR INSTALLATION

10/18/2021

CHIEF OF TRAFFIC ENGINEERING — DATE

ADDENDA / REVISIONS

SCALE 0 30 60 90 FEET

2016 HEP
SITE N

CONTRACT	T201800402
COUNTY	NEW CASTLE
PERMIT NO.	W771 & NCAM235
DESIGNED BY:	D. GUNYUZLU
CHECKED BY:	K. CLEVENGER

SIGNAL PLAN
E. 4TH STREET (SR 9 /US 13)
N. CHURCH STREET (US 13)

SECTION	WRA
SHEET NO.	1

N:\31957-025\CADD\SC01_4th St @ Church St.dgn
10/12/2021 11:57:44 PM

CONDUIT RUN SCHEDULE

CO#	# OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/ WIRE
1A	1	2"	GALV	5'	T	NEW (1)2/#8 U.F. W/GROUND - LOAD SIDE
1B	1	2"	GALV	10'	T	NEW (3)1/#8 THHN SC - LINE SIDE
1C	1	2"	GALV	50'/30'	T/P	NEW (3)1/#8 THHN SC - LINE SIDE
2	4	4"	PVC	5'	T	NEW (2)16/#14 (4)5/#14 (8)2/#14 (4)4/#18 (4)#6 SC
3	1	4"	PVC	10'	T	NEW (2)2/#14 (1)#6 SC
4	1	2.5"	PVC	5'	T	NEW (1)5/#14 (1)#6 SC
5	1	4"	PVC	20'	T	NEW (2)2/#14 (1)#6 SC
6	1	4"	HDPE	75'	B	NEW (1)16/#14 (3)5/#14 (4)2/#14 (1)#6 SC
7	1	2.5"	PVC	10'	T	NEW (2)5/#14 (1)#6 SC
8	1	4"	HDPE	55'	B	NEW (1)16/#14 (1)5/#14 (2)2/#14 (1)#6 SC
9	1	2.5"	PVC	20'	T	NEW (1)5/#14 (1)#6 SC
XOH1	-	-	-	-	-	REMOVE AERIAL (1)2/#8 U.F. W/GROUND
X10	1	1.5"	-	5'	-	REMOVE (1)2/#8 U.F. W/GROUND - ABANDON CONDUIT
X11	2	2.5"	-	5'	-	REMOVE [(1)16/#14 (4)4/#18] NEW [(1)16/#14 (4)4/#18 (1)#6 SC]
X12	1	2.5"	-	5'	-	REMOVE (4)4/#18 - ABANDON CONDUIT
X13	1	2.5"	-	60'	-	REMOVE (1)16/#14] (3)9/#14 (2)4/#18 - AB CONDUIT
X14	1	2.5"	-	5'	-	REMOVE (2)9/#14 - ABANDON CONDUIT
X15	1	2.5"	-	75'	-	REMOVE [(1)16/#14 (1)9/#14 (1)4/#18] NEW [(1)16/#14 (1)#6 SC]

LEGEND
X- DENOTES EXISTING
SC- STRANDED COPPER
B- BORE
T- TRENCH
O- OPEN CUT
P- ATTACH TO POLE

MAST ARM SCHEDULE

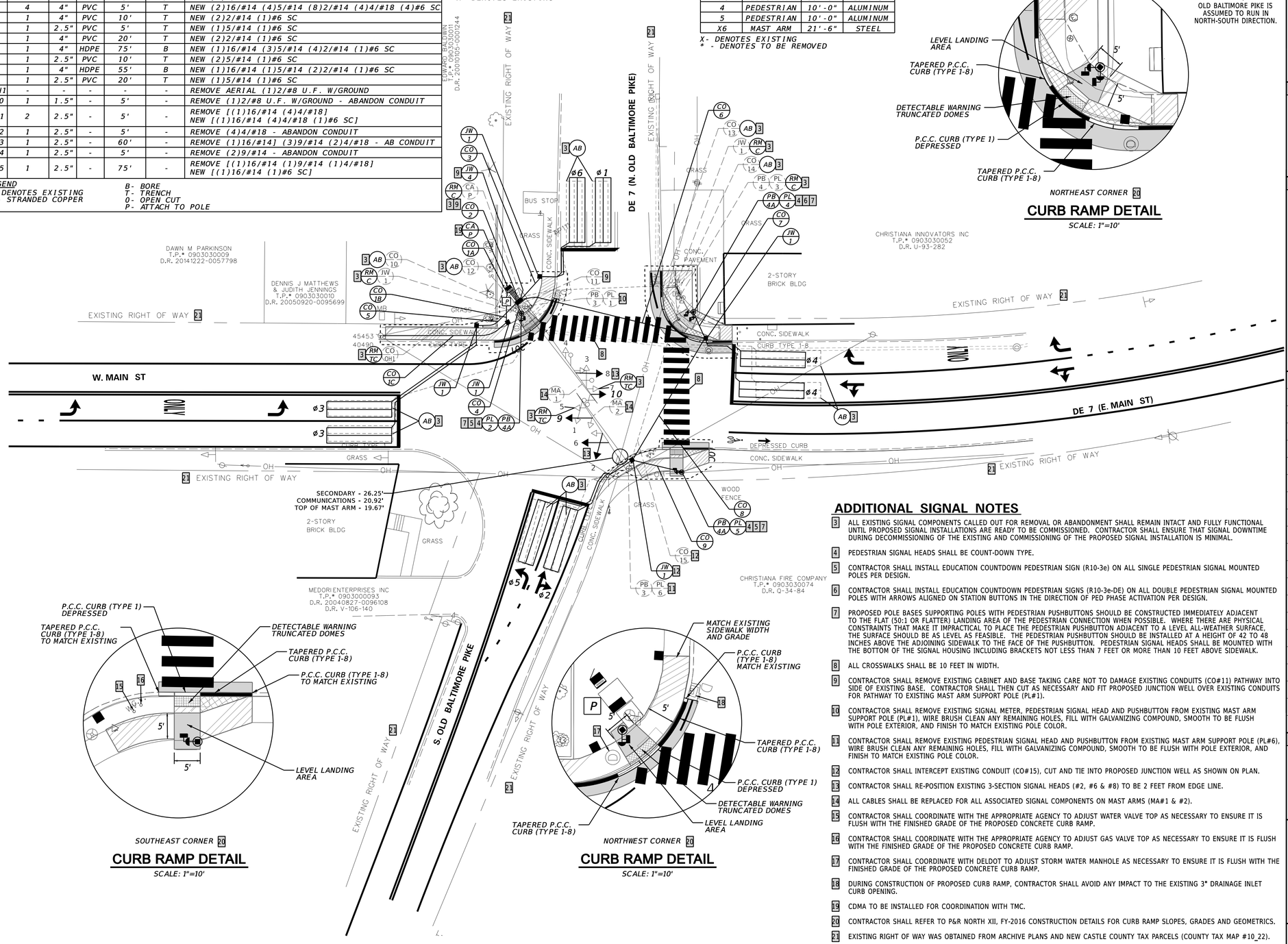
MA#	LENGTH OF ARM	# OF HEADS	# OF OPTICOM RECEIVERS	ARM MOUNT HEIGHT
X1	45'	4	4	17'
X2	35'	4	0	17'

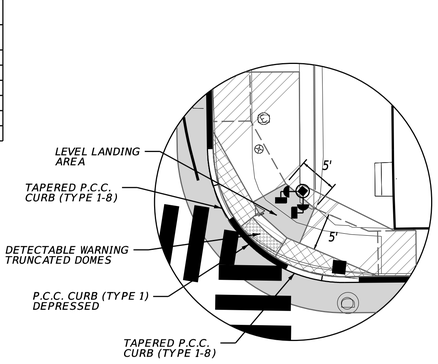
X- DENOTES EXISTING

POLE SCHEDULE

POLE #	POLE TYPE	HEIGHT	MATERIAL
X1	MAST ARM	21'-6"	STEEL
2	PEDESTRIAN	10'-0"	ALUMINUM
*X3	PEDESTRIAN	10'-0"	ALUMINUM
4	PEDESTRIAN	10'-0"	ALUMINUM
5	PEDESTRIAN	10'-0"	ALUMINUM
X6	MAST ARM	21'-6"	STEEL

X- DENOTES EXISTING
** - DENOTES TO BE REMOVED*





NORTHEAST CORNER 20

CURB RAMP DETAIL

SCALE: 1"=10'

SOUTHEAST CORNER 20

CURB RAMP DETAIL

SCALE: 1"=10'

NORTHWEST CORNER 20

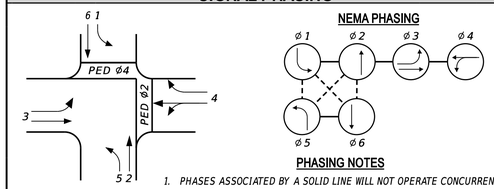
CURB RAMP DETAIL

SCALE: 1"=10'

ADDITIONAL SIGNAL NOTES

3. ALL EXISTING SIGNAL COMPONENTS CALLED OUT FOR REMOVAL OR ABANDONMENT SHALL REMAIN INTACT AND FULLY FUNCTIONAL UNTIL PROPOSED SIGNAL INSTALLATIONS ARE READY TO BE COMMISSIONED. CONTRACTOR SHALL ENSURE THAT SIGNAL DOWNTIME DURING DECOMMISSIONING OF THE EXISTING AND COMMISSIONING OF THE PROPOSED SIGNAL INSTALLATION IS MINIMAL.
4. PEDESTRIAN SIGNAL HEADS SHALL BE COUNT-DOWN TYPE.
5. CONTRACTOR SHALL INSTALL EDUCATION COUNTDOWN PEDESTRIAN SIGN (R10-3e) ON ALL SINGLE PEDESTRIAN SIGNAL MOUNTED POLES PER DESIGN.
6. CONTRACTOR SHALL INSTALL EDUCATION COUNTDOWN PEDESTRIAN SIGNS (R10-3e-DE) ON ALL DOUBLE PEDESTRIAN SIGNAL MOUNTED POLES WITH ARROWS ALIGNED ON STATION BUTTONS IN THE DIRECTION OF PED PHASE ACTIVATION PER DESIGN.
7. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHOULD BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (50:1 OR FLATTER) LANDING AREA OF THE PEDESTRIAN CONNECTION WHEN POSSIBLE. WHERE THERE ARE PHYSICAL CONSTRAINTS THAT MAKE IT IMPRACTICAL TO PLACE THE PEDESTRIAN PUSHBUTTON ADJACENT TO A LEVEL ALL-WEATHER SURFACE, THE SURFACE SHOULD BE AS LEVEL AS FEASIBLE. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE ADJOINING SIDEWALK TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK.
8. ALL CROSSWALKS SHALL BE 10 FEET IN WIDTH.
9. CONTRACTOR SHALL REMOVE EXISTING CABINET AND BASE TAKING CARE NOT TO DAMAGE EXISTING CONDUITS (CO#11) PATHWAY INTO SIDE OF EXISTING BASE. CONTRACTOR SHALL THEN CUT AS NECESSARY AND FIT PROPOSED JUNCTION WELL OVER EXISTING CONDUITS FOR PATHWAY TO EXISTING MAST ARM SUPPORT POLE (PL#1).
10. CONTRACTOR SHALL REMOVE EXISTING SIGNAL METER, PEDESTRIAN SIGNAL HEAD AND PUSHBUTTON FROM EXISTING MAST ARM SUPPORT POLE (PL#1), WIRE BRUSH CLEAN ANY REMAINING HOLES, FILL WITH GALVANIZING COMPOUND, SMOOTH TO BE FLUSH WITH POLE EXTERIOR, AND FINISH TO MATCH EXISTING POLE COLOR.
11. CONTRACTOR SHALL REMOVE EXISTING PEDESTRIAN SIGNAL HEAD AND PUSHBUTTON FROM EXISTING MAST ARM SUPPORT POLE (PL#6), WIRE BRUSH CLEAN ANY REMAINING HOLES, FILL WITH GALVANIZING COMPOUND, SMOOTH TO BE FLUSH WITH POLE EXTERIOR, AND FINISH TO MATCH EXISTING POLE COLOR.
12. CONTRACTOR SHALL INTERCEPT EXISTING CONDUIT (CO#15), CUT AND TIE INTO PROPOSED JUNCTION WELL AS SHOWN ON PLAN.
13. CONTRACTOR SHALL RE-POSITION EXISTING 3-SECTION SIGNAL HEADS (#2, #6 & #8) TO BE 2 FEET FROM EDGE LINE.
14. ALL CABLES SHALL BE REPLACED FOR ALL ASSOCIATED SIGNAL COMPONENTS ON MAST ARMS (MA#1 & #2).
15. CONTRACTOR SHALL COORDINATE WITH THE APPROPRIATE AGENCY TO ADJUST WATER VALVE TOP AS NECESSARY TO ENSURE IT IS FLUSH WITH THE FINISHED GRADE OF THE PROPOSED CONCRETE CURB RAMP.
16. CONTRACTOR SHALL COORDINATE WITH THE APPROPRIATE AGENCY TO ADJUST GAS VALVE TOP AS NECESSARY TO ENSURE IT IS FLUSH WITH THE FINISHED GRADE OF THE PROPOSED CONCRETE CURB RAMP.
17. CONTRACTOR SHALL COORDINATE WITH DELDOT TO ADJUST STORM WATER MANHOLE AS NECESSARY TO ENSURE IT IS FLUSH WITH THE FINISHED GRADE OF THE PROPOSED CONCRETE CURB RAMP.
18. DURING CONSTRUCTION OF PROPOSED CURB RAMP, CONTRACTOR SHALL AVOID ANY IMPACT TO THE EXISTING 3" DRAINAGE INLET CURB OPENING.
19. CDMA TO BE INSTALLED FOR COORDINATION WITH TMC.
20. CONTRACTOR SHALL REFER TO P&R NORTH XII, FY-2016 CONSTRUCTION DETAILS FOR CURB RAMP SLOPES, GRADES AND GEOMETRICS.
21. EXISTING RIGHT OF WAY WAS OBTAINED FROM ARCHIVE PLANS AND NEW CASTLE COUNTY TAX PARCELS (COUNTY TAX MAP #10_22).

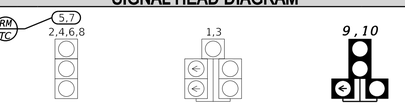
SIGNAL PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

AB	ABANDON	OH #	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH #	*PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)*
CA X	*PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)*	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PB X	*PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)*
CO #	*PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)*	PL X	EXISTING POLE IDENTIFIER (# OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	*PROPOSED POLE IDENTIFIER (# OF POLE)*
JW X	*PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)*	RM C	*REMOVE BY CONTRACTOR*
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	*REMOVE BY OTHERS*
MA XX	*PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)*	RM TC	*REMOVE BY TRAFFIC CONTRACTOR*

	EXISTING SYMBOL	*PROPOSED SYMBOL*
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
VIDEO DETECTOR		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		*R/W*
SERVICE PEDESTAL	P	*P*
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
CCTV CAMERA		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION ZONE		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.

PREPARED BY
CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
550 Bay Road
DOVER, DELAWARE 19901
(302) 734-9188

BRET A. MARTINE — REGISTERED — No. 11947 — DELAWARE PROFESSIONAL ENGINEER

01/19/2021
THIS SEAL APPLIES TO THIS SHEET ONLY. DATE

SEAL

CONCURRENCE FOR INSTALLATION

1/22/2021
CHIEF OF TRAFFIC ENGINEERING DATE

ADDENDA / REVISIONS

SCALE
0 20 40 60
FEET

PAVEMENT & REHABILITATION NORTH XII, FY- 2016 MAIN STREET

CONTRACT	PERMIT NO.	N232	SECTION
T201606112	DESIGNED BY:	M. KUBOVCIK	CEI
COUNTY	CHECKED BY:	B. MARTINE	SHEET NO.
NEW CASTLE			61

SIGNAL PLAN DE 7 (MAIN ST) @ OLD BALTIMORE PIKE

LAST REVISED: 9/11/2018
13:34A
1/22/2021
G:\Projects\145002.00 (DelDOT Agmt 1679)\TS1 (T201606112) - Trfc-ADA Pleasant Valley Rd\CADD FILES\Sheets\SignalsSg_N232_Main St @ OBP.dgn

SIGNAL CONSTRUCTION NOTES (CONT'D)

3. DELMARVA POWER FORCES TO PROVIDE LINE CLEARANCE IN THE INTERSECTION SOUTHEAST CORNER. CONTACT DELMARVA POWER CUSTOMER SERVICE AT 1-800-375-7117 TO REQUEST SERVICE A MINIMUM OF 30 DAYS PRIOR TO THE START OF CONSTRUCTION.
4. DELDOT MAINTENANCE FORCES TO TRIM BACK EXISTING TREE LINE OVERHANGING THE SR 41 NORTHBOUND RIGHT-TURN LANE IN THE INTERSECTION SOUTHEAST CORNER. CONTACT THE ASSISTANT SUPERVISOR FOR AREA 11 AT 302-516-8204 A MINIMUM OF 10 DAYS PRIOR TO THE START OF CONSTRUCTION.
5. ALL EXISTING JUNCTION WELLS SHALL BE BONDED.
6. RESET, ADJUST, AND/OR REPAIR EXISTING TYPE 1 JUNCTION WELL FLUSH WITH THE FINISHED GRADE OF THE MEDIAN/SIDEWALK.
7. RESET, ADJUST, AND/OR REPAIR EXISTING TYPE 1 JUNCTION WELL FLUSH WITH THE FINISHED GRADE OF THE SIDEWALK AND REPLACE WITH NEW FRAME AND LID.
8. INSTALL FULL-CIRCLE VISORS AND BACKPLATES WITH TWO-INCH WIDE YELLOW RETROREFLECTIVE BORDER.
9. REMOVE EXISTING CABINET BASE.
10. REMOVE EXISTING TETHER WIRES, SIGNAL HEADS, CABLES, SPAN WIRES, POLES, AND POLE BASES.
11. REMOVE EXISTING CABLES/WIRES FROM ALL ABANDONED CONDUIT.
12. CARE SHALL BE TAKEN NOT TO DISTURB ANY TREE ROOTS WHEN INSTALLING CONDUITS.
13. ALL PROPOSED WORK UNDER THIS CONTRACT IS INTENDED TO OCCUR WITHIN DELDOT'S EXISTING RIGHT-OF-WAY ON TAX MAP 8-20.3.

SR 41 (NEWPORT GAP PIKE) IS ASSUMED TO RUN IN A NORTH-SOUTH DIRECTION

AERIAL HEIGHTS (A)

STATIC/ TRANSMISSION	>40' -0
PRIMARY	36' -11" ~ 40' -0"
FIBER (DP&E)	31' -4"
SECONDARY	30' -8"
COMM. CABLE	21' -0" ~ 23' -5"
MAST ARM	20' -0"

AERIAL HEIGHTS (B)

STATIC/ TRANSMISSION	>33' -3"
NEUTRAL	27' -03"
MAST ARM	21' -1"
COMM. CABLES	18' -1" ~ 20' -6"

AERIAL HEIGHTS (C)

SPAN WIRE	23' -5"
MAST ARM	21' -3"
TETHER WIRE	19' -0"

AERIAL HEIGHTS (D)

SPAN WIRE	27' -6"
MAST ARM	21' -0"
TETHER WIRE	23' -1"

CONDUIT RUN SCHEDULE

CO #	#OF CO	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE / WIRE
1	1	2"	GALV	25'	T	NEW [(1) #8/2 UF W/ GRND]
2	1	2"	GALV	5'	T	NEW [(1) #8/2 UF W/ GRND]
3	4	4"	PVC	5'	T	NEW [(4) #14/9 (4) #18/4 (10) #14/2 (2) #6]
4	1	4"	PVC	45'	T	NEW [(1) #14/9 (1) #18/4 (5) #14/2 (1) #6]
5	1	3"	PVC	20'	T	NEW [(1) #14/9 (1) #18/4 (1) #6]
6	1	3"	PVC	25'	T	NEW [(1) #14/9 (1) #18/4 (1) #6]
7	1	4"	PVC	100'	T	NEW [(5) #14/2 (1) #6]
8	1	4"	HDPE	45'	B	NEW [(4) #14/2 (1) #6]
9	1	4"	HDPE	40'	B	NEW [(2) #14/2 (1) #6]
10	1	4"	PVC	250'	T	NEW [(1) #14/2 (1) #6]
11	1	4"	HDPE	80'	B	NEW [(2) #14/9 (2) #18/4 (5) #14/2 (1) #6]
12	1	4"	HDPE	30'	B	NEW [(2) #14/9 (2) #18/4 (3) #14/2 (1) #6]
13	1	4"	HDPE	50'	B	NEW [(2) #14/9 (2) #18/4 (1) #14/2 (1) #6]
14	1	3"	PVC	65'	T	NEW [(1) #14/9 (1) #18/4 (1) #6]
15	1	3"	PVC	125'	T	NEW [(1) #14/9 (1) #18/4 (1) #6]
16	1	4"	PVC	250'	T	NEW [(1) #14/2 (1) #6]
*17	1	2"	GALV	65'	-	REMOVE [(2) #14/2] AND ABANDON
*18	1	2"	GALV	40'	-	REMOVE [(2) #14/2] AND ABANDON
*19	1	2"	GALV	80'	-	REMOVE [(2) #14/16] AND ABANDON
*20	1	2"	GALV	130'	-	REMOVE [(2) #14/2 (1) #8/2 UF W/ GRND] AND ABANDON
*21	1	2"	GALV	15'	-	REMOVE [(1) #8/2 UF W/ GRND] AND ABANDON
*22	1	2"	GALV	70'	-	REMOVE [(2) #14/2] AND ABANDON
*23	1	2"	GALV	30'	-	REMOVE [(1) #14/2] AND ABANDON
*24	1	2"	GALV	15'	-	EMPTY
*25	1	-	GALV	170'	-	REMOVE [(1) #14/2] AND ABANDON
*26	1	-	GALV	UNKNOWN	-	REMOVE [(1) #14/2] AND ABANDON
*27	1	-	GALV	UNKNOWN	-	REMOVE [(1) #14/2] AND ABANDON

* DENOTES EXISTING B-BORE T-TRENCH O-OPEN CUT P-ATTACHED TO POLE

MAST ARM SCHEDULE

MA NO.	LENGTH OF ARM	NO. OF HEADS	S.F. OF SIGNING
1	50'	2	13.5
2	50'	2	10.5
3	50'	2	13.5
4	50'	2	13.5

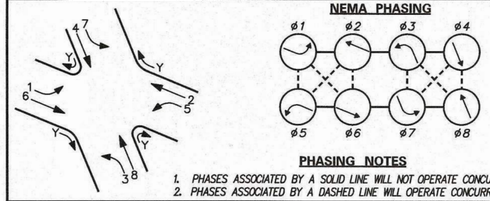
SIGNAL POLE SCHEDULE

POLE NO.	POLE TYPE	HEIGHT	MATERIAL
1	MAST ARM	21' -6"	STEEL
2	MAST ARM	21' -6"	STEEL
3	MAST ARM	21' -6"	STEEL
4	MAST ARM	21' -6"	STEEL
X5R	STRAIN	28' -0"	STEEL
X6R	STRAIN	28' -0"	STEEL
X7R	STRAIN	28' -0"	STEEL
X8R	STRAIN	28' -0"	STEEL

X-EXISTING R-REMOVAL

SIGNAL PHASING

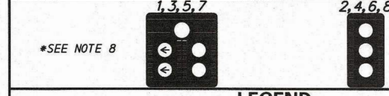
NEMA PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

AB	ABANDON	OH •	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH •	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO •	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO •	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (* OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (* OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		□
LOOP DETECTOR, TYPE 2		▭
LUMINAIRE	—○	—✦
MAST ARM		▶
MICROWAVE DETECTION	—◀	—◀
OPTICOM RECEIVER	—○	—●
OVERHEAD SIGNING		—⊣
PEDESTRIAN POLE/BASE	○	◉
PEDESTRIAN PUSHBUTTON	—▷	—▶
PEDESTRIAN SIGNAL HEAD		—▶
RIGHT-OF-WAY	———	—R/W—
SERVICE PEDESTAL		P
SIGNAL CABINET		▼
SIGNAL HEAD	—▷	—▶
SIGNAL POLE/BASE	⊗	⊙
CCTV CAMERA		
SPAN WIRE	—XX—	—◇—
UTILITY POLE	⊘	◥
VIDEO DETECTION		◀

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.

PREPARED BY
RUMMEL, KLEPPER & KAHL, LLP

BARRY L. BRANDT LICENSE No. 17066 DELAWARE PROFESSIONAL ENGINEER — SEAL

Barry L. Brandt — 2/15/2019 DATE

THIS SEAL APPLIES TO ALL SHEETS BEARING THE "RKK" SECTION DESIGNATION.

APPROVED FOR INSTALLATION

CHIEF TRAFFIC ENGINEER — 2/21/19 DATE

ADDENDA / REVISIONS

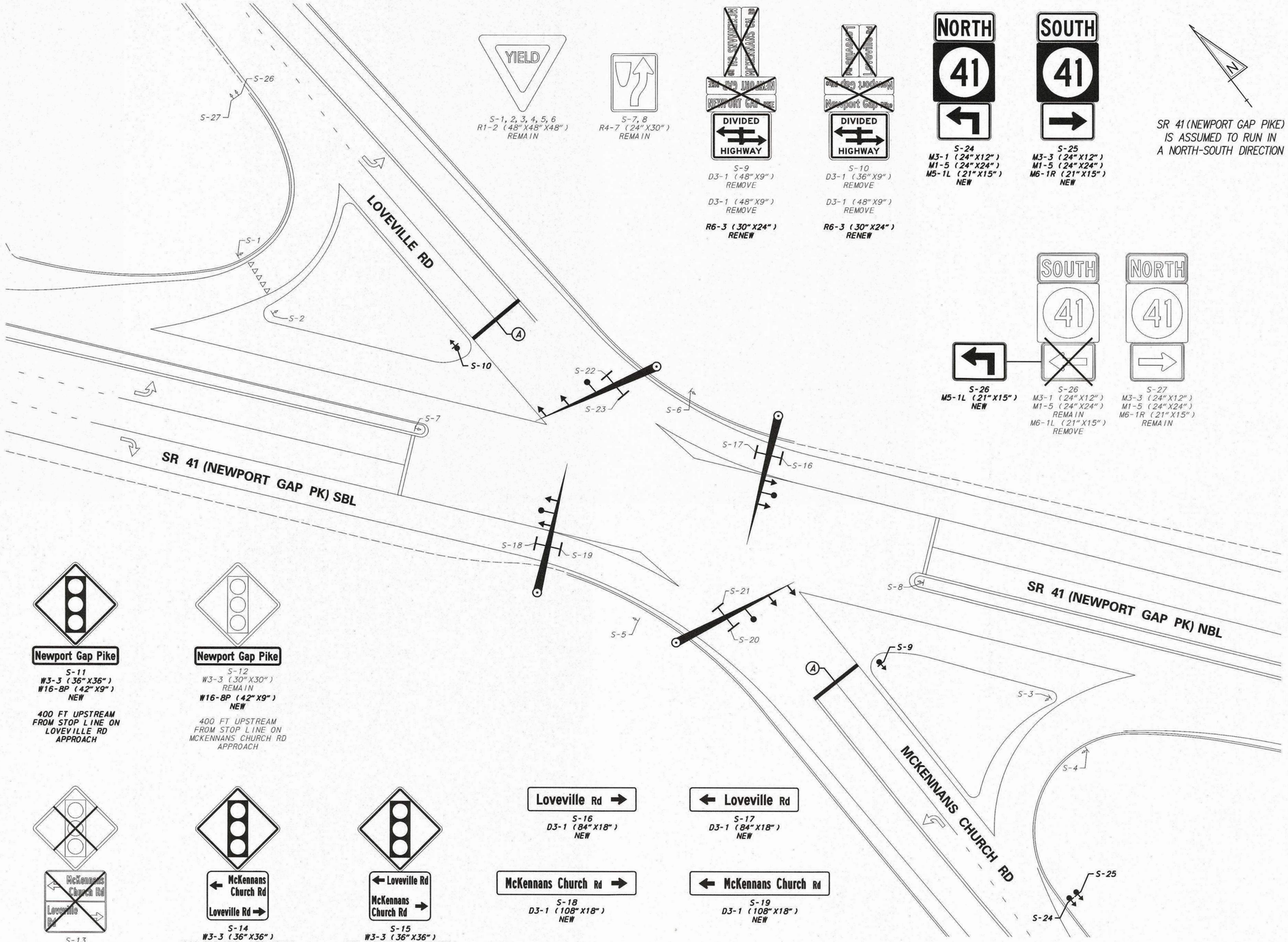
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INTERSECTION IMPROVEMENTS

CONTRACT T201904001	PERMIT NO.	N262	SECTION RKK
COUNTY NEW CASTLE	DESIGNED BY: SH		SHEET NO. 1
	CHECKED BY: JVB		

SIGNALIZATION PLAN SR 41 (NEWPORT GAP PIKE) AT LOVEVILLE RD / MCKENNANS CHURCH RD

LAST REVISED: 9/11/2018
2/21/2019
8:38:15 AM
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YIELD

S-1, 2, 3, 4, 5, 6
R1-2 (48"X48"X48")
REMAIN

S-7, 8
R4-7 (24"X30")
REMAIN

DIVIDED HIGHWAY

S-9
D3-1 (48"X9")
REMOVE
D3-1 (48"X9")
REMOVE
R6-3 (30"X24")
RENEW

DIVIDED HIGHWAY

S-10
D3-1 (36"X9")
REMOVE
D3-1 (48"X9")
REMOVE
R6-3 (30"X24")
RENEW

NORTH 41

S-24
M3-1 (24"X12")
M1-5 (24"X24")
M5-1L (21"X15")
NEW

SOUTH 41

S-25
M3-3 (24"X12")
M1-5 (24"X24")
M6-1R (21"X15")
NEW

SR 41 (NEWPORT GAP PIKE)
IS ASSUMED TO RUN IN
A NORTH-SOUTH DIRECTION

SOUTH 41

S-26
M5-1L (21"X15")
NEW

SOUTH 41

S-26
M3-1 (24"X12")
M1-5 (24"X24")
REMAIN
M6-1L (21"X15")
REMOVE

NORTH 41

S-27
M3-3 (24"X12")
M1-5 (24"X24")
M6-1R (21"X15")
REMAIN

Newport Gap Pike

S-11
W3-3 (36"X36")
W16-8P (42"X9")
NEW

400 FT UPSTREAM FROM STOP LINE ON LOVEVILLE RD APPROACH

Newport Gap Pike

S-12
W3-3 (30"X30")
REMAIN
W16-8P (42"X9")
NEW

400 FT UPSTREAM FROM STOP LINE ON MCKENNANS CHURCH RD APPROACH

McKennans Church Rd
Loveville Rd

S-13
W3-3 (30"X30")
W16-8aP(MOD) (30"X30")
REMOVE

775 FT UPSTREAM FROM NEWPORT GAP PIKE STOP LINE NB APPROACH

McKennans Church Rd
Loveville Rd

S-14
W3-3 (36"X36")
W16-8aP(MOD) (30"X24")
NEW

INSTALL 475 FT UPSTREAM FROM NEWPORT GAP PIKE STOP LINE NB APPROACH

Loveville Rd
McKennans Church Rd

S-15
W3-3 (36"X36")
W16-8aP(MOD) (30"X24")
NEW

INSTALL 475 FT UPSTREAM FROM NEWPORT GAP PIKE STOP LINE SB APPROACH

Loveville Rd

S-16
D3-1 (84"X18")
NEW

Loveville Rd

S-17
D3-1 (84"X18")
NEW

McKennans Church Rd

S-18
D3-1 (108"X18")
NEW

McKennans Church Rd

S-19
D3-1 (108"X18")
NEW

41 Newport Gap Pike

S-20, 21, 22, 23
D3-1 (108"X18")
NEW

PAVEMENT MARKINGS LEGEND

SYMBOL	ITEM	QUANTITY
A	16" SOLID WHITE ALKYD-THERMOPLASTIC (ITEM 817002)	60 SF

SIGNAL PHASING

SIGNAL HEAD DIAGRAM

LEGEND

AB	**ABANDON**	OH •	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH •	**PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)**
CA X	**PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)**	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO •	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PB X	**PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)**
CO •	**PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)**	PL X	EXISTING POLE IDENTIFIER (* OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	**PROPOSED POLE IDENTIFIER (* OF POLE)**
JW X	**PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)**	RM C	**REMOVE BY CONTRACTOR**
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	**REMOVE BY OTHERS**
MA XX	**PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)**	RM TC	**REMOVE BY TRAFFIC CONTRACTOR**

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		□
LOOP DETECTOR, TYPE 2		▭
LUMINAIRE	—○	—✦
MAST ARM		▶
MICROWAVE DETECTION	—◀	—◀
OPTICOM RECEIVER	—○	—●
OVERHEAD SIGNING		—┤
PEDESTRIAN POLE/BASE	○	◉
PEDESTRIAN PUSHBUTTON	—▯	—▶
PEDESTRIAN SIGNAL HEAD	—▭	—▰
RIGHT-OF-WAY		—R/W—
SERVICE PEDESTAL		P
SIGNAL CABINET	▭	▰
SIGNAL HEAD	—▷	—▶
SIGNAL POLE/BASE	⊗	⊙
CCTV CAMERA		
SPAN WIRE	—XX—	—◇—
UTILITY POLE	⊘	◥
VIDEO DETECTION	◀	◀

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
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PREPARED BY
RUMMEL, KLEPPER & KAHL, LLP

BARRY L. BRANDT LICENSE No. 17066 DELAWARE PROFESSIONAL ENGINEER

Barry L. Brandt — 2/15/2019
THIS SEAL APPLIES TO ALL SHEETS BEARING THE "RKK" SECTION DESIGNATION. — DATE

SEAL

APPROVED FOR INSTALLATION

CHIEF TRAFFIC ENGINEER — 2/21/19 DATE

ADDENDA / REVISIONS	

SCALE
0 20 40 60
FEET

INTERSECTION IMPROVEMENTS

CONTRACT	PERMIT NO.	N262
T201904001	DESIGNED BY: SH	
COUNTY	CHECKED BY: JVB	
NEW CASTLE		

SIGNALIZATION PLAN SR 41 (NEWPORT GAP PIKE) AT LOVEVILLE RD / MCKENNANS CHURCH RD

SECTION: RKK
SHEET NO.: 2

LAST REVISED: 9/11/2018
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ADDITIONAL GENERAL SIGNAL NOTES

3. POLE BASES, CABINET BASES, AND CONDUIT JUNCTION WELLS TO BE REMOVED IN ACCORDANCE WITH SECTION 211 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY THE ENGINEER. EXISTING CONDUIT SHALL BE ABANDONED.

4. RECONSTRUCT EXISTING TYPE 1 JUNCTION WELLS ALONG NORTHBOUND AND SOUTHBOUND APPROACHES.

5. THE PROPOSED CABINET SHALL BE INSTALLED ON A 56"X58" CONCRETE PAD WITH BASE EXTENSION.

6. EXISTING RIGHT OF WAY LINES ARE BASED ON THE EXISTING SIGNAL PLANS AND OTHER AS-BUILT PLANS (CONTRACT NO. 1533) AND ARE SHOWN APPROXIMATELY FOR GRAPHICAL PURPOSES ONLY.

7.TRAFFIC CONTRACTOR SHALL REMOVE ALL EXISTING CABLES FROM EXISTING CONDUIT BEING ABANDONED.

8. MAINTAIN THE EXISTING SIGNAL CONTROLLER CABINET AND POWER SOURCE UNTIL THE PROPOSED SIGNAL CONTROLLER CABINET IS OPERATIONAL AND IS POWERED BY THE PROPOSED POWER SOURCE. THE SIGNAL SHALL BE OPERATIONAL DURING CONSTRUCTION.

9. REMOVE EXISTING SPAN WIRE, OVERHEAD SIGNAL AND OPTICOM CABLES, SIGNAL HEADS, AND OPTICOMS.

10. CONDUIT SHOULD BE INSTALLED AS TO AVOID ANY CONFLICT WITH EXISTING UNDERGROUND UTILITIES.

ADDITIONAL GENERAL SIGNAL NOTES

11. UTILITY INFORMATION IS FOR SCHEMATIC PURPOSES ONLY AND WILL NEED TO BE VERIFIED IN THE FIELD. THE LOCATIONS FOR THE EXISTING UTILITIES ARE BASED ON THE AS-BUILT PLANS AS WELL AS INFORMATION OBTAINED FROM THE FOLLOWING UTILITY COMPANIES: NEW CASTLE COUNTY DEPARTMENT OF PUBLIC WORKS, DELMARVA GAS, AND ARTESIAN WATER COMPANY.

12. INSTALL ALL SIGNAL HEADS SUCH THAT THE BOTTOM OF THE LOWEST SIGNAL HEAD IS AT LEAST 16' ABOVE ROADWAY SURFACE.

13. UTILIZE TA-47B FROM THE DELAWARE MUTCD AS NECESSARY TO CONSTRUCT THE TRAFFIC SIGNAL. NO LANE CLOSURES ARE ALLOWED MONDAY THROUGH FRIDAY BETWEEN THE HOURS OF 5:00 AM AND 9:00 AM AND 3:00 PM TO 8:00 PM.

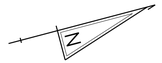
14. THE SIGNAL POLE MOUNTED CCTV CAMERA (NCAM236) SHALL BE INSTALLED ON MAST ARM POLE #1. EQUIPMENT FOR THE CAMERA SHALL BE INSTALLED IN THE N284 SIGNAL CABINET.

15. INSTALL CDMA IN THE TRAFFIC CONTROLLER CABINET.

OVERHEAD SIGN DETAILS

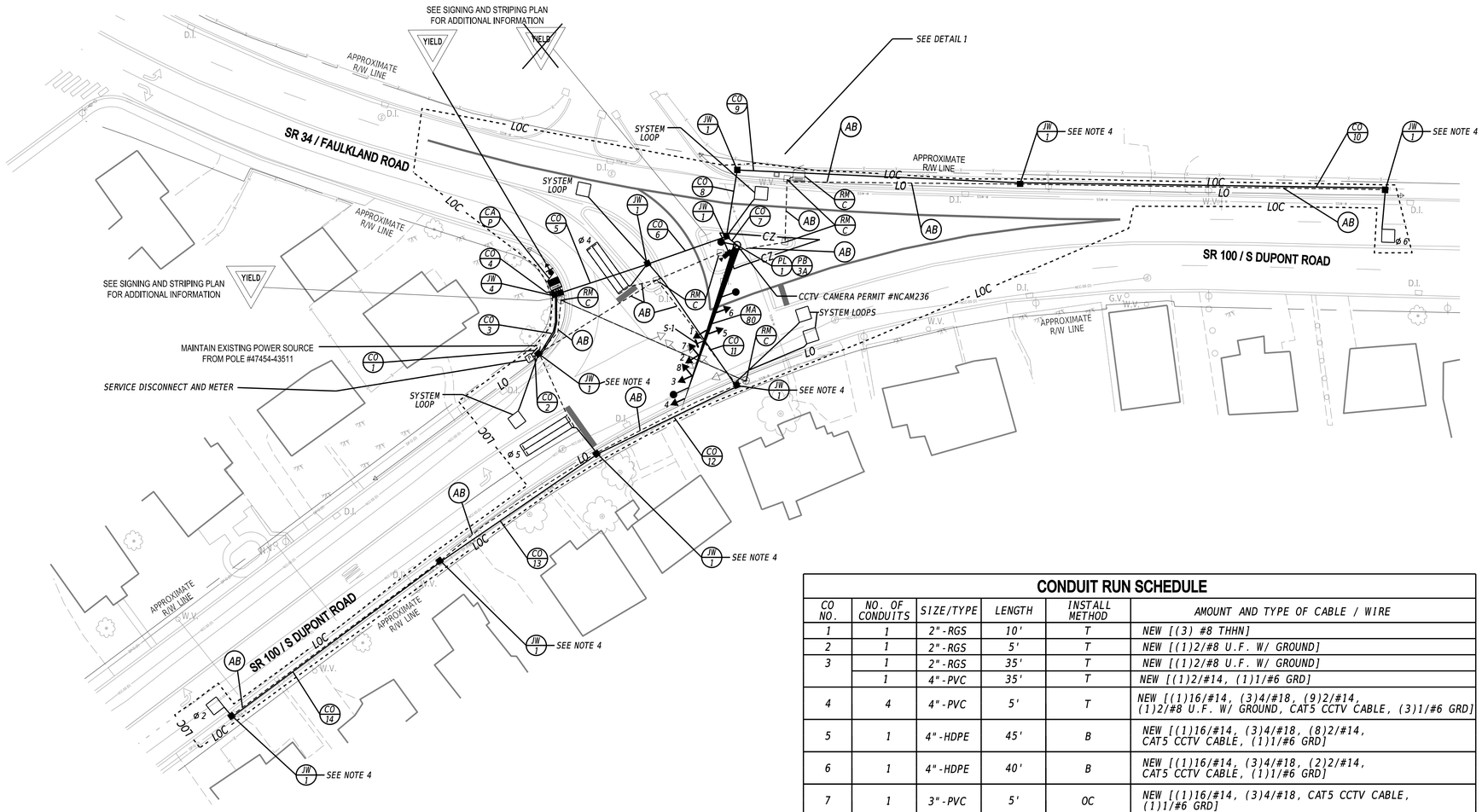
LEFT TURN YIELD ON FLASHING RED ARROW AFTER STOP

S-1
R10-27
30" x 36"



MAST ARM SCHEDULE

NO.	MOUNTING HEIGHT	LENGTH	NO. OF SIGNAL HEADS	NO. OF OPTICOMS	S.F. SIGNAGE
1	17'	80'	6 - 3 SECTION,2 - 4 SECTION	3	7.5 S.F.



POLE SCHEDULE

POLE NO.	TYPE	NORTHING	EASTING
1	80' MAST ARM W/ TYPE 3A POLE BASE	637129.2537	607500.0852

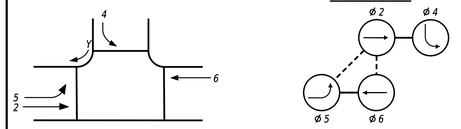
CONDUIT RUN SCHEDULE

CO NO.	NO. OF CONDUITS	SIZE/TYPE	LENGTH	INSTALL METHOD	AMOUNT AND TYPE OF CABLE / WIRE
1	1	2"-RGS	10'	T	NEW [(3) #8 THHN]
2	1	2"-RGS	5'	T	NEW [(1)2/#8 U.F. W/ GROUND]
3	1	2"-RGS	35'	T	NEW [(1)2/#8 U.F. W/ GROUND]
	1	4"-PVC	35'	T	NEW [(1)2/#14, (1)1/#6 GRD]
4	4	4"-PVC	5'	T	NEW [(1)16/#14, (3)4/#18, (9)2/#14, (1)2/#8 U.F. W/ GROUND, CAT5 CCTV CABLE, (3)1/#6 GRD]
5	1	4"-HDPE	45'	B	NEW [(1)16/#14, (3)4/#18, (8)2/#14, CAT5 CCTV CABLE, (1)1/#6 GRD]
6	1	4"-HDPE	40'	B	NEW [(1)16/#14, (3)4/#18, (2)2/#14, CAT5 CCTV CABLE, (1)1/#6 GRD]
7	1	3"-PVC	5'	OC	NEW [(1)16/#14, (3)4/#18, CAT5 CCTV CABLE, (1)1/#6 GRD]
8	1	4"-HDPE	35'	B	NEW [(1)2/#14, (1)1/#6 GRD]
9	1	4"-PVC	135'	T	NEW [(1)2/#14, (1)1/#6 GRD]
10	1	4"-PVC	170'	T	NEW [(1)2/#14, (1)1/#6 GRD]
11	1	4"-HDPE	70'	B	NEW [(4)2/#14, (1)1/#6 GRD]
12	1	4"-PVC	75'	T	NEW [(2)2/#14, (1)1/#6 GRD]
13	1	4"-PVC	90'	T	NEW [(1)2/#14, (1)1/#6 GRD]
14	1	4"-PVC	125'	T	NEW [(1)2/#14, (1)1/#6 GRD]

* DENOTES EXISTING CONDUIT RUN.
TYPES: HDPE, PVC, RGS, EX = EXISTING
INSTALL METHODS: B=BORE, IB=IN BARRIER, OC=OPEN CUT, OS=ON STRUCTURE, T=TRENCH

SIGNAL PHASING

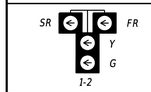
NEMA PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

AB	ABANDON	OH #	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH #	PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (# OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (# OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
CCTV CAMERA		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION		

GENERAL SIGNAL NOTES

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PREPARED BY

JMT

Mir A. Wahed

10/21/2021
DATE

THIS SEAL APPLIES TO ALL SHEETS BEARING THE "JMT" SECTION DESIGNATION.

MIR A. WAHED LICENSE No. 14810 DELAWARE PROFESSIONAL ENGINEER

SEAL

CONCURRENCE FOR INSTALLATION

CHIEF OF TRAFFIC ENGINEERING

10/21/21
DATE

ADDENDA / REVISIONS	

SCALE
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FEET

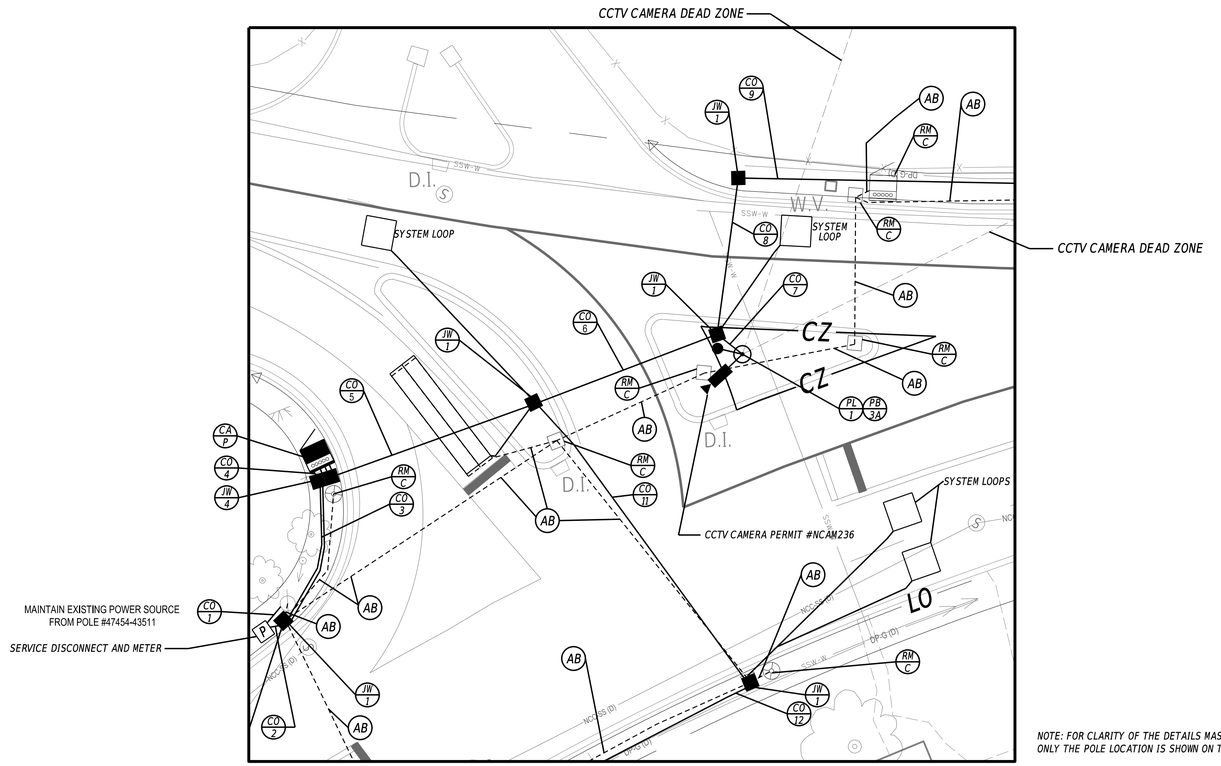
SIGNAL REBUILD AT SR 34 (FAULKLAND ROAD) AND SR 100 (DUPONT ROAD)

CONTRACT	T202204001	PERMIT NO.	N284
COUNTY	NEW CASTLE	DESIGNED BY: J. SMITH	
		CHECKED BY: M. WAHED	

SIGNAL PLAN SR 34 (FAULKLAND ROAD) AT SR 100 (DUPONT ROAD)

SECTION	
JMT	
SHEET NO.	
1	

LAST REVISED: 9/11/2018
10/21/2021
9:55:35 AM
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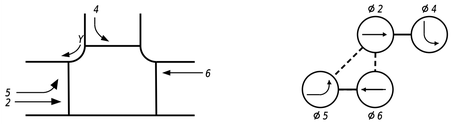


DETAIL 1 - INTERSECTION
SCALE: 1" = 15'

NOTE: FOR CLARITY OF THE DETAILS MAST ARMS ARE NOT SHOWN. ONLY THE POLE LOCATION IS SHOWN ON THE DETAIL.

SIGNAL PHASING

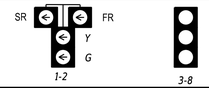
NEMA PHASING



PHASING NOTES

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2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

AB	ABANDON	OH #	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH #	*PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)*
CA X	*PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)*	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PB X	*PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)*
CO #	*PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)*	PL X	EXISTING POLE IDENTIFIER (# OF POLE)
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JW X	*PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)*	RM C	*REMOVE BY CONTRACTOR*
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	*REMOVE BY OTHERS*
MA XX	*PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)*	RM TC	*REMOVE BY TRAFFIC CONTRACTOR*

	EXISTING SYMBOL	*PROPOSED SYMBOL*
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
CCTV CAMERA		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.

PREPARED BY

JMT

Mir Ak Waked — 10/21/2021

THIS SEAL APPLIES TO ALL SHEETS BEARING THE "JMT" SECTION DESIGNATION.

DATE

MIR A. WAHED — LICENSE — No. 14810 — DELAWARE PROFESSIONAL ENGINEER

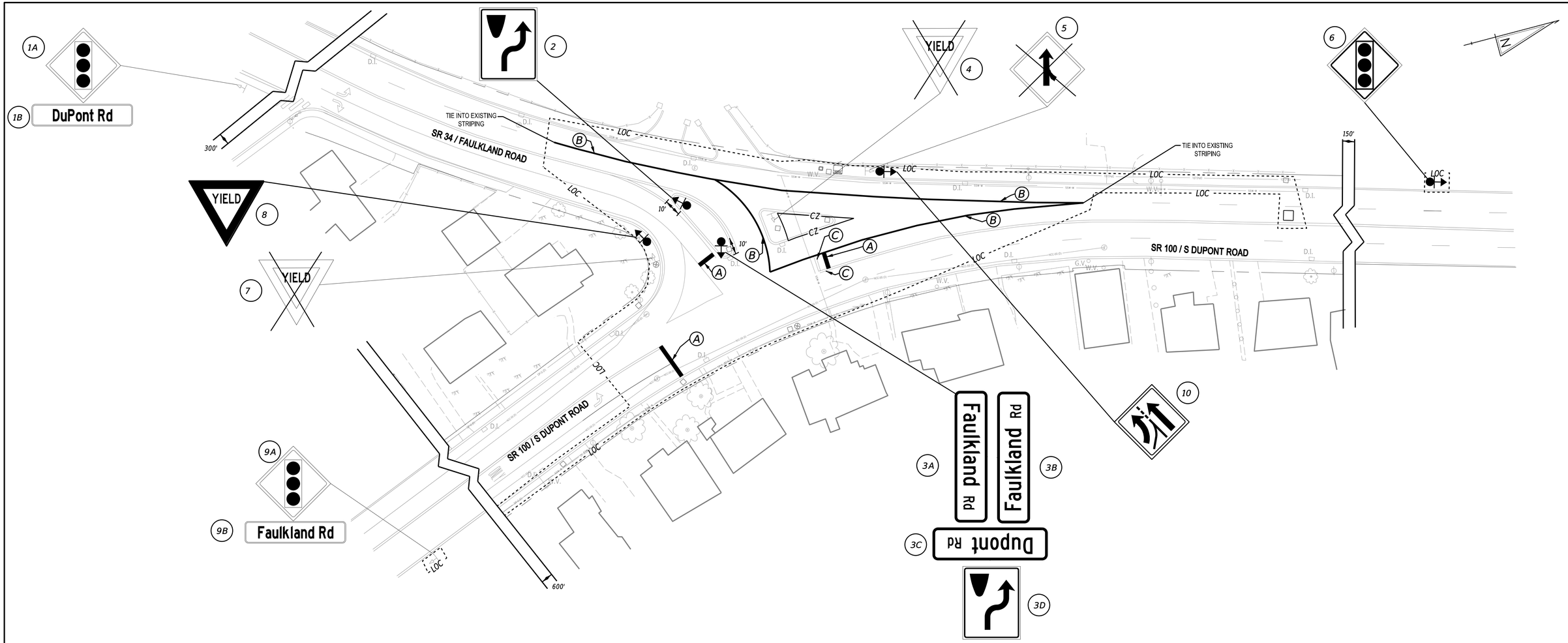
SEAL

CONCURRENCE FOR INSTALLATION

CHIEF OF TRAFFIC ENGINEERING — 10/21/21 DATE

ADDENDA / REVISIONS		NOT TO SCALE	SIGNAL REBUILD AT SR 34 (FAULKLAND ROAD) AND SR 100 (DUPONT ROAD)	CONTRACT	PERMIT NO. N284	SIGNAL PLAN SR 34 (FAULKLAND ROAD) AT SR 100 (DUPONT ROAD)	SECTION
				T202204001	DESIGNED BY: J. SMITH		JMT
				COUNTY NEW CASTLE	CHECKED BY: M. WAHED		SHEET NO. 2

LAST REVISED: 9/11/2018
10/21/2021
9:32:18 AM
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SIGNING AND STRIPING NOTES

1. CONTRACTOR SHALL MEASURE STRIPING LENGTHS FROM STRIPING PLANS.
2. EXISTING SIGNS IN THE PROJECT AREA NOT SHOWN ON THIS PLAN ARE NOT TO BE DISTURBED.
3. FURNISHING AND INSTALLATION OF PVC SLEEVE FOR SIGNS INSTALLED IN CONCRETE SHALL BE INCIDENTAL TO THE INSTALLATION OF THE SIGN.

PAVEMENT MARKINGS LEGEND

SYMBOL		QUANTITY
Ⓐ	ALKYD-THERMOPLASTIC PAVEMENT STRIPING, WHITE 16" SOLID (ITEM 817002)	70 SF
Ⓑ	EPOXY RESIN PAINT PAVEMENT STRIPING, WHITE 5" SOLID (ITEM 817013)	650 LF
	EPOXY RESIN PAINT PAVEMENT STRIPING, BLACK 3" SOLID (ITEM 817018)	650 LF
Ⓒ	REMOVAL OF PAVEMENT STRIPING (ITEM 817031)	340 SF

PREPARED BY
JMT

Mir Abe Waked — 10/21/2021
THIS SEAL APPLIES TO ALL SHEETS BEARING THE "JMT" SECTION DESIGNATION. — DATE

MIR A. WAHED LICENSE No. 14810 DELAWARE PROFESSIONAL ENGINEER
SEAL

CONCURRENCE FOR INSTALLATION

CHIEF OF TRAFFIC ENGINEERING — 10/21/21 DATE

ADDENDA / REVISIONS	

SCALE
0 30 60 90
FEET

SIGNAL REBUILD AT SR 34 (FAULKLAND ROAD) AND SR 100 (DUPONT ROAD)

CONTRACT	T202204001
COUNTY	NEW CASTLE
PERMIT NO.	N284
DESIGNED BY: J. SMITH	
CHECKED BY: M. WAHED	

SIGNING AND STRIPING PLAN SR 34 (FAULKLAND ROAD) AT SR 100 (DUPONT ROAD)

SECTION	JMT
SHEET NO.	3

LAST REVISED: 9/11/2018
10/21/2021
9:34:59 AM
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PERMANENT SIGN SCHEDULE

SHEET NO.	PLAN IDENTIFIER	SIGN DESIGNATION	QTY.	DESCRIPTION	SIGN WIDTH (IN)	SIGN HEIGHT (IN)	SIGN AREA (SF)	ITEM 819018 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE POST (EACH)			ITEM 819019 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS (SF)			POST INSTALLATION TYPE	Code X11 12' Post (W/ Basepost) (EACH)	Code X11A 15' Post (W/ Basepost) (EACH)	ITEM 819016 4" HOLE, 0-6" (EACH)	ITEM 819017 4" HOLE, >6" (EACH)	REMARKS
								SIGN DISPOSITION	REMOVE	INSTALL	SIGN DISPOSITION	REMOVE	INSTALL						
3	1A	W3-3(36)	1	SIGNAL AHEAD (Symbol) - 36x36	36	36		REMAIN											
3	1B	W16-8P	1	ADVANCE STREET NAME (1 - line plaque)	42	9		REMAIN											Dupont Rd
3	2	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	NEW		1				EX. CONCRETE	1		1		PVC Sleeve
3	3A	D3-1(12)	1	STREET NAME (1 Line) Posted speed ≤ 40 MPH	48	12	4.0	NEW		1				EX. CONCRETE	1		1		Faulkland Rd
3	3B	D3-1(12)	1	STREET NAME (1 Line) Posted speed ≤ 40 MPH	48	12	4.0	NEW		1									Faulkland Rd
3	3C	D3-1(12)	1	STREET NAME (1 Line) Posted speed ≤ 40 MPH	42	12	3.5	NEW		1									Dupont Rd
3	3D	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	NEW		1									PVC Sleeve
3	4	R1-2(36)	1	YIELD	36	36		REMOVE	1										
3	5	W4-1_R(36)	1	MERGE (Right) - 36x36	36	36		REMOVE	1										
3	6	W3-3(36)	1	SIGNAL AHEAD (Symbol) - 36x36	36	36	9.0	NEW		1				SOIL	1				
3	7	R1-2(36)	1	YIELD	36	36		REMOVE	1										Remove from signal pole
3	8	R1-2(36)	1	YIELD	36	36	3.9	NEW		1				SOIL	1				
3	9A	W3-3(36)	1	SIGNAL AHEAD (Symbol) - 36x36	36	36		REMAIN											
3	9B	W16-8P	1	ADVANCE STREET NAME (1 - line plaque)	42	9	2.6	ADD TO ASSEMBLY		1									Faulkland Rd
3	10	W4-6_L(36)	1	ENTERING ROADWAY ADDED LANE (Left) - 36x36	36	36	9.0	NEW		1				SOIL	1				
PAGE TOTALS							46		3	9		0	0		5	0	2	0	

PREPARED BY
JMT

Mir A. Wahed — 10/21/2021
THIS SEAL APPLIES TO ALL SHEETS BEARING THE "JMT" SECTION DESIGNATION. — DATE

MIR A. WAHED — LICENSE — No. 14810 — DELAWARE PROFESSIONAL ENGINEER
SEAL

CONCURRENCE FOR INSTALLATION

CHIEF OF TRAFFIC ENGINEERING — 10/21/21 DATE

ADDENDA / REVISIONS		NOT TO SCALE	SIGNAL REBUILD AT SR 34 (FAULKLAND ROAD) AND SR 100 (DUPONT ROAD)	CONTRACT	PERMIT NO.	N284	SIGNING AND STRIPING PLAN SR 34 (FAULKLAND ROAD) AT SR 100 (DUPONT ROAD)	SECTION
				T202204001	DESIGNED BY: J. SMITH			JMT
				COUNTY	CHECKED BY: M. WAHED			SHEET NO.
				NEW CASTLE				4

LAST REVISED: 9/11/2018
10/21/2021
9:35:14 AM
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PROPOSED OVERHEAD SIGNING

A — D3-1, 108" X 18" (HWY C-U8", L6") — (20) Pyle Center Rd ←

D — D3-1, 108" X 18" (HWY C-U8", L6") — (20) Zion Church Rd →

B — D3-1, 108" X 18" (HWY C-U8", L6") — (20) Pyle Center Rd →

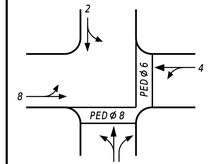
E — D3-1, 108" X 18" (HWY C-U8", L6") — (20) Zion Church Rd ←

C — D3-1, 70" X 18" (HWY C-U8", L6") — (17) Roxana Rd

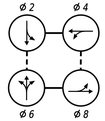
ADDITIONAL SIGNAL NOTES

3. ALL EXISTING SIGNAL COMPONENTS CALLED OUT FOR REMOVAL OR ABANDONMENT SHALL REMAIN INTACT AND FULLY FUNCTIONAL UNTIL ALL PROPOSED SIGNAL INSTALLATIONS ARE READY TO BE COMMISSIONED. CONTRACTOR SHALL ENSURE THAT SIGNAL DOWNTIME DURING DECOMMISSIONING OF THE EXISTING AND COMMISSIONING OF THE PROPOSED SIGNAL INSTALLATION IS MINIMAL.
4. CONTRACTOR SHALL RESET, ADJUST, AND/OR REPAIR EXISTING JUNCTION WELL AS NECESSARY FOR INTEGRATION OF PROPOSED CONDUIT AND/OR TO FINISH FLUSH WITH FINAL GRADES.
5. CDMA TO BE INSTALLED FOR COORDINATION WITH TMC.
6. ALL WORK PERFORMED UNDER THIS PROJECT IS INTENDED TO OCCUR WITHIN DELDOT'S EXISTING RIGHT-OF-WAY BASED ON ARCHIVED SIGNAL PLANS FOR ROXANA RD (CONTRACT # 88-092-01, DATED NOVEMBER 19, 1987)
7. FOR DURATION OF SIGNAL RE-BUILD, THE CONTRACTOR SHALL UTILIZE TYPICAL APPLICATION 47, FIGURE 6H-47B FOR TRAFFIC CONTROL OPERATIONS. ANY LANE CLOSURES SHALL BE LIMITED TO WEEKDAYS MONDAY-THURSDAY BETWEEN THE TIMES OF 9AM AND 3PM. CHANGEABLE MESSAGE BOARDS SHALL INCLUDE ANTICIPATED SIGNAL CONSTRUCTION AND NEW TRAFFIC PATTERN CHANGE NOTIFICATIONS.
8. PEDESTRIAN SIGNAL HEADS SHALL BE COUNTDOWN TYPE. CONTRACTOR SHALL INSTALL EDUCATION COUNTDOWN SIGNS (R10-3e) ON ALL SINGLE PEDESTRIAN SIGNAL MOUNTED POLES AND EDUCATION COUNTDOWN SIGNS (R10-3e-DE) ON ALL DOUBLE PEDESTRIAN SIGNAL MOUNTED POLES WITH ARROWS ALIGNED ON EACH STATION BUTTON IN THE DIRECTION OF PED PHASE ACTIVATION PER DESIGN.

SIGNAL PHASING



NEMA PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM

1,2,3,4,5,6,7,8



LEGEND

AB	ABANDON	OH #	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH #	PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (# OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (# OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
CCTV CAMERA		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION (FISH EYE)		
VIDEO DETECTION ZONE		

CONDUIT RUN SCHEDULE

CR NO.	NO. OF CONDUITS	SIZE (TYPE)	LENGTH (B/T/O/P)	AMOUNT AND TYPE OF CABLE / WIRE
1A	1	2"(GALV)	10'/30'(T/P)	NEW (3)#8 THHN SC - LINE SIDE
1B	1	2"(GALV)	75'(T)	NEW (1)2/#8 U.F.W/GROUND - LOAD SIDE
2	4	4"(PVC)	10'(T)	NEW (2)16/#14 (3)5/#14 (4)2/#14 (4)4/#18 (4)#6 SC
3	1	3"(PVC)	5'(T)	NEW (1)16/#14 (2)4/#18 (1)#6 SC
4	1	4"(HDPE)	70'(B)	NEW (1)16/#14 (3)2/#14 (2)4/#18 (1)#6 SC
5	1	4"(HDPE)	60'(B)	NEW (1)16/#14 (2)2/#14 (2)4/#18 (1)#6 SC
6	1	3"(PVC)	10'(T)	NEW (1)16/#14 (2)4/#18 (1)#6 SC
7	1	3"(PVC)	175'(T)	NEW (1)2/#14 (1)#6 SC
8	1	3"(PVC)	190'(T)	NEW (1)2/#14 (1)#6 SC
9	1	3"(PVC)	10'(T)	NEW (1)5/#14 (1)#6 SC
10	1	3"(PVC)	5'(T)	NEW (1)5/#14 (1)#6 SC
11	1	4"(HDPE)	90'(B)	NEW (1)5/#14 (1)#6 SC
12	1	3"(PVC)	20'(T)	NEW (1)5/#14 (1)#6 SC
13	1	3"(PVC)	25'(T)	NEW (1)5/#14 (1)#6 SC
X14	1	2.5"	12'	REMOVE (2)16/#14 (3)4/#18 (1)2/#8 U.F.W/GRND
X15	2	2.5"	8'	REMOVE [(6)4/#18 (1)2/#8]
X16	1	2.5"	55'	REMOVE [(3)4/#18 (1)2/#8]
X17	1	1.5"	135'	REMOVE (2)4/#18
X18	1	1.5"	165'	REMOVE (2)4/#18
X19	1	2.5"	70'	REMOVE [(1)4/#18 (1)2/#8]
X20	1	1.5"	5'	REMOVE (1)2/#8
X21	1	2.5"	55'	REMOVE (2)4/#18
X22	1	1.5"	221'	REMOVE (2)4/#18
X23	1	1.5"	70'	REMOVE (1)4/#18

LEGEND
X- DENOTES EXISTING
SC- STRANDED COPPER
HR- HOME RUN
B- BORE
T- TRENCH
O- OPEN CUT
P- ATTACH TO POLE
SM- SINGLE MODE FIBER OPTICS
MM- MULTIMODE FIBER OPTICS

POLE SCHEDULE

POLE NO.	POLE TYPE	HEIGHT	MATERIAL
*X1	STRAIN	25'	STEEL
*X2	STRAIN	25'	STEEL
3	PEDESTAL	10'-0"	ALUMINUM
4	PEDESTAL	10'-0"	ALUMINUM
5	MAST	21'-6"	STEEL
6	PEDESTAL	10'-0"	ALUMINUM
7	MAST	21'-6"	STEEL

X- DENOTES EXISTING * - TO BE REMOVED

PAVEMENT MARKINGS LEGEND

SYM	ITEM	QUANTITY
A	ALKYD-THERMOPLASTIC PAVEMENT STRIPING, 24" SOLID WHITE SYMBOL/LEGEND, (ITEM 817002)	67 SF
J	ALKYD-THERMOPLASTIC PAVEMENT STRIPING, WHITE SYMBOL/LEGEND, (ITEM 817002)	12.5 SF

MAST ARM SCHEDULE

MA NO.	LENGTH OF ARM	NO. OF HEADS	NO. OF OPTICOMS	S.F. OF SIGNING	ARM MOUNT HEIGHT
1	35'	2	1	27 SF	20'-0"
2	60'	2	1	0 SF	17'-6"
3	35'	2	1	27 SF	20'-0"
4	45'	2	1	17.5 SF	17'-6"

GENERAL SIGNAL NOTES

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PREPARED BY
CENTURY ENGINEERING
500 BAY ROAD
DOVER, DELAWARE 19901
(302) 734-9188

BRET A. MARTINE — No. 11947 — DELAWARE — PROFESSIONAL ENGINEER

THIS SEAL APPLIES TO THIS SHEET ONLY. 08/13/2020 DATE

SEAL

CONCURRENCE FOR INSTALLATION

CHIEF TRAFFIC ENGINEER 8/31/2020 DATE

ADDENDA / REVISIONS

SCALE 0 30 60 90 FEET

SIGNAL RE-BUILD PROGRAM

CONTRACT	PERMIT NO.	S104	SECTION
T202104001	DESIGNED BY: B. A. MARTINE		TRAFFIC
COUNTY	CHECKED BY: B. MARTINE		SHEET NO.
SUSSEX			1 OF 2

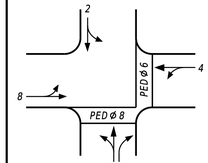
SIGNAL PLAN
DE 17 (ROXANA RD) @
DE 20 (PYLE CENTER RD)

LAST REVISED: 9/11/2018
11:40:02 - 8/31/2020
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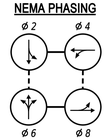
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SIGNAL PHASING



NEMA PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
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SIGNAL HEAD DIAGRAM

1,2,3,4,5,6,7,8



LEGEND

AB	ABANDON	OH #	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH #	PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (# OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (# OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
CCTV CAMERA		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION (FISH EYE)		
VIDEO DETECTION ZONE		

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PREPARED BY

CENTURY ENGINEERING
500 BAY ROAD
DOVER, DELAWARE 19901
(302) 734-9188

08/13/2020
DATE

THIS SEAL APPLIES TO THIS SHEET ONLY.



SEAL

CONCURRENCE FOR INSTALLATION

CHIEF TRAFFIC ENGINEER

8/31/2020
DATE

CURB RAMP DETAILS

SCALE: 1" = 10'

ADDENDA / REVISIONS	

SCALE: 0 30 60 90 FEET

SIGNAL RE-BUILD PROGRAM

CONTRACT	T202104001
COUNTY	SUSSEX
PERMIT NO.	S104
DESIGNED BY:	B. A. MARTINE
CHECKED BY:	B. MARTINE

SIGNAL PLAN DE 17 (ROXANA RD) @ DE 20 (PYLE CENTER RD)

SECTION	
TRAFFIC	
SHEET NO.	2 OF 2

LAST REVISED: 9/11/2018
11:50:57 AM 08/07/2020
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CONDUIT RUN SCHEDULE

CR NO.	NO. OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE / WIRE
1	N/A	N/A	N/A	20 FT	DIRECT BURY	UNDERGROUND SERVICE ENTRY CABLE TO BE INSTALLED BY DEC
2	1	2"	GALV	2 FT	T	(1) 2/#8 U.F.W/GROUND
3	1	2"	GALV	4 FT	T	(1) 2/#8 U.F.W/GROUND
4	4	4"	80 PVC	2 FT	T	(4) 9/#14,(4) 4/#18,(10) 2/#14,(6) 5/#14,(4)1/#6 GRD COAX CAMERA CABLE EMPTY
5	1	4"	80 PVC	48 FT	T	(2)9/#14,(2)4/#18,(2)5/#14,(3)2/#14,(1)1/#6 GRD, COAX CAMERA CABLE
6	1	3"	80 PVC	7 FT	T	(1) 9/#14, (1) 4/#18, (1)1/#6 GRD, COAX CAMERA CABLE
7	1	4"	HDPE	86 FT	B	(1) 9/#14, (1) 4/#18, (2)5/#14, (2)2/#14, (1)1/#6 GRD
8	1	2.5"	80 PVC	25 FT	T	(2) 5/#14, (1)1/#6 GRD
9	1	4"	HDPE	63 FT	B	(1) 9/#14, (1) 4/#18, (1)1/#6 GRD
10	1	3"	80 PVC	10 FT	T	(1) 9/#14, (1) 4/#18, (1)1/#6 GRD
11	1	4"	80 PVC	109 FT	T	(1) 2/#14, (1)1/#6 GRD
12	1	4"	80 PVC	171 FT	T	(1) 2/#14, (1)1/#6 GRD
13	1	2.5"	80 PVC	13 FT	T	(1) 5/#14, (1)1/#6 GRD
14	1	3"	80 PVC	18 FT	T	(1) 9/#14, (1) 4/#18, (1)1/#6 GRD
15	1	4"	80 PVC	69 FT	T	(1) 2/#14, (1)1/#6 GRD
16	1	4"	HDPE	85 FT	B	(1)9/#14, (1)4/#18, (1)5/#14, (3)2/#14, (1)1/#6 GRD
17	1	2.5"	80 PVC	9 FT	T	(1) 5/#14, (1)1/#6 GRD
18	1	4"	80 PVC	240'FT	T	(1) 2/#14, (1)1/#6 GRD
19	1	3"	80 PVC	23 FT	T	(1) 9/#14, (1) 4/#18, (1)1/#6 GRD
20	1	4"	HDPE	52 FT	B	(1) 9/#14, (1) 4/#18, (1) 2/#14, (1)1/#6 GRD
21	1	4"	80 PVC	66 FT	T	(2)9/#14, (2) 4/#18, (2) 5/#14, (5) 2/#14, (1)1/#6 GRD
22	1	2.5"	80 PVC	7 FT	T	(1) 5/#14, (1)1/#6 GRD
23	1	2.5"	80 PVC	20 FT	T	(1) 5/#14, (1)1/#6 GRD
24	1	4"	80 PVC	61 FT	T	(2) 9/#14, (2) 4/#18, (4)5/#14, (7) 2/#14, (1)1/#6 GRD

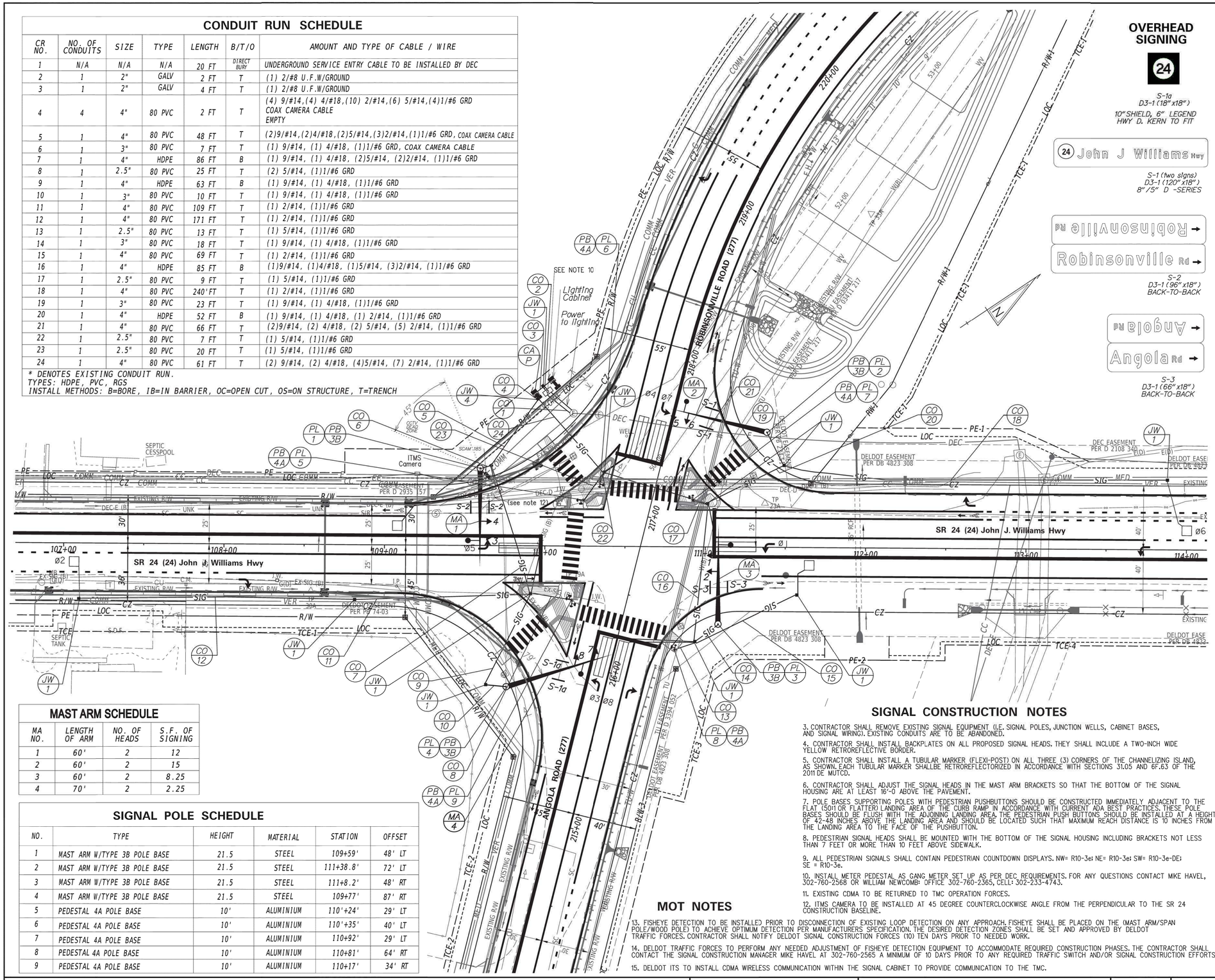
* DENOTES EXISTING CONDUIT RUN.
TYPES: HDPE, PVC, RGS
INSTALL METHODS: B=BORE, IB=IN BARRIER, OC=OPEN CUT, OS=ON STRUCTURE, T=TRENCH

MAST ARM SCHEDULE

MA NO.	LENGTH OF ARM	NO. OF HEADS	S.F. OF SIGNING
1	60'	2	12
2	60'	2	15
3	60'	2	8.25
4	70'	2	2.25

SIGNAL POLE SCHEDULE

NO.	TYPE	HEIGHT	MATERIAL	STATION	OFFSET
1	MAST ARM W/TYPE 3B POLE BASE	21.5	STEEL	109+59'	48' LT
2	MAST ARM W/TYPE 3B POLE BASE	21.5	STEEL	111+38.8'	72' LT
3	MAST ARM W/TYPE 3B POLE BASE	21.5	STEEL	111+8.2'	48' RT
4	MAST ARM W/TYPE 3B POLE BASE	21.5	STEEL	109+77'	87' RT
5	PEDESTAL 4A POLE BASE	10'	ALUMINIUM	110'+24'	29' LT
6	PEDESTAL 4A POLE BASE	10'	ALUMINIUM	110'+35'	40' LT
7	PEDESTAL 4A POLE BASE	10'	ALUMINIUM	110+92'	29' LT
8	PEDESTAL 4A POLE BASE	10'	ALUMINIUM	110+81'	64' RT
9	PEDESTAL 4A POLE BASE	10'	ALUMINIUM	110+17'	34' RT


ROBINSONVILLE ROAD (27)
ANGOLA ROAD (27)
SR 24 (24) John J. Williams Hwy
SEE NOTE 10
Lighting Cabinet
Power to lighting
ITMS Camera
SEPTIC CESSPOOL
DELDOT EASEMENT PER DB 4823 308
DEC EASEMENT PER D 2108 340
DELDOT EASEMENT PER DB 4823 308
DELDOT EASEMENT PER DB 4823 308
DELDOT EASEMENT PER DB 4823 308

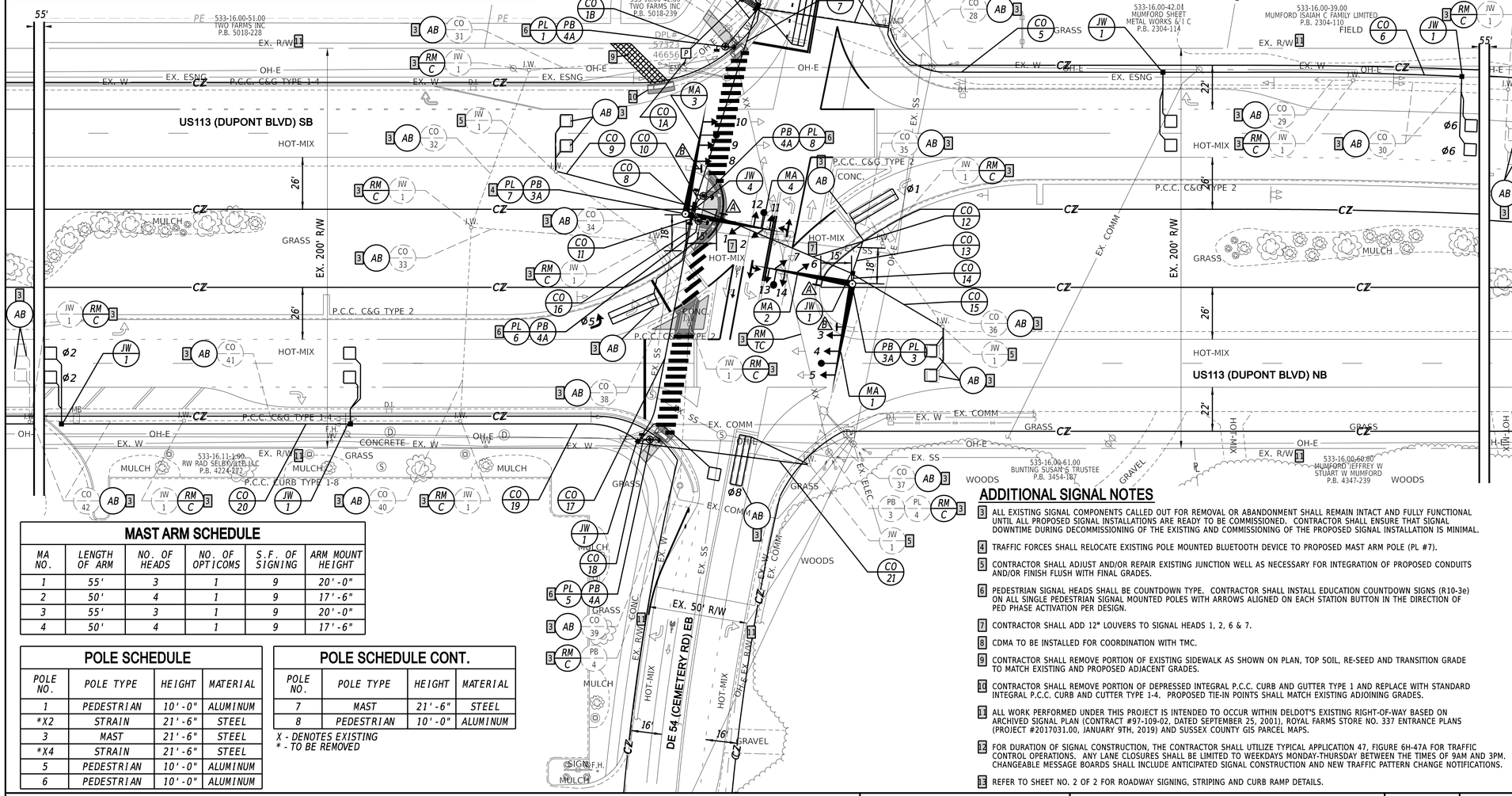
CONDUIT RUN SCHEDULE

CR NO.	NO. OF CONDUITS	SIZE (TYPE)	LENGTH (B/T/O/P)	AMOUNT AND TYPE OF CABLE / WIRE
1A	1	2"(GALV)	10'30'(T/P)	NEW (3)#8 THHN SC - LINE SIDE
1B	1	2"(GALV)	40'(T)	NEW (1)2/#8 U.F.W/GROUND - LOAD SIDE
2	4	4"(PVC)	10'(T)	NEW (2)16/#14 (2)9/#14 (4)5/#14 (4)4/#18 (18)2/#14 (3)#6 SC
3	1	3"(PVC)	25'(T)	NEW (1)5/#14 (1)#6 SC
4	1	4"(HDPE)	70'(B)	NEW (5)2/#14 (1)#6 SC
5	1	4"(PVC)	150'(T)	NEW (4)2/#14 (1)#6 SC
6	1	4"(PVC)	150'(T)	NEW (2)2/#14 (1)#6 SC
7	1	4"(HDPE)	105'(B)	NEW (2)16/#14 (2)9/#14 (3)5/#14 (4)4/#18 (12)2/#14 (1)#6 SC
8	1	3"(PVC)	5'(T)	NEW (1)16/#14 (1)9/#14 (2)4/#18 (1)#6 SC
9	1	4"(PVC)	70'(T)	NEW (2)2/#14 (1)#6 SC
10	1	3"(PVC)	5'(T)	NEW (1)5/#14 (1)#6 SC
11	1	3"(PVC)	5'(T)	NEW (1)5/#14 (1)#6 SC
12	1	4"(HDPE)	90'(B)	NEW (1)16/#14 (1)9/#14 (2)4/#18 (1)#6 SC
13	1	1.5"(GALV)	20'(T)	NEW (2)1/#14
14	1	3"(PVC)	5'(T)	NEW (1)16/#14 (1)9/#14 (2)4/#18 (1)#6 SC
15	1	4"(PVC)	50'(T)	NEW (2)2/#14 (1)#6 SC
16	1	1.5"(GALV)	20'(T)	NEW (2)1/#14
17	1	4"(HDPE)	120'(B)	NEW (1)5/#14 (6)2/#14 (1)#6 SC
18	1	3"(PVC)	5'(T)	NEW (1)5/#14 (1)#6 SC
19	1	4"(PVC)	145'(T)	NEW (4)2/#14 (1)#6 SC
20	1	4"(PVC)	145'(T)	NEW (2)2/#14 (1)#6 SC
21	1	4"(HDPE)	90'(B)	NEW (1)2/#14 (1)#6 SC
X22	1	1.5"	50'	REMOVE (1)2/#8 U.F.W/GRND - ABANDON CONDUIT

PROPOSED OVERHEAD SIGNING

A — D3-1 72" X 18" (HWY C-U8", L6") — 113 Dupont Blvd

B — D3-1 72" X 18" (HWY C-U8", L6") — 54 Cemetery Rd



MAST ARM SCHEDULE

MA NO.	LENGTH OF ARM	NO. OF HEADS	NO. OF OPTICOMS	S.F. OF SIGNING	ARM MOUNT HEIGHT
1	55'	3	1	9	20'-0"
2	50'	4	1	9	17'-6"
3	55'	3	1	9	20'-0"
4	50'	4	1	9	17'-6"

POLE SCHEDULE

POLE NO.	POLE TYPE	HEIGHT	MATERIAL
1	PEDESTRIAN	10'-0"	ALUMINUM
*X2	STRAIN	21'-6"	STEEL
3	MAST	21'-6"	STEEL
*X4	STRAIN	21'-6"	STEEL
5	PEDESTRIAN	10'-0"	ALUMINUM
6	PEDESTRIAN	10'-0"	ALUMINUM

POLE SCHEDULE CONT.

POLE NO.	POLE TYPE	HEIGHT	MATERIAL
7	MAST	21'-6"	STEEL
8	PEDESTRIAN	10'-0"	ALUMINUM

X - DENOTES EXISTING
* - TO BE REMOVED

CONDUIT RUN SCHEDULE CONTINUED

CR NO.	NO. OF CONDUITS	SIZE (TYPE)	LENGTH (B/T/O/P)	AMOUNT AND TYPE OF CABLE / WIRE
X23	2	2.5"	6'	REMOVE [(1)16/#14 (1)4/#14 (14)4/#18] - ABANDON CONDUIT
X24	1	2.5"	18'	REMOVE [(1)16/#14 (1)4/#14 (3)4/#18 - ABANDON CONDUIT
X25	1	2.5"	68'	REMOVE (2)4/#18 - ABANDON CONDUIT
X26	1	2.5"	6'	EMPTY - ABANDON CONDUIT
X27	1	1.5"	-	REMOVE (2)4/#18 - ABANDON CONDUIT
X28	1	2.5"	300'	REMOVE (2)4/#18 - ABANDON CONDUIT
X29	1	1.5"	-	REMOVE (2)4/#18 - ABANDON CONDUIT
X30	1	1.5"	132'	REMOVE (1)4/#18 - ABANDON CONDUIT
X31	1	1.5"	125'	REMOVE (7)4/#18 - ABANDON CONDUIT
X32	1	2.5"	84'	REMOVE (7)4/#18 - ABANDON CONDUIT
X33	1	1.5"	91'	REMOVE (5)4/#18 - ABANDON CONDUIT
X34	1	2.5"	60'	REMOVE (1)4/#18 - ABANDON CONDUIT
X35	1	2.5"	120'	REMOVE (3)4/#18 - ABANDON CONDUIT
X36	1	2.5"	50'	REMOVE (1)4/#18 - ABANDON CONDUIT
X37	1	2.5"	117'	REMOVE (1)4/#18 - ABANDON CONDUIT
X38	1	2.5"	45'	EMPTY - ABANDON CONDUIT
X39	1	2.5"	80'	EMPTY - ABANDON CONDUIT
X40	1	2.5"	97'	REMOVE (2)4/#18 - ABANDON CONDUIT
X41	1	1.5"	138'	REMOVE (2)4/#18 - ABANDON CONDUIT
X42	1	1.5"	129'	REMOVE (1)4/#18 - ABANDON CONDUIT

LEGEND
X- DENOTES EXISTING
SC- STRANDED COPPER
HR- HOME RUN

B- BORE
T- TRENCH
O- OPEN CUT
R- ATTACH TO POLE

ADDITIONAL SIGNAL NOTES

3 ALL EXISTING SIGNAL COMPONENTS CALLED OUT FOR REMOVAL OR ABANDONMENT SHALL REMAIN INTACT AND FULLY FUNCTIONAL UNTIL ALL PROPOSED SIGNAL INSTALLATIONS ARE READY TO BE COMMISSIONED. CONTRACTOR SHALL ENSURE THAT SIGNAL DOWNTIME DURING DECOMMISSIONING OF THE EXISTING AND COMMISSIONING OF THE PROPOSED SIGNAL INSTALLATION IS MINIMAL.

4 TRAFFIC FORCES SHALL RELOCATE EXISTING POLE MOUNTED BLUETOOTH DEVICE TO PROPOSED MAST ARM POLE (PL #7).

5 CONTRACTOR SHALL ADJUST AND/OR REPAIR EXISTING JUNCTION WELL AS NECESSARY FOR INTEGRATION OF PROPOSED CONDUITS AND/OR FINISH FLUSH WITH FINAL GRADES.

6 PEDESTRIAN SIGNAL HEADS SHALL BE COUNTDOWN TYPE. CONTRACTOR SHALL INSTALL EDUCATION COUNTDOWN SIGNS (R10-3e) ON ALL SINGLE PEDESTRIAN SIGNAL MOUNTED POLES WITH ARROWS ALIGNED ON EACH STATION BUTTON IN THE DIRECTION OF PED PHASE ACTIVATION PER DESIGN.

7 CONTRACTOR SHALL ADD 12" LOUVERS TO SIGNAL HEADS 1, 2, 6 & 7.

8 CDMA TO BE INSTALLED FOR COORDINATION WITH TMC.

9 CONTRACTOR SHALL REMOVE PORTION OF EXISTING SIDEWALK AS SHOWN ON PLAN, TOP SOIL, RE-SEED AND TRANSITION GRADE TO MATCH EXISTING AND PROPOSED ADJACENT GRADES.

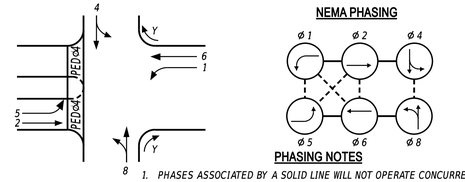
10 CONTRACTOR SHALL REMOVE PORTION OF DEPRESSED INTEGRAL P.C.C. CURB AND GUTTER TYPE 1 AND REPLACE WITH STANDARD INTEGRAL P.C.C. CURB AND CUTTER TYPE 1-4. PROPOSED TIE-IN POINTS SHALL MATCH EXISTING ADJOINING GRADES.

11 ALL WORK PERFORMED UNDER THIS PROJECT IS INTENDED TO OCCUR WITHIN DELDOT'S EXISTING RIGHT-OF-WAY BASED ON ARCHIVED SIGNAL PLAN (CONTRACT #97-109-02, DATED SEPTEMBER 25, 2001), ROYAL FARMS STORE NO. 337 ENTRANCE PLANS (PROJECT #2017031.00, JANUARY 9TH, 2019) AND SUSSEX COUNTY GIS PARCEL MAPS.

12 FOR DURATION OF SIGNAL CONSTRUCTION, THE CONTRACTOR SHALL UTILIZE TYPICAL APPLICATION 47, FIGURE 6H-47A FOR TRAFFIC CONTROL OPERATIONS. ANY LANE CLOSURES SHALL BE LIMITED TO WEEKDAYS MONDAY-THURSDAY BETWEEN THE TIMES OF 9AM AND 3PM. CHANGEABLE MESSAGE BOARDS SHALL INCLUDE ANTICIPATED SIGNAL CONSTRUCTION AND NEW TRAFFIC PATTERN CHANGE NOTIFICATIONS.

13 REFER TO SHEET NO. 2 OF 2 FOR ROADWAY SIGNING, STRIPING AND CURB RAMP DETAILS.

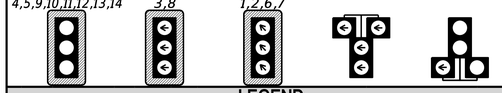
SIGNAL PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

AB	ABANDON	OH #	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH #	PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (# OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (# OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY	R/W	R/W
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
CCTV CAMERA		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION (FISH EYE)		
VIDEO DETECTION ZONE		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.

PREPARED BY

CENTURY ENGINEERING
550 BAY ROAD
DOVER, DELAWARE 19901
(302) 734-9188

08/13/2020
DATE

THIS SEAL APPLIES TO THIS SHEET ONLY.

BRET P. MARTINE — REGISTERED — No. 11947 — DELAWARE — PROFESSIONAL ENGINEER

SEAL

CONCURRENCE FOR INSTALLATION

CHIEF TRAFFIC ENGINEER

8/14/2020
DATE

ADDENDA / REVISIONS

SCALE 0 30 60 90 FEET

SIGNAL RE-BUILD PROGRAM

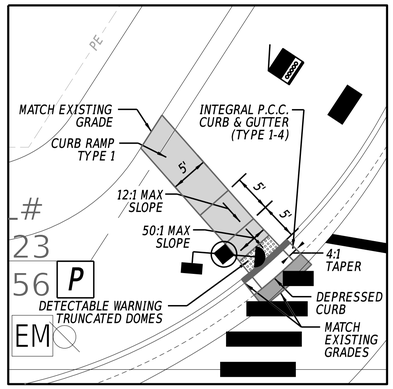
CONTRACT	T202104001
COUNTY	SUSSEX

PERMIT NO.	S160
DESIGNED BY:	MKUBOVCIK
CHECKED BY:	B. MARTINE

SIGNAL PLAN US113 (DUPONT BLVD) @ DE 54 (CEMETERY RD)

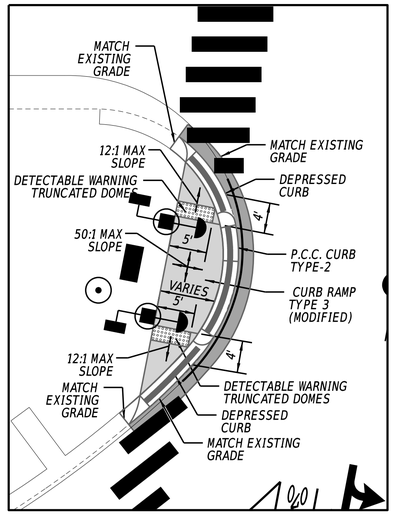
SECTION	TRAFFIC
SHEET NO.	1 OF 2

LAST REVISED: 9/11/2018
PLOT DATE: 8/12-2020
11:19 AM
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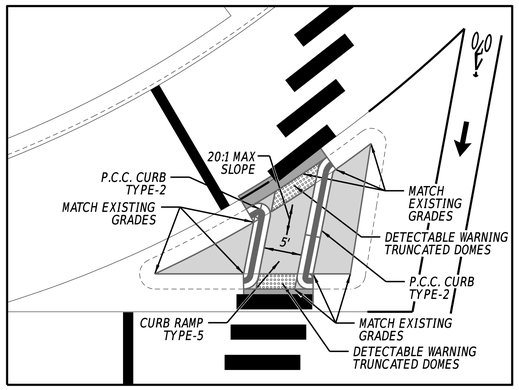
SW CORNER CURB RAMP DETAIL

SCALE: 1"=10'



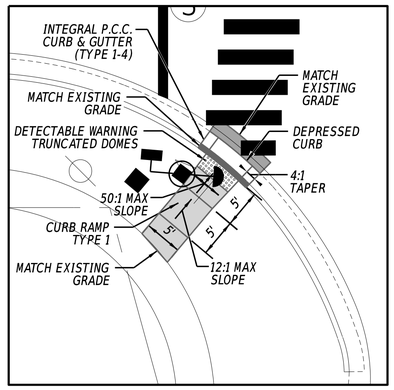
MEDIAN CURB RAMP DETAIL

SCALE: 1"=10'



ISLAND CURB RAMP DETAIL

SCALE: 1"=10'

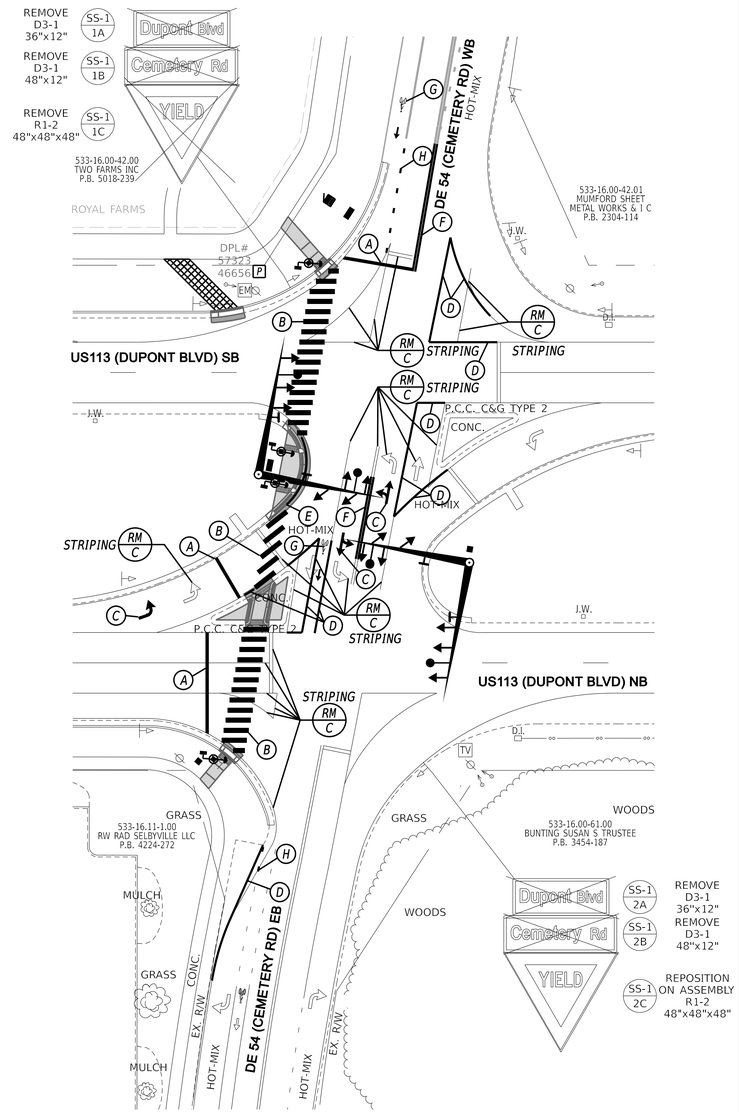


SE CORNER CURB RAMP DETAIL

SCALE: 1"=10'

PAVEMENT MARKINGS LEGEND

SYM	ITEM	QUANTITY
A	ALKYD-THERMOPLASTIC PAVEMENT STRIPING, WHITE 16" SOLID (ITEM 817002)	120 SF
B	ALKYD-THERMOPLASTIC PAVEMENT STRIPING, WHITE 24" SOLID (ITEM 817002)	660 SF
C	ALKYD-THERMOPLASTIC PAVEMENT STRIPING, WHITE SYMBOL/LEGEND, (ITEM 817002)	60 SF
D	EPOXY RESIN PAINT PAVEMENT STRIPING, WHITE 5" SOLID (ITEM 817013)	360 LF
E	EPOXY RESIN PAINT PAVEMENT STRIPING, YELLOW 5" SOLID (ITEM 817013)	30 LF
F	EPOXY RESIN PAINT PAVEMENT STRIPING, YELLOW 5" SOLID DOUBLE LINE (ITEM 817013)	170 LF
G	PREFORMED THERMOPLASTIC PAVEMENT MARKING WHITE, BIKE SYMBOL (ITEM 817015)	2 EA
H	EPOXY RESIN PAINT PAVEMENT STRIPING, WHITE 5" DOTTED - 2' LINE & 6' GAP (ITEM 817013)	16 LF



SIGNAL PHASING

SIGNAL HEAD DIAGRAM

LEGEND

AB	ABANDON	OH/#	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA/X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH/#	PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA/X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB/X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO/#	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PB/X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO/#	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PL/X	EXISTING POLE IDENTIFIER (# OF POLE)
JW/X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL/X	PROPOSED POLE IDENTIFIER (# OF POLE)
JW/X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM/C	REMOVE BY CONTRACTOR
MA/XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM/O	REMOVE BY OTHERS
MA/XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM/TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
CCTV CAMERA		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION (FISH EYE)		
VIDEO DETECTION ZONE		

GENERAL SIGNAL NOTES

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PREPARED BY

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550 BAY ROAD
DOVER, DELAWARE 19901
(302) 734-9188

BRET A. MARTINE — No. 11947 — DELAWARE — PROFESSIONAL ENGINEER

B. Martine 08/13/2020

THIS SEAL APPLIES TO THIS SHEET ONLY. DATE

SEAL

CONCURRENCE FOR INSTALLATION

CHIEF TRAFFIC ENGINEER DATE

ADDENDA / REVISIONS

SCALE 0 30 60 90 FEET

SIGNAL RE-BUILD PROGRAM

CONTRACT	PERMIT NO.	S160
T202104001	DESIGNED BY:	MKUBOVCIK
COUNTY	CHECKED BY:	B. MARTINE
SUSSEX		

SIGNING, STRIPING AND CURB RAMP DETAILS US113 (DUPONT BLVD) @ DE 54 (CEMETERY RD)

SECTION: TRAFFIC
SHEET NO.: 2 OF 2

LAST REVISED: 9/11/2018
2018-JUL-2020
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G:\Projects\185033.00 TRAFFIC - 1883 - 21\185033.02 Trfc Signal Designs\CADD FILES\Sheets\ssg_S160_US113 and DE54_2 of 2.dgn

CONDUIT RUN SCHEDULE

CO NO.	NO. OF CONDUITS	SIZE/TYPE	LENGTH	INSTALL METHOD	AMOUNT AND TYPE OF CABLE / WIRE
1	N/A	N/A	65 FT	DIRECT BURY	UNDERGROUND SERVICE ENTRY CABLE TO BE INSTALLED BY DEC
2	1	2"-GALV	2 FT	T	(1) 2/#8 U.F.W/GROUND
	1	2"-GALV	4 FT	T	(1) 2/#8 U.F.W/GROUND
4	4	4"-PVC	2 FT	T	(5)9/#14,(4)4/#18,(4)5/#14,(10)2/#14,(4)1/#6 GRD Coax Camera cable
5	1	4"-PVC	18 FT	T	(3)9/#14, (2)4/#18, (1)1/#6 GRD, (5)2/#14, (1)5/#14, (1)1/#6 GRD, Coax Camera cable
	1	3"-PVC	5 FT	T	(2)9/#14, (2) 4/#18, (1)1/#6 GRD, Coax Camera cable
7	1	2.5"-PVC	8 FT	T	(1)5/#14, (1)1/#6 GRD
8	1	4"-HDPE	99 FT	B	(1)9/#14, (1)2/#14, (1)1/#6 GRD
9	1	3"-PVC	6 FT	T	(1)9/#14, (1)4/#18, (1)1/#6 GRD
10	1	4"-HDPE	105 FT	B	(1)9/#14, (1)4/#18, (1)1/#6 GRD
11	1	3"-PVC	4 FT	T	(1)9/#14, (1)4/#18, (1)1/#6 GRD
12	1	4"-HDPE	37 FT	B	(2)9/#14, (2)4/#18, (1)1/#6 GRD
13	1	2.5"-PVC	11 FT	T	(1)5/#14, (1)1/#6 GRD
14	1	4"-HDPE	54 FT	B	(2)9/#14, (2)4/#18, (1)5/#14, (3)2/#14, 1/#6 GRD
15	1	2.5"-PVC	13 FT	T	(2)5/#14, (1)1/#6 GRD
16	1	4"-HDPE	39 FT	B	(2)9/#14, (2)4/#18, (3)5/#14, (4) 2/#14, 1/#6 GRD
17	1	4"-PVC	170 FT	T	(1)2/#14, (1)1/#6 GRD
18	1	4"-HDPE	104 FT	B	(2)9/#14, (2)4/#18, (3)5/#14, (5)2/#14, (1)1/#6 GRD
19	1	4"-PVC	167 FT	T	(1)9/#14, (1)2/#14, (1)1/#6 GRD

TYPES: HDPE, PVC, RGS. INSTALL METHODS: B=BORE, IB=IN BARRIER, OC=OPEN CUT, OS=ON STRUCTURE, T=TRENCH

SIGNAL POLE SCHEDULE

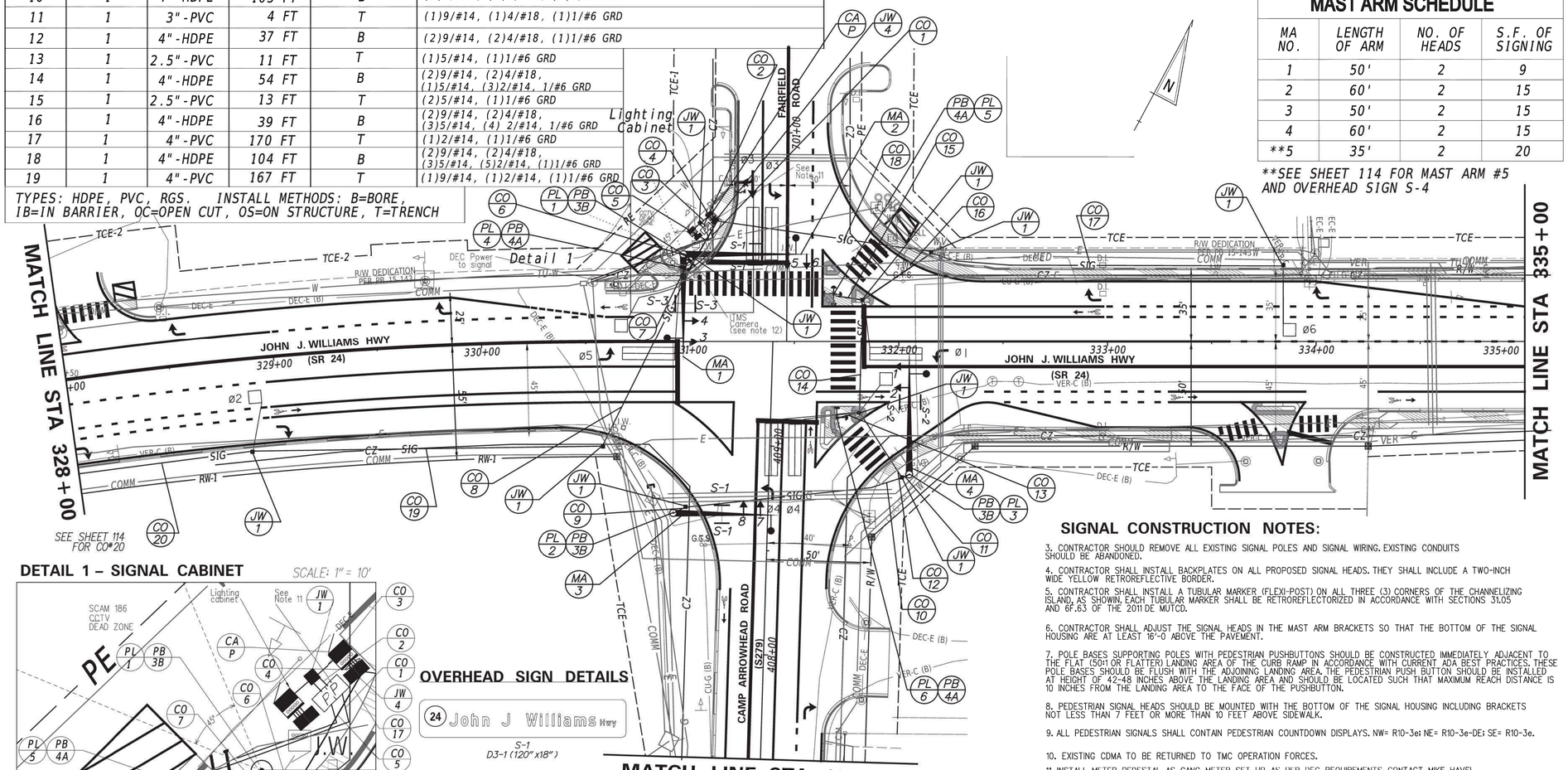
NO.	TYPE	HEIGHT	MATERIAL	STATION	OFFSET
1	MAST ARM W/TYPE 3B POLE BASE	21.5	STEEL	330+96.80	41.80' LT
2	MAST ARM W/TYPE 3B POLE BASE	21.5	STEEL	330+91.90	82.15' RT
3	MAST ARM W/TYPE 3B POLE BASE	21.5	STEEL	332+04.90	63.50' RT
4	PEDESTAL/TYPE 4A POLE BASE	10'	ALUMINIUM	330+95.20	36.40' LT
5	PEDESTAL/TYPE 4A POLE BASE	10'	ALUMINIUM	331+68.90	23.10' LT
6	PEDESTAL/TYPE 4A POLE BASE	10'	ALUMINIUM	331+70.40	36.40' RT
**7	MAST ARM W/TYPE 3A POLE BASE	21.5'	STEEL	320+52.14	42.82' RT

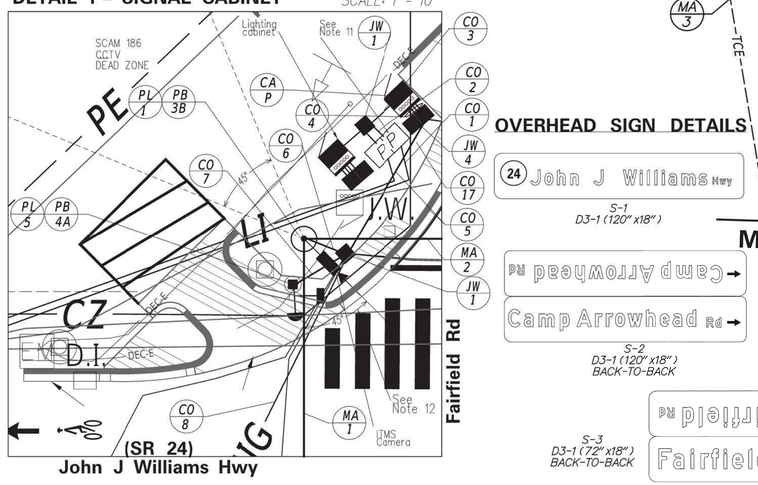
**SEE SHEET 114 FOR POLE #7

MAST ARM SCHEDULE

MA NO.	LENGTH OF ARM	NO. OF HEADS	S.F. OF SIGNING
1	50'	2	9
2	60'	2	15
3	50'	2	15
4	60'	2	15
**5	35'	2	20

**SEE SHEET 114 FOR MAST ARM #5 AND OVERHEAD SIGN S-4

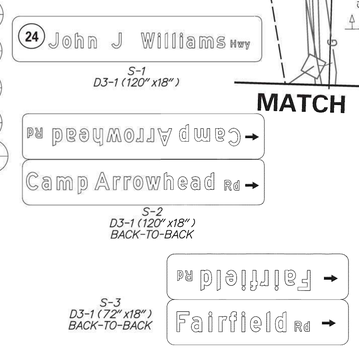




DETAIL 1 – SIGNAL CABINET

SCALE: 1" = 10'

OVERHEAD SIGN DETAILS



SIGNAL CONSTRUCTION NOTES:

3. CONTRACTOR SHOULD REMOVE ALL EXISTING SIGNAL POLES AND SIGNAL WIRING. EXISTING CONDUITS SHOULD BE ABANDONED.

4. CONTRACTOR SHALL INSTALL BACKPLATES ON ALL PROPOSED SIGNAL HEADS. THEY SHALL INCLUDE A TWO-INCH WIDE YELLOW RETROREFLECTIVE BORDER.

5. CONTRACTOR SHALL INSTALL A TUBULAR MARKER (FLEXI-POST) ON ALL THREE (3) CORNERS OF THE CHANNELIZING ISLAND, AS SHOWN. EACH TUBULAR MARKER SHALL BE RETROREFLECTORIZED IN ACCORDANCE WITH SECTIONS 31.05 AND 6F.63 OF THE 2011 DE MUTCD.

6. CONTRACTOR SHALL ADJUST THE SIGNAL HEADS IN THE MAST ARM BRACKETS SO THAT THE BOTTOM OF THE SIGNAL HOUSING ARE AT LEAST 16'-0 ABOVE THE PAVEMENT.

7. POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHOULD BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (50H OR FLATTER) LANDING AREA OF THE CURB RAMP IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THESE POLE BASES SHOULD BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSH BUTTON SHOULD BE INSTALLED AT HEIGHT OF 42-48 INCHES ABOVE THE LANDING AREA AND SHOULD BE LOCATED SUCH THAT MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON.

8. PEDESTRIAN SIGNAL HEADS SHOULD BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK.

9. ALL PEDESTRIAN SIGNALS SHALL CONTAIN PEDESTRIAN COUNTDOWN DISPLAYS. NW= R10-3e; NE= R10-3e-DE; SE= R10-3e.

10. EXISTING CDMA TO BE RETURNED TO TMC OPERATION FORCES.

11. INSTALL METER PEDESTAL AS GANG METER SET UP AS PER DEC REQUIREMENTS, CONTACT MIKE HAVEL OFFICE 302-760-2365, OR WILLIAM NEWCOMB WITH ANY QUESTIONS: OFFICE 302-760-2365, CELL: 302-233-4743.

12. ITMS CAMERA TO BE INSTALLED AT 45 DEGREE COUNTERCLOCKWISE ANGLE FROM THE PERPENDICULAR TO SR 24 CONSTRUCTION BASE LINE.

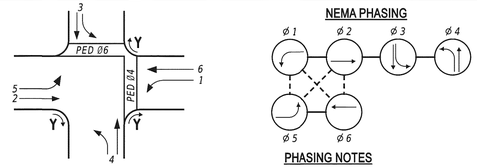
MOT NOTES:

13. FISHEYE DETECTION TO BE INSTALLED PRIOR TO DISCONNECTION OF EXISTING LOOP DETECTION ON ANY APPROACH. FISHEYE SHALL BE PLACED ON THE (MAST ARM/SPAN POLE/WOOD POLE) TO ACHIEVE OPTIMUM DETECTION PER MANUFACTURERS SPECIFICATION. THE DESIRED DETECTION ZONES SHALL BE SET AND APPROVED BY DELDOT TRAFFIC FORCED. CONTRACTOR SHALL NOTIFY DELDOT SIGNAL CONSTRUCTION FORCES (10) TEN DAYSPRIOR TO NEEDED WORK.

14. DELDOT TRAFFIC FORCES TO PERFORM ANY NEED ADJUSTMENT OF FISHEYE DETECTION EQUIPMENT TO ACCOMMODATE REQUIRED CONSTRUCTION PHASES. THE CONTRACTOR SHALL CONTACT THE SIGNAL CONSTRUCTION MANAGER MIKE HAVEL AT 302-760-2565 A MINIMUM OF 10 DAYS PRIOR TO ANY REQUIRED TRAFFIC SWITCH AND/OR SIGNAL CONSTRUCTION EFFORTS.

15. DELDOT ITS TO INSTALL CDMA WIRELESS COMMUNICATION WITHIN THE SIGNAL CABINET TO PROVIDE COMMUNICATION TO THE TMC.

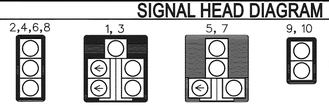
SIGNAL PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

AB	ABANDON	OH #	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH #	PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (# OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (# OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL		P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
CCTV CAMERA		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.

2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.

PREPARED BY
DELDOT - TRANSPORTATION SOLUTIONS
TRAFFIC DESIGN

Nii-Atswei Tetteh — 09/29/2021 (DATE)

THIS SEAL APPLIES TO ALL SHEETS BEARING THE "TD" SECTION DESIGNATION.

NII-ATSWEI TETTEH — LICENSE — No. 14933 — DELAWARE PROFESSIONAL ENGINEER (SEAL)

CONCURRENCE FOR INSTALLATION

Chief of Traffic Engineering — 9/30/2021 (DATE)

ADDENDA / REVISIONS

SCALE: 0 30 60 90 FEET

HSIP SC, SR24 AT CAMP ARROW HEAD ROAD AND SR24 AT ANGOLA ROAD

CONTRACT	T201200902	PERMIT NO.	S213
COUNTY	SUSSEX	DESIGNED BY:	B. CUEVAS
		CHECKED BY:	N. TETTEH

SIGNAL PLAN
SR24 @ CAMP ARROWHEAD RD /FAIRFIELD RD

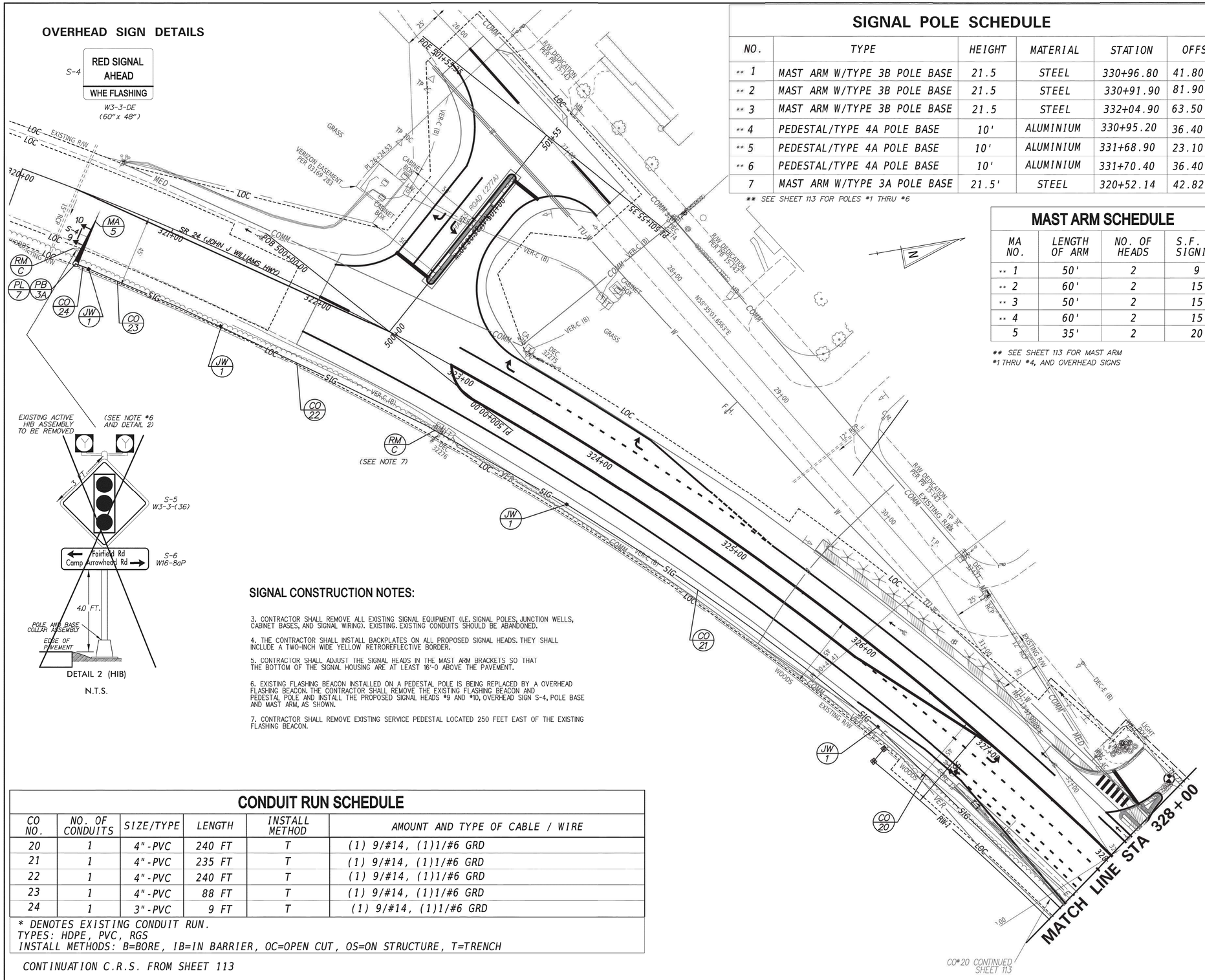
SECTION: TD
SHEET NO.: 113

LAST REVISED: 9/11/2018
29-SEP-2021
15:50
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OVERHEAD SIGN DETAILS

DETAIL 2 (HIB)

N.T.S.



SIGNAL CONSTRUCTION NOTES:

3. CONTRACTOR SHALL REMOVE ALL EXISTING SIGNAL EQUIPMENT (I.E. SIGNAL POLES, JUNCTION WELLS, CABINET BASES, AND SIGNAL WIRING). EXISTING CONDUITS SHOULD BE ABANDONED.

4. THE CONTRACTOR SHALL INSTALL BACKPLATES ON ALL PROPOSED SIGNAL HEADS. THEY SHALL INCLUDE A TWO-INCH WIDE YELLOW RETROREFLECTIVE BORDER.

5. CONTRACTOR SHALL ADJUST THE SIGNAL HEADS IN THE MAST ARM BRACKETS SO THAT THE BOTTOM OF THE SIGNAL HOUSING ARE AT LEAST 16'-0 ABOVE THE PAVEMENT.

6. EXISTING FLASHING BEACON INSTALLED ON A PEDESTAL POLE IS BEING REPLACED BY A OVERHEAD FLASHING BEACON. THE CONTRACTOR SHALL REMOVE THE EXISTING FLASHING BEACON AND PEDESTAL POLE AND INSTALL THE PROPOSED SIGNAL HEADS #9 AND #10, OVERHEAD SIGN S-4, POLE BASE AND MAST ARM, AS SHOWN.

7. CONTRACTOR SHALL REMOVE EXISTING SERVICE PEDESTAL LOCATED 250 FEET EAST OF THE EXISTING FLASHING BEACON.

SIGNAL POLE SCHEDULE

NO.	TYPE	HEIGHT	MATERIAL	STATION	OFFSET
** 1	MAST ARM W/TYPE 3B POLE BASE	21.5	STEEL	330+96.80	41.80' LT
** 2	MAST ARM W/TYPE 3B POLE BASE	21.5	STEEL	330+91.90	81.90' LT
** 3	MAST ARM W/TYPE 3B POLE BASE	21.5	STEEL	332+04.90	63.50' RT
** 4	PEDESTAL/TYPE 4A POLE BASE	10'	ALUMINIUM	330+95.20	36.40' LT
** 5	PEDESTAL/TYPE 4A POLE BASE	10'	ALUMINIUM	331+68.90	23.10' LT
** 6	PEDESTAL/TYPE 4A POLE BASE	10'	ALUMINIUM	331+70.40	36.40' RT
7	MAST ARM W/TYPE 3A POLE BASE	21.5'	STEEL	320+52.14	42.82' RT

** SEE SHEET 113 FOR POLES #1 THRU #6

MAST ARM SCHEDULE

MA NO.	LENGTH OF ARM	NO. OF HEADS	S.F. OF SIGNING
** 1	50'	2	9
** 2	60'	2	15
** 3	50'	2	15
** 4	60'	2	15
5	35'	2	20

** SEE SHEET 113 FOR MAST ARM #1 THRU #4, AND OVERHEAD SIGNS

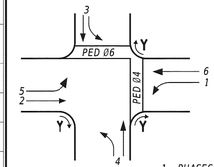
CONDUIT RUN SCHEDULE

CO NO.	NO. OF CONDUITS	SIZE/TYPE	LENGTH	INSTALL METHOD	AMOUNT AND TYPE OF CABLE / WIRE
20	1	4"-PVC	240 FT	T	(1) 9/#14, (1)1/#6 GRD
21	1	4"-PVC	235 FT	T	(1) 9/#14, (1)1/#6 GRD
22	1	4"-PVC	240 FT	T	(1) 9/#14, (1)1/#6 GRD
23	1	4"-PVC	88 FT	T	(1) 9/#14, (1)1/#6 GRD
24	1	3"-PVC	9 FT	T	(1) 9/#14, (1)1/#6 GRD

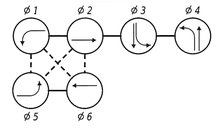
* DENOTES EXISTING CONDUIT RUN.
TYPES: HDPE, PVC, RGS
INSTALL METHODS: B=BORE, IB=IN BARRIER, OC=OPEN CUT, OS=ON STRUCTURE, T=TRENCH

CONTINUATION C.R.S. FROM SHEET 113

SIGNAL PHASING



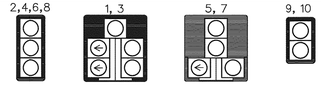
NEMA PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



(SEE NOTE 4)

LEGEND

AB	ABANDON	OH #	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH #	PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (# OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (# OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICRONAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL		P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
CCTV CAMERA		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.

PREPARED BY
DELDOT - TRANSPORTATION SOLUTIONS
TRAFFIC DESIGN

Naa-Atswei Tetteh — 09/29/2021
THIS SEAL APPLIES TO ALL SHEETS BEARING THE "TD" SECTION DESIGNATION. — DATE

NAA-ATSWEI TETTEH LICENSE No. 14933 DELAWARE PROFESSIONAL ENGINEER — SEAL

CONCURRENCE FOR INSTALLATION

CHIEF OF TRAFFIC ENGINEERING — 9/30/2021 DATE

ADDENDA / REVISIONS	

SCALE 0 30 60 90 FEET

HSIP SC, SR24 AT CAMP ARROW HEAD ROAD AND SR24 AT ANGOLA ROAD

CONTRACT	T201200902
COUNTY	SUSSEX
PERMIT NO.	S213
DESIGNED BY:	B. CUEVAS
CHECKED BY:	N. TETTEH

SIGNAL PLAN SR24 @ CAMP ARROWHEAD RD /FAIRFIELD RD

SECTION	TD
SHEET NO.	114

LAST REVISED: 9/11/2018
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CONDUIT RUN SCHEDULE

CO#	# OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/WIRE
1A	1	2"	GALV	10'	T	(3)#6 THHN SC - LINE SIDE
1B	1	2"	GALV	30'	T	(1)2/#8 U.F.W/GROUND - LOAD SIDE
1C	1	2"	GALV	160'	T	(1)2/#8 U.F.W/GROUND - LOAD SIDE
X1D	1	2"	GALV	40'	T	(1)2/#8 U.F.W/GROUND - LOAD SIDE
2	3	3"	PVC	15'	T	(4)9/#14 (4)4/#18 (4)2/#14 (1)#6 SC
3	1	4"	PVC	10'	T	(1)9/#14 (1)4/#18 (1)#6 SC
4	1	4"	PVC	140'	T	(1)2/#14 (1)#6 SC
5	1	4"	PVC	125'	T	(1)2/#14 (1)#6 SC
6	1	4"	PVC	105'	B	(2)9/#14 (2)4/#18 (2)2/#14 (1)#6 SC
7	1	4"	PVC	20'	T	(1)9/#14 (1)4/#18 (1)#6 SC
8	1	4"	PVC	115'	B	(1)9/#14 (1)4/#18 (1)2/#14 (1)#6 SC
9	1	4"	PVC	45'	T	(1)9/#14 (1)4/#18 (1)#6 SC
10	1	4"	PVC	245'	T	(1)2/#14 (1)#6 SC
11	1	4"	PVC	75'	B	(1)9/#14 (1)4/#18 (1)2/#14 (1)#6 SC
12	1	4"	PVC	25'	T	(1)9/#14 (1)4/#18 (1)#6 SC

LEGEND

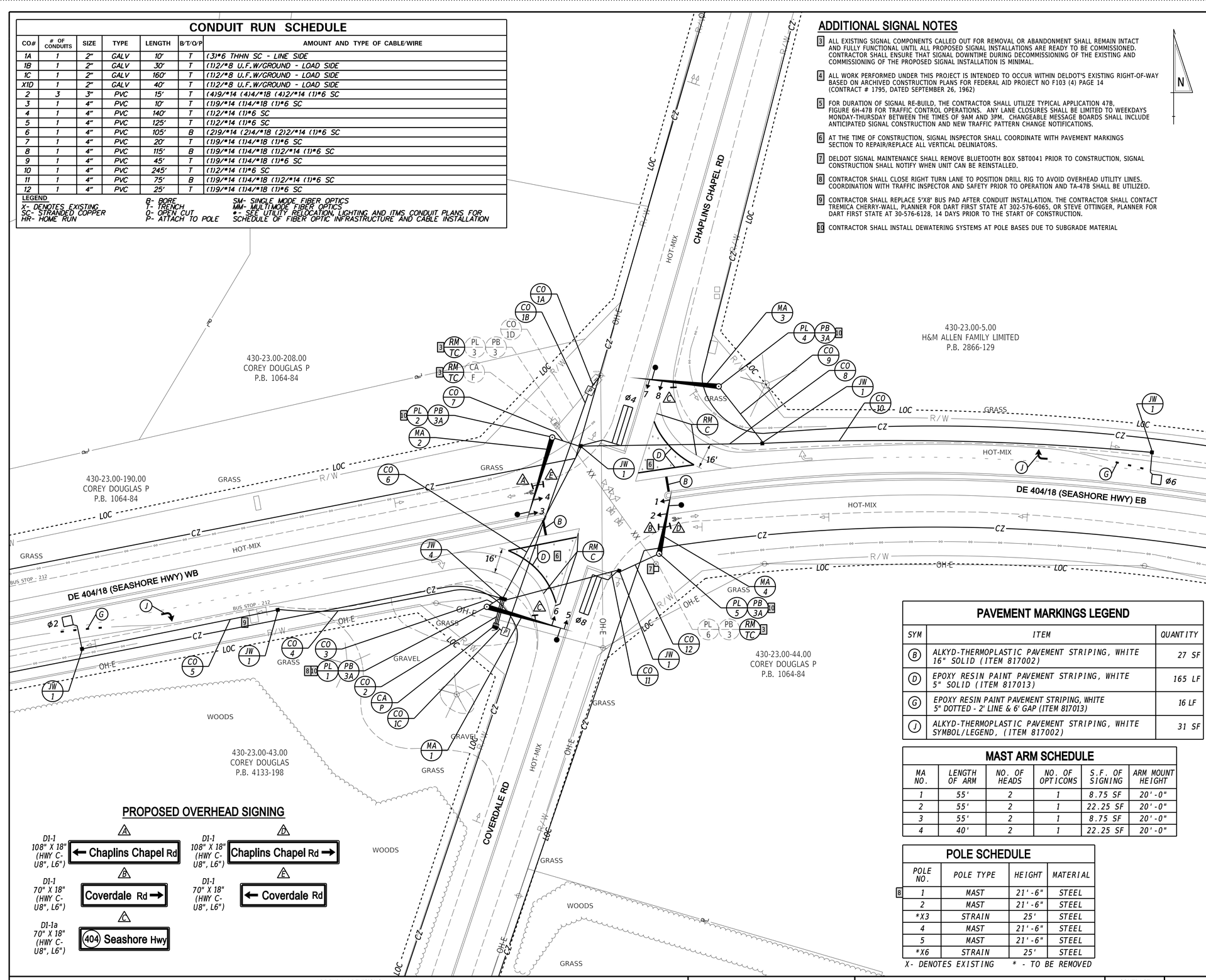
X- DENOTES EXISTING
SC- STRANDED COPPER
HR- HOME RUN

B- BORE
T- TRENCH
O- OPEN CUT
P- ATTACH TO POLE

SM- SINGLE MODE FIBER OPTICS
MM- MULTIMODE FIBER OPTICS
*- SEE UTILITY RELOCATION, LIGHTING, AND ITMS CONDUIT PLANS FOR SCHEDULE OF FIBER OPTIC INFRASTRUCTURE AND CABLE INSTALLATION

ADDITIONAL SIGNAL NOTES

3. ALL EXISTING SIGNAL COMPONENTS CALLED OUT FOR REMOVAL OR ABANDONMENT SHALL REMAIN INTACT AND FULLY FUNCTIONAL UNTIL ALL PROPOSED SIGNAL INSTALLATIONS ARE READY TO BE COMMISSIONED. CONTRACTOR SHALL ENSURE THAT SIGNAL DOWNTIME DURING DECOMMISSIONING OF THE EXISTING AND COMMISSIONING OF THE PROPOSED SIGNAL INSTALLATION IS MINIMAL.
4. ALL WORK PERFORMED UNDER THIS PROJECT IS INTENDED TO OCCUR WITHIN DELDOT'S EXISTING RIGHT-OF-WAY BASED ON ARCHIVED CONSTRUCTION PLANS FOR FEDERAL AID PROJECT NO F103 (4) PAGE 14 (CONTRACT # 1795, DATED SEPTEMBER 26, 1962)
5. FOR DURATION OF SIGNAL RE-BUILD, THE CONTRACTOR SHALL UTILIZE TYPICAL APPLICATION 47B, FIGURE 6H-47B FOR TRAFFIC CONTROL OPERATIONS. ANY LANE CLOSURES SHALL BE LIMITED TO WEEKDAYS MONDAY-THURSDAY BETWEEN THE TIMES OF 9AM AND 3PM. CHANGEABLE MESSAGE BOARDS SHALL INCLUDE ANTICIPATED SIGNAL CONSTRUCTION AND NEW TRAFFIC PATTERN CHANGE NOTIFICATIONS.
6. AT THE TIME OF CONSTRUCTION, SIGNAL INSPECTOR SHALL COORDINATE WITH PAVEMENT MARKINGS SECTION TO REPAIR/REPLACE ALL VERTICAL DELINIATORS.
7. DELDOT SIGNAL MAINTENANCE SHALL REMOVE BLUETOOTH BOX SBT0041 PRIOR TO CONSTRUCTION, SIGNAL CONSTRUCTION SHALL NOTIFY WHEN UNIT CAN BE REINSTALLED.
8. CONTRACTOR SHALL CLOSE RIGHT TURN LANE TO POSITION DRILL RIG TO AVOID OVERHEAD UTILITY LINES. COORDINATION WITH TRAFFIC INSPECTOR AND SAFETY PRIOR TO OPERATION AND TA-47B SHALL BE UTILIZED.
9. CONTRACTOR SHALL REPLACE 5'X8' BUS PAD AFTER CONDUIT INSTALLATION. THE CONTRACTOR SHALL CONTACT TREMICA CHERRY-WALL, PLANNER FOR DART FIRST STATE AT 302-576-6065, OR STEVE OTTINGER, PLANNER FOR DART FIRST STATE AT 30-576-6128, 14 DAYS PRIOR TO THE START OF CONSTRUCTION.
10. CONTRACTOR SHALL INSTALL DEWATERING SYSTEMS AT POLE BASES DUE TO SUBGRADE MATERIAL



PROPOSED OVERHEAD SIGNING

PAVEMENT MARKINGS LEGEND

SYM	ITEM	QUANTITY
B	ALKYD-THERMOPLASTIC PAVEMENT STRIPING, WHITE 16" SOLID (ITEM 817002)	27 SF
D	EPOXY RESIN PAINT PAVEMENT STRIPING, WHITE 5" SOLID (ITEM 817013)	165 LF
G	EPOXY RESIN PAINT PAVEMENT STRIPING, WHITE 5" DOTTED - 2' LINE & 6' GAP (ITEM 817013)	16 LF
J	ALKYD-THERMOPLASTIC PAVEMENT STRIPING, WHITE SYMBOL/LEGEND, (ITEM 817002)	31 SF

MAST ARM SCHEDULE

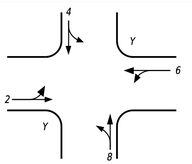
MA NO.	LENGTH OF ARM	NO. OF HEADS	NO. OF OPTICOMS	S.F. OF SIGNING	ARM MOUNT HEIGHT
1	55'	2	1	8.75 SF	20'-0"
2	55'	2	1	22.25 SF	20'-0"
3	55'	2	1	8.75 SF	20'-0"
4	40'	2	1	22.25 SF	20'-0"

POLE SCHEDULE

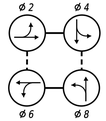
POLE NO.	POLE TYPE	HEIGHT	MATERIAL
1	MAST	21'-6"	STEEL
2	MAST	21'-6"	STEEL
*X3	STRAIN	25'	STEEL
4	MAST	21'-6"	STEEL
5	MAST	21'-6"	STEEL
*X6	STRAIN	25'	STEEL

X- DENOTES EXISTING * - TO BE REMOVED

SIGNAL PHASING



NEMA PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM

1, 2, 3, 4, 5, 6, 7, 8



LEGEND

AB	ABANDON	OH #	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH #	PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (# OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (# OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
CCTV CAMERA		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION (FISH EYE)		
VIDEO DETECTION ZONE		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.

PREPARED BY
CENTURY ENGINEERING

THIS SEAL APPLIES TO THIS SHEET ONLY — DATE: 8/28/2020

BRET A. MARTINE — REGISTERED — No. 11947 — DELAWARE — PROFESSIONAL ENGINEER

SEAL

CONCURRENCE FOR INSTALLATION

CHIEF OF TRAFFIC ENGINEERING — DATE: 8/31/2020

ADDENDA / REVISIONS

SCALE 0 30 60 90 FEET

SIGNAL REBUILD PROGRAM

CONTRACT	PERMIT NO.	S226
T202104001	DESIGNED BY:	B. A. MARTINE
COUNTY	CHECKED BY:	B. MARTINE
SUSSEX		

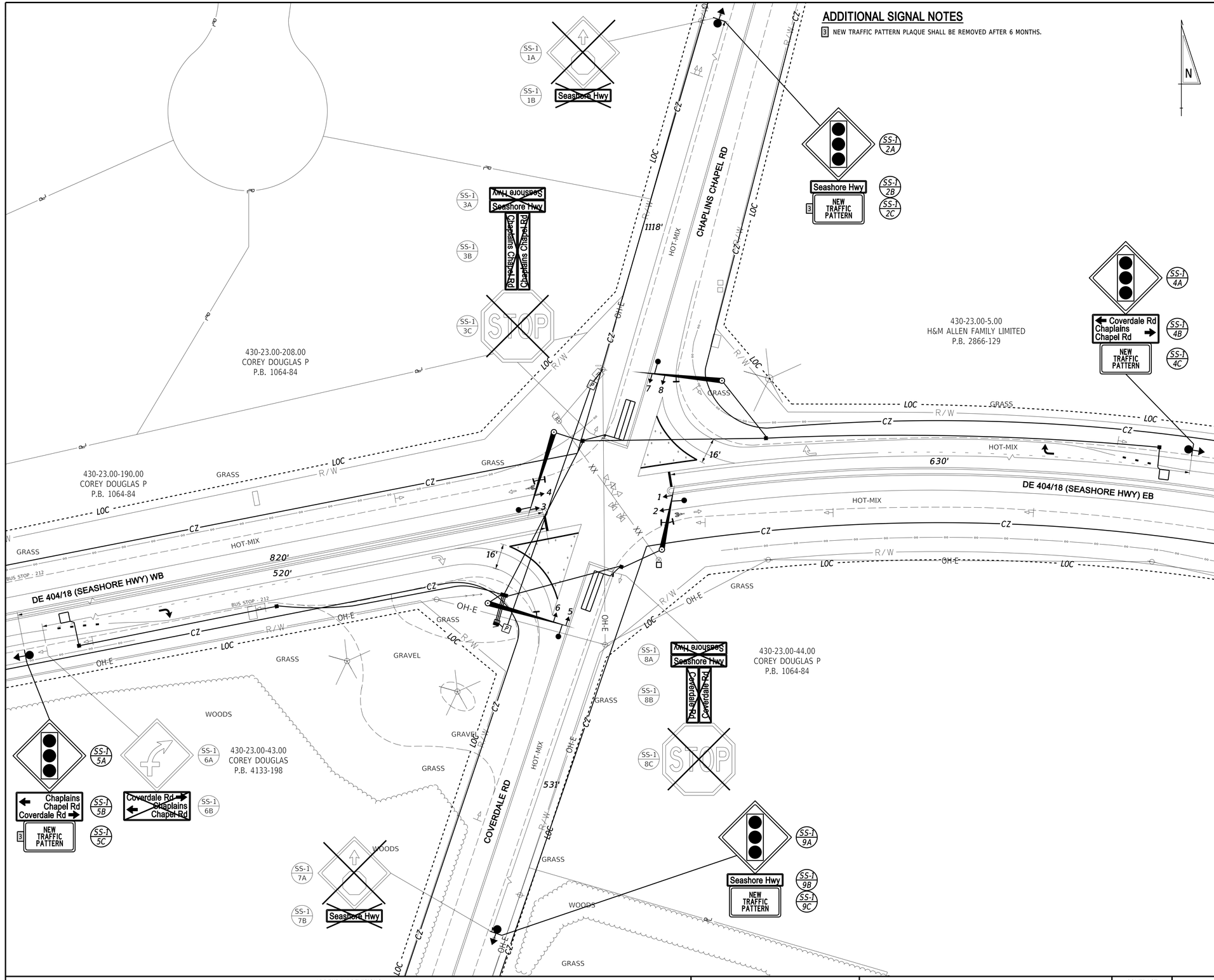
SIGNAL PLAN
DEL. RT. 18 & RD 42 -
COVERDALE CROSSROADS

SECTION: TRAFFIC
SHEET NO.: 1 OF 3

LAST REVISED: 9/11/2018
7:27 AM
13:26
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ADDITIONAL SIGNAL NOTES

3 NEW TRAFFIC PATTERN PLAQUE SHALL BE REMOVED AFTER 6 MONTHS.



SIGNAL PHASING

SIGNAL HEAD DIAGRAM

LEGEND

AB	*ABANDON*	OH #	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	*OH #*	*PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)*
CA X	*PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)*	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	*PB X*	*PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)*
CO #	*PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)*	PL X	EXISTING POLE IDENTIFIER (# OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	*PL X*	*PROPOSED POLE IDENTIFIER (# OF POLE)*
JW X	*PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)*	*RM C*	*REMOVE BY CONTRACTOR*
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	*RM O*	*REMOVE BY OTHERS*
MA XX	*PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)*	*RM TC*	*REMOVE BY TRAFFIC CONTRACTOR*

	EXISTING SYMBOL	*PROPOSED SYMBOL*
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
CCTV CAMERA		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION (FISH EYE)		
VIDEO DETECTION ZONE		

GENERAL SIGNAL NOTES

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PREPARED BY
CENTURY ENGINEERING

THIS SEAL APPLIES TO THIS SHEET ONLY — DATE: 8/28/2020

BRET A. MARTINE — ENGINEERING — No. 11947 — DELAWARE — PROFESSIONAL ENGINEER

SEAL

CONCURRENCE FOR INSTALLATION

CHIEF OF TRAFFIC ENGINEERING — DATE: 8/31/2020

ADDENDA / REVISIONS	SCALE		CONTRACT	PERMIT NO.	S226		SECTION
	0 30 60 90 FEET	SIGNAL REBUILD PROGRAM	T202104001	DESIGNED BY:	B. A. MARTINE	SIGNING PLAN DEL. RT. 18 & RD 42 - COVERDALE CROSSROADS	TRAFFIC
			COUNTY	CHECKED BY:	B. MARTINE		SHEET NO.
			SUSSEX				2 OF 3

LAST REVISED: 9/11/2018
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PERMANENT SIGN SCHEDULE

SHEET NO.	PLAN IDENTIFIER	SIGN DESIGNATION	QTY.	DESCRIPTION	SIGN WIDTH (IN)	SIGN HEIGHT (IN)	SIGN AREA (SF)	ITEM 819018 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE POST (EACH)			ITEM 819019 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS (SF)			POST INSTALLATION TYPE	Code X11 12' Post (W/ Basepost) (EACH)	Code X11A 15' Post (W/ Basepost) (EACH)	ITEM 819016 4" HOLE, 0-6" (EACH)	ITEM 819017 4" HOLE, >6" (EACH)	REMARKS
								SIGN DISPOSITION	REMOVE	INSTALL	SIGN DISPOSITION	REMOVE	INSTALL						
SG-1	A	D1-1	1	DESTINATION (1 Line)	108	18	13.5												"Chaplins Chapel Rd" U8"/L6", Hwy D - Install by TC
SG-1	B	D1-1	1	DESTINATION (1 Line)	70	18	8.8												"Coverdale Rd" U8"/L6", Hwy D - Install by TC
SG-1	C	D1-1	2	DESTINATION (1 Line)	108	18	27.0												"Chaplins Chapel Rd" U8"/L6", Hwy D - Install by TC
SG-1	D	D1-1	1	DESTINATION (1 Line)	70	18	8.8												"Coverdale Rd" U8"/L6", Hwy D - Install by TC
SG-1	E	D1-1a(18-B)	1	DESTINATION (1 Line)	70	18	8.8												"Seashore Hwy" U8"/L6", Hwy D - Install by TC
SS-1	1A	W3-1(36)	1	STOP AHEAD (Symbol) - 36x36	36	36		REMOVE	1										
SS-1	1B	W16-8P	1	ADVANCE STREET NAME (1 - line plaque)	36	9		REMOVE	1										Seashore Hwy
SS-1	2A	W3-3(36)	1	SIGNAL AHEAD (Symbol) - 36x36	36	36	9.0	NEW		1				SOIL	1				
SS-1	2B	W16-8P	1	ADVANCE STREET NAME (1 - line plaque)	36	9	2.3	ADD TO ASSEMBLY		1									"Seashore Hwy" 4", Hwy C Kern26%
SS-1	2C	W23-2P-DE(30)	1	NEW TRAFFIC PATTERN (plaque) - 30x24	30	24	5.0	ADD TO ASSEMBLY		1									
SS-1	3A	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	42	12		REMOVE	2										Seashore Hwy
SS-1	3B	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	48	12		REMOVE	2										Chaplains Chapel Rd
SS-1	3C	R1-1(36)	1	STOP	36	36		REMOVE	1										
SS-1	4A	W3-3(36)	1	SIGNAL AHEAD (Symbol) - 36x36	36	36	9.0	NEW		1				SOIL		1			
SS-1	4B	W16-8aP	1	ADVANCE STREET NAME (3 - line plaque)	42	18	5.3	ADD TO ASSEMBLY		1									<- Coverdale Rd Chaplains -> Chapel Rd 4", Hwy C Kern26%
SS-1	4C	W23-2P-DE(30)	1	NEW TRAFFIC PATTERN (plaque) - 30x24	30	24	5.0	ADD TO ASSEMBLY		1									
SS-1	5A	W3-3(36)	1	SIGNAL AHEAD (Symbol) - 36x36	36	36	9.0	NEW		1				SOIL		1			
SS-1	5B	W16-8aP	1	ADVANCE STREET NAME (3 - line plaque)	42	18	5.3	ADD TO ASSEMBLY		1									<- Chaplains Chapel Rd Coverdale Rd -> 4", Hwy C Kern26%
SS-1	5C	W23-2P-DE(30)	1	NEW TRAFFIC PATTERN (plaque) - 30x24	30	24	5.0	ADD TO ASSEMBLY		1									
SS-1	6A	W1-10a_L(36)	1	COMBINATION HORIZONTAL ALIGNMENT/INTERSECTION (Left) - 36x36	36	36		REMAIN											
SS-1	6B	W16-8aP	1	ADVANCE STREET NAME (3 - line plaque)	42	18		REMOVE	1										Coverdale Rd -> <- Chaplains Chapel Rd
SS-1	7A	W3-1(36)	1	STOP AHEAD (Symbol) - 36x36	36	36		REMOVE	1										
SS-1	7B	W16-8P	1	ADVANCE STREET NAME (1 - line plaque)	36	9		REMOVE	1										Seashore Hwy
SS-1	8A	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	42	12		REMOVE	2										Seashore Hwy
SS-1	8B	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	42	12		REMOVE	2										Coverdale Rd
SS-1	8C	R1-1(36)	1	STOP	36	36		REMOVE	1										
SS-1	9A	W3-3(36)	1	SIGNAL AHEAD (Symbol) - 36x36	36	36	9.0	NEW		1				SOIL	1				
SS-1	9B	W16-8P	1	ADVANCE STREET NAME (1 - line plaque)	36	9	2.3	ADD TO ASSEMBLY		1									"Seashore Hwy" 4", Hwy C Kern26%
SS-1	9C	W23-2P-DE(30)	1	NEW TRAFFIC PATTERN (plaque) - 30x24	30	24	5.0	ADD TO ASSEMBLY		1									
PAGE TOTALS							138		15	12		0	0		2	2	0	0	
JOB TOTALS							138		15	12		0	0		2	2	0	0	

LAST REVISED: 9/11/2018
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ADDENDA / REVISIONS							

SIGNAL REBUILD PROGRAM

CONTRACT	PERMIT NO.	S226
T202004001	DESIGNED BY:	B. A. MARTINE
COUNTY	CHECKED BY:	B. MARTINE
SUSSEX		

PERMANENT SIGN SCHEDULE DEL. RT. 18 & RD 42 - COVERDALE CROSSROADS

SECTION	
TRAFFIC	
SHEET NO.	
3 OF 3	

CONDUIT RUN SCHEDULE

CO#	# OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/ WIRE
1A	1	2.0"	GALV.	5'/40'	T/P	NEW (3)#8 THHN SC - LINE SIDE
1B	1	2.0"	GALV.	15'	T	NEW (1) 2/#8 U.F. W/ GROUND - LOAD SIDE
1C	1	4.0"	HDPE	70'	B	NEW (1) 2/#8 U.F. W/ GROUND - LOAD SIDE
1D	1	2.0"	GALV.	35'	T	NEW (1) 2/#8 U.F. W/ GROUND - LOAD SIDE
1E	1	2.0"	GALV.	15'	T	NEW (1) 2/#8 U.F. W/ GROUND - LOAD SIDE
X1F	1	2.5"	GALV.	6'/40'	-	REMOVE (3)1/#8 - ABANDON CONDUIT
X1G	1	2.5"	GALV.	75'	-	REMOVE (3)1/#8 - ABANDON CONDUIT
X1H	1	2.5"	GALV.	65'	-	REMOVE (3)1/#8 - ABANDON CONDUIT
X1K	2	2.5"	GALV.	5'	-	REMOVE (3)1/#8 (1) 2/#8 U.F. W/ GROUND - AB CONDUIT
X1L	1	2.5"	GALV.	3'	-	REMOVE (1)2/#8 U.F. W/ GROUND NEW (1)2/#8 U.F. W/GROUND - LOAD SIDE
X2	1	2.5"	PVC	3'	-	REMOVE (4)4/#18 NEW [(5)2/#14 (4)5/#14 (1)#6 SC]
X3	1	2.5"	PVC	60'	-	REMOVE (2)4/#18 - ABANDON CONDUIT
X4	1	2.5"	PVC	130'	-	REMOVE (1)4/#18 - ABANDON CONDUIT

EXISTING OVERHEAD SIGNING

A — D3-1 (96"X16") — Savannah Rd

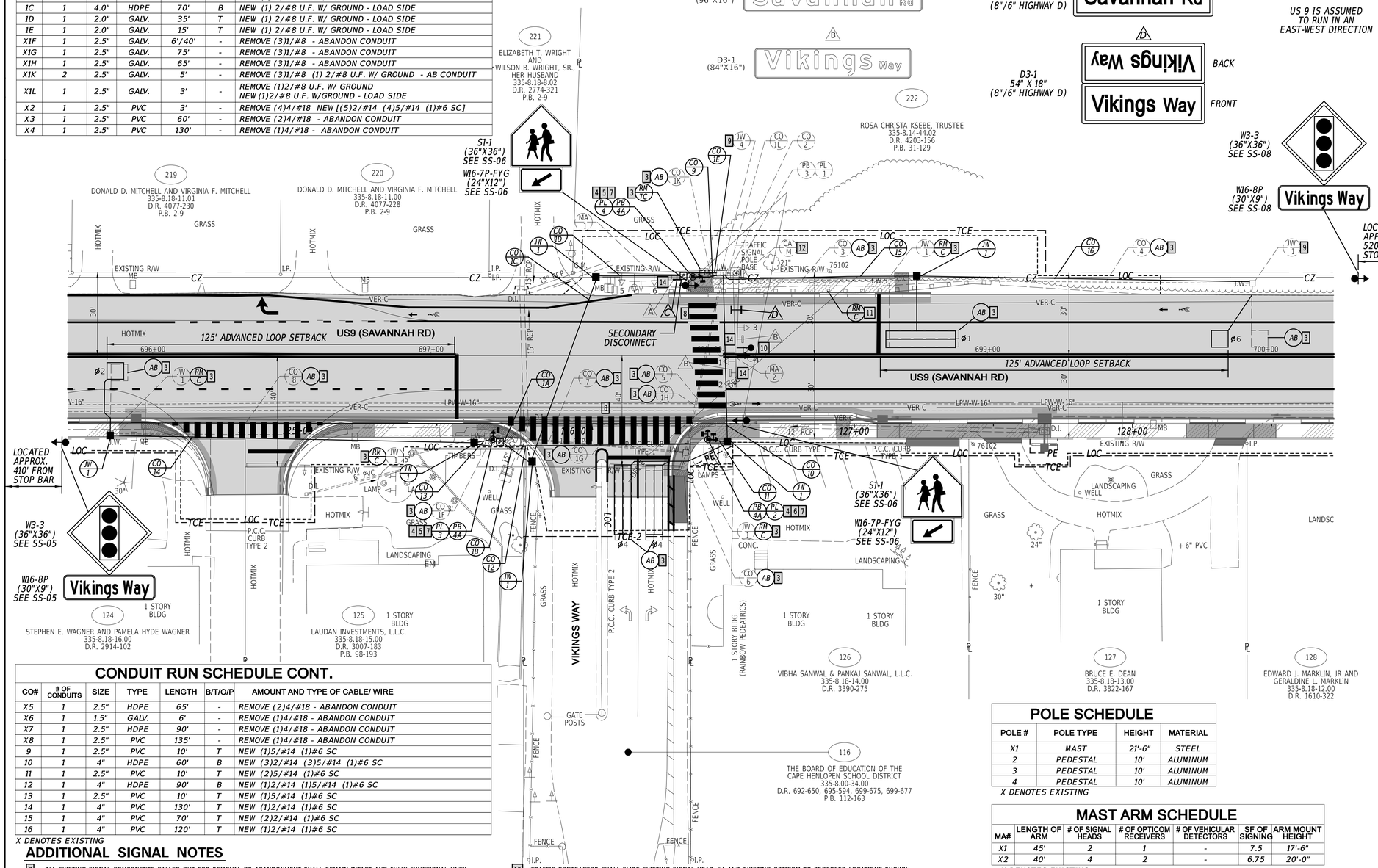
B — D3-1 (84"X16") — Vikings Way

PROPOSED OVERHEAD SIGNING

C — D3-1, 60" X 18" (8"/6" HIGHWAY D) — Savannah Rd

D — D3-1, 54" X 18" (8"/6" HIGHWAY D) — Vikings Way (BACK) / Vikings Way (FRONT)

US 9 IS ASSUMED TO RUN IN AN EAST-WEST DIRECTION



POLE SCHEDULE

POLE #	POLE TYPE	HEIGHT	MATERIAL
X1	MAST	21'-6"	STEEL
2	PEDESTAL	10'	ALUMINUM
3	PEDESTAL	10'	ALUMINUM
4	PEDESTAL	10'	ALUMINUM

X DENOTES EXISTING

MAST ARM SCHEDULE

MA#	LENGTH OF ARM	# OF SIGNAL HEADS	# OF OPTICOM RECEIVERS	# OF VEHICULAR DETECTORS	SF OF SIGNING	ARM MOUNT HEIGHT
X1	45'	2	1	-	7.5	17'-6"
X2	40'	4	2	-	6.75	20'-0"

X DENOTES EXISTING

CONDUIT RUN SCHEDULE CONT.

CO#	# OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/ WIRE
X5	1	2.5"	HDPE	65'	-	REMOVE (2)4/#18 - ABANDON CONDUIT
X6	1	1.5"	GALV.	6'	-	REMOVE (1)4/#18 - ABANDON CONDUIT
X7	1	2.5"	HDPE	90'	-	REMOVE (1)4/#18 - ABANDON CONDUIT
X8	1	2.5"	PVC	135'	-	REMOVE (1)4/#18 - ABANDON CONDUIT
9	1	2.5"	PVC	10'	T	NEW (1)5/#14 (1)#6 SC
10	1	4"	HDPE	60'	B	NEW (3)2/#14 (3)5/#14 (1)#6 SC
11	1	2.5"	PVC	10'	T	NEW (2)5/#14 (1)#6 SC
12	1	4"	HDPE	90'	B	NEW (1)2/#14 (1)5/#14 (1)#6 SC
13	1	2.5"	PVC	10'	T	NEW (1)5/#14 (1)#6 SC
14	1	4"	PVC	130'	T	NEW (1)2/#14 (1)#6 SC
15	1	4"	PVC	70'	T	NEW (2)2/#14 (1)#6 SC
16	1	4"	PVC	120'	T	NEW (1)2/#14 (1)#6 SC

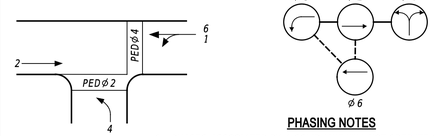
X DENOTES EXISTING

ADDITIONAL SIGNAL NOTES

3. ALL EXISTING SIGNAL COMPONENTS CALLED OUT FOR REMOVAL OR ABANDONMENT SHALL REMAIN INTACT AND FULLY FUNCTIONAL UNTIL ALL PROPOSED SIGNAL INSTALLATIONS ARE READY TO BE COMMISSIONED. CONTRACTOR SHALL ENSURE THAT SIGNAL DOWNTIME DURING DECOMMISSIONING OF THE EXISTING AND COMMISSIONING OF THE PROPOSED SIGNAL INSTALLATION IS MINIMAL.
4. PEDESTRIAN SIGNAL HEADS SHALL BE OF COUNT-DOWN TYPE AND PEDESTRIAN PUSHBUTTONS SHALL BE OF NON-LATCHING TYPE.
5. TRAFFIC CONTRACTOR SHALL INSTALL EDUCATION COUNTDOWN PEDESTRIAN SIGN (R10-3e) ON ALL SINGLE PEDESTRIAN SIGNAL MOUNTED POLES PER DESIGN.
6. TRAFFIC CONTRACTOR SHALL INSTALL EDUCATION COUNTDOWN PEDESTRIAN SIGNS (R10-3e-DE) ON ALL DOUBLE PEDESTRIAN SIGNAL MOUNTED POLES WITH ARROWS ALIGNED ON STATION BUTTONS IN THE DIRECTION OF PED PHASE ACTIVATION PER DESIGN.
7. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHOULD BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (50:1 OR FLATTER) LANDING AREA OF THE PEDESTRIAN CONNECTION WHEN POSSIBLE. WHERE THERE ARE PHYSICAL CONSTRAINTS THAT MAKE IT IMPRACTICAL TO PLACE THE PEDESTRIAN PUSHBUTTON ADJACENT TO A LEVEL ALL-WEATHER SURFACE, THE SURFACE SHOULD BE AS LEVEL AS FEASIBLE. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE ADJOINING SIDEWALK TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK.
8. ALL CROSSWALKS SHALL BE 10 FEET IN WIDTH.
9. CONSTRUCTION CONTRACTOR SHALL RESET, ADJUST AND/OR REPAIR EXISTING JUNCTION WELL AS NECESSARY FOR INTEGRATION OF PROPOSED CONDUIT AND/OR TO FINISH FLUSH WITH FINAL GRADES. BOND AND GROUND EXISTING JUNCTION WELL.
10. TRAFFIC CONTRACTOR SHALL SLIDE EXISTING SIGNAL HEAD #4 AND EXISTING OPTICOM TO PROPOSED LOCATIONS SHOWN.
11. CONSTRUCTION CONTRACTOR SHALL REMOVE GUARDRAIL UNDER ITEM 211000. BORROW TYPE F SHALL BE UTILIZED FOR BACKFILL.
12. TRAFFIC CONTRACTOR SHALL COORDINATE WITH DELDOT TMC AND CONSTRUCTION TO ROTATE EXISTING POLE MOUNTED SIGNAL CABINET 90 DEGREES TO BE LOCATED OUTSIDE OF PROPOSED SIDEWALK AREA AS SHOWN. THE EXISTING EXTERIOR GALVANIZED CABINET CONDUIT SHALL BE ADJUSTED AND EXTENDED TO PROPOSED POLE MOUNTED CABINET LOCATION.
13. TRAFFIC CONTRACTOR SHALL REPLACE EXISTING SIGNAL HEAD BACKPLATES WITH NEW SIGNAL HEAD BACKPLATES WITH 2" WIDE RETROREFLECTIVE YELLOW BORDER.
14. TRAFFIC CONTRACTOR SHALL REMOVE EXISTING OVERHEAD SIGNING AND REPLACE WITH PROPOSED OVERHEAD SIGNING AS SHOWN ON PLAN.
15. FOR DURATION OF SIGNAL CONSTRUCTION, THE CONTRACTOR SHALL UTILIZE TYPICAL APPLICATION 3, FIGURE 6H-3 FOR TRAFFIC CONTROL OPERATIONS. ANY LANE RESTRICTIONS SHALL UTILIZE TYPICAL APPLICATION 11B, FIGURE 6H-11B AND BE LIMITED TO WEEK NIGHTS MONDAY-THURSDAY BETWEEN THE TIMES OF 8PM AND 6AM. CHANGEABLE MESSAGE BOARDS SHALL INCLUDE ANTICIPATED SIGNAL CONSTRUCTION NOTIFICATIONS.
16. SURVEY DATA WAS GATHERED BY CENTURY ENGINEERING INC.
17. ALL WORK PERFORMED UNDER THIS PROJECT IS INTENDED TO OCCUR WITHIN DELDOT'S EXISTING RIGHT OF WAY, PROPOSED & TEMPORARY CONSTRUCTION EASEMENTS, AND PER TRAFFIC SIGNAL INSTALLATION AGREEMENT DATED APRIL 30TH, 2010.

SIGNAL PHASING

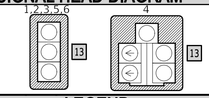
NEMA PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

AB	ABANDON	OH #	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH #	PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (# OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (# OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
CCTV CAMERA		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.

PREPARED BY
CENTURY ENGINEERING

6/28/2021
DATE

THIS SEAL APPLIES TO THIS SHEET ONLY.

BRET A. MARTINE — No. 11947 — PROFESSIONAL ENGINEER — DELAWARE
SEAL

CONCURRENCE FOR INSTALLATION

CHIEF OF TRAFFIC ENGINEERING — 6/29/2021 DATE

LAST REVISED: 9/11/2018
PLOT DATE: 6/30/2021
7:58:44
G:\Projects\185003.00 Agmt 1834 TAP\185003.01 (Task 1 - Savannah Road Final)\CADD\Sheets\SGlsg01_savannah.dgn

ADDENDA / REVISIONS

SCALE
0 20 40 60
FEET

SAVANNAH ROAD
SIDEWALK IMPROVEMENTS

CONTRACT	T201801302	PERMIT NO.	S319
COUNTY	SUSSEX	DESIGNED BY:	M.KUBOVCIK
		CHECKED BY:	B.MARTINE

SIGNAL PLAN
US 9 (SAVANNAH RD) @
VIKINGS WAY (CAPE HENLOPEN HS)

SECTION	CEI
SHEET NO.	65

CONDUIT RUN SCHEDULE

CR NO.	NO. OF CONDUITS	SIZE (TYPE)	LENGTH (B/T/O/P)	AMOUNT AND TYPE OF CABLE / WIRE
1A	1	2"(GALV)	10'/30'(T/P)	NEW (3)#8 THHN SC - LINE SIDE
1B	1	2"(GALV)	10'(T)	NEW (1)2/#8 U.F.W/GROUND - LOAD SIDE
1C	1	2"(GALV)	70'(B)	NEW (1)2/#8 U.F.W/GROUND - LOAD SIDE
1D	1	2"(GALV)	10'(T)	NEW (1)2/#8 U.F.W/GROUND - LOAD SIDE
1E	1	2"(GALV)	10'(T)	NEW (1)2/#8 U.F.W/GROUND - LOAD SIDE
2	4	4"(PVC)	10'(T)	NEW (2)16/#14 (4)5/#14 (11)2/#14 (4)4/#18 (4)#6 SC
3	1	3"(PVC)	10'(T)	NEW (1)16/#14 (2)4/#18 (1)#6 SC
4	1	3"(PVC)	15'(T)	NEW (1)5/#14 (1)#6 SC
5	1	4"(HDPE)	80'(B)	NEW (2)5/#14 (4)2/#14 (1)#6 SC
6	1	3"(PVC)	10'(T)	NEW (2)5/#14 (1)#6 SC
7	1	4"(PVC)	150'(T)	NEW (2)2/#14 (1)#6 SC
8	1	4"(PVC)	150'(T)	NEW (1)2/#14 (1)#6 SC
9	1	4"(HDPE)	75'(B)	NEW (1)16/#14 (1)5/#14 (4)2/#14 (2)4/#18 (1)#6 SC
10	1	4"(PVC)	140'(T)	NEW (2)2/#14 (1)#6 SC
11	1	4"(PVC)	140'(T)	NEW (1)2/#14 (1)#6 SC
12	1	4"(HDPE)	70'(B)	NEW (1)16/#14 (1)5/#14 (1)2/#14 (2)4/#18 (1)#6 SC
13	1	3"(PVC)	20'(T)	NEW (1)16/#14 (2)4/#18 (1)#6 SC
14	1	3"(PVC)	10'(T)	NEW (1)5/#14 (1)#6 SC

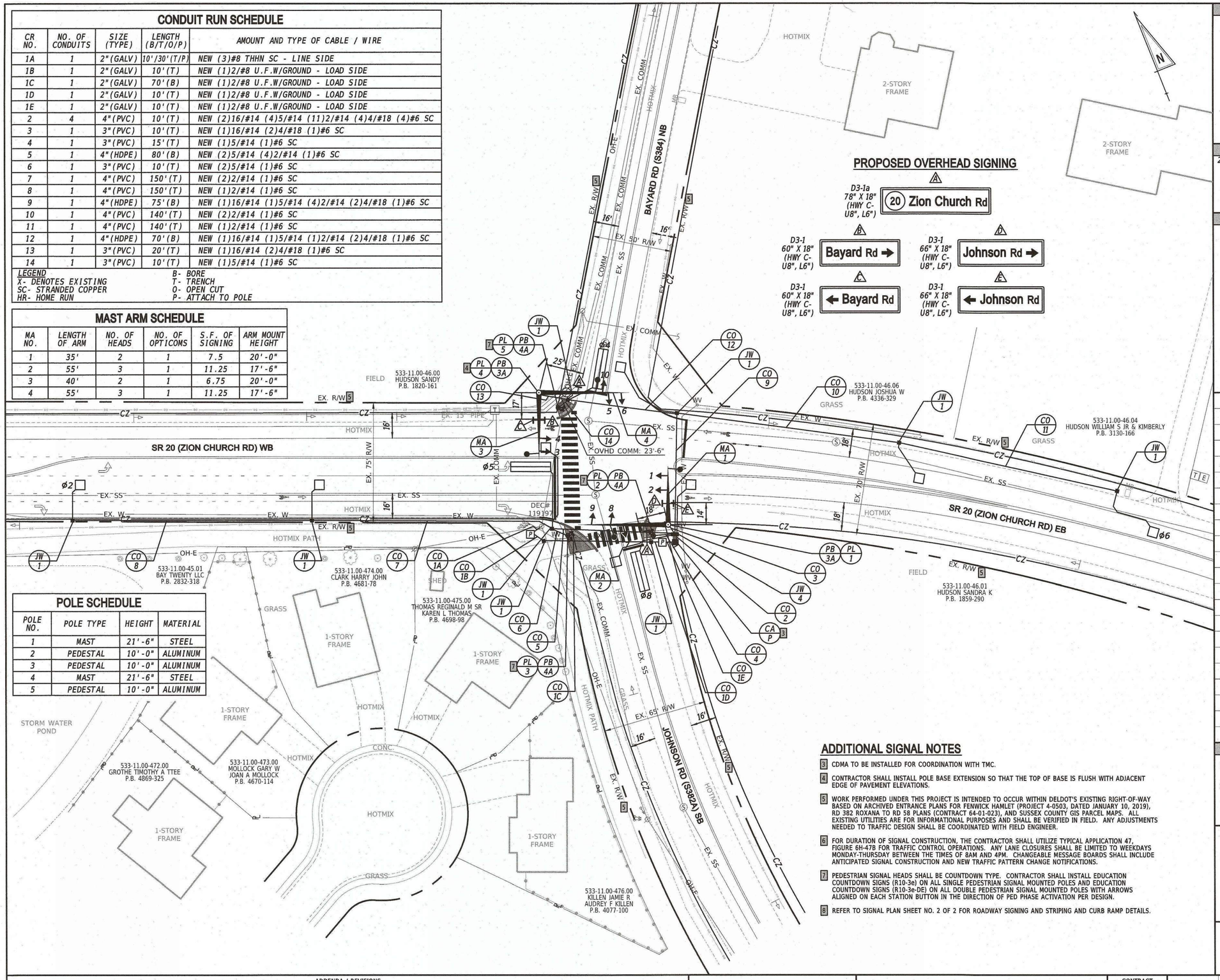
LEGEND
X- DENOTES EXISTING
SC- STRANDED COPPER
HR- HOME RUN
B- BORE
T- TRENCH
O- OPEN CUT
P- ATTACH TO POLE

MAST ARM SCHEDULE

MA NO.	LENGTH OF ARM	NO. OF HEADS	NO. OF OPTICOMS	S.F. OF SIGNING	ARM MOUNT HEIGHT
1	35'	2	1	7.5	20'-0"
2	55'	3	1	11.25	17'-6"
3	40'	2	1	6.75	20'-0"
4	55'	3	1	11.25	17'-6"

POLE SCHEDULE

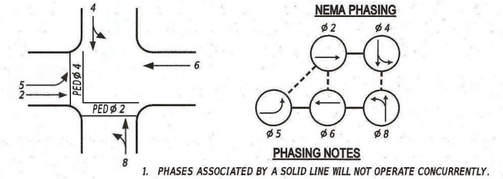
POLE NO.	POLE TYPE	HEIGHT	MATERIAL
1	MAST	21'-6"	STEEL
2	PEDESTAL	10'-0"	ALUMINUM
3	PEDESTAL	10'-0"	ALUMINUM
4	MAST	21'-6"	STEEL
5	PEDESTAL	10'-0"	ALUMINUM



ADDITIONAL SIGNAL NOTES

3. CDMA TO BE INSTALLED FOR COORDINATION WITH TMC.
4. CONTRACTOR SHALL INSTALL POLE BASE EXTENSION SO THAT THE TOP OF BASE IS FLUSH WITH ADJACENT EDGE OF PAVEMENT ELEVATIONS.
5. WORK PERFORMED UNDER THIS PROJECT IS INTENDED TO OCCUR WITHIN DELDOT'S EXISTING RIGHT-OF-WAY BASED ON ARCHIVED ENTRANCE PLANS FOR FENWICK HAMLET (PROJECT 4-0503, DATED JANUARY 10, 2019), RD 382 ROXANA TO RD 58 PLANS (CONTRACT 64-01-023), AND SUSSEX COUNTY GIS PARCEL MAPS. ALL EXISTING UTILITIES ARE FOR INFORMATIONAL PURPOSES AND SHALL BE VERIFIED IN FIELD. ANY ADJUSTMENTS NEEDED TO TRAFFIC DESIGN SHALL BE COORDINATED WITH FIELD ENGINEER.
6. FOR DURATION OF SIGNAL CONSTRUCTION, THE CONTRACTOR SHALL UTILIZE TYPICAL APPLICATION 47, FIGURE 6H-47B FOR TRAFFIC CONTROL OPERATIONS. ANY LANE CLOSURES SHALL BE LIMITED TO WEEKDAYS MONDAY-THURSDAY BETWEEN THE TIMES OF 8AM AND 4PM. CHANGEABLE MESSAGE BOARDS SHALL INCLUDE ANTICIPATED SIGNAL CONSTRUCTION AND NEW TRAFFIC PATTERN CHANGE NOTIFICATIONS.
7. PEDESTRIAN SIGNAL HEADS SHALL BE COUNTDOWN TYPE. CONTRACTOR SHALL INSTALL EDUCATION COUNTDOWN SIGNS (R10-3e) ON ALL SINGLE PEDESTRIAN SIGNAL MOUNTED POLES AND EDUCATION COUNTDOWN SIGNS (R10-3e-DE) ON ALL DOUBLE PEDESTRIAN SIGNAL MOUNTED POLES WITH ARROWS ALIGNED ON EACH STATION BUTTON IN THE DIRECTION OF PED PHASE ACTIVATION PER DESIGN.
8. REFER TO SIGNAL PLAN SHEET NO. 2 OF 2 FOR ROADWAY SIGNING AND STRIPING AND CURB RAMP DETAILS.

SIGNAL PHASING



SIGNAL HEAD DIAGRAM



LEGEND

AB	ABANDON	OH (#)	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA (X)	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH (#)	PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA (X)	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB (X)	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO (#)	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PB (X)	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO (#)	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PL (X)	EXISTING POLE IDENTIFIER (# OF POLE)
JW (X)	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL (X)	PROPOSED POLE IDENTIFIER (# OF POLE)
JW (X)	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA (XX)	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA (XX)	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
CCTV CAMERA		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION (FISH EYE)		
VIDEO DETECTION ZONE		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.

PREPARED BY
CENTURY ENGINEERING
550 BAY ROAD
DOVER, DELAWARE 19901
(302) 734-9188

THIS SEAL APPLIES TO THIS SHEET ONLY. DATE 2/27/2020

ERNEST A. MARTINE REGISTERED No. 11647 PROFESSIONAL ENGINEER DELAWARE

SEAL

CONCURRENCE FOR INSTALLATION

CHIEF TRAFFIC ENGINEER DATE 2/28/2020

ADDENDA / REVISIONS

SCALE 0 30 60 90 FEET

SIGNAL CONSTRUCTION PROGRAM

CONTRACT	T201909811	PERMIT NO.	S380
COUNTY	SUSSEX	DESIGNED BY:	MKUBOVCIK
		CHECKED BY:	BMARTINE

SIGNAL PLAN SR 20 (ZION CHURCH RD) @ BAYARD RD (S384)/ JOHNSON RD (S382A)

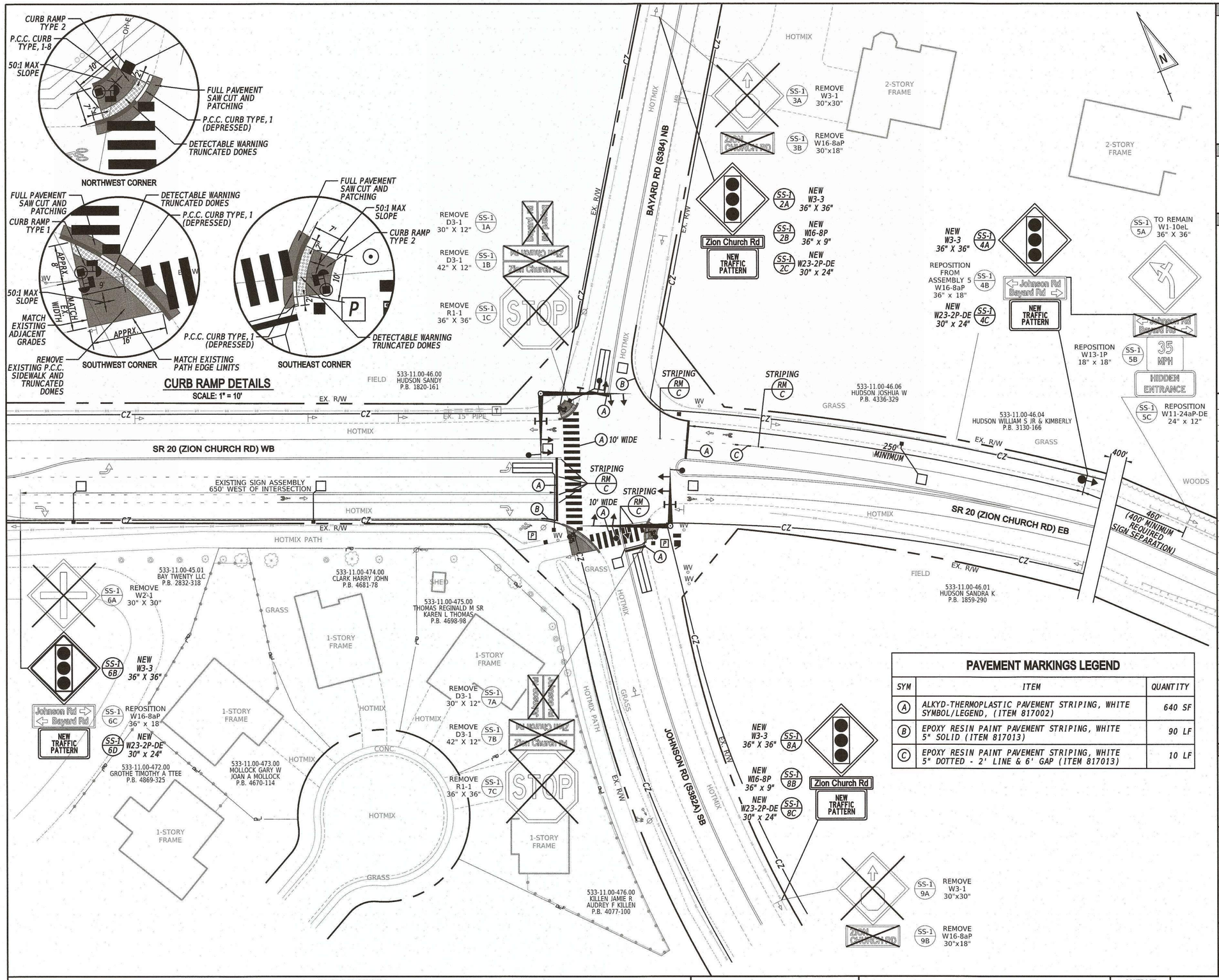
SECTION	
TRAFFIC	
SHEET NO.	1 OF 2

LAST REVISED: 9/11/2018
2/27/2020
2:39:24 PM
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CURB RAMP DETAILS

SCALE: 1" = 10'

REMOVE D3-1 30" X 12" (SS-1 1A)
REMOVE D3-1 42" X 12" (SS-1 1B)
REMOVE R1-1 36" X 36" (SS-1 1C)



PAVEMENT MARKINGS LEGEND

SYM	ITEM	QUANTITY
(A)	ALKYD-THERMOPLASTIC PAVEMENT STRIPING, WHITE SYMBOL/LEGEND, (ITEM 817002)	640 SF
(B)	EPOXY RESIN PAINT PAVEMENT STRIPING, WHITE 5" SOLID (ITEM 817013)	90 LF
(C)	EPOXY RESIN PAINT PAVEMENT STRIPING, WHITE 5" DOTTED - 2' LINE & 6' GAP (ITEM 817013)	10 LF

SIGNAL PHASING

SIGNAL HEAD DIAGRAM

LEGEND

AB — ABANDON	OH/# — EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA/X — EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH/# — PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA/X — PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB/X — EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO/# — EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PB/X — PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO/# — PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PL/X — EXISTING POLE IDENTIFIER (# OF POLE)
JW/X — EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL/X — PROPOSED POLE IDENTIFIER (# OF POLE)
JW/X — PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM/C — REMOVE BY CONTRACTOR
MA/XX — EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM/O — REMOVE BY OTHERS
MA/XX — PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM/TC — REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		□
LOOP DETECTOR, TYPE 2		▭
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
CCTV CAMERA		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION (FISH EYE)		
VIDEO DETECTION ZONE		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.

PREPARED BY
CENTURY ENGINEERING
500 BAY ROAD
DOVER, DELAWARE 19901
(302) 734-9188

THIS SEAL APPLIES TO THIS SHEET ONLY. 2/27/2020 DATE

BRET A. MARTINE — No. 11947 — REGISTERED PROFESSIONAL ENGINEER — DELAWARE

SEAL

CONCURRENCE FOR INSTALLATION

CHIEF TRAFFIC ENGINEER 2/28/2020 DATE

ADDENDA / REVISIONS

SCALE 0 30 60 90 FEET

SIGNAL CONSTRUCTION PROGRAM

CONTRACT	T201909811	PERMIT NO.	S380
COUNTY	SUSSEX	DESIGNED BY:	MKUBOVCIK
		CHECKED BY:	BMARTINE

SIGNAL PLAN
SR 20 (ZION CHURCH RD) @ BAYARD RD (S384)/ JOHNSON RD (S382A)

SECTION: TRAFFIC
SHEET NO.: 2 OF 2

LAST REVISED: 9/11/2018
2/27/2020 2:40:04 PM
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CONDUIT RUN SCHEDULE

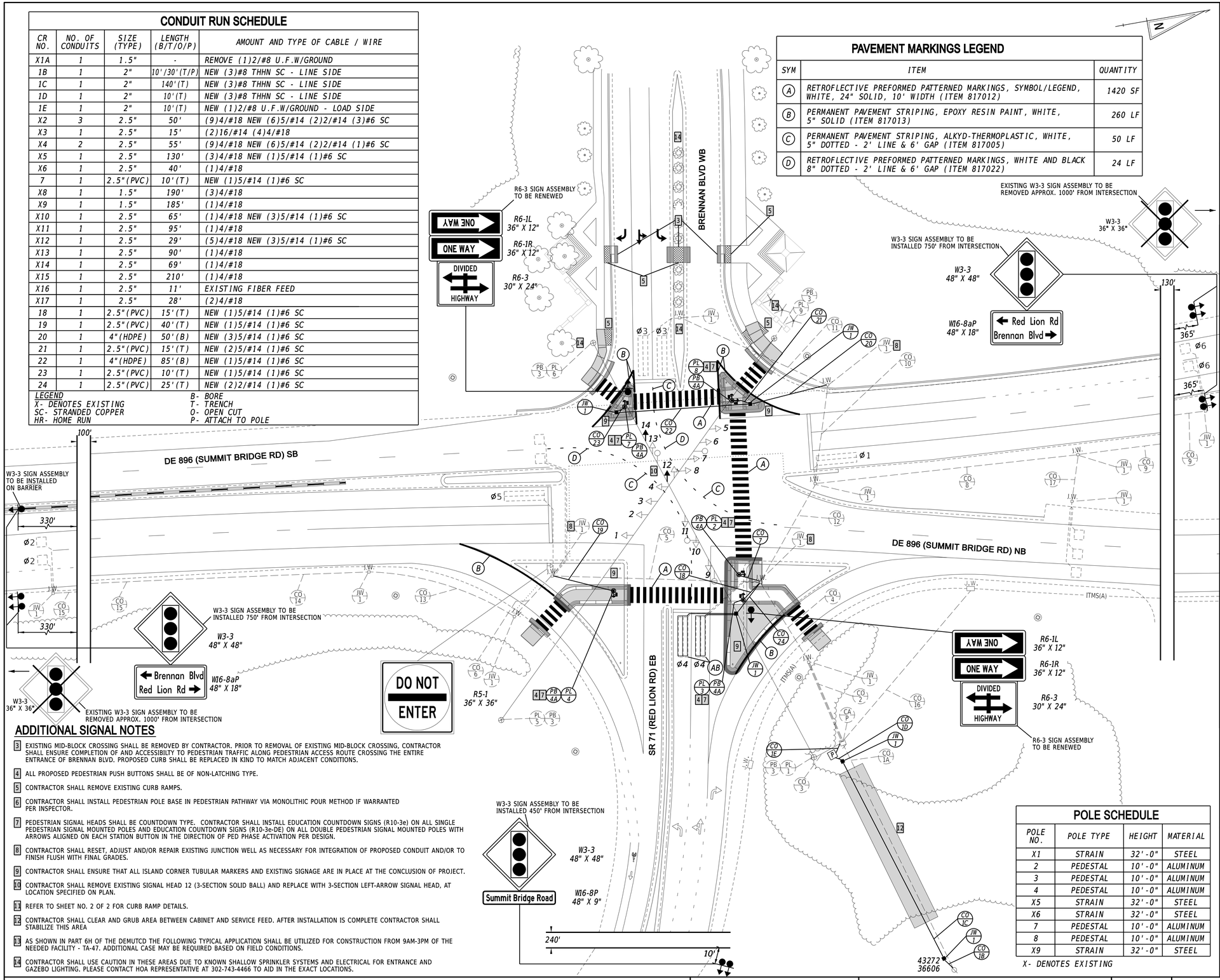
CR NO.	NO. OF CONDUITS	SIZE (TYPE)	LENGTH (B/T/O/P)	AMOUNT AND TYPE OF CABLE / WIRE
X1A	1	1.5"	-	REMOVE (1)2/#8 U.F.W/GROUND
1B	1	2"	10'/30'(T/P)	NEW (3)#8 THHN SC - LINE SIDE
1C	1	2"	140'(T)	NEW (3)#8 THHN SC - LINE SIDE
1D	1	2"	10'(T)	NEW (3)#8 THHN SC - LINE SIDE
1E	1	2"	10'(T)	NEW (1)2/#8 U.F.W/GROUND - LOAD SIDE
X2	3	2.5"	50'	(9)4/#18 NEW (6)5/#14 (2)2/#14 (3)#6 SC
X3	1	2.5"	15'	(2)16/#14 (4)4/#18
X4	2	2.5"	55'	(9)4/#18 NEW (6)5/#14 (2)2/#14 (1)#6 SC
X5	1	2.5"	130'	(3)4/#18 NEW (1)5/#14 (1)#6 SC
X6	1	2.5"	40'	(1)4/#18
7	1	2.5"(PVC)	10'(T)	NEW (1)5/#14 (1)#6 SC
X8	1	1.5"	190'	(3)4/#18
X9	1	1.5"	185'	(1)4/#18
X10	1	2.5"	65'	(1)4/#18 NEW (3)5/#14 (1)#6 SC
X11	1	2.5"	95'	(1)4/#18
X12	1	2.5"	29'	(5)4/#18 NEW (3)5/#14 (1)#6 SC
X13	1	2.5"	90'	(1)4/#18
X14	1	2.5"	69'	(1)4/#18
X15	1	2.5"	210'	(1)4/#18
X16	1	2.5"	11'	EXISTING FIBER FEED
X17	1	2.5"	28'	(2)4/#18
18	1	2.5"(PVC)	15'(T)	NEW (1)5/#14 (1)#6 SC
19	1	2.5"(PVC)	40'(T)	NEW (1)5/#14 (1)#6 SC
20	1	4"(HDPE)	50'(B)	NEW (3)5/#14 (1)#6 SC
21	1	2.5"(PVC)	15'(T)	NEW (2)5/#14 (1)#6 SC
22	1	4"(HDPE)	85'(B)	NEW (1)5/#14 (1)#6 SC
23	1	2.5"(PVC)	10'(T)	NEW (1)5/#14 (1)#6 SC
24	1	2.5"(PVC)	25'(T)	NEW (2)2/#14 (1)#6 SC

LEGEND
X- DENOTES EXISTING
SC- STRANDED COPPER
HR- HOME RUN

B- BORE
T- TRENCH
O- OPEN CUT
P- ATTACH TO POLE

PAVEMENT MARKINGS LEGEND

SYM	ITEM	QUANTITY
A	RETROFLECTIVE PREFORMED PATTERNED MARKINGS, SYMBOL/LEGEND, WHITE, 24" SOLID, 10' WIDTH (ITEM 817012)	1420 SF
B	PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, WHITE, 5" SOLID (ITEM 817013)	260 LF
C	PERMANENT PAVEMENT STRIPING, ALKYD-THERMOPLASTIC, WHITE, 5" DOTTED - 2' LINE & 6' GAP (ITEM 817005)	50 LF
D	RETROFLECTIVE PREFORMED PATTERNED MARKINGS, WHITE AND BLACK 8" DOTTED - 2' LINE & 6' GAP (ITEM 817022)	24 LF



ADDITIONAL SIGNAL NOTES

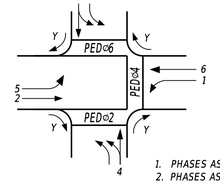
3. EXISTING MID-BLOCK CROSSING SHALL BE REMOVED BY CONTRACTOR. PRIOR TO REMOVAL OF EXISTING MID-BLOCK CROSSING, CONTRACTOR SHALL ENSURE COMPLETION OF AND ACCESSIBILTY TO PEDESTRIAN TRAFFIC ALONG PEDESTRIAN ACCESS ROUTE CROSSING THE ENTIRE ENTRANCE OF BRENNAN BLVD. PROPOSED CURB SHALL BE REPLACED IN KIND TO MATCH ADJACENT CONDITIONS.
4. ALL PROPOSED PEDESTRIAN PUSH BUTTONS SHALL BE OF NON-LATCHING TYPE.
5. CONTRACTOR SHALL REMOVE EXISTING CURB RAMPS.
6. CONTRACTOR SHALL INSTALL PEDESTRIAN POLE BASE IN PEDESTRIAN PATHWAY VIA MONOLITHIC POUR METHOD IF WARRANTED PER INSPECTOR.
7. PEDESTRIAN SIGNAL HEADS SHALL BE COUNTDOWN TYPE. CONTRACTOR SHALL INSTALL EDUCATION COUNTDOWN SIGNS (R10-3e) ON ALL SINGLE PEDESTRIAN SIGNAL MOUNTED POLES AND EDUCATION COUNTDOWN SIGNS (R10-3e-DE) ON ALL DOUBLE PEDESTRIAN SIGNAL MOUNTED POLES WITH ARROWS ALIGNED ON EACH STATION BUTTON IN THE DIRECTION OF PED PHASE ACTIVATION PER DESIGN.
8. CONTRACTOR SHALL RESET, ADJUST AND/OR REPAIR EXISTING JUNCTION WELL AS NECESSARY FOR INTEGRATION OF PROPOSED CONDUIT AND/OR TO FINISH FLUSH WITH FINAL GRADES.
9. CONTRACTOR SHALL ENSURE THAT ALL ISLAND CORNER TUBULAR MARKERS AND EXISTING SIGNAGE ARE IN PLACE AT THE CONCLUSION OF PROJECT.
10. CONTRACTOR SHALL REMOVE EXISTING SIGNAL HEAD 12 (3-SECTION SOLID BALL) AND REPLACE WITH 3-SECTION LEFT-ARROW SIGNAL HEAD, AT LOCATION SPECIFIED ON PLAN.
11. REFER TO SHEET NO. 2 OF 2 FOR CURB RAMP DETAILS.
12. CONTRACTOR SHALL CLEAR AND GRUB AREA BETWEEN CABINET AND SERVICE FEED. AFTER INSTALLATION IS COMPLETE CONTRACTOR SHALL STABILIZE THIS AREA
13. AS SHOWN IN PART 6H OF THE DEMUTCD THE FOLLOWING TYPICAL APPLICATION SHALL BE UTILIZED FOR CONSTRUCTION FROM 9AM-3PM OF THE NEEDED FACILITY - TA-47. ADDITIONAL CASE MAY BE REQUIRED BASED ON FIELD CONDITIONS.
14. CONTRACTOR SHALL USE CAUTION IN THESE AREAS DUE TO KNOWN SHALLOW SPRINKLER SYSTEMS AND ELECTRICAL FOR ENTRANCE AND GAZEBO LIGHTING. PLEASE CONTACT HOA REPRESENTATIVE AT 302-743-4466 TO AID IN THE EXACT LOCATIONS.

POLE SCHEDULE

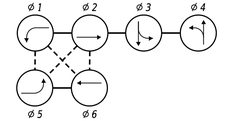
POLE NO.	POLE TYPE	HEIGHT	MATERIAL
X1	STRAIN	32'-0"	STEEL
2	PEDESTAL	10'-0"	ALUMINUM
3	PEDESTAL	10'-0"	ALUMINUM
4	PEDESTAL	10'-0"	ALUMINUM
X5	STRAIN	32'-0"	STEEL
X6	STRAIN	32'-0"	STEEL
7	PEDESTAL	10'-0"	ALUMINUM
8	PEDESTAL	10'-0"	ALUMINUM
X9	STRAIN	32'-0"	STEEL

X- DENOTES EXISTING

SIGNAL PHASING



NEMA PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

AB	ABANDON	OH #	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH #	PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (# OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (# OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
CCTV CAMERA		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION (FISH EYE)		
VIDEO DETECTION ZONE		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
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PREPARED BY
CENTURY ENGINEERING
550 BAY ROAD
DOVER, DELAWARE 19901
(302) 734-9188

BRET A. MARTINE
No. 11947
DELAWARE
PROFESSIONAL ENGINEER

THIS SEAL APPLIES TO THIS SHEET ONLY. 8/26/2021 DATE

SEAL

CONCURRENCE FOR INSTALLATION

CHIEF OF TRAFFIC ENGINEERING 8/26/2021 DATE

ADDENDA / REVISIONS

SCALE 0 30 60 90 FEET

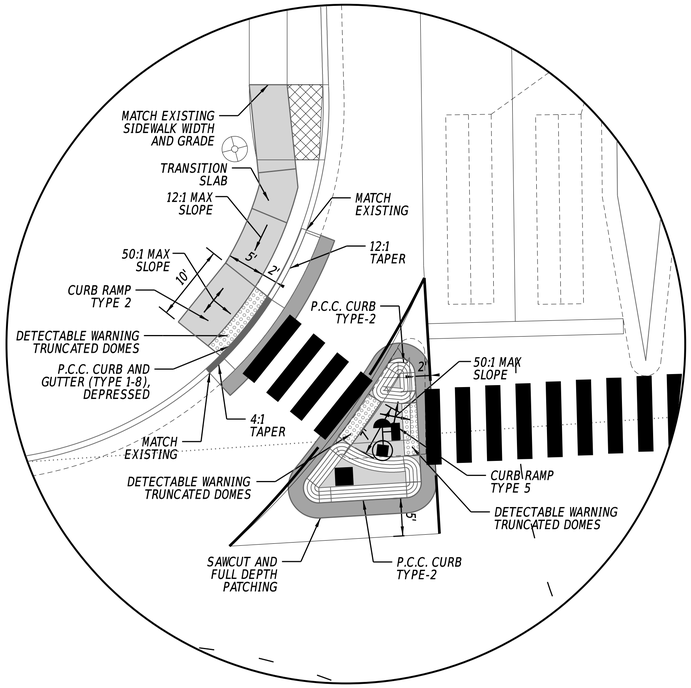
SIGNAL PEDESTRIAN UPGRADES

CONTRACT	T202208306
COUNTY	NEW CASTLE
PERMIT NO.	N216
DESIGNED BY:	BRANDAN MARTINE
CHECKED BY:	BRET A. MARTINE

SIGNAL PLAN
DE 896 (SUMMIT BRIDGE RD) @
DE 71 (RED LION RD)

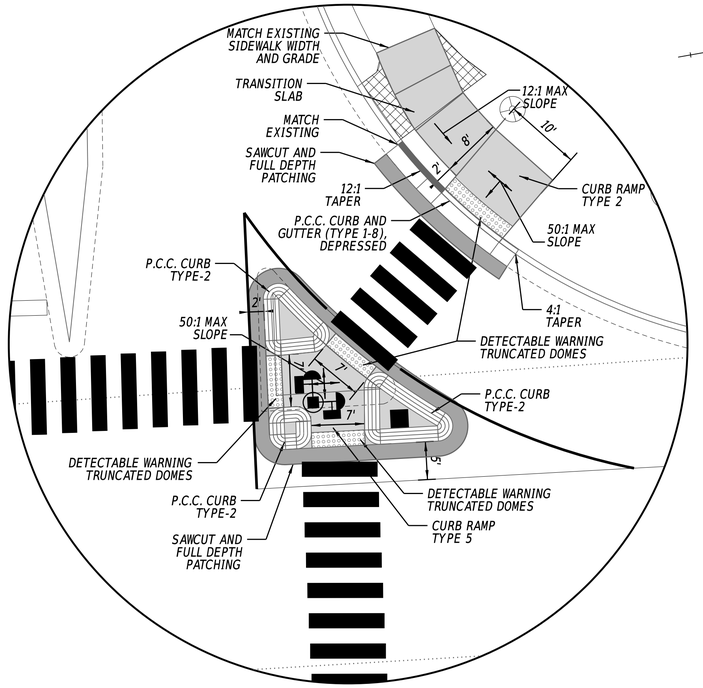
SECTION	CEI
SHEET NO.	1 OF 2

LAST REVISED: 9/11/2018
PLOTTED: 12-AUG-2021
12:40
G:\Projects\185033.00 TRAFFIC - 1883 - 2\185033.03 SR896 and Brennan\CADD FILES\Sheets\sg_N216_SR896 and SR71 1 of 2.dgn



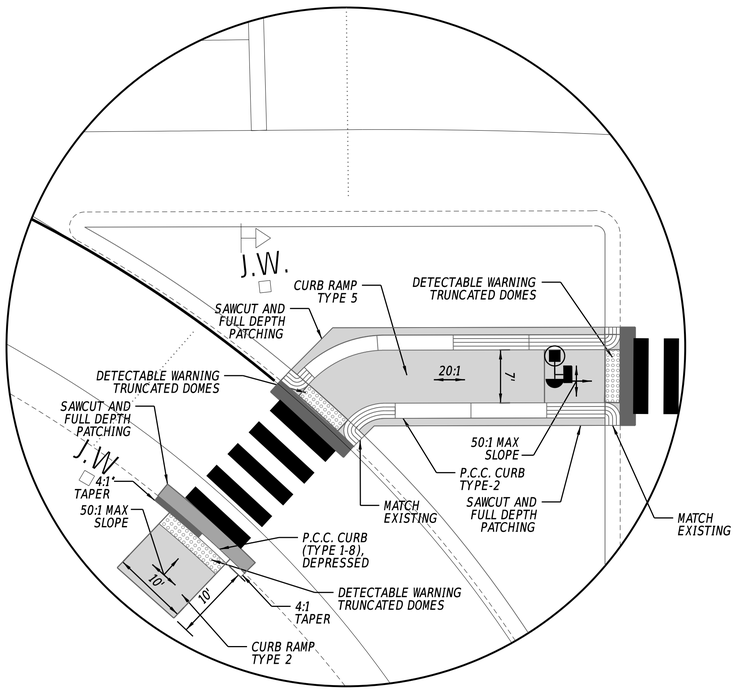
SW CORNER/ISLAND CURB RAMP DETAIL

SCALE: 1"=10'



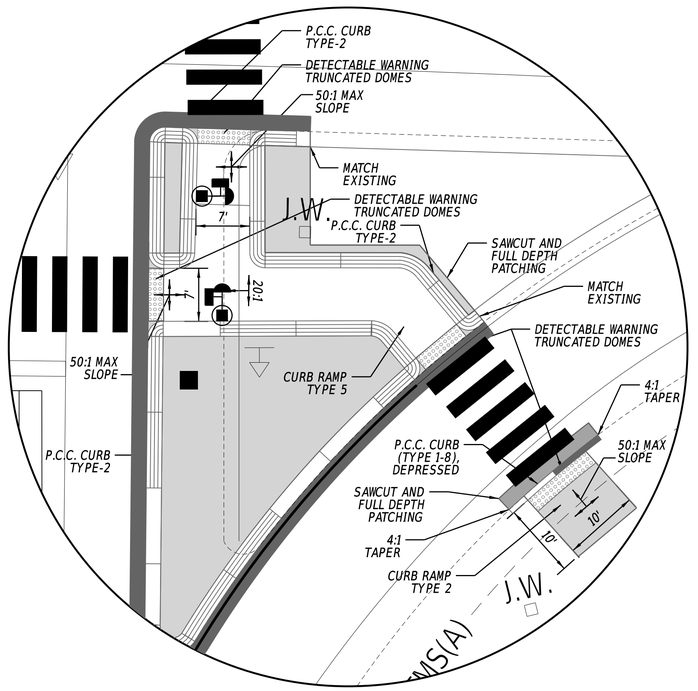
NW CORNER/ISLAND CURB RAMP DETAIL

SCALE: 1"=10'



SE CORNER/ISLAND CURB RAMP DETAIL

SCALE: 1"=10'



NE CORNER/ISLAND CURB RAMP DETAIL

SCALE: 1"=10'

SIGNAL PHASING

SIGNAL HEAD DIAGRAM

LEGEND

AB	ABANDON	OH #	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH #	*PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)*
CA X	*PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)*	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PB X	*PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)*
CO #	*PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)*	PL X	EXISTING POLE IDENTIFIER (# OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	*PROPOSED POLE IDENTIFIER (# OF POLE)*
JW X	*PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)*	RM C	*REMOVE BY CONTRACTOR*
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	*REMOVE BY OTHERS*
MA XX	*PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)*	RM TC	*REMOVE BY TRAFFIC CONTRACTOR*

	EXISTING SYMBOL	*PROPOSED SYMBOL*
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
CCTV CAMERA		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION (FISH EYE)		
VIDEO DETECTION ZONE		

GENERAL SIGNAL NOTES

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PREPARED BY

CENTURY ENGINEERING
550 BAY ROAD
DOVER, DELAWARE 19901
(302) 734-9188

BRET A. MARTINE — REGISTERED — No. 11947 — DELAWARE PROFESSIONAL ENGINEER

8/26/2021
THIS SEAL APPLIES TO THIS SHEET ONLY. — DATE

SEAL

CONCURRENCE FOR INSTALLATION

8/26/2021
CHIEF OF TRAFFIC ENGINEERING — DATE

ADDENDA / REVISIONS

		SIGNAL PEDESTRIAN UPGRADES	CONTRACT T202208306	PERMIT NO. N216	SIGNAL PLAN CURB RAMP DETAILS DE 896 (SUMMIT BRIDGE RD) @ DE 71 (RED LION RD)
			COUNTY NEW CASTLE	DESIGNED BY: BRANDAN MARTINE	SECTION CEI
				CHECKED BY: BRET A. MARTINE	SHEET NO. 2 OF 2

LAST REVISED: 9/11/2018
PLOTTED: 26-AUG-2021
12:08
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CONDUIT RUN SCHEDULE

CR NO.	NO. OF CONDUITS	SIZE (TYPE)	LENGTH (B/T/O/P)	AMOUNT AND TYPE OF CABLE / WIRE
X1	1	2"	4'	EXISTING (1)2/#8 U.F. W/GND
X2	1	2"	38'	EXISTING (1)2/#8 U.F. W/GND
X3	2	2.5"	8'	EXISTING [(2)5/#14 (18)2/#14 (2)FIBERS (2)#6 SC] REMOVE (2)5/#14 NEW (2)5/#14
X4	1	2.5"	7'	EXISTING (1)#6 SC REMOVE [(2)16/#14 (4)4/#18] NEW [(2)16/#14 (4)4/#18]
X5	1	2.5"	135'	EXISTING [(1)5/#14 (6)2/#14 (2)FIBERS (1)#6 SC] REMOVE (2)5/#14 NEW (2)5/#14
X6	1	1.5"	14'	EXISTING (1)5/#14 (1)#6 SC
X7	1	2.5"	180'	EXISTING (2)2/#14 (2)FIBERS (1)#6 SC
X8	1	2.5"	-	EXISTING (2)FIBERS
X9	1	2.5"	62'	EX.[(4)2/#14 (1)#6 SC] REMOVE (2)5/#14 NEW (2)5/#14
X10	1	2.5"	36'	REMOVE[(2)5/#14 (1)#6 SC] NEW[(2)5/#14 (1)#6 SC]
X11	1	2.5"	8'	REMOVE (1)5/#14 (1)#6 SC - ABANDON CONDUIT
X12	1	2.5"	16'	REMOVE (1)5/#14 (1)#6 SC - ABANDON CONDUIT
X13	1	2.5"	3'	EMPTY - ABANDON CONDUIT
X14	1	2.5"	110'	EXISTING (1)5/#14 (8)2/#14 (1)#6 SC
X15	1	1.5"	16'	EXISTING (1)5/#14 (1)#6 SC
X16	1	2.5"	12'	EXISTING (3)2/#14 (1)#6 SC
X17	1	1.5"	100'	EXISTING (2)2/#14 (1)#6 SC
X18	1	1.5"	85'	EXISTING (2)2/#14 (1)#6 SC
X19	1	2.5"	55'	EXISTING (5)2/#14 (1)#6 SC
X20	1	4"	33'	EXISTING (2)FIBERS
X21	1	4"	-	EXISTING (2)FIBERS
22	1	2.5"(GALV)	15'(T)	NEW (2)5/#14 (1)#6 SC
23	1	2.5"(PVC)	10'(T)	NEW (1)5/#14 (1)#6 SC
24	1	2.5"(PVC)	20'(T)	NEW (1)5/#14 (1)#6 SC
25	1	3"(PVC)	20'(T)	NEW (1)#6 SC

X- DENOTES EXISTING

POLE SCHEDULE

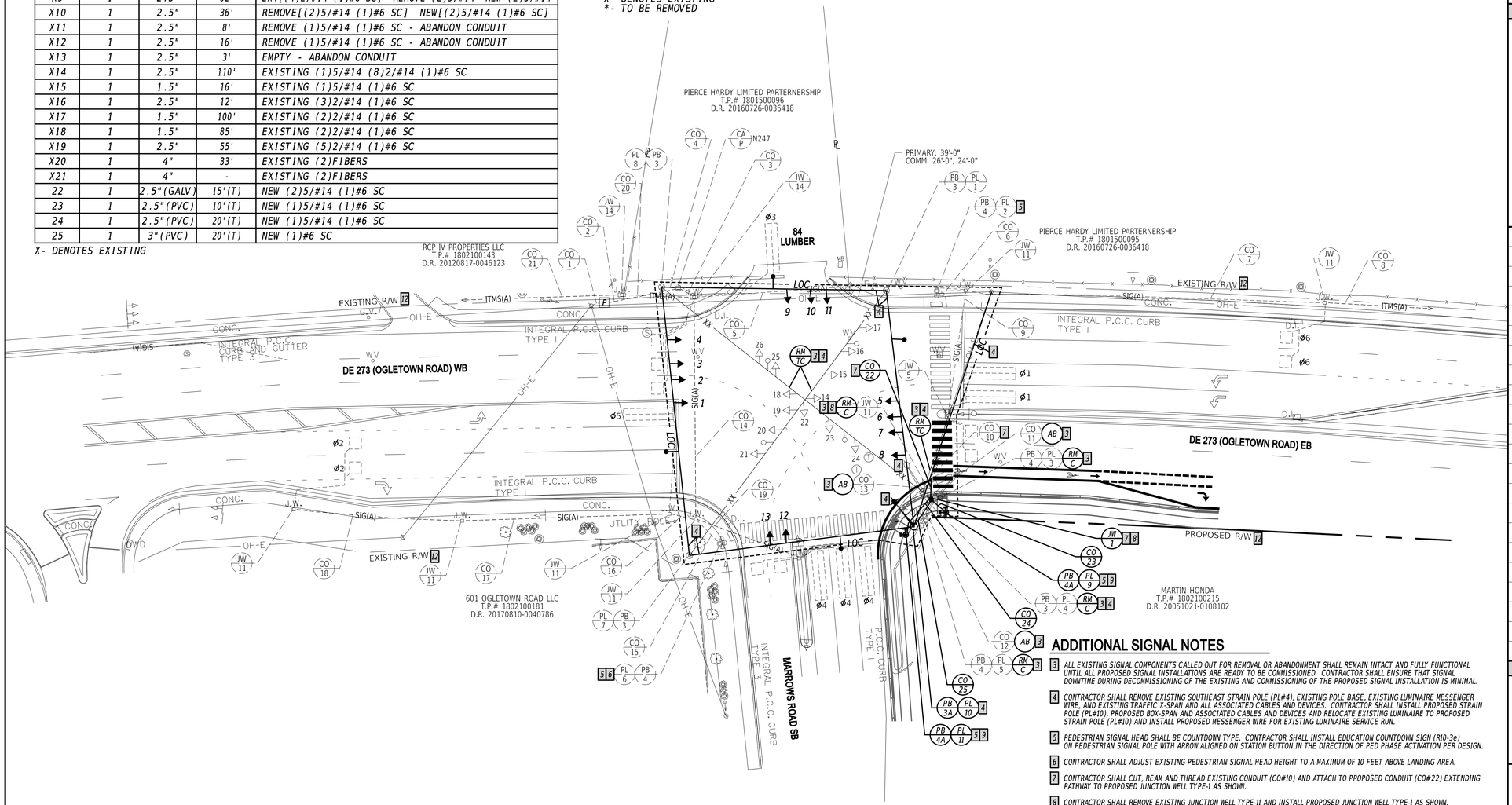
POLE NO.	POLE TYPE	HEIGHT	MATERIAL
X1	STRAIN	28'	STEEL
X2	PEDESTAL	10'	ALUMINUM
*X3	PEDESTAL	10'	ALUMINUM
*X4	STRAIN	28'	STEEL
*X5	PEDESTAL	10'	ALUMINUM
X6	PEDESTAL	10'	ALUMINUM
X7	STRAIN	28'	STEEL
X8	STRAIN	28'	STEEL
9	PEDESTAL	10'	ALUMINUM
10	STRAIN	28'	STEEL
11	PEDESTAL	10'	ALUMINUM

X- DENOTES EXISTING
**- TO BE REMOVED*

SPAN WIRE SCHEDULE

SPAN	LENGTH	SPAN MOUNT HEIGHT	4% SAG	SPAN LOW POINT	BOTTOM OF LOWEST HEAD
NORTH	113'	25.50'	4.52'	20.98'	16.98'
EAST	120'	25.00'	4.80'	20.20'	16.20'
SOUTH	114'	25.50'	4.56'	20.94'	16.94'
WEST	136'	25.35'	5.44'	19.91'	15.91'

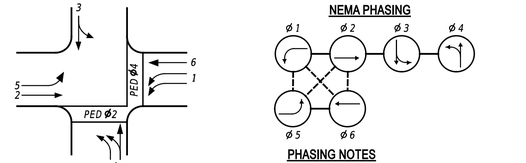
** FIELD ADJUSTMENTS AS REQUIRED*



ADDITIONAL SIGNAL NOTES

3. ALL EXISTING SIGNAL COMPONENTS CALLED OUT FOR REMOVAL OR ABANDONMENT SHALL REMAIN INTACT AND FULLY FUNCTIONAL UNTIL ALL PROPOSED SIGNAL INSTALLATIONS ARE READY TO BE COMMISSIONED. CONTRACTOR SHALL ENSURE THAT SIGNAL DOWNTIME DURING DECOMMISSIONING OF THE EXISTING AND COMMISSIONING OF THE PROPOSED SIGNAL INSTALLATION IS MINIMAL.
4. CONTRACTOR SHALL REMOVE EXISTING SOUTHEAST STRAIN POLE (PL#4), EXISTING POLE BASE, EXISTING LUMINAIRE MESSENGER WIRE, AND EXISTING TRAFFIC X-SPAN AND ALL ASSOCIATED CABLES AND DEVICES. CONTRACTOR SHALL INSTALL PROPOSED STRAIN POLE (PL#10), PROPOSED BOX-SPAN AND ASSOCIATED CABLES AND DEVICES AND RELOCATE EXISTING LUMINAIRE TO PROPOSED STRAIN POLE (PL#10) AND INSTALL PROPOSED MESSENGER WIRE FOR EXISTING LUMINAIRE SERVICE RUN.
5. PEDESTRIAN SIGNAL HEAD SHALL BE COUNTDOWN TYPE. CONTRACTOR SHALL INSTALL EDUCATION COUNTDOWN SIGN (R10-3e) ON PEDESTRIAN SIGNAL POLE WITH ARROW ALIGNED ON STATION BUTTON IN THE DIRECTION OF PED PHASE ACTIVATION PER DESIGN.
6. CONTRACTOR SHALL ADJUST EXISTING PEDESTRIAN SIGNAL HEAD HEIGHT TO A MAXIMUM OF 10 FEET ABOVE LANDING AREA.
7. CONTRACTOR SHALL CUT, REAM AND THREAD EXISTING CONDUIT (CO#10) AND ATTACH TO PROPOSED CONDUIT (CO#22) EXTENDING PATHWAY TO PROPOSED JUNCTION WELL TYPE-1 AS SHOWN.
8. CONTRACTOR SHALL REMOVE EXISTING JUNCTION WELL TYPE-11 AND INSTALL PROPOSED JUNCTION WELL TYPE-1 AS SHOWN. JUNCTION WELL SHALL BE INSTALLED FLUSH WITH ADJACENT GRADES.
9. CONTRACTOR SHALL INSTALL 18 INCHES OF SIDEWALK LANDING EXTENSION TO ENSURE PEDESTRIAN FACILITY ACCESSIBILITY.
10. TRAFFIC SIGNAL HEADS TO BE INSTALLED PER CURRENT TRAFFIC DESIGN MANUAL.
11. CONTRACTOR SHALL REFER TO DEVELOPER CIVIL PLANS FOR RIGHT OF WAY, SIGNING AND STRIPING, AND GRADING & GEOMETRICS INFORMATION, UNLESS NOTED OTHERWISE. PROPOSED TRAFFIC DESIGN IS BASED ON COORDINATION WITH DEVELOPER PLANS.
12. RIGHT-OF-WAY LINES SHOWN ON PLANS ARE REFERENCED FROM CONTRACT PLANS T201606114 - SIGNAL PLAN (DATED 3/25/2019), MCBRIDE & ZIEGLER, INC SIGNAL AGREEMENT PLAN (DATED 4/20/2020), AND 2019 DELAWARE STATE PLANE PARCELS.
13. FOR DURATION OF SIGNAL CONSTRUCTION, THE CONTRACTOR SHALL UTILIZE TYPICAL APPLICATION 47, FIGURE 6H-47A FOR TRAFFIC CONTROL OPERATIONS. ANY LANE CLOSURES SHALL BE LIMITED TO WEEK NIGHTS MONDAY-THURSDAY BETWEEN THE TIMES OF 8PM AND 6AM. CHANGEABLE MESSAGE BOARDS SHALL INCLUDE ANTICIPATED SIGNAL CONSTRUCTION NOTIFICATIONS.

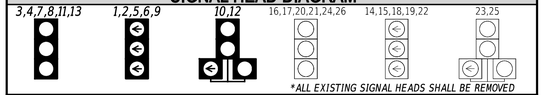
SIGNAL PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



**ALL EXISTING SIGNAL HEADS SHALL BE REMOVED*

LEGEND

AB	ABANDON
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
CO #	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)
CO #	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)
MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)
OH #	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
OH #	PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
PL X	EXISTING POLE IDENTIFIER (# OF POLE)
PL X	PROPOSED POLE IDENTIFIER (# OF POLE)
RM C	REMOVE BY CONTRACTOR
RM O	REMOVE BY OTHERS
RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
CCTV CAMERA		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION (FISH EYE)		
VIDEO DETECTION ZONE		

GENERAL SIGNAL NOTES

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550 BAY ROAD
DOVER, DELAWARE 19901
(302) 734-9188

BRET A. MARTINE — No. 11947 — DELAWARE PROFESSIONAL ENGINEER

12/18/2020
THIS SEAL APPLIES TO THIS SHEET ONLY. DATE

SEAL

CONCURRENCE FOR INSTALLATION

CHIEF OF TRAFFIC ENGINEERING — DATE 12/22/2020

ADDENDA / REVISIONS	

SCALE
0 30 60 90
FEET

SIGNALIZED INTERSECTION DEVELOPER IMPROVEMENTS

CONTRACT	T202109816	PERMIT NO.	N247
COUNTY	NEW CASTLE	DESIGNED BY:	M. KUBOVCIK
		CHECKED BY:	B. MARTINE

SIGNAL PLAN DE 273 (OGLETOWN ROAD) & MARROWS ROAD

SECTION	
TRAFFIC	
SHEET NO.	1

LAST REVISED: 9/11/2018
PLOT DATE: 12-DEC-2020
11:28:38
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CONDUIT RUN SCHEDULE

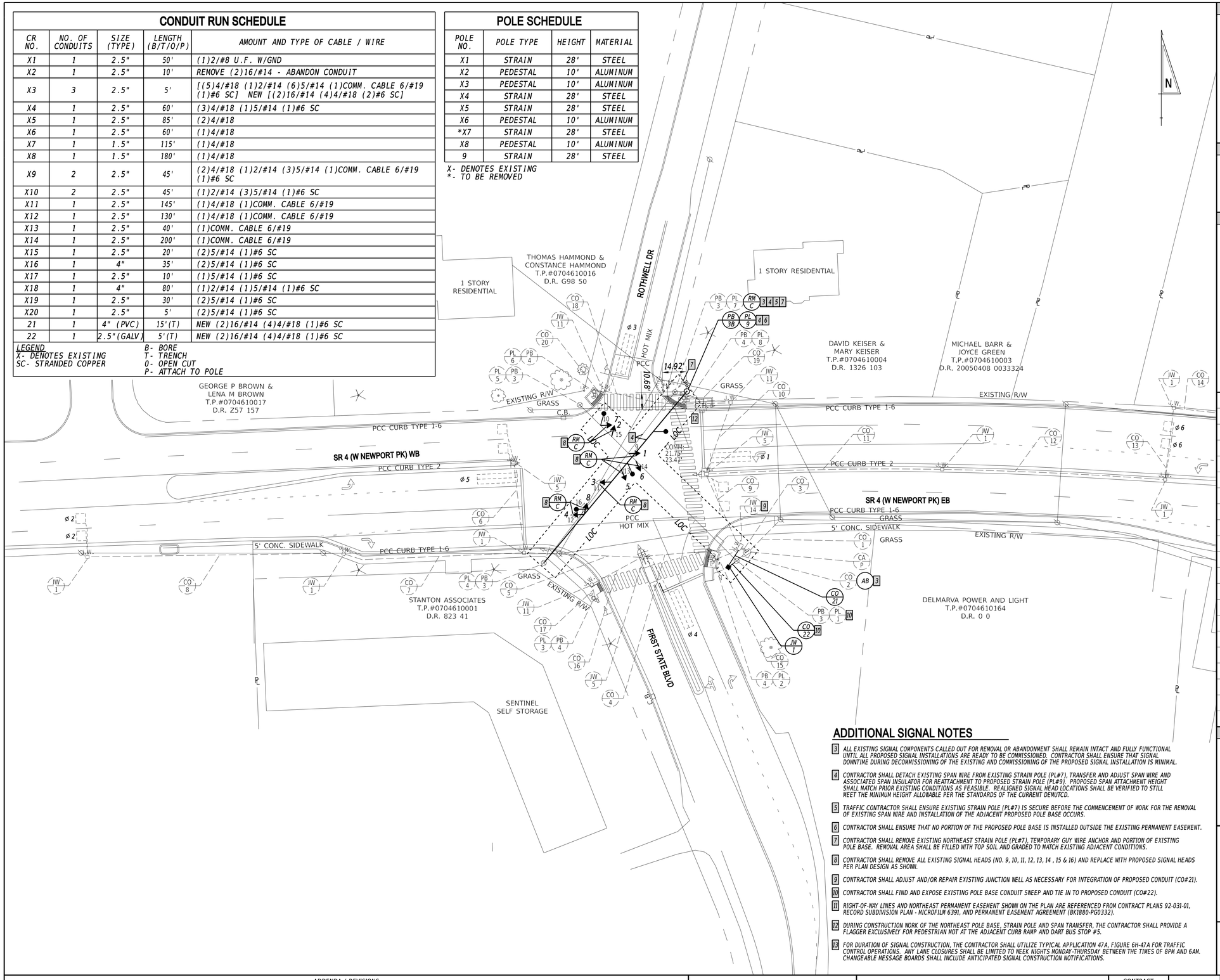
CR NO.	NO. OF CONDUITS	SIZE (TYPE)	LENGTH (B/T/O/P)	AMOUNT AND TYPE OF CABLE / WIRE
X1	1	2.5"	50'	(1)2/#8 U.F. W/GND
X2	1	2.5"	10'	REMOVE (2)16/#14 - ABANDON CONDUIT
X3	3	2.5"	5'	[(5)4/#18 (1)2/#14 (6)5/#14 (1)COMM. CABLE 6/#19 (1)#6 SC] NEW [(2)16/#14 (4)4/#18 (2)#6 SC]
X4	1	2.5"	60'	(3)4/#18 (1)5/#14 (1)#6 SC
X5	1	2.5"	85'	(2)4/#18
X6	1	2.5"	60'	(1)4/#18
X7	1	1.5"	115'	(1)4/#18
X8	1	1.5"	180'	(1)4/#18
X9	2	2.5"	45'	(2)4/#18 (1)2/#14 (3)5/#14 (1)COMM. CABLE 6/#19 (1)#6 SC
X10	2	2.5"	45'	(1)2/#14 (3)5/#14 (1)#6 SC
X11	1	2.5"	145'	(1)4/#18 (1)COMM. CABLE 6/#19
X12	1	2.5"	130'	(1)4/#18 (1)COMM. CABLE 6/#19
X13	1	2.5"	40'	(1)COMM. CABLE 6/#19
X14	1	2.5"	200'	(1)COMM. CABLE 6/#19
X15	1	2.5"	20'	(2)5/#14 (1)#6 SC
X16	1	4"	35'	(2)5/#14 (1)#6 SC
X17	1	2.5"	10'	(1)5/#14 (1)#6 SC
X18	1	4"	80'	(1)2/#14 (1)5/#14 (1)#6 SC
X19	1	2.5"	30'	(2)5/#14 (1)#6 SC
X20	1	2.5"	5'	(2)5/#14 (1)#6 SC
21	1	4" (PVC)	15'(T)	NEW (2)16/#14 (4)4/#18 (1)#6 SC
22	1	2.5"(GALV)	5'(T)	NEW (2)16/#14 (4)4/#18 (1)#6 SC

LEGEND
X- DENOTES EXISTING
SC- STRANDED COPPER
B- BORE
T- TRENCH
O- OPEN CUT
P- ATTACH TO POLE

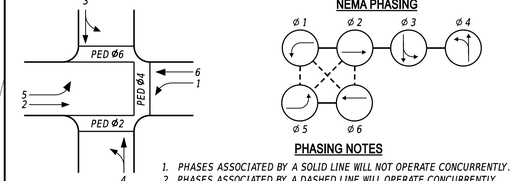
POLE SCHEDULE

POLE NO.	POLE TYPE	HEIGHT	MATERIAL
X1	STRAIN	28'	STEEL
X2	PEDESTAL	10'	ALUMINUM
X3	PEDESTAL	10'	ALUMINUM
X4	STRAIN	28'	STEEL
X5	STRAIN	28'	STEEL
X6	PEDESTAL	10'	ALUMINUM
*X7	STRAIN	28'	STEEL
X8	PEDESTAL	10'	ALUMINUM
9	STRAIN	28'	STEEL

X- DENOTES EXISTING
**- TO BE REMOVED*



SIGNAL PHASING



PHASING NOTES

1. *PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.*
2. *PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.*

SIGNAL HEAD DIAGRAM



**ALL EXISTING SIGNAL HEADS SHALL BE REMOVED*

LEGEND

AB	ABANDON	OH #	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	*OH #*	*PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)*
CA X	*PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)*	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	*PB X*	*PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)*
CO #	*PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)*	PL X	EXISTING POLE IDENTIFIER (# OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	*PL X*	*PROPOSED POLE IDENTIFIER (# OF POLE)*
JW X	*PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)*	RM C	REMOVE BY CONTRACTOR
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA XX	*PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)*	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	*PROPOSED SYMBOL*
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL		P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
CCTV CAMERA		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION		

ADDITIONAL SIGNAL NOTES

3. *ALL EXISTING SIGNAL COMPONENTS CALLED OUT FOR REMOVAL OR ABANDONMENT SHALL REMAIN INTACT AND FULLY FUNCTIONAL UNTIL ALL PROPOSED SIGNAL INSTALLATIONS ARE READY TO BE COMMISSIONED. CONTRACTOR SHALL ENSURE THAT SIGNAL DOWNTIME DURING DECOMMISSIONING OF THE EXISTING AND COMMISSIONING OF THE PROPOSED SIGNAL INSTALLATION IS MINIMAL.*
4. *CONTRACTOR SHALL DETACH EXISTING SPAN WIRE FROM EXISTING STRAIN POLE (PL#7), TRANSFER AND ADJUST SPAN WIRE AND ASSOCIATED SPAN INSULATOR FOR REATTACHMENT TO PROPOSED STRAIN POLE (PL#9). PROPOSED SPAN ATTACHMENT HEIGHT SHALL MATCH PRIOR EXISTING CONDITIONS AS FEASIBLE. REALIGNED SIGNAL HEAD LOCATIONS SHALL BE VERIFIED TO STILL MEET THE MINIMUM HEIGHT ALLOWABLE PER THE STANDARDS OF THE CURRENT DEMUTCD.*
5. *TRAFFIC CONTRACTOR SHALL ENSURE EXISTING STRAIN POLE (PL#7) IS SECURE BEFORE THE COMMENCEMENT OF WORK FOR THE REMOVAL OF EXISTING SPAN WIRE AND INSTALLATION OF THE ADJACENT PROPOSED POLE BASE OCCURS.*
6. *CONTRACTOR SHALL ENSURE THAT NO PORTION OF THE PROPOSED POLE BASE IS INSTALLED OUTSIDE THE EXISTING PERMANENT EASEMENT.*
7. *CONTRACTOR SHALL REMOVE EXISTING NORTHEAST STRAIN POLE (PL#7), TEMPORARY GUY WIRE ANCHOR AND PORTION OF EXISTING POLE BASE. REMOVAL AREA SHALL BE FILLED WITH TOP SOIL AND GRADED TO MATCH EXISTING ADJACENT CONDITIONS.*
8. *CONTRACTOR SHALL REMOVE ALL EXISTING SIGNAL HEADS (NO. 9, 10, 11, 12, 13, 14 , 15 & 16) AND REPLACE WITH PROPOSED SIGNAL HEADS PER PLAN DESIGN AS SHOWN.*
9. *CONTRACTOR SHALL ADJUST AND/OR REPAIR EXISTING JUNCTION WELL AS NECESSARY FOR INTEGRATION OF PROPOSED CONDUIT (CO#21).*
10. *CONTRACTOR SHALL FIND AND EXPOSE EXISTING POLE BASE CONDUIT SWEEP AND TIE IN TO PROPOSED CONDUIT (CO#22).*
11. *RIGHT-OF-WAY LINES AND NORTHEAST PERMANENT EASEMENT SHOWN ON THE PLAN ARE REFERENCED FROM CONTRACT PLANS 92-031-01, RECORD SUBDIVISION PLAN - MICROFILM 6391, AND PERMANENT EASEMENT AGREEMENT (BK1880-PG0332).*
12. *DURING CONSTRUCTION WORK OF THE NORTHEAST POLE BASE, STRAIN POLE AND SPAN TRANSFER, THE CONTRACTOR SHALL PROVIDE A FLAGGER EXCLUSIVELY FOR PEDESTRIAN MOT AT THE ADJACENT CURB RAMP AND DART BUS STOP #5.*
13. *FOR DURATION OF SIGNAL CONSTRUCTION, THE CONTRACTOR SHALL UTILIZE TYPICAL APPLICATION 47A, FIGURE 6H-47A FOR TRAFFIC CONTROL OPERATIONS. ANY LANE CLOSURES SHALL BE LIMITED TO WEEK NIGHTS MONDAY-THURSDAY BETWEEN THE TIMES OF 8PM AND 6AM. CHANGEABLE MESSAGE BOARDS SHALL INCLUDE ANTICIPATED SIGNAL CONSTRUCTION NOTIFICATIONS.*

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.

PREPARED BY
CENTURY ENGINEERING
550 BAY ROAD
DOVER, DELAWARE 19901
(302) 734-9188

3/1/2021
DATE

BRET A. MARTINE — No. 11947 — DELAWARE PROFESSIONAL ENGINEER
SEAL

CONCURRENCE FOR INSTALLATION

CHIEF OF TRAFFIC ENGINEERING

3/1/2021
DATE

ADDENDA / REVISIONS	

SCALE
0 30 60 90
FEET

SIGNAL MODIFICATIONS

CONTRACT	T202104002	PERMIT NO.	N566
COUNTY	NEW CASTLE	DESIGNED BY:	M.KUBOVCIK
		CHECKED BY:	B.MARTINE

SIGNAL PLAN
SR 4 & ROTHWELL DR
(FIRST STATE BLVD)

SECTION	
CEI	
SHEET NO.	
1	

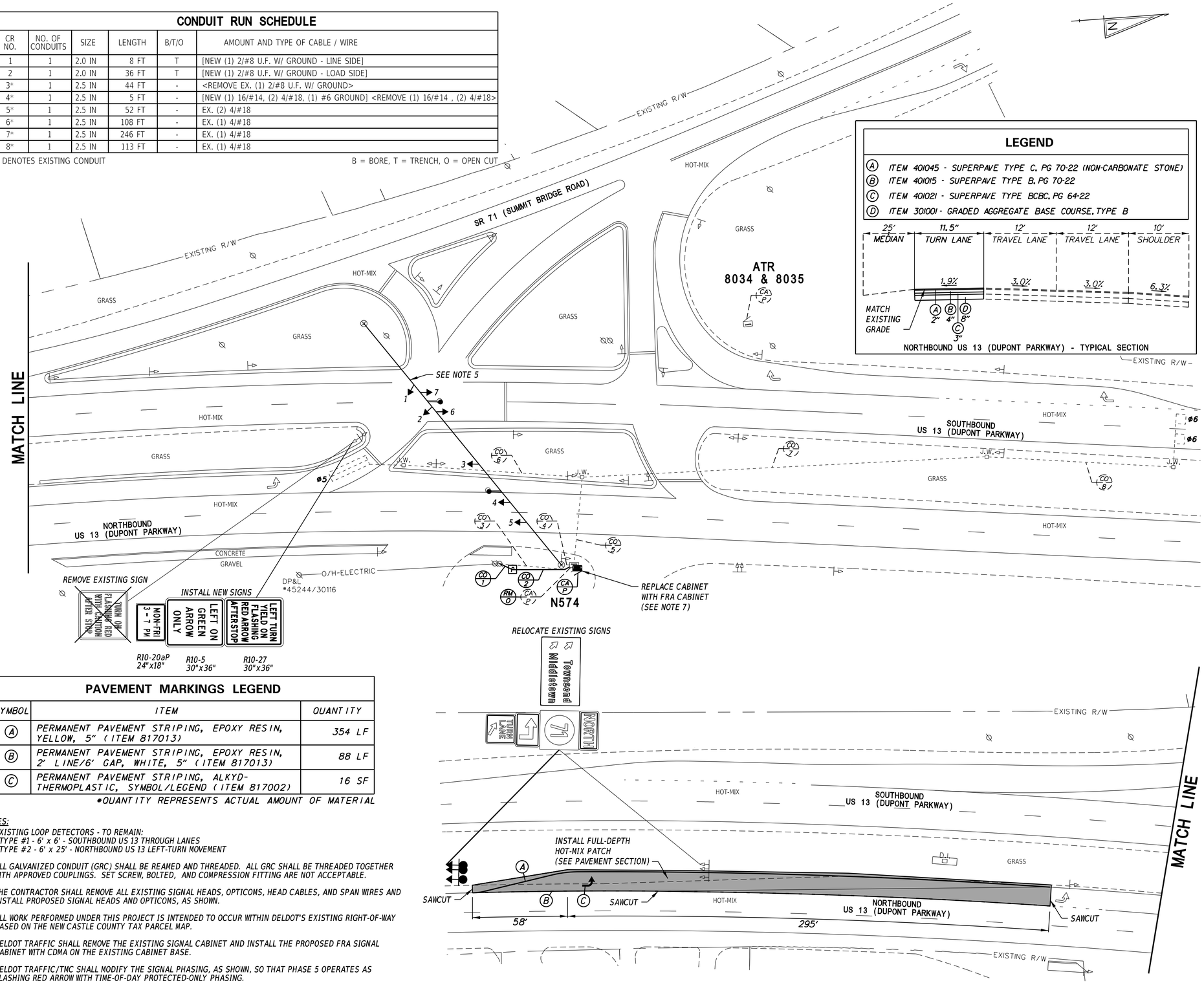
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1-MAR-2021
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CONDUIT RUN SCHEDULE

CR NO.	NO. OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE / WIRE
1	1	2.0 IN	8 FT	T	[NEW (1) 2/#8 U.F. W/ GROUND - LINE SIDE]
2	1	2.0 IN	36 FT	T	[NEW (1) 2/#8 U.F. W/ GROUND - LOAD SIDE]
3*	1	2.5 IN	44 FT	-	<REMOVE EX. (1) 2/#8 U.F. W/ GROUND>
4*	1	2.5 IN	5 FT	-	[NEW (1) 16/#14, (2) 4/#18, (1) #6 GROUND] <REMOVE (1) 16/#14 , (2) 4/#18>
5*	1	2.5 IN	52 FT	-	EX. (2) 4/#18
6*	1	2.5 IN	108 FT	-	EX. (1) 4/#18
7*	1	2.5 IN	246 FT	-	EX. (1) 4/#18
8*	1	2.5 IN	113 FT	-	EX. (1) 4/#18

* DENOTES EXISTING CONDUIT

B = BORE, T = TRENCH, O = OPEN CUT



LEGEND

- (A) ITEM 401045 - SUPERPAVE TYPE C, PG 70-22 (NON-CARBONATE STONE)
- (B) ITEM 401015 - SUPERPAVE TYPE B, PG 70-22
- (C) ITEM 401021 - SUPERPAVE TYPE BCBC, PG 64-22
- (D) ITEM 301001 - GRADED AGGREGATE BASE COURSE, TYPE B

NORTHBOUND US 13 (DUPONT PARKWAY) - TYPICAL SECTION

PAVEMENT MARKINGS LEGEND

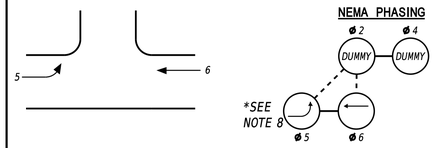
SYMBOL	ITEM	QUANTITY
(A)	PERMANENT PAVEMENT STRIPING, EPOXY RESIN, YELLOW, 5" (ITEM 817013)	354 LF
(B)	PERMANENT PAVEMENT STRIPING, EPOXY RESIN, 2' LINE/6' GAP, WHITE, 5" (ITEM 817013)	88 LF
(C)	PERMANENT PAVEMENT STRIPING, ALKYD-THERMOPLASTIC, SYMBOL/LEGEND (ITEM 817002)	16 SF

*QUANTITY REPRESENTS ACTUAL AMOUNT OF MATERIAL

NOTES:

3. EXISTING LOOP DETECTORS - TO REMAIN:
   TYPE #1 - 6' x 6' - SOUTHBOUND US 13 THROUGH LANES
   TYPE #2 - 6' x 25' - NORTHBOUND US 13 LEFT-TURN MOVEMENT
4. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED, AND COMPRESSION FITTING ARE NOT ACCEPTABLE.
5. THE CONTRACTOR SHALL REMOVE ALL EXISTING SIGNAL HEADS, OPTICOMS, HEAD CABLES, AND SPAN WIRES AND INSTALL PROPOSED SIGNAL HEADS AND OPTICOMS, AS SHOWN.
6. ALL WORK PERFORMED UNDER THIS PROJECT IS INTENDED TO OCCUR WITHIN DELDOT'S EXISTING RIGHT-OF-WAY BASED ON THE NEW CASTLE COUNTY TAX PARCEL MAP.
7. DELDOT TRAFFIC SHALL REMOVE THE EXISTING SIGNAL CABINET AND INSTALL THE PROPOSED FRA SIGNAL CABINET WITH CDMA ON THE EXISTING CABINET BASE.
8. DELDOT TRAFFIC/TMC SHALL MODIFY THE SIGNAL PHASING, AS SHOWN, SO THAT PHASE 5 OPERATES AS FLASHING RED ARROW WITH TIME-OF-DAY PROTECTED-ONLY PHASING.

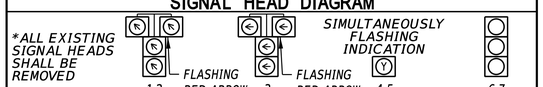
SIGNAL PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

AB	ABANDON	OH #	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH #	*PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)*
CA X	*PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)*	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PB X	*PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)*
CO #	*PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)*	PL X	EXISTING POLE IDENTIFIER (# OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	*PROPOSED POLE IDENTIFIER (# OF POLE)*
JW X	*PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)*	RM C	*REMOVE BY CONTRACTOR*
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	*REMOVE BY OTHERS*
MA XX	*PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)*	RM TC	*REMOVE BY TRAFFIC CONTRACTOR*

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
CCTV CAMERA		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.

PREPARED BY

Whitman, Requardt and Associates, LLP
Engineers • Architects • Environmental Planners Est. 1915

4/15/2020
DATE

THIS SEAL APPLIES TO ALL SHEETS BEARING THE "WRA" SECTION DESIGNATION.

CHRISTINA BUCKLEY — No. 16204 — PROFESSIONAL ENGINEER

SEAL

CONCURRENCE FOR INSTALLATION

4/16/2020
DATE

CHIEF TRAFFIC ENGINEER

ADDENDA / REVISIONS

1 EXTENDED NB LEFT-TURN LANE, CHANGED SIGNAL PHASING, AND CONVERTED NB LEFT-TURN PHASING TO MUTCD-COMPLIANT FLASHING RED ARROW
B.M.W. (WRA) 03-20 (CONTRACT #T201909202)

SCALE
0 30 60 90
FEET

CONTRACT	T201909202	PERMIT NO.	N574
COUNTY	NEW CASTLE	DESIGNED BY:	B.M.W. (WRA)
		CHECKED BY:	M.J.B. (WRA)

SIGNAL PLAN
US 13 (DUPONT PARKWAY) AT SR 71 (SUMMIT BRIDGE ROAD) (A.K.A., "H & H")

SECTION	
WRA	
SHEET NO.	
1	

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CONDUIT RUN SCHEDULE

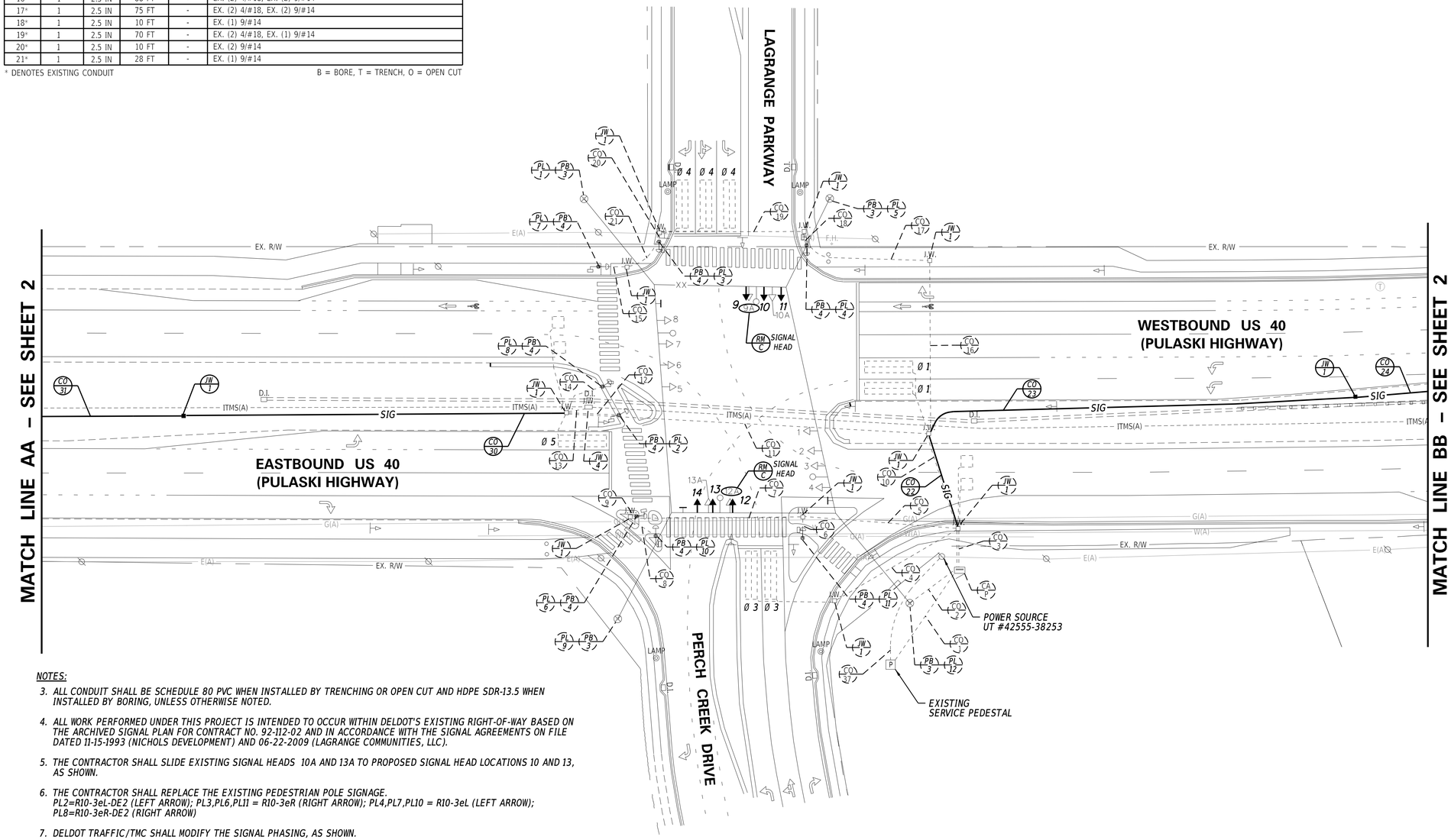
CR NO.	NO. OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE / WIRE
1*	1	1.5 IN	-	-	EX. (1) 2/#8 U.F. W/GROUND - LOAD SIDE
2*	1	2.5 IN	35 FT	-	EX. (4) 4/#18, EX. (2) 16/#14
3*	2	2.5 IN	18 FT	- -	EX. (10) 4/#18, EX. (5) 9/#14, EX. (1) 12 CNT FIBER, [NEW (4) 4#14, (2) #6 GROUND]
4*	1	2.5 IN	71 FT	-	EX. (1) 4/#18
5*	1	2.5 IN	79 FT	-	EX. (2) 9/#14
6*	1	2.5 IN	12 FT	-	EX. (1) 9/#14
7*	1	2.5 IN	85 FT	-	EX. (1) 9/#14
8*	1	2.5 IN	17 FT	-	EX. (1) 9/#14
9*	1	2.5 IN	6 FT	-	EX. (1) 9/#14
10*	1	2.5 IN	50 FT		EX.(7) 4/#18, EX. (3) 9/#14, EX. (1) 12 CNT FIBER
11*	1	2.5 IN	186 FT	-	EX. (3) 4/#18, EX. (1) 9/#14, EX. (1) 12 CNT FIBER, [NEW (2) 4#14, (1) #6 GROUND]
12*	1	2.5 IN	30 FT	-	EX. (2) 9/#14
13*	1	4.0 IN	10 FT	-	EX. (1) 12 CNT FIBER
14*	1	2.5 IN	30 FT	-	EX. (1) 9/#14
15*	1	2.5 IN	15 FT	-	EX. (1) 9/#14
16*	1	2.5 IN	88 FT	-	EX. (2) 4/#18, EX. (2) 9/#14
17*	1	2.5 IN	75 FT	-	EX. (2) 4/#18, EX. (2) 9/#14
18*	1	2.5 IN	10 FT	-	EX. (1) 9/#14
19*	1	2.5 IN	70 FT	-	EX. (2) 4/#18, EX. (1) 9/#14
20*	1	2.5 IN	10 FT	-	EX. (2) 9/#14
21*	1	2.5 IN	28 FT	-	EX. (1) 9/#14

* DENOTES EXISTING CONDUIT — B = BORE, T = TRENCH, O = OPEN CUT

CONDUIT RUN SCHEDULE CONT.

CR NO.	NO. OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE / WIRE
22	1	4.0 IN	50 FT	B	[NEW (4) 4/#14, (1) #6 GROUND]
23	1	4.0 IN	223 FT	T	[NEW (2) 4/#14, (1) #6 GROUND]
24	1	4.0 IN	230 FT	T	[NEW (2) 4/#14, (1) #6 GROUND]
25	1	4.0 IN	215 FT	T	[NEW (2) 4/#14, (1) #6 GROUND]
26	1	4.0 IN	48 FT	B	[NEW (1) 4/#14, (1) #6 GROUND]
27	1	4.0 IN	122 FT	T	[NEW (1) 4/#14, (1) #6 GROUND]
28	1	3.0 IN	8 FT	T	[NEW (1) 4/#14, (1) #6 GROUND]
29	1	3.0 IN	5 FT	T	[NEW (1) 4/#14, (1) #6 GROUND]
30	1	4.0 IN	196 FT	T	[NEW (2) 4/#14, (1) #6 GROUND]
31	1	4.0 IN	205 FT	T	[NEW (2) 4/#14, (1) #6 GROUND]
32	1	4.0 IN	198 FT	T	[NEW (2) 4/#14, (1) #6 GROUND]
33	1	4.0 IN	198 FT	T	[NEW (2) 4/#14, (1) #6 GROUND]
34	1	4.0 IN	50 FT	B	[NEW (1) 4/#14, (1) #6 GROUND]
35	1	3.0 IN	10 FT	T	[NEW (1) 4/#14, (1) #6 GROUND]
36	1	3.0 IN	10 FT	T	[NEW (1) 4/#14, (1) #6 GROUND]
37*	1	1.5 IN	60 FT	-	EX. (1) 2/#8 U.F. W/GROUND - LINE SIDE

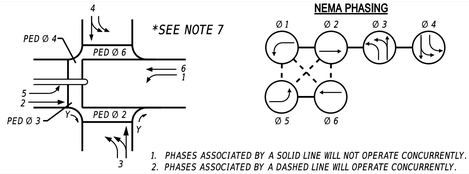
* DENOTES EXISTING CONDUIT — B = BORE, T = TRENCH, O = OPEN CUT



NOTES:

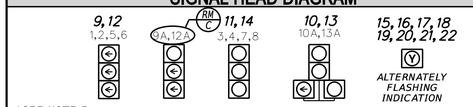
3. *ALL CONDUIT SHALL BE SCHEDULE 80 PVC WHEN INSTALLED BY TRENCHING OR OPEN CUT AND HDPE SDR-13.5 WHEN INSTALLED BY BORING, UNLESS OTHERWISE NOTED.*
4. *ALL WORK PERFORMED UNDER THIS PROJECT IS INTENDED TO OCCUR WITHIN DELDOT'S EXISTING RIGHT-OF-WAY BASED ON THE ARCHIVED SIGNAL PLAN FOR CONTRACT NO. 92-112-02 AND IN ACCORDANCE WITH THE SIGNAL AGREEMENTS ON FILE DATED 11-15-1993 (NICHOLS DEVELOPMENT) AND 06-22-2009 (LAGRANGE COMMUNITIES, LLC).*
5. *THE CONTRACTOR SHALL SLIDE EXISTING SIGNAL HEADS 10A AND 13A TO PROPOSED SIGNAL HEAD LOCATIONS 10 AND 13, AS SHOWN.*
6. *THE CONTRACTOR SHALL REPLACE THE EXISTING PEDESTRIAN POLE SIGNAGE.*
   PL2=R10-3eL-DE2 (LEFT ARROW); PL3,PL6,PL11 = R10-3eR (RIGHT ARROW); PL4,PL7,PL10 = R10-3eL (LEFT ARROW); PL8=R10-3eR-DE2 (RIGHT ARROW)
7. *DELDOT TRAFFIC/TMC SHALL MODIFY THE SIGNAL PHASING, AS SHOWN.*

SIGNAL PHASING



1. *PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.*
2. *PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.*

SIGNAL HEAD DIAGRAM



**SEE NOTE 5*

LEGEND

AB	*ABANDON*	OH #	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	*OH #*	*PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)*
CA X	*PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)*	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	*PB X*	*PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)*
CO #	*PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)*	PL X	EXISTING POLE IDENTIFIER (# OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	*PL X*	*PROPOSED POLE IDENTIFIER (# OF POLE)*
JW X	*PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)*	RM C	*REMOVE BY CONTRACTOR*
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	*REMOVE BY OTHERS*
MA XX	*PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)*	RM TC	*REMOVE BY TRAFFIC CONTRACTOR*

	EXISTING SYMBOL	*PROPOSED SYMBOL*
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		*R/W*
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
CCTV CAMERA		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.

PREPARED BY

Whitman, Requardt and Associates, LLP
Engineers • Architects • Environmental Planners Est. 1915

7/19/2021
DATE

THIS SEAL APPLIES TO ALL SHEETS BEARING THE "WRA" SECTION DESIGNATION.

MICHAEL J.A. BUCKLEY — No. 16224 — REGISTERED PROFESSIONAL ENGINEER

SEAL

CONCURRENCE FOR INSTALLATION

CHIEF OF TRAFFIC ENGINEERING

7/20/2021
DATE

ADDENDA / REVISIONS	
1	*INSTALLED NEW ACTIVE WARNING HIB ASSEMBLIES ON US 40. B. DONOWAY(WRA) 04-21 (CONTRACT #T202204001)*

SCALE
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FEET

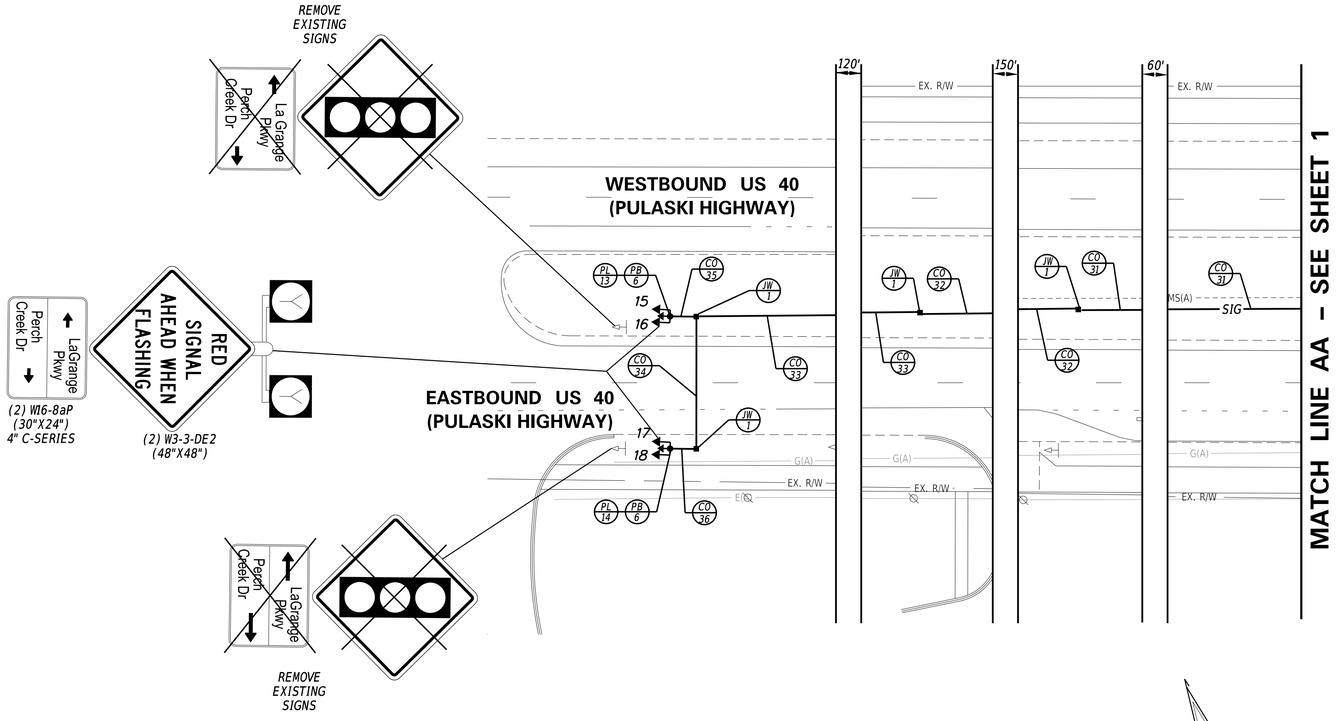
FY22 I.I. PROGRAM, FEDERAL

CONTRACT	T202204001	PERMIT NO.	N626
COUNTY	NEW CASTLE	DESIGNED BY:	B. DONOWAY
		CHECKED BY:	M. BUCKLEY

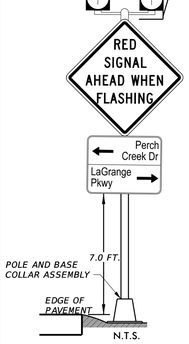
ACTIVE HIB PLAN
US 40 (PULASKI HIGHWAY)
@ LAGRANGE PARKWAY/
PERCH CREEK DRIVE

SECTION
WRA
SHEET NO.
1

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7/21/2021
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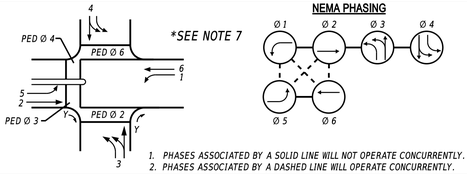


ACTIVE HIB ASSEMBLY



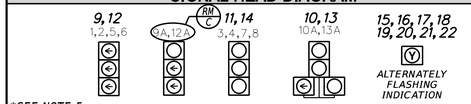
1. HAZARD IDENTIFICATION BEACON (HIB) ASSEMBLY SHALL CONSIST OF A PAIR OF ALTERNATELY FLASHING BEACONS AND A RED SIGNAL AHEAD WHEN FLASHING SIGN (W3-3-DE2, 48" x 48") WITH AN ADVANCE STREET NAME PLAQUE SIGN (W16-8aP, 30" x 24") MOUNTED ON A PEDESTAL POLE.
2. THE ACTIVE BEACONS SHALL BE 12-INCH YELLOW L.E.D. ONE-SECTION TRAFFIC SIGNAL HEADS.
3. THE ACTIVE BEACONS SHALL OPERATE 24 HOURS A DAY, 7 DAYS A WEEK USING A DELAY TIMER CIRCUIT.
4. THE FLASHING RATE SHALL NOT BE LESS THAN 50 NOR MORE THAN 60 TIMES PER MINUTE.
5. THE ILLUMINATED PERIOD OF EACH FLASH SHALL NOT BE LESS THAN 1 /2 NOR MORE THAN 2/3 OF THE FLASH CYCLE.
6. SIGNFIX (OR SIMILAR) SHALL BE INSTALLED ON THE BACK OF THE PROPOSED SIGNS FOR MOUNTING SUPPORT.
7. THE PEDESTAL POLE SHALL BE CONTINUOUS SPUN ALUMINUM, SCHEDULE 80. SPLICING POLE EXTENSIONS SHALL BE PROHIBITED.

SIGNAL PHASING



1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



*SEE NOTE 5

LEGEND

AB	ABANDON	OH #	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH #	*PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)*
CA X	*PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)*	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PB X	*PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)*
CO #	*PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)*	PL X	EXISTING POLE IDENTIFIER (# OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	*PROPOSED POLE IDENTIFIER (# OF POLE)*
JW X	*PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)*	RM C	*REMOVE BY CONTRACTOR*
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	*REMOVE BY OTHERS*
MA XX	*PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)*	RM TC	*REMOVE BY TRAFFIC CONTRACTOR*

	EXISTING SYMBOL	*PROPOSED SYMBOL*
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
CCTV CAMERA		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION		

CONDUIT RUN SCHEDULE

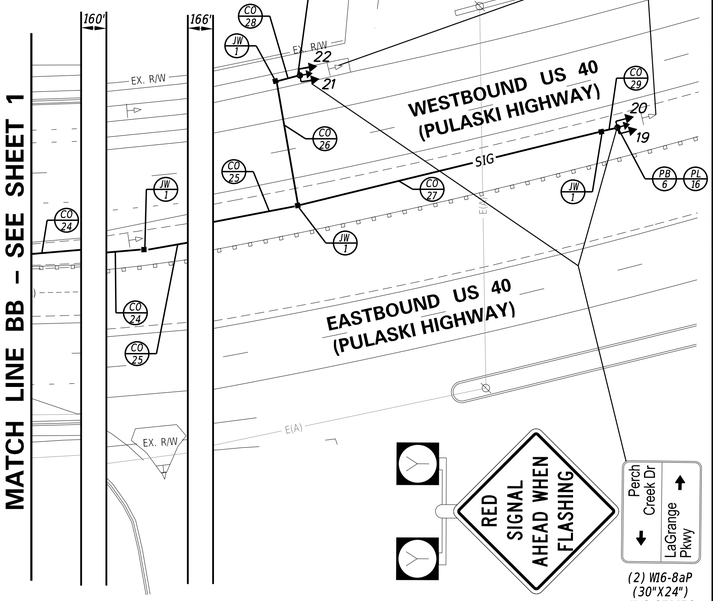
CR NO.	NO. OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE / WIRE
1*	1	1.5 IN	-	-	EX. (1) 2/#8 U.F. W/GROUND - LOAD SIDE
2*	1	2.5 IN	35 FT	-	EX. (4) 4/#18, EX. (2) 16/#14
3*	2	2.5 IN	18 FT	- -	EX. (10) 4/#18, EX. (5) 9/#14, EX. (1) 12 CNT FIBER, [NEW (4) 4#14, (2) #6 GROUND]
4*	1	2.5 IN	71 FT	-	EX. (1) 4/#18
5*	1	2.5 IN	79 FT	-	EX. (2) 9/#14
6*	1	2.5 IN	12 FT	-	EX. (1) 9/#14
7*	1	2.5 IN	85 FT	-	EX. (1) 9/#14
8*	1	2.5 IN	17 FT	-	EX. (1) 9/#14
9*	1	2.5 IN	6 FT	-	EX. (1) 9/#14
10*	1	2.5 IN	50 FT		EX.(7) 4/#18, EX. (3) 9/#14, EX. (1) 12 CNT FIBER
11*	1	2.5 IN	186 FT	-	EX. (3) 4/#18, EX. (1) 9/#14, EX. (1) 12 CNT FIBER, [NEW (2) 4#14, (1) #6 GROUND]
12*	1	2.5 IN	30 FT	-	EX. (2) 9/#14
13*	1	4.0 IN	10 FT	-	EX. (1) 12 CNT FIBER
14*	1	2.5 IN	30 FT	-	EX. (1) 9/#14
15*	1	2.5 IN	15 FT	-	EX. (1) 9/#14
16*	1	2.5 IN	88 FT	-	EX. (2) 4/#18, EX. (2) 9/#14
17*	1	2.5 IN	75 FT	-	EX. (2) 4/#18, EX. (2) 9/#14
18*	1	2.5 IN	10 FT	-	EX. (1) 9/#14
19*	1	2.5 IN	70 FT	-	EX. (2) 4/#18, EX. (1) 9/#14
20*	1	2.5 IN	10 FT	-	EX. (2) 9/#14
21*	1	2.5 IN	28 FT	-	EX. (1) 9/#14

* DENOTES EXISTING CONDUIT — B = BORE, T = TRENCH, O = OPEN CUT

CONDUIT RUN SCHEDULE CONT.

CR NO.	NO. OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE / WIRE
22	1	4.0 IN	50 FT	B	[NEW (4) 4/#14, (1) #6 GROUND]
23	1	4.0 IN	223 FT	T	[NEW (2) 4/#14, (1) #6 GROUND]
24	1	4.0 IN	230 FT	T	[NEW (2) 4/#14, (1) #6 GROUND]
25	1	4.0 IN	215 FT	T	[NEW (2) 4/#14, (1) #6 GROUND]
26	1	4.0 IN	48 FT	B	[NEW (1) 4/#14, (1) #6 GROUND]
27	1	4.0 IN	122 FT	T	[NEW (1) 4/#14, (1) #6 GROUND]
28	1	3.0 IN	8 FT	T	[NEW (1) 4/#14, (1) #6 GROUND]
29	1	3.0 IN	5 FT	T	[NEW (1) 4/#14, (1) #6 GROUND]
30	1	4.0 IN	196 FT	T	[NEW (2) 4/#14, (1) #6 GROUND]
31	1	4.0 IN	205 FT	T	[NEW (2) 4/#14, (1) #6 GROUND]
32	1	4.0 IN	198 FT	T	[NEW (2) 4/#14, (1) #6 GROUND]
33	1	4.0 IN	198 FT	T	[NEW (2) 4/#14, (1) #6 GROUND]
34	1	4.0 IN	50 FT	B	[NEW (1) 4/#14, (1) #6 GROUND]
35	1	3.0 IN	10 FT	T	[NEW (1) 4/#14, (1) #6 GROUND]
36	1	3.0 IN	10 FT	T	[NEW (1) 4/#14, (1) #6 GROUND]
37*	1	1.5 IN	60 FT	-	EX. (1) 2/#8 U.F. W/GROUND - LINE SIDE

* DENOTES EXISTING CONDUIT — B = BORE, T = TRENCH, O = OPEN CUT



NOTES:

3. *ALL CONDUIT SHALL BE SCHEDULE 80 PVC WHEN INSTALLED BY TRENCHING OR OPEN CUT AND HDPE SDR-13.5 WHEN INSTALLED BY BORING, UNLESS OTHERWISE NOTED.*
4. *ALL WORK PERFORMED UNDER THIS PROJECT IS INTENDED TO OCCUR WITHIN DELDOT'S EXISTING RIGHT-OF-WAY BASED ON THE ARCHIVED SIGNAL PLAN FOR CONTRACT NO. 92-112-02 AND IN ACCORDANCE WITH THE SIGNAL AGREEMENTS ON FILE DATED 11-15-1993 (NICHOLS DEVELOPMENT) AND 06-22-2009 (LAGRANGE COMMUNITIES, LLC).*
5. *THE CONTRACTOR SHALL SLIDE EXISTING SIGNAL HEADS 10A AND 13A TO PROPOSED SIGNAL HEAD LOCATIONS 10 AND 13, AS SHOWN.*
6. *THE CONTRACTOR SHALL REPLACE THE EXISTING PEDESTRIAN POLE SIGNAGE. PL2=R10-3eL-DE2 (LEFT ARROW); PL3,PL6,PL11 = R10-3eR (RIGHT ARROW); PL4,PL7,PL10 = R10-3eL (LEFT ARROW); PL8=R10-3eR-DE2 (RIGHT ARROW)*
7. *DELDOT TRAFFIC/TMC SHALL MODIFY THE SIGNAL PHASING, AS SHOWN.*

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.

PREPARED BY

Whitman, Requardt and Associates, LLP
Engineers • Architects • Environmental Planners Est. 1915

THIS SEAL APPLIES TO ALL SHEETS BEARING THE "WRA" SECTION DESIGNATION.

7/19/2021
DATE

MICHAEL A. BUCKLEY — No. 19234 — REGISTERED PROFESSIONAL ENGINEER

SEAL

CONCURRENCE FOR INSTALLATION

CHIEF OF TRAFFIC ENGINEERING

7/20/2021
DATE

ADDENDA / REVISIONS

1 *INSTALLED NEW ACTIVE WARNING HIB ASSEMBLIES ON US 40. B. DONOWAY(WRA) 04-21 (CONTRACT #T202204001)*

SCALE 0 30 60 90 FEET

FY22 I.I. PROGRAM, FEDERAL

CONTRACT	PERMIT NO.	N626	SECTION
T202204001	DESIGNED BY:	B. DONOWAY	WRA
COUNTY	CHECKED BY:	M. BUCKLEY	SHEET NO.
NEW CASTLE			2

ACTIVE HIB PLAN US 40 (PULASKI HIGHWAY) @ LAGRANGE PARKWAY/ PERCH CREEK DRIVE

LAST REVISED: 9/11/2018
7/21/2021
9:33:35 AM
N:\3215\01\3\CADD\SIG02_US40 @ Lagrange_Perch Creek.dgn

CONDUIT RUN SCHEDULE

CO#	# OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/ WIRE
X1A	1	2"	-	46'	-	REMOVE (1)2/#8 U.F. W/GROUND - ABANDON CONDUIT
1B	1	2"	GALV	40'	T	NEW (1)2/#8 U.F. W/GROUND - LOAD SIDE
1C	1	2"	GALV	10'/30'	T/P	NEW (3)1/#8 THHN SC - LINE SIDE
X2	3	2.5"	-	5'	-	(2)16/#14 (2)12 CNT MM REMOVE [(8)4/#18 (1)9/#14] NEW [(9)2/#14 (6)5/#14 (3)#6 SC]
X3	1	2.5"	-	30'	-	(4)4/#18 (1)9/#14 (2)16/#14 NEW (1)#6 SC
X4	1	2.5"	-	30'	-	REMOVE (1)9/#14 - ABANDON CONDUIT
X5	1	2.5"	-	165'	-	REMOVE (1)4/#18 NEW [(1)2/#14 (1)#6 SC]
X6	1	2.5"	-	180'	-	REMOVE (1)4/#18 - AB CONDUIT NEW[(1)2/#14 (1)#6 SC]
X7	1	1.5"	-	15'	-	REMOVE (2)4/#18 NEW (2)1/#14
X8	1	2.5"	-	105'	-	REMOVE [(4)4/#18 (1)9/#14] NEW [(3)2/#14 (2)5/#14 (1)#6 SC]
X9	1	2.5"	-	15'	-	REMOVE (1)9/#14 - ABANDON CONDUIT
X10	1	2.5"	-	130'	-	REMOVE (2)4/#18 - ABANDON CONDUIT
X11	1	1.5"	-	170'	-	REMOVE (1)4/#18 NEW [(1)2/#14 (1)#6 SC]
X12	1	1.5"	-	175'	-	REMOVE (1)4/#18 - AB CONDUIT NEW[(1)2/#14 (1)#6 SC]
X13	1	2.5"	-	75'	-	REMOVE (1)4/#18 - ABANDON CONDUIT
X14	1	2.5"	-	90'	-	REMOVE (1)4/#18 - ABANDON CONDUIT
15	1	2.5"	PVC	20'	T	NEW (2)5/#14 (1)#6 SC
16	1	2.5"	PVC	15'	T	NEW (2)5/#14 (1)#6 SC
17	1	4"	PVC	30'	T	NEW (2)2/#14 (1)#6 SC
18	1	2.5"	PVC	20'	T	NEW (1)5/#14 (1)#6 SC
19	1	4"	HDPE	90'	B	NEW (2)2/#14 (1)5/#14 (1)#6 SC
20	1	4"	HDPE	65'	B	NEW (3)2/#14 (1)5/#14 (1)#6 SC
21	1	2.5"	PVC	5'	T	NEW (1)5/#14 (1)#6 SC
22	1	4"	HDPE	100'	B	NEW (4)2/#14 (2)5/#14 (1)#6 SC
XF23	1	2.5"	-	95'	-	EXISTING (2)12 CNT MM
XF24	1	2.5"	-	350'	-	EXISTING (1)12 CNT MM (1)48 CNT SM
	1	2.5"	-	350'	-	EXISTING (2)12 CNT MM
XF25	1	2.5"	-	350'	-	EXISTING (1)12 CNT MM (1)48 CNT SM
XF26	1	2.5"	-	195'	-	EXISTING (1)12 CNT MM (1)48 CNT SM

LEGEND
X- DENOTES EXISTING
SC- STRANDED COPPER
B- BORE
T- TRENCH
O- OPEN CUT
P- ATTACH TO POLE
MM- MULTI-MODE FIBER OPTIC CABLE
SM- SINGLE-MODE FIBER OPTIC CABLE

ADDITIONAL SIGNAL NOTES

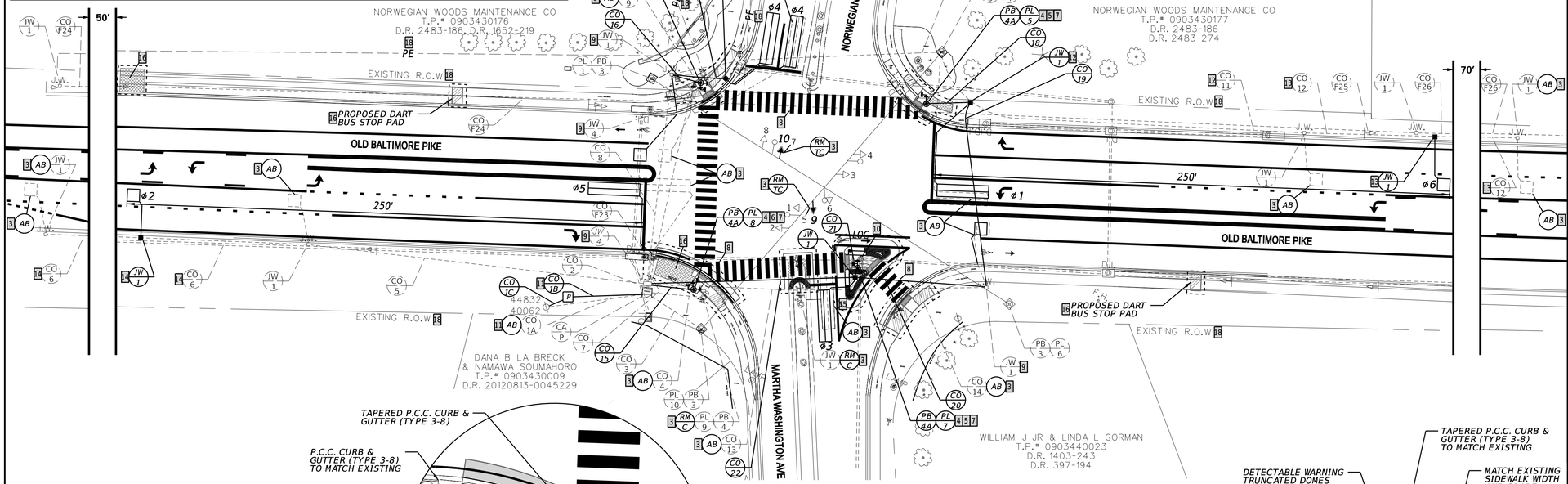
3. ALL EXISTING SIGNAL COMPONENTS CALLED OUT FOR REMOVAL OR ABANDONMENT SHALL REMAIN INTACT AND FULLY FUNCTIONAL UNTIL ALL PROPOSED SIGNAL INSTALLATIONS ARE READY TO BE COMMISSIONED. CONTRACTOR SHALL ENSURE THAT SIGNAL DOWNTIME DURING DECOMMISSIONING OF THE EXISTING AND COMMISSIONING OF THE PROPOSED SIGNAL INSTALLATION IS MINIMAL.
4. PEDESTRIAN SIGNAL HEADS SHALL BE COUNT-DOWN TYPE.
5. CONTRACTOR SHALL INSTALL EDUCATION COUNTDOWN PEDESTRIAN SIGN (R10-3e) ON ALL SINGLE PEDESTRIAN SIGNAL MOUNTED POLES PER DESIGN.
6. CONTRACTOR SHALL INSTALL EDUCATION COUNTDOWN PEDESTRIAN SIGNS (R10-3e-DE) ON ALL DOUBLE PEDESTRIAN SIGNAL MOUNTED POLES WITH ARROWS ALIGNED ON STATION BUTTONS IN THE DIRECTION OF PED PHASE ACTIVATION PER DESIGN.
7. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHOULD BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (50:1 OR FLATTER) LANDING AREA OF THE PEDESTRIAN CONNECTION WHEN POSSIBLE. WHERE THERE ARE PHYSICAL CONSTRAINTS THAT MAKE IT IMPRACTICAL TO PLACE THE PEDESTRIAN PUSHBUTTON ADJACENT TO A LEVEL ALL-WEATHER SURFACE, THE SURFACE SHOULD BE AS LEVEL AS FEASIBLE. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE ADJOINING SIDEWALK TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK.
8. ALL CROSSWALK PAVEMENT MARKINGS SHALL BE 10 FEET IN WIDTH.
9. CONTRACTOR SHALL RESET, ADJUST, AND/OR REPAIR EXISTING JUNCTION WELL AS NECESSARY FOR INTEGRATION OF PROPOSED CONDUIT, SAW CUT LOOPS AND/OR TO FINISH FLUSH WITH FINAL GRADES. BOND AND GROUND.
10. CONTRACTOR SHALL COORDINATE WITH APPROPRIATE UTILITY AGENCY FOR THE PROVISION OF ADA STANDARD SLIP RESISTANT MANHOLE LID AND FOR ANY ADJUSTMENTS TO TOP OF LID TO ENSURE IT IS FLUSH WITH PROPOSED CURB RAMP GRADES.
11. CONTRACTOR SHALL INTERCEPT EXISTING CONDUIT (CO-1A), CUT AND INSTALL PROPOSED CONDUIT (CO-1B) AS SHOWN ON PLAN.
12. CONTRACTOR SHALL INTERCEPT EXISTING CONDUIT (CO-11), CUT AND TIE INTO PROPOSED JUNCTION WELL AS SHOWN ON PLAN.
13. CONTRACTOR SHALL INTERCEPT EXISTING CONDUIT (CO-12), CUT AND TIE INTO PROPOSED JUNCTION WELL AS SHOWN ON PLAN.
14. CONTRACTOR SHALL INTERCEPT EXISTING CONDUIT (CO-6), CUT AND TIE INTO PROPOSED JUNCTION WELL AS SHOWN ON PLAN.
15. CONTRACTOR SHALL INSTALL CORNER TUBULAR MARKERS ON PROPOSED ISLAND.
16. DART BUS STOP PAD SHALL BE REMOVED AND RELOCATED TO DART COORDINATED LOCATION SHOWN ON PLAN.
17. CONTRACTOR SHALL REFER TO P&R NORTH XII, FY-2016 CONSTRUCTION DETAILS FOR CURB RAMP SLOPES, SIDEWALK GRADES AND GEOMETRICS.
18. EXISTING RIGHT OF WAY AND EXISTING PERMANENT EASEMENT WAS OBTAINED FROM RIGHT OF WAY PLANS DATED JULY 29, 1998 PER CONTRACT 79-105-01.

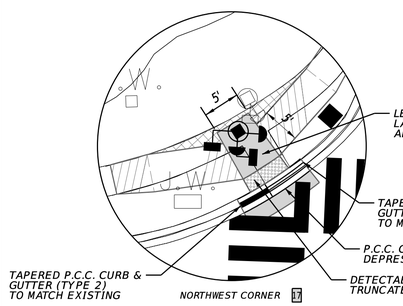
POLE SCHEDULE

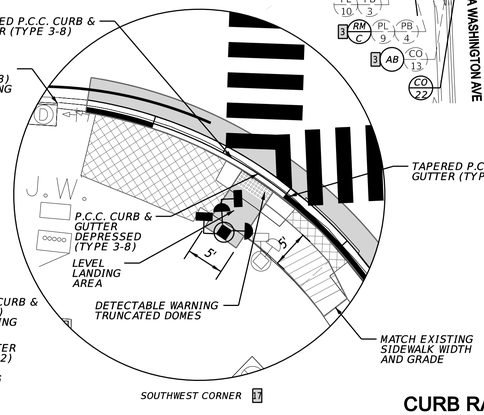
POLE #	POLE TYPE	HEIGHT	MATERIAL
X1	STRAIN	32'	STEEL
*X2	PEDESTRIAN	10'	ALUMINUM
3	PEDESTRIAN	10'	ALUMINUM
X4	STRAIN	32'	STEEL
5	PEDESTRIAN	10'	ALUMINUM
X6	STRAIN	32'	STEEL
7	PEDESTRIAN	10'	ALUMINUM
8	PEDESTRIAN	10'	ALUMINUM
*X9	PEDESTRIAN	10'	ALUMINUM
X10	STRAIN	32'	STEEL

X - DENOTES EXISTING
* - TO BE REMOVED

OLD BALTIMORE PIKE IS ASSUMED TO RUN IN EAST-WEST DIRECTION.

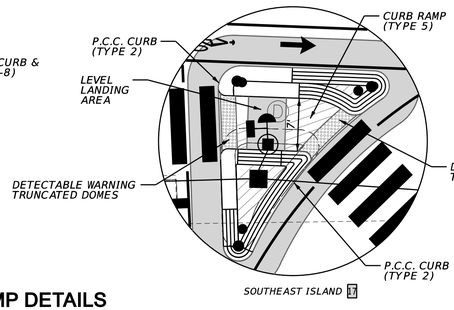


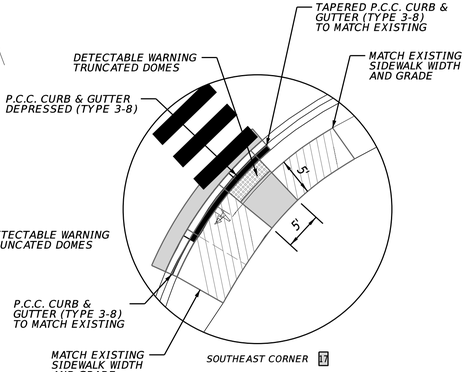


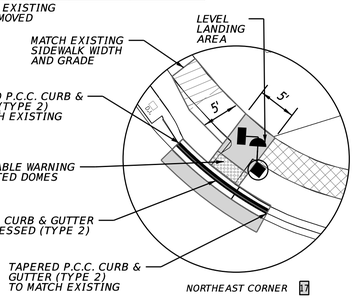


CURB RAMP DETAILS

SCALE: 1"=10'



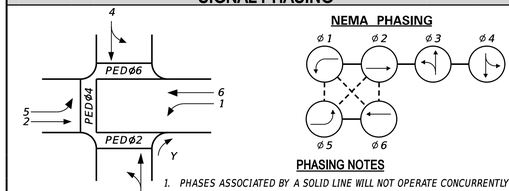




CURB RAMP DETAIL

SCALE: 1"=10'

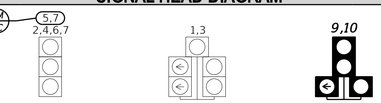
SIGNAL PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

AB	ABANDON	OH #	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH #	PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (# OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (# OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
VIDEO DETECTOR		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
CCTV CAMERA		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION ZONE		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.

PREPARED BY

CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
550 Bay Road
DOVER, DELAWARE 19901
(302) 734-9188

BRET A. MARTINE — No. 11947 — DELAWARE PROFESSIONAL ENGINEER

B. Martine 01/19/2021
THIS SEAL APPLIES TO THIS SHEET ONLY. DATE

SEAL

CONCURRENCE FOR INSTALLATION

CHIEF OF TRAFFIC ENGINEERING — DATE 1/22/2021

ADDENDA / REVISIONS

SCALE
0 30 60 90
FEET

PAVEMENT & REHABILITATION NORTH XII, FY- 2016 OLD BALTIMORE PIKE

CONTRACT	PERMIT NO.	N632
T201606112	DESIGNED BY:	M. KUBOVCIK
COUNTY	CHECKED BY:	B. MARTINE
NEW CASTLE		

SIGNAL PLAN OLD BALTIMORE PIKE @ MARTHA WASHINGTON AVE

SECTION: CEI
SHEET NO.: 62

LAST REVISED: 9/11/2018
13-JAN-2021
13:33
G:\Projects\145002.00 (DelDOT Agmt 1679)\T51 (T201606112) - Trfc-ADA Pleasant Valley Rd\CADD FILES\Sheets\Signals\sg_N632_OBP @ Martha Washington Ave.dgn

ADDITIONAL SIGNAL NOTES

7. CONTRACTOR SHALL REMOVE EXISTING TYPE 11 JUNCTION WELL FRAME AND LID AND REPLACE WITH TYPE 1 FRAME AND LID TO PROPOSED SIDEWALK GRADE PER CONSTRUCTION DETAIL FOR CURB RAMP 16. DURING THE REMOVAL AND REPLACEMENT PROCESS CARE SHALL BE TAKEN NOT TO DAMAGE EXISTING CONDUITS AND CABLES.
8. CONTRACTOR SHALL REMOVE EXISTING JUNCTION WELL FRAME AND LID AND RETROFIT WITH PROPOSED JUNCTION WELL FRAME AND LID. DURING THE REMOVAL AND REPLACEMENT PROCESS CARE SHALL BE TAKEN NOT TO DAMAGE EXISTING CONDUITS AND CABLES.
9. CONTRACTOR SHALL REMOVE EXISTING PEDESTRIAN SIGNAL HEADS AND PUSH BUTTONS AND REPLACE WITH NEW COUNTDOWN TYPE PEDESTRIAN SIGNAL HEADS AND PUSH BUTTONS.
10. CONTRACTOR SHALL INSTALL COUNTDOWN PEDESTRIAN SIGNS (R10-3E) WITH ARROWS ALIGNED ON EACH STATION BUTTON PER PLANNING DESIGN.
11. DELDOT TRAFFIC SHALL CONTACT REESE BLAHUTA (CONDUENT PROJECT MANAGER) AT 971-221-2690 IF THE EXISTING RED LIGHT CAMERA CABLES ARE AFFECTED DURING CONSTRUCTION. RL-1
12. ALL CROSSWALKS SHALL BE 10 FEET IN WIDTH. PINCH POINT ON THE SOUTH CROSSING SHALL BE MINIMUM OF 6 FEET WIDE.
13. CONTRACTOR SHALL REMOVE EXISTING TYPE 1 JUNCTION WELL AND INSTALL PROPOSED TYPE 1 JUNCTION WELL ADJACENT TO EXISTING PEDESTRIAN CURB RAMP AS SHOWN. CONDUIT RUN NO 39 SHALL INTERCEPT CONDUIT RUN NO 33. TRAFFIC CONTRACTOR SHALL RELOCATE EXISTING SIGNAL CABLES TO RUN THROUGH PROPOSED CONDUITS AND JUNCTION WELL.
14. A FIELD SURVEY WAS COMPLETED BY CENTURY ENGINEERING DURING THE MONTH OF AUGUST, 2016.
15. RIGHT-OF-WAY LINES SHOWN WERE OBTAINED FROM SIGNAL PLAN DATED APRIL 10TH 2008.
16. TRAFFIC CONTRACTOR SHALL REMOVE EXISTING 3-SECTION (TYPE C) SIGNAL HEAD NUMBERS 2 AND 6 FROM 2-WAY SPAN WIRE BRACKET. TRAFFIC CONTRACTOR SHALL RELOCATE EXISTING 3-SECTION (TYPE C) SIGNAL HEADS ON ONE-WAY SPAN WIRE BRACKETS AT PROPOSED LOCATIONS AS SHOWN.
17. ~~TRAFFIC FORCES SHALL DETERMINE WHICH COMPONENTS TO BE REPLACED IN SIGNAL CABINET.~~ RL-1
18. CONTRACTOR SHALL REFER TO P&R NORTH XIX, FY 2016 CONSTRUCTION DETAILS FOR CURB RAMP SLOPES AND GRADES.
19. CONTRACTOR SHALL REMOVE EXISTING TYPE 1 JUNCTION WELL AND INSTALL PROPOSED TYPE 1 JUNCTION WELL ADJACENT TO EXISTING PEDESTRIAN CURB RAMP AS SHOWN. CONDUIT RUN NO 43 AND 44 SHALL INTERCEPT CONDUIT RUN NO 25 AND NO 22, RESPECTIVELY. TRAFFIC CONTRACTOR SHALL RELOCATE EXISTING SIGNAL CABLES TO RUN THROUGH PROPOSED CONDUITS AND JUNCTION WELL.

20 CONTRACTOR SHALL SLIDE EXISTING SIGNAL HEADS (#9, #10, #11 & #12) AND INSTALL PROPOSED SIGNAL HEADS (#13 & #14) TO CONFORM WITH POSITIONING GUIDANCE IN THE DELDOT TRAFFIC DESIGN MANUAL RL-1

REVISION PREPARED BY
CENTURY ENGINEERING INC.
THIS SEAL APPLIES TO THIS SHEET ONLY
REDLINE-1 UPDATES
05/28/20 DATE

BRET A. MARTIN — No. 11947 — DELAWARE — PROFESSIONAL ENGINEER — SEAL

POLE SCHEDULE

POLE #	POLE TYPE	HEIGHT	MATERIAL
X1	STRAIN	32'	STEEL
X2	STRAIN	32'	STEEL
X3	PEDESTAL	10'	ALUMINUM
4	PEDESTAL	10'	ALUMINUM
*X5	PEDESTAL	10'	ALUMINUM
6	PEDESTAL	10'	ALUMINUM
*X7	PEDESTAL	10'	ALUMINUM
X8	STRAIN	32'	STEEL
*X9	PEDESTAL	10'	ALUMINUM
10	PEDESTAL	10'	ALUMINUM
X11	STRAIN	32'	STEEL

X- DENOTES EXISTING
*- TO BE REMOVED

US 40 IS ASSUMED TO RUN IN AN EAST-WEST DIRECTION

11-023.00-054
LANDS N/F
SUNSET LAND LLC
C/O GLASGOW PINES IV LLC
INSTR. 20080917 0062954

GLASGOW PINES MAINTENANCE ASSN
T.P. #1102300033
D.R. 4911

11-023.00-060
LANDS N/F
NATIONAL RAILROAD PASSENGER CORP.
C/O ADVANTAGE IQ-MS 1586
D.R. 184 174

11-023.00-071
LANDS N/F
REYBOLD VENTURE GROUP 1
THE REYBOLD GROUP OF COMPANIES, INC.
D.R. 409 80

SCOTLAND DR

US 40 WB (PULASKI HWY)

US 40 EB (PULASKI HWY)

EAST SCOTLAND DR

EXISTING R.O.W

CZ

370'

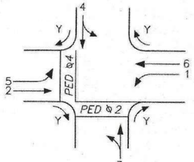
75'

100'

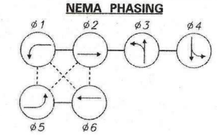
10:1 SCALE

10:1 SCALE

SIGNAL PHASING



NEMA PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



RL-2 CONTRACTOR SHALL REPLACE ALL SIGNAL HEADS AND CABLES

LEGEND

AB	ABANDON	OH*	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH*	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO *	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO *	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (* OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (* OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY	R/W	R/W
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
SPAN INSULATOR		
SPAN WIRE	XX	X
UTILITY POLE		
VIDEO DETECTION		

CONDUIT RUN SCHEDULE

CO#	# OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/WIRE
X1A	1	2.5"	GALV	10'	-	EXISTING (1)2/*8 U.F. W/GROUND
X1B	1	2.5"	GALV	20'	-	EXISTING (1)2/*8 U.F. W/GROUND
X2	2	2.5"	GALV	5'	-	EXISTING [(4)4/*18 (2)16/*14 RLE CABLE (1)12 SM] REMOVE [(10)4/*18 (1)4/*14 (1)9/*14] NEW [(4)5/*14 (16)2/*14 (2)*6 BSC]
X3	1	2.5"	GALV	25'	-	EXISTING [(4)4/*18 (2)16/*14] NEW [(1)9/*14 (1)*6 BSC]
X4	1	2.5"	GALV	255'	-	REMOVE [(2)4/*18] NEW [(2)2/*14 (1)*6 BSC]
X5	1	2"	PVC	120'	-	EXISTING RLE CABLE
X6	1	2"	PVC	10'	-	EXISTING RLE CABLE
X7	1	2.5"	GALV	130'	-	REMOVE [(1)4/*18] NEW [(2)2/*14 (1)*6 BSC]
X8	1	1.5"	GALV	3'	-	REMOVE [(4)1/*14] NEW [(4)1/*14]
X9	1	2.5"	GALV	95'	-	REMOVE [(3)4/*18] NEW [(4)2/*14 (1)*6 BSC]
X10	1	1.5"	GALV	6'	-	REMOVE [(2)1/*14] NEW [(4)1/*14]
X11	1	2.5"	GALV	70'	-	REMOVE [(2)4/*18] NEW [(2)2/*14 (1)*6 BSC]
X12	1	1"	FLEX	5'	-	REMOVE [(4)1/*14] NEW [(4)1/*14]
X13	1	4"	HDPE	85'	-	EXISTING [RLE CABLE] REMOVE [(1)4/*14 (1)9/*14 (7)4/*18] NEW [(4)5/*14 (10)2/*14 (1)*6 BSC]
X14	1	1.5"	GALV	7'	-	EXISTING (4)1/*14
X15	1	2.5"	GALV	44'	-	REMOVE (1)4/*14
X16	1	2"	PVC	62'	-	EXISTING RLE CABLE
X17	1	2"	PVC	5'	-	EXISTING RLE CABLE
X18	1	4"	HDPE	75'	-	EXISTING [RLE CABLE] REMOVE [(1)9/*14 (6)4/*18] NEW [(3)5/*14 (8)2/*14 (1)*6 BSC]
X19	1	1.5"	GALV	9'	-	REMOVE [(4)1/*14] NEW [(4)1/*14]
X20	1	2.5"	GALV	80'	-	REMOVE [(2)4/*18] NEW [(2)2/*14 (1)*6 BSC]
X21	1	1.5"	GALV	5'	-	REMOVE [(4)1/*14] NEW [(4)1/*14]
X22	1	4"	HDPE	91'	-	EXISTING [RLE CABLE] REMOVE [(1)9/*14 (3)4/*18] NEW [(3)5/*14 (4)2/*14 (1)*6 BSC]

LEGEND
X- DENOTES EXISTING
BSC- BARE STRANDED COPPER
MW- MICROWAVE
B- BORE
T- TRENCH
O- OPEN CUT
P- ATTACH TO POLE
MM- MULTI-MODE FIBER OPTIC CABLE
SM- SINGLE-MODE FIBER OPTIC CABLE
RLE- RED LIGHT ENFORCEMENT
A- AERIAL

CONDUIT RUN SCHEDULE CONT.

CO#	# OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/WIRE
X23	1	2.5"	PVC	5'	-	REMOVE [(1)9/*14]
X24	1	2.5"	PVC	9'	-	REMOVE [(1)9/*14]
X25	1	2.5"	GALV	5'	-	EXISTING [RLE CABLE] REMOVE [(1)4/*18] NEW [(2)2/*14 (1)*6 BSC]
X26	1	2.5"	GALV	115'	-	EXISTING [RLE CABLE] REMOVE [(1)4/*18] NEW [(2)2/*14 (1)*6 BSC]
X27	1	2.5"	GALV	127'	-	REMOVE [(1)4/*18] NEW [(2)2/*14 (1)*6 BSC]
X28	1	2.5"	GALV	112'	-	REMOVE [(1)4/*18] NEW [(2)2/*14 (1)*6 BSC]
X29	1	1.5"	GALV	7'	-	REMOVE [(4)1/*14] NEW [(4)1/*14]
X30	1	2"	PVC	10'	-	EXISTING RLE CABLES
X31	1	2.5"	GALV	10'	-	EMPTY
X32	1	3"	GALV	43'	-	REMOVE [(1)4/*14 (1)4/*18] NEW [(1)5/*14 (1)2/*14 (1)*6 BSC]
X33	1	2.5"	GALV	37'	-	REMOVE [(1)4/*14] NEW [(1)5/*14 (1)*6 BSC]
X34	1	4"	HDPE	250'	-	EMPTY
X35	1	2.5"	GALV	15'	-	EMPTY
X36	1	4"	HDPE	180'	-	EMPTY
37	1	1.5"	GALV	10'	T	NEW (4)1/*14
38	1	4"	HDPE	40'	B	NEW [(1)5/*14 (2)2/*14 (1)*6 BSC]
RL-1 39	1	2.5"	GALV	5'	T	NEW [(1)5/*14 (1)*6 BSC]
RL-1 40	1	2.5"	PVC	15'	T	NEW [(1)5/*14 (1)*6 BSC]
RL-1 41	1	2.5"	PVC	10'	T	NEW [(1)5/*14 (1)*6 BSC]
RL-1 42	1	2.5"	HDPE	40'	B	NEW [(1)5/*14 (1)*6 BSC]
43	1	2.5"	GALV	10'	T	RELOCATE [RLE CABLE] NEW [(2)2/*14 (1)*6 BSC]
44	1	4"	HDPE	10'	T	RELOCATE [RLE CABLE] NEW [(3)5/*14 (4)2/*14 (1)*6BSC]
XF1	1	4"	HDPE	340'	-	EXISTING (1)12 SM (1)48 SM
XF2	1	4"	HDPE	315'	-	EXISTING (1)12 SM (1)48 SM
XF3	1	2"	PVC	100'	-	EXISTING (1)12 SM
XF4	1	4"	HDPE	450'	-	EXISTING (1)12 SM (1)48 SM

LEGEND
X- DENOTES EXISTING
BSC- BARE STRANDED COPPER
MW- MICROWAVE
B- BORE
T- TRENCH
O- OPEN CUT
P- ATTACH TO POLE
MM- MULTI-MODE FIBER OPTIC CABLE
SM- SINGLE-MODE FIBER OPTIC CABLE
RLE- RED LIGHT ENFORCEMENT
A- AERIAL

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-DOVER, DELAWARE.
2. POLE BASES, CABINET BASE AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201, 202, AND 746 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.
3. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (50:1 FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES, THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAT 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL.
4. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
5. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
6. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.

RECOMMENDED _____ DATE: _____

RECOMMENDED Scott Peterson DATE: 4/27/18

RECOMMENDED [illegible] DATE: 4/25/18

APPROVED TRAFFIC ENGINEER [illegible] SAINTIL DATE: 04/30/2018

APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER [illegible] DATE: 5/1/18

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

RL-1 UPDATED PROPOSED POLE BASE TYPES, ADDITIONAL NOTES, CONDUIT SCHEDULE AND ADDED SIGNAL HEADS. M. KUBOVCIK (CEI) 5/28 (CONTRACT T201606119)

RL-2 CONTRACTOR SHALL REPLACE ALL SIGNAL HEADS AND CABLES PER SIGNAL MAINTENANCE REQUEST. M. KUBOVCIK (CEI) 10/15 (CONTRACT T201606119)

SCALE 0 30 60 90 FEET

PAVEMENT AND REHABILITATION NORTH XIX, 2016
US 40 (PULASKI HWY)

CONTRACT	PERMIT NO.	N332
T201606119	DESIGNED BY: EBS (CEI)	
COUNTY	CHECKED BY: BAM (CEI)	
NEW CASTLE		

SIGNAL PLAN
US 40 & SCOTLAND DR

SHEET NO. 84
TOTAL SHTS. 88

4/20/2018
\\192.168.0.52\snap\PROJECTS\145002.00 (DelDOT Agmt 1679)\T52 (T201606119) - Traffic-ADA Pulaski Hwy\CADD FILES\Signals\sg_N332_20180322_1of1.dgn
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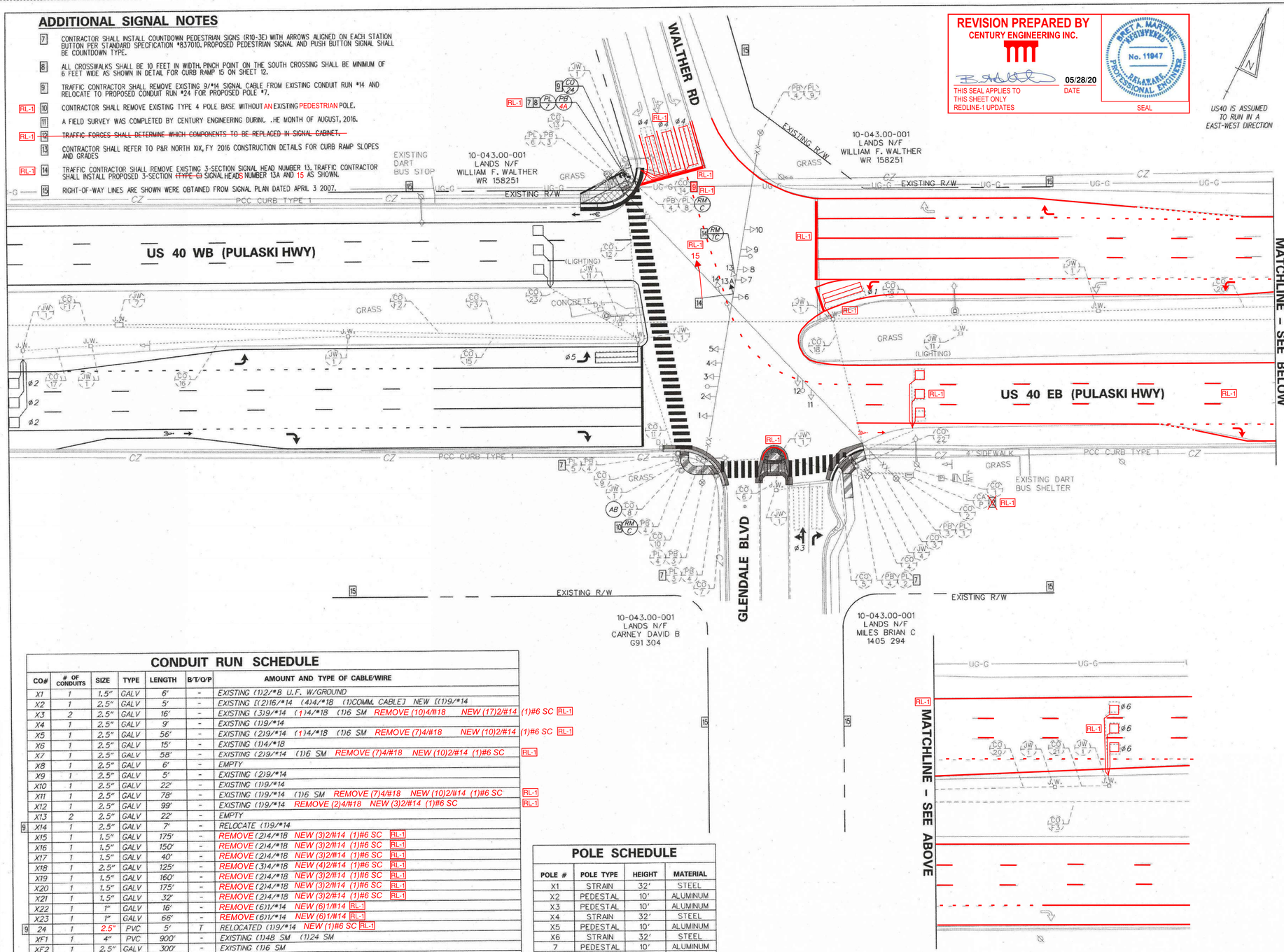
ADDITIONAL SIGNAL NOTES

7. CONTRACTOR SHALL INSTALL COUNTDOWN PEDESTRIAN SIGNS (R10-3E) WITH ARROWS ALIGNED ON EACH STATION BUTTON PER STANDARD SPECIFICATION #837010. PROPOSED PEDESTRIAN SIGNAL AND PUSH BUTTON SIGNAL SHALL BE COUNTDOWN TYPE.
8. ALL CROSSWALKS SHALL BE 10 FEET IN WIDTH. PINCH POINT ON THE SOUTH CROSSING SHALL BE MINIMUM OF 6 FEET WIDE AS SHOWN IN DETAIL FOR CURB RAMP 15 ON SHEET 12.
9. TRAFFIC CONTRACTOR SHALL REMOVE EXISTING 9/#14 SIGNAL CABLE FROM EXISTING CONDUIT RUN #14 AND RELOCATE TO PROPOSED CONDUIT RUN #24 FOR PROPOSED POLE #7.
RL-1 10. CONTRACTOR SHALL REMOVE EXISTING TYPE 4 POLE BASE WITHOUT AN EXISTING PEDESTRIAN POLE.
11. A FIELD SURVEY WAS COMPLETED BY CENTURY ENGINEERING DURING THE MONTH OF AUGUST, 2016.
RL-1 12. ~~TRAFFIC FORCES SHALL DETERMINE WHICH COMPONENTS TO BE REPLACED IN SIGNAL CABINET.~~
13. CONTRACTOR SHALL REFER TO P&R NORTH XIX, FY 2016 CONSTRUCTION DETAILS FOR CURB RAMP SLOPES AND GRADES
RL-1 14. TRAFFIC CONTRACTOR SHALL REMOVE EXISTING 3-SECTION SIGNAL HEAD NUMBER 13. TRAFFIC CONTRACTOR SHALL INSTALL PROPOSED 3-SECTION ~~TYPE C~~ SIGNAL HEADS NUMBER 13A AND 15 AS SHOWN.
15. RIGHT-OF-WAY LINES ARE SHOWN WERE OBTAINED FROM SIGNAL PLAN DATED APRIL 3 2007.

REVISION PREPARED BY
CENTURY ENGINEERING INC.
THIS SEAL APPLIES TO THIS SHEET ONLY
REDLINE-1 UPDATES
05/28/20 DATE

BRET A. MARTINE No. 11947 RELEASED FOR PROFESSIONAL ENGINEERS SEAL

US40 IS ASSUMED TO RUN IN A EAST-WEST DIRECTION



CONDUIT RUN SCHEDULE

	CO#	# OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/WIRE
	X1	1	1.5"	GALV	6'	-	EXISTING (1)2/#8 U.F. W/GROUND
	X2	1	2.5"	GALV	5'	-	EXISTING (1C)16/#14 (4)4/#18 (1)COMM. CABLE) NEW (1)9/#14
	X3	2	2.5"	GALV	16'	-	EXISTING (3)9/#14 (1)4/#18 (1)6 SM REMOVE (10)4/#18 NEW (17)2/#14 (1)#6 SC RL-1
	X4	1	2.5"	GALV	9'	-	EXISTING (1)9/#14
	X5	1	2.5"	GALV	56'	-	EXISTING (2)9/#14 (1)4/#18 (1)6 SM REMOVE (7)4/#18 NEW (10)2/#14 (1)#6 SC RL-1
	X6	1	2.5"	GALV	15'	-	EXISTING (1)4/#18
	X7	1	2.5"	GALV	58'	-	EXISTING (2)9/#14 (1)6 SM REMOVE (7)4/#18 NEW (10)2/#14 (1)#6 SC RL-1
	X8	1	2.5"	GALV	6'	-	EMPTY
	X9	1	2.5"	GALV	5'	-	EXISTING (2)9/#14
	X10	1	2.5"	GALV	22'	-	EXISTING (1)9/#14
	X11	1	2.5"	GALV	78'	-	EXISTING (1)9/#14 (1)6 SM REMOVE (7)4/#18 NEW (10)2/#14 (1)#6 SC RL-1
	X12	1	2.5"	GALV	99'	-	EXISTING (1)9/#14 REMOVE (2)4/#18 NEW (3)2/#14 (1)#6 SC RL-1
	X13	2	2.5"	GALV	22'	-	EMPTY
9	X14	1	2.5"	GALV	7'	-	RELOCATE (1)9/#14
	X15	1	1.5"	GALV	175'	-	REMOVE (2)4/#18 NEW (3)2/#14 (1)#6 SC RL-1
	X16	1	1.5"	GALV	150'	-	REMOVE (2)4/#18 NEW (3)2/#14 (1)#6 SC RL-1
	X17	1	1.5"	GALV	40'	-	REMOVE (2)4/#18 NEW (3)2/#14 (1)#6 SC RL-1
	X18	1	2.5"	GALV	125'	-	REMOVE (3)4/#18 NEW (4)2/#14 (1)#6 SC RL-1
	X19	1	1.5"	GALV	160'	-	REMOVE (2)4/#18 NEW (3)2/#14 (1)#6 SC RL-1
	X20	1	1.5"	GALV	175'	-	REMOVE (2)4/#18 NEW (3)2/#14 (1)#6 SC RL-1
	X21	1	1.5"	GALV	32'	-	REMOVE (2)4/#18 NEW (3)2/#14 (1)#6 SC RL-1
	X22	1	1"	GALV	16'	-	REMOVE (6)1/#14 NEW (6)1/#14 RL-1
	X23	1	1"	GALV	66'	-	REMOVE (6)1/#14 NEW (6)1/#14 RL-1
9	24	1	2.5"	PVC	5'	T	RELOCATED (1)9/#14 NEW (1)#6 SC RL-1
	XF1	1	4"	PVC	900'	-	EXISTING (1)48 SM (1)24 SM
	XF2	1	2.5"	GALV	300'	-	EXISTING (1)6 SM
	XF1	1	4"	PVC	1000'	-	EXISTING (1)48 SM (1)24 SM

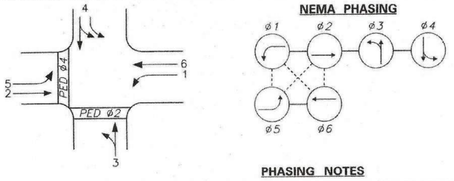
LEGEND
X- DENOTES EXISTING
#SC- BARE STRANDED COPPER
MW- MICROWAVE
B- BORE
T- TRENCH
O- OPEN CUT
P- ATTACH TO POLE
MM- MULTI-MODE FIBER OPTIC CABLE
SM- SINGLE-MODE FIBER OPTIC CABLE
RLE- RED LIGHT ENFORCEMENT
A- AERIAL

POLE SCHEDULE

POLE #	POLE TYPE	HEIGHT	MATERIAL
X1	STRAIN	32'	STEEL
X2	PEDESTAL	10'	ALUMINUM
X3	PEDESTAL	10'	ALUMINUM
X4	STRAIN	32'	STEEL
X5	PEDESTAL	10'	ALUMINUM
X6	STRAIN	32'	STEEL
7	PEDESTAL	10'	ALUMINUM
*X8	PEDESTAL	10'	ALUMINUM
X9	STRAIN	32'	STEEL

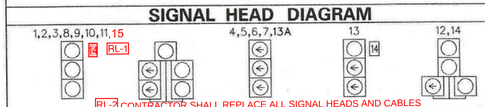
X- DENOTES EXISTING
*- TO BE REMOVED

SIGNAL PHASING



PHASING NOTES
1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



RL-2 CONTRACTOR SHALL REPLACE ALL SIGNAL HEADS AND CABLES

LEGEND

AB	ABANDON	OH-*	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA-X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH-*	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA-X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB-X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO-*	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PB-X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO-*	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PL-X	EXISTING POLE IDENTIFIER (* OF POLE)
JW-X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL-X	PROPOSED POLE IDENTIFIER (* OF POLE)
JW-X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM-C	REMOVE BY CONTRACTOR
MA-XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM-O	REMOVE BY OTHERS
MA-XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM-TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
SPAN INSULATOR		
SPAN WIRE	XX	X
UTILITY POLE		
VIDEO DETECTION		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-DOVER, DELAWARE.
2. POLE BASES, CABINET BASE AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201, 202, AND 746 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.
3. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (5.0:1 FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAT 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL.
4. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
5. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
6. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.

RECOMMENDED _____ DATE: _____
RECOMMENDED Jesse Pickett DATE: 4/27/18
RECOMMENDED B Martine DATE: 4/25/18
APPROVED TRAFFIC ENGINEER Mark Saintil DATE: 05/01/2018
APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER Mark Luft DATE: 5/1/18

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS
RL-1 UPDATED PROPOSED POLE BASE TYPE, ADDITIONAL NOTES, CONDUIT SCHEDULE, AND ADDED SIGNAL HEAD. INCLUDED P&R STRIPING UPDATES AND PROPOSED LOOPS. M. KUBOVCIK (CEI) 5/28 (CONTRACT T201606119)
RL-2 CONTRACTOR SHALL REPLACE ALL SIGNAL HEADS AND CABLES PER SIGNAL MAINTENANCE REQUEST. M. KUBOVCIK (CEI) 10/15 (CONTRACT T201606119)

SCALE 0 30 60 90 FEET

PAVEMENT AND REHABILITATION NORTH XIX, 2016 US 40 (PULASKI HWY)

CONTRACT	T201606119
COUNTY	NEW CASTLE
PERMIT NO.	N517
DESIGNED BY: EBS (CEI)	
CHECKED BY: BAM (CEI)	

SIGNAL PLAN
US 40 & WALTHER RD

SHEET NO.	85
TOTAL SHTS.	88

4/20/2018 8:10:14 AM
\\192.168.0.52\snap\PROJECTS\145002.00 (DelDOT Agmt 16-79)\T52 (T201606119) - Traffic-ADA Pulaski Hwy\CADD FILES\Signals\sg_N517_20180322_1of1.dgn

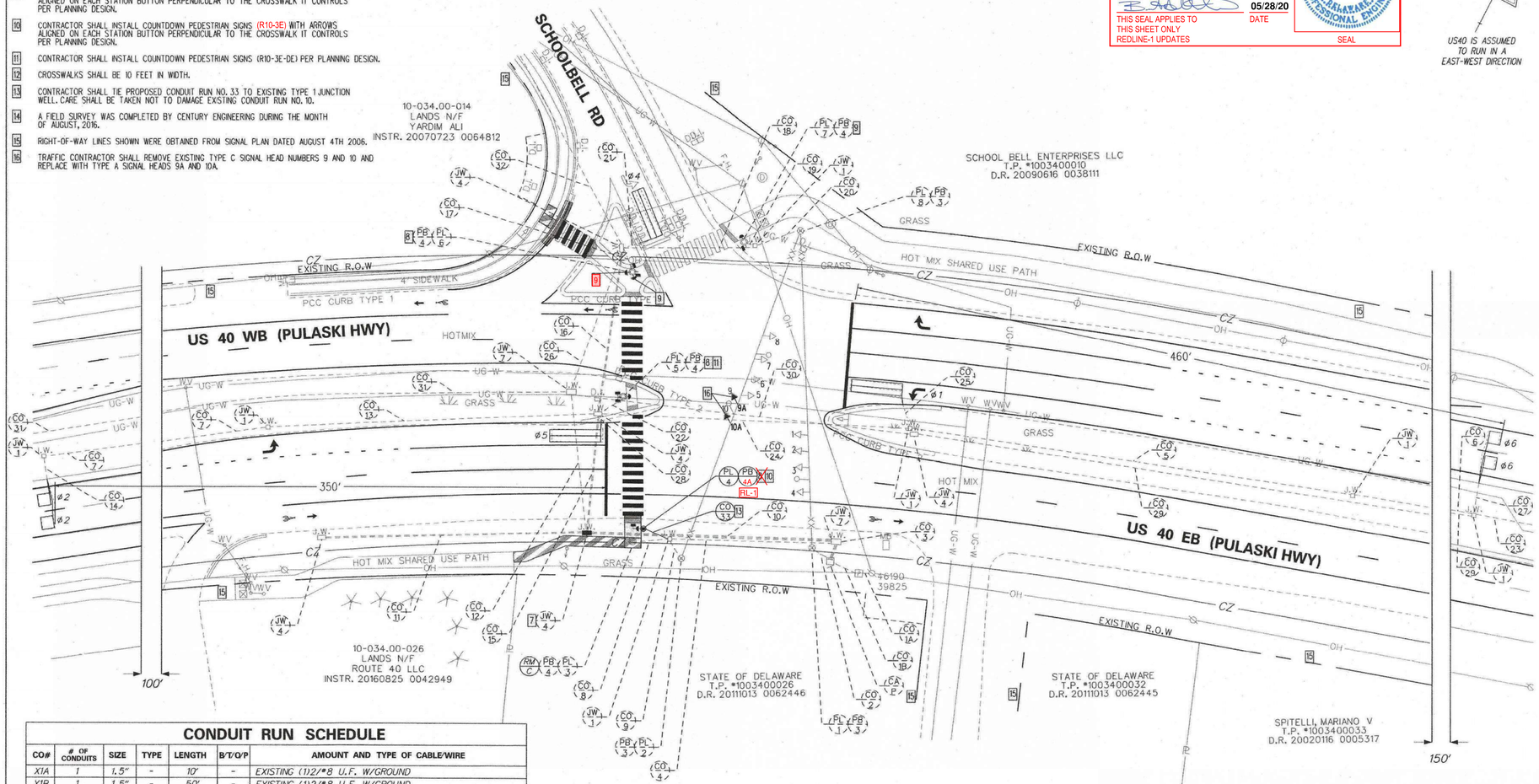
ADDITIONAL SIGNAL NOTES

7. CONTRACTOR SHALL ADJUST EXISTING JUNCTION WELL TYPE-4 METAL FRAME TO MATCH GRADE OF PROPOSED SIDEWALK. DURING THE ADJUSTMENT PROCESS CARE SHALL BE TAKEN NOT TO DAMAGE EXISTING CONDUITS AND CABLES.
8. CONTRACTOR SHALL REMOVE EXISTING PEDESTRIAN SIGNAL HEADS AND PUSH BUTTONS AND REPLACE WITH NEW COUNTDOWN TYPE PEDESTRIAN SIGNAL HEADS AND PUSH BUTTONS.
9. CONTRACTOR SHALL INSTALL COUNTDOWN PEDESTRIAN SIGNS (R10-3E-DE) WITH ARROWS ALIGNED ON EACH STATION BUTTON PERPENDICULAR TO THE CROSSWALK IT CONTROLS PER PLANNING DESIGN.
10. CONTRACTOR SHALL INSTALL COUNTDOWN PEDESTRIAN SIGNS (R10-3E) WITH ARROWS ALIGNED ON EACH STATION BUTTON PERPENDICULAR TO THE CROSSWALK IT CONTROLS PER PLANNING DESIGN.
11. CONTRACTOR SHALL INSTALL COUNTDOWN PEDESTRIAN SIGNS (R10-3E-DE) PER PLANNING DESIGN.
12. CROSSWALKS SHALL BE 10 FEET IN WIDTH.
13. CONTRACTOR SHALL TIE PROPOSED CONDUIT RUN NO. 33 TO EXISTING TYPE 1 JUNCTION WELL. CARE SHALL BE TAKEN NOT TO DAMAGE EXISTING CONDUIT RUN NO. 10.
14. A FIELD SURVEY WAS COMPLETED BY CENTURY ENGINEERING DURING THE MONTH OF AUGUST, 2016.
15. RIGHT-OF-WAY LINES SHOWN WERE OBTAINED FROM SIGNAL PLAN DATED AUGUST 4TH 2006.
16. TRAFFIC CONTRACTOR SHALL REMOVE EXISTING TYPE C SIGNAL HEAD NUMBERS 9 AND 10 AND REPLACE WITH TYPE A SIGNAL HEADS 9A AND 10A.

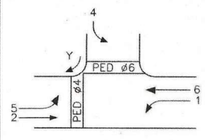
REVISION PREPARED BY
CENTURY ENGINEERING INC.
05/28/20 DATE
THIS SEAL APPLIES TO THIS SHEET ONLY
REDLINE-1 UPDATES

BRET A. MARTINE — No. 11947 — PROFESSIONAL ENGINEER — SEAL

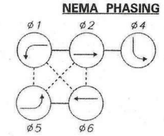
US40 IS ASSUMED TO RUN IN A EAST-WEST DIRECTION



SIGNAL PHASING



NEMA PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

AB	ABANDON	OH(*)	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA(X)	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH(*)	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA(X)	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB(X)	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO(*)	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PB(X)	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO(*)	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PL(X)	EXISTING POLE IDENTIFIER (* OF POLE)
JW(X)	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL(X)	PROPOSED POLE IDENTIFIER (* OF POLE)
JW(X)	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM(C)	REMOVE BY CONTRACTOR
MA(XX)	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM(O)	REMOVE BY OTHERS
MA(XX)	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM(TC)	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		□
LOOP DETECTOR, TYPE 2		▭
LUMINAIRE		—●—
MAST ARM		➤
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
SPAN INSULATOR		
SPAN WIRE	XX	X
UTILITY POLE		
VIDEO DETECTION		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-DOVER, DELAWARE.
2. POLE BASES, CABINET BASE AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201.202, AND 746 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.
3. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (50:1 FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES, THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAT 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL.
4. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
5. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
6. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.

CONDUIT RUN SCHEDULE

CO#	# OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/WIRE
X1A	1	1.5"	-	10'	-	EXISTING (1)2/*8 U.F. W/GROUND
X1B	1	1.5"	-	50'	-	EXISTING (1)2/*8 U.F. W/GROUND
X2	1	2.5"	-	10'	-	EXISTING (1)16/*14 (1)4/*18
X3	2	2.5"	-	5'	-	EXISTING [(2)4/*18 (1)16/*14 FIBER OPTIC CABLE] REMOVE [(10)4/*18 (1)4/*14 (3)9/*14] NEW [(7)2/*14 (5)5/*14 (3)*6 BSC] RL-1
X4	1	2.5"	-	79'	-	EXISTING [(2)4/*18 (1)16/*14 (1)6/*19] REMOVE [(1)9/*14] NEW [(1)5/*14 (1)*6 BSC]
X5	1	1.5"	-	215'	-	REMOVE (2)4/*18 NEW [(2)2/*14 (1)*6 BSC]
X6	1	1.5"	-	200'	-	REMOVE (2)4/*18 NEW [(2)2/*14 (1)*6 BSC]
X7	1	1.5"	-	200'	-	REMOVE (1)4/*18 NEW [(2)2/*14 (1)*6 BSC]
X8	1	2.5"	-	28'	-	REMOVE [(1)9/*14]
X9	1	2.5"	-	11'	-	EXISTING (1)16/*14 (2)4/*18
X10	3	2.5"/4"	-	117'	-	EXISTING [FIBER OPTIC CABLE] REMOVE [(5)4/*18 (1)4/*14 (2)9/*14] NEW [(7)2/*14 (4)5/*14 (3)*6 BSC] RL-1
X11	2	2.5"	-	126'	-	EMPTY
X12	1	4"	-	67'	-	EXISTING FIBER OPTIC CABLE
X13	1	2.5"	-	159'	-	REMOVE (1)4/*18 NEW [(2)2/*14 (1)*6 BSC]
X14	1	1.5"	-	12'	-	REMOVE (4)1/*14 NEW (4)1/*14
X15	2	2.5"	-	61'	-	REMOVE [(5)4/*18 (1)4/*14 (2)9/*14] NEW [(7)2/*14 (4)5/*14 (1)*6 BSC] RL-1
X16	2	2.5"	-	80'	-	REMOVE [(1)4/*18 (2)9/*14] NEW [(1)2/*14 (3)5/*14 (1)*6 BSC]
X17	1	2.5"	-	9'	-	REMOVE (1)9/*14 NEW [(2)5/*14 (1)*6 BSC]
X18	1	2.5"	-	65'	-	REMOVE (1)9/*14 NEW [(1)5/*14 (1)*6 BSC]
X19	1	2.5"	-	5'	-	REMOVE (1)9/*14 NEW [(1)5/*14 (1)*6 BSC]
X20	1	2.5"	-	26'	-	EMPTY

CONDUIT RUN SCHEDULE CONT.

CO#	# OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/WIRE
X21	1	1.5"	-	10'	-	REMOVE (2)1/*14 NEW (2)1/*14
X22	1	2.5"	-	13'	-	REMOVE [(1)9/*14] NEW [(1)5/*14 (1)*6 BSC] RL-1
X23	1	4"	-	--	-	EXISTING FIBER OPTIC CABLE
X24	1	2.5"	-	150'	-	REMOVE (2)4/*18 NEW [(3)2/*14 (1)*6 BSC]
X25	1	1.5"	-	9'	-	REMOVE (2)1/*14 NEW [(2)1/*14 (1)*6 BSC]
X26	1	4"	-	80'	-	EMPTY
X27	1	1.5"	-	10'	-	REMOVE (4)1/*14 NEW (4)1/*14
X28	1	1.5"	-	6'	-	REMOVE (2)1/*14 NEW (2)1/*14
X29	1	4"	-	412'	-	EXISTING FIBER OPTIC CABLE
X30	1	4"	-	165'	-	EXISTING FIBER OPTIC CABLE
X31	1	4"	-	--	-	EXISTING FIBER OPTIC CABLE
X32	1	4"	-	--	-	EMPTY
33	1	2.5"	PVC	15'	T	NEW [(1)5/*14 (1)*6 BSC] RL-1

LEGEND
X- DENOTES EXISTING
BSC- BARE STRANDED COPPER
MW- MICROWAVE
B- BORE
T- TRENCH
O- OPEN CUT
P- ATTACH TO POLE
A- AERIAL

POLE SCHEDULE

POLE #	POLE TYPE	HEIGHT	MATERIAL
X1	STRAIN	32'	STEEL
X2	STRAIN	32'	STEEL
*X3	PEDESTAL	10'	ALUMINUM
4	PEDESTAL	10'	ALUMINUM
X5	PEDESTAL	10'	ALUMINUM
X6	PEDESTAL	10'	ALUMINUM
X7	PEDESTAL	10'	ALUMINUM
X8	STRAIN	32'	STEEL

X- DENOTES EXISTING
*- TO BE REMOVED

RECOMMENDED _____ DATE: _____

RECOMMENDED [signature] DATE: 4/27/18

RECOMMENDED [signature] DATE: 1/25/18

APPROVED TRAFFIC ENGINEER [signature] DATE: 05/01/2018

APPROVED FOR INSTALLATION
CHIEF TRAFFIC ENGINEER [signature] DATE: 5/1/18

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS
RL-1 UPDATED PROPOSED POLE BASE TYPE, ADDITIONAL NOTES, AND CONDUIT SCHEDULE. M. KUBOVCIK (CEI) 5/28 (CONTRACT T201606119)

SCALE 0 30 60 90 FEET

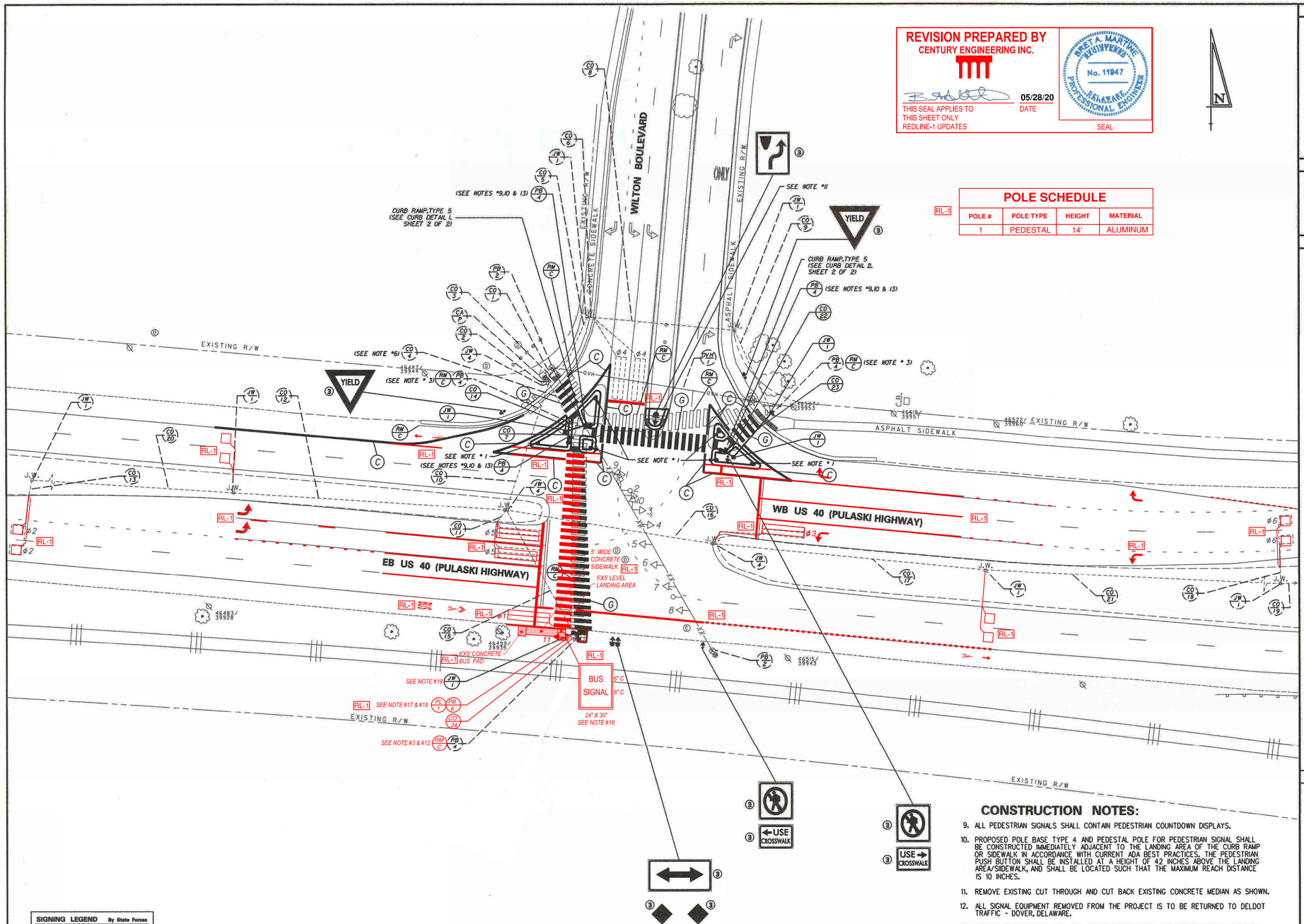
PAVEMENT AND REHABILITATION NORTH XIX, 2016
US 40 (PULASKI HWY)

CONTRACT	T201606119
COUNTY	NEW CASTLE
PERMIT NO.	N601
DESIGNED BY: EBS (CEI)	
CHECKED BY: BAM (CEI)	

SIGNAL PLAN
US 40 & SCHOOLBELL RD

SHEET NO.	86
TOTAL SHTS.	88

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REVISION PREPARED BY
CENTURY ENGINEERING INC.

THIS SEAL APPLIES TO THIS SHEET ONLY
REDLINE-1 UPDATES

05/28/20
DATE

BRET A. MARTINEZ — No. 11947 — DELAWARE — PROFESSIONAL ENGINEER
SEAL

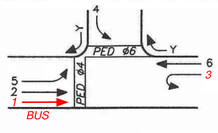
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POLE SCHEDULE

RL-1

POLE #	POLE TYPE	HEIGHT	MATERIAL
1	PEDESTAL	14'	ALUMINUM

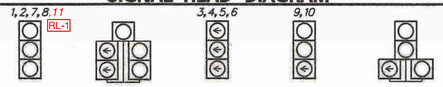
SIGNAL PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.
3. OVERLAP A = 1 + 2
   OVERLAP C = 3 + 6

SIGNAL HEAD DIAGRAM



LEGEND

PROPOSED SIGNAL CABINET		RM C	REMOVE BY CONTRACTOR
EXISTING SIGNAL CABINET		RM O	REMOVE BY OTHERS
PROPOSED SIGNAL POLE BASE		AB	ABANDON
EXISTING SIGNAL POLE BASE		PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
PROPOSED PEDESTRIAN POLE BASE		PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
EXISTING PEDESTRIAN POLE BASE		JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
PROPOSED WOOD POLE		JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
EXISTING UTILITY POLE		CO #	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)
PROPOSED JUNCTION WELL		CO #	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)
EXISTING JUNCTION WELL		OH #	PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
PROPOSED SIGNAL HEAD		OH #	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
EXISTING SIGNAL HEAD		MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)
PROPOSED PEDESTRIAN SIGNAL HEAD		MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)
EXISTING PEDESTRIAN SIGNAL HEAD		CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
PROPOSED PEDESTRIAN PUSHBUTTON		CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
EXISTING PEDESTRIAN PUSHBUTTON			PROPOSED SPAN WIRE
PROPOSED VIDEO DETECTION		XX	EXISTING SPAN WIRE
EXISTING VIDEO DETECTION			RIGHT-OF-WAY OR PROPERTY LINE
PROPOSED MICROWAVE DETECTION		OVH	EXISTING OVERHEAD RUN
EXISTING MICROWAVE DETECTION			PROPOSED SPAN INSULATOR
OVERHEAD SIGNING			EXISTING SPAN INSULATOR
PROPOSED OPTICOM RECEIVER		P	SERVICE PEDESTAL
EXISTING OPTICOM RECEIVER			EXISTING HIGHWAY SIGN
PROPOSED MAST ARM			PROPOSED HIGHWAY SIGN
EXISTING MAST ARM			TUBULAR MARKER (FLEXI-POST)
PROPOSED LUMINAIRE			
EXISTING LUMINAIRE			
PROPOSED LOOP DETECTOR (TYPE 1 OR 2)			
EXISTING LOOP DETECTOR (TYPE 1 OR 2)			

GENERAL SIGNAL NOTES

1. THE CONTRACTOR SHALL INSTALL A TUBULAR MARKER (FLEXI-POST) ON ALL THREE (3) CORNERS OF THE CHANNELIZING ISLAND, AS SHOWN. EACH TUBULAR MARKER SHALL BE RETROREFLECTORIZED IN ACCORDANCE WITH SECTION 6F.60 OF THE DE MUTCD.
2. R/W INFORMATION SHOWN ON THIS PLAN IS SCHEMATIC ONLY.
3. POLE BASES, CABINET BASE AND CONDUIT JUNCTION WELLS TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER.
4. ALL GALVANIZED CONDUIT (GRC) SHALL BE REMOVED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS.SET SCREW, BOLTED, AND COMPRESSION FITTING ARE NOT ACCEPTABLE.
5. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLAN ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.
6. EXTEND AND REDIRECT EXISTING CONDUIT RUN #4 INTO PROPOSED JUNCTION WELL AT NW ISLAND.
7. CONSTRUCT 5' X 7' CONCRETE LANDING AREA AND INSTALL TRUNCATED DOMES. LANDING AREA TO BE IMMEDIATLEY ADJACENT TO EXISTING POLE BASE TYPE 4 AND PEDESTAL POLE IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES.
8. EXISTING PEDESTRIAN CROSSWALK MARKINGS TO BE REMOVED.

SIGNING LEGEND By State Forces

1. REMOVE EXISTING SIGN
2. EXISTING SIGN TO REMAIN
3. PLACE NEW SIGN
4. RENEW EXISTING SIGN
5. REPOSITION EXISTING SIGN

CONSTRUCTION NOTES:

9. ALL PEDESTRIAN SIGNALS SHALL CONTAIN PEDESTRIAN COUNTDOWN DISPLAYS.
10. PROPOSED POLE BASE TYPE 4 AND PEDESTAL POLE FOR PEDESTRIAN SIGNAL SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THE PEDESTRIAN PUSH BUTTON SHALL BE INSTALLED AT A HEIGHT OF 42 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES.
11. REMOVE EXISTING CUT THROUGH AND CUT BACK EXISTING CONCRETE MEDIAN AS SHOWN.
12. ALL SIGNAL EQUIPMENT REMOVED FROM THE PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
13. INSTALL "EDUCATIONAL SIGN FOR COUNT-DOWN PEDESTRIAN SIGNALS" (R10-3e) ABOVE EACH PUSH BUTTON.
14. REMOVE EXISTING PEDESTRIAN SIGNAL HEAD AND REPLACE WITH PEDESTRIAN COUNTDOWN DISPLAY. ROTATE EXISTING PUSH BUTTON TO BE 42 INCHES ABOVE PROPOSED LANDING AREA AND HAVE A MAXIMUM REACH DISTANCE OF 10 INCHES.
15. PROPOSED JUNCTION WELL TO STRADDLE CONDUIT RUN #15.
16. LOCATION OF PROPOSED LANDING AREA AND ADJACENT GRASS AREA WILL REQUIRE FILL TO RAISE TO LEVEL OF PAVEMENT.
17. PROPOSED POLE BASE TYPE 6 AND 14' PEDESTAL POLE (PL #1) FOR PEDESTRIAN SIGNAL SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE LEVEL LANDING AREA OF THE CURB RAMP IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THE PEDESTRIAN PUSH BUTTON SHALL BE INSTALLED AT A HEIGHT OF 42 INCHES ABOVE THE LANDING AREA AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS WITHIN 10 INCHES.

RL-1

18. CONTRACTOR SHALL INSTALL TOP MOUNTED VEHICULAR SIGNAL HEAD #11 ON 14' PEDESTAL POLE WITH 24"X 30" "BUS SIGNAL" REGULATORY SIGN BANDED BELOW.
19. CONTRACTOR SHALL RESET, ADJUST, AND/OR REPAIR EXISTING JUNCTION WELL AS NECESSARY FOR INTEGRATION OF PROPOSED CONDUIT AND TO FINISH FLUSH WITH FINAL FINISH GRADE. BOND AND GROUND.

RECOMMENDED Lisa Delyaur DATE: 9/14/2010

RECOMMENDED _____ DATE: _____

RECOMMENDED _____ DATE: _____

APPROVED TRAFFIC ENGINEER _____ DATE: 9/16/10

APPROVED FOR INSTALLATION
CHIEF TRAFFIC ENGINEER _____ DATE: 9/16/10

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

RL-1 UPDATED SOUTH PEDESTRIAN FACILITY TO INCLUDE BUS RAPID TRANSIT SIGNAL WITH PROPOSED LEVEL LANDING, SIDEWALK AND BUS PAD. INCLUDED P&R STRIPING UPDATES AND PROPOSED LOOPS. M. KUBOVCIK (CEI) 5/28. (CONTRACT T201606119)

SCALE
0 30 60 90
FEET

INTERSECTION IMPROVEMENTS PROJECT

CONTRACT: Statewide Funds
COUNTY: NEW CASTLE
PERMIT NO.: N514
DESIGNED BY: SJE
CHECKED BY: LYD

SIGNAL PLAN
US 40 (PULASKI HWY)
@ WILTON BLVD

SHEET NO. 87 RL-1
TOTAL SHTS. 88 RL-1

PAVEMENT MARKINGS LEGEND

SYMBOL	QUANTITY	ITEM
(A)		4" SOLID YELLOW EPOXY RESIN PAINT PAVEMENT STRIPING
(B)		4" SOLID DOUBLE YELLOW EPOXY RESIN PAINT PAVEMENT STRIPING
(C)	450 L.F.	4" SOLID WHITE EPOXY RESIN PAINT PAVEMENT STRIPING
(D)		4" DASHED WHITE EPOXY RESIN PAINT (10' LINE, 30' GAP) PAVEMENT STRIPING
(E)		4" DASHED WHITE EPOXY RESIN PAINT (2' LINE, 6' GAP) PAVEMENT STRIPING
(F)		12" SOLID YELLOW ALKYD-THERMOPLASTIC PAVEMENT STRIPING
(G)	1000 S.F.	SYMBOL/LEGEND ALKYD-THERMOPLASTIC PAVEMENT STRIPING
(H)		12" SOLID WHITE ALKYD-THERMOPLASTIC PAVEMENT STRIPING
(I)		PREFORMED RETROREFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS, SYMBOL/LEGEND

OVERHEAD RUN SCHEDULE

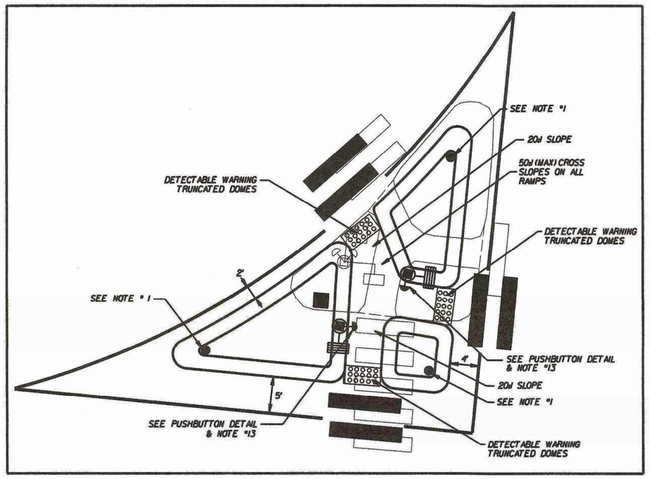
CO*	LENGTH	AMOUNT AND TYPE OF CABLE/ WIRE
*1	145'	(1)2/*8 U.F. W/GROUND

* INDICATES EXISTING RUN

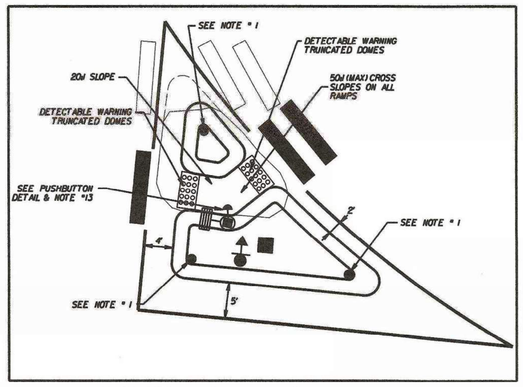
CONDUIT RUN SCHEDULE

CO*	*OF CON	SIZE	LENGTH	AMOUNT AND TYPE OF CABLE/ WIRE TO REMAIN	REMOVE	INSTALL	
*1	1	2.0"	7'	(1)2/*8 U.F. W/GROUND			
*2	2	2.5"	5'	(2)16/*14 (3)9/#14 (4)4/#18 (1) 12 PAIR/*19 COMM. CABLE	(1)9/#14 (4)4/#18	(2)5/#14 (12)2/#14 (2)#6 SC	RL-1
*3	1	2.5"	9'	(2)16/*14 (3)4/*18			
*4	1	2.5"	27'	(2)9/#14			
*5	1	2.5"	45'	(1)4/*18 (1)9/#14			
*6	1	1.5"	4'	(1)4/*18			
7	1	2.5"	5'	(1)9/#14			
*8	1	2.5"	87'	(1)9/#14			
*9	1	2.5"	53'	(1)9/#14			
*10	1	2.5"	79'	(1) 12 PAIR/*19 COMM. CABLE	(1)9/#14 (4)4/#18	(2)5/#14 (12)2/#14 (1)#6 SC	RL-1
*11	1	1.5"	9'		(1)4/#18	(4)1/#14	RL-1
*12	1	2.5"	160'		(1)4/#18	(4)2/#14 (1)#6 SC	RL-1
*13	1	1.5"	9'		(1)4/#18	(4)1/#14	RL-1
14	1	2.5"	13'	(1)9/#14			
*15	1	2.5"	86'		(1)9/#14	(2)5/#14 (1)2/#14 (1)#6 SC	RL-1
*16	1	2.5"	123'	(1) 12 PAIR/*19 COMM. CABLE	(2)4/#18	(5)2/#14 (1)#6 SC	RL-1
*17	1	2.5"	160'	(1) 12 PAIR/*19 COMM. CABLE	(1)4/#18	(4)2/#14 (1)#6 SC	RL-1
*18	1	1.5"	10'		(1)4/#18	(4)1/#14	RL-1
*19	1	UNK	UNK	(1) 12 PAIR/*19 COMM. CABLE			
*20	1	2.5"	166'		(1)4/#18	(2)2/#14 (1)#6 SC	RL-1
*21	1	2.5"	216'	(1) 12 PAIR/*19 COMM. CABLE	(1)4/#18	(2)2/#14 (1)#6 SC	RL-1
22	1	2.5"	6'	(1)9/#14			
23	1	2.5"	35'	(1)9/#14			
24	1	3"	5'			(2)5/#14 (1)2/#14 (1)#6 SC	RL-1

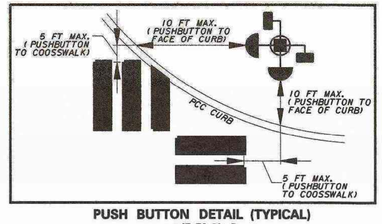
* INDICATES EXISTING CONDUIT
SC - STRANDED COPPER



CURB DETAIL 1 (FIELD ADJUSTMENTS AS REQUIRED)
(SCALE 1" = 10')

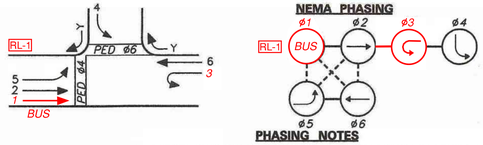


CURB DETAIL 2 (FIELD ADJUSTMENTS AS REQUIRED)
(SCALE 1" = 10')



PUSH BUTTON DETAIL (TYPICAL)
(NOT TO SCALE)

SIGNAL PHASING

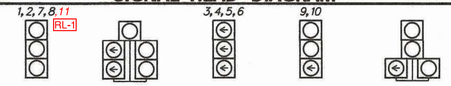


PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.
3. OVERLAP A = 1 + 2
   OVERLAP C = 3 + 6

RL-1

SIGNAL HEAD DIAGRAM



LEGEND

- PROPOSED SIGNAL CABINET
- EXISTING SIGNAL CABINET
- PROPOSED SIGNAL POLE BASE
- EXISTING SIGNAL POLE BASE
- PROPOSED PEDESTRIAN POLE BASE
- EXISTING PEDESTRIAN POLE BASE
- PROPOSED WOOD POLE
- EXISTING UTILITY POLE
- PROPOSED JUNCTION WELL
- EXISTING JUNCTION WELL
- PROPOSED SIGNAL HEAD
- EXISTING SIGNAL HEAD
- PROPOSED PEDESTRIAN SIGNAL HEAD
- EXISTING PEDESTRIAN SIGNAL HEAD
- PROPOSED PEDESTRIAN PUSHBUTTON
- EXISTING PEDESTRIAN PUSHBUTTON
- PROPOSED VIDEO DETECTION
- EXISTING VIDEO DETECTION
- PROPOSED MICROWAVE DETECTION
- EXISTING MICROWAVE DETECTION
- OVERHEAD SIGNING
- PROPOSED OPTICOM RECEIVER
- EXISTING OPTICOM RECEIVER
- PROPOSED MAST ARM
- EXISTING MAST ARM
- PROPOSED LUMINAIRE
- EXISTING LUMINAIRE
- PROPOSED LOOP DETECTOR (TYPE 1 OR 2)
- EXISTING LOOP DETECTOR (TYPE 1 OR 2)
- REMOVE BY CONTRACTOR (RM/C)
- REMOVE BY OTHERS (RM/O)
- ABANDON (AB)
- PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE) (PB/X)
- EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE) (PB/X)
- PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL) (JW/X)
- EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL) (JW/X)
- PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN) (CO/#)
- EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN) (CO/#)
- PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN) (OH/#)
- EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN) (OH/#)
- PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM) (MA/XX)
- EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM) (MA/XX)
- PROPOSED CABINET IDENTIFIER (TYPE OF CABINET) (CA/X)
- EXISTING CABINET IDENTIFIER (TYPE OF CABINET) (CA/X)
- PROPOSED SPAN WIRE
- XX — EXISTING SPAN WIRE
- RIGHT-OF-WAY OR PROPERTY LINE
- OVH — EXISTING OVERHEAD RUN
- PROPOSED SPAN INSULATOR
- EXISTING SPAN INSULATOR
- SERVICE PEDESTAL (P)
- EXISTING HIGHWAY SIGN
- PROPOSED HIGHWAY SIGN
- TUBULAR MARKER (FLEXI-POST)

GENERAL SIGNAL NOTES

REVISION PREPARED BY
CENTURY ENGINEERING INC.

05/28/20
DATE

THIS SEAL APPLIES TO THIS SHEET ONLY
REDLINE-1 UPDATES

BRET A. MARTINE — No. 11947 — REGISTERED PROFESSIONAL ENGINEER — DELAWARE
SEAL

RECOMMENDED Lisa Delyaur DATE: 9/14/2010

RECOMMENDED _____ DATE: _____

RECOMMENDED _____ DATE: _____

APPROVED TRAFFIC ENGINEER _____ DATE: 9/16/10

APPROVED FOR INSTALLATION
CHIEF TRAFFIC ENGINEER _____ DATE: 9/16/10

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

RL-1 UPDATED SOUTH PEDESTRIAN FACILITY TO INCLUDE BUS RAPID TRANSIT SIGNAL WITH PROPOSED LEVEL LANDING, SIDEWALK AND BUS PAD. INCLUDED P&R STRIPING UPDATES AND PROPOSED LOOPS. M. KUBOVCIK (CEI) 5/28. (CONTRACT T201606119)

SCALE
0 30 60 90
FEET

INTERSECTION IMPROVEMENTS PROJECT

CONTRACT
COUNTY: NEW CASTLE
PERMIT NO.: N514
DESIGNED BY: SJE
CHECKED BY: LYD

SIGNAL PLAN
US 40 (PULASKI HWY)
@ WILTON BLVD

SHEET NO.: 88 RL-1
TOTAL SHTS.: 88 RL-1

ADDITIONAL GENERAL SIGNAL NOTES

3. POLE BASES, CABINET BASES, AND CONDUIT JUNCTION WELLS TO BE REMOVED IN ACCORDANCE WITH SECTION 211 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY THE ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.

4. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED, AND COMPRESSION FITTING ARE NOT ACCEPTABLE.

5. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHOULD BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (50:1 OR FLATTER) LANDING AREA OF THE CURB RAMP WHEN POSSIBLE. WHERE THERE ARE PHYSICAL CONSTRAINTS THAT MAKE IT IMPRACTICAL TO PLACE THE PEDESTRIAN PUSHBUTTON ADJACENT TO A LEVEL ALL-WEATHER SURFACE, THE SURFACE SHOULD BE AS LEVEL AS FEASIBLE. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE ADJOINING SIDEWALK, AND SHOULD BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE DOES NOT EXCEED 10 INCHES FROM THE ADJOINING SIDEWALK TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE.

6. THE FISHEYE CAMERA SYSTEM WILL PROVIDE DETECTION FOR BOTH VEHICLES AND BICYCLES, AS WELL AS PROVIDE INTERSECTION BIKE COUNTS.

7. THE FISHEYE DETECTOR SHALL BE PLACED ON THE MAST ARM TO ACHIEVE OPTIMUM DETECTION PER MANUFACTURER'S SPECIFICATION. THE DESIRED DETECTION ZONES SHALL BE SET AND APPROVED BY DELDOT.

8. THE EXISTING CONTROLLER CABINET SHALL BE MAINTAINED UNTIL THE PROPOSED CONTROLLER CABINET IS OPERATIONAL.

9. REMOVAL OF POLE BASES SHALL BE PAID BY ITEM *211000.

10. R10-3E SIGNS SHALL BE INSTALLED ON POLES WITH ONE PEDESTRIAN SIGNAL HEAD. R10-3E-DE SIGNS SHALL BE INSTALLED ON POLES WITH TWO PEDESTRIAN SIGNAL HEADS.

11. BACKPLATES WILL BE INSTALLED FOR ALL SIGNAL HEADS. A 2" REFLECTIVE YELLOW STRIPING WILL BE INSTALLED ON THE BORDER OF THE BACKPLATES.

12. ALL PEDESTAL POLES WITH PEDESTRIAN SIGNALS ARE 10', AND ALL PEDESTAL POLES WITH BICYCLE SIGNALS ARE 14', UNLESS OTHERWISE NOTED. SEE DETAIL SHEETS FOR BICYCLE SIGNAL MOUNTING DETAIL.

13. THE APS SIGNAL SHALL BE MAINTAINED DURING CONSTRUCTION. THE CONTRACTOR SHALL INSTALL APS STATION WITH THE PUSHBUTTONS ON POLE *4, *5, *6 AND *7, ROTATED SO THAT THE FACE OF THE PUSHBUTTON IS PARALLEL WITH THE CROSSING.

14. DUE TO THE DEPTH OF THE WALL ALONG THE SIDEWALK ALONG SOUTH COLLEGE AVENUE, CONDUIT *1 WILL NEED TO BE HAND TRENCHED IN THE SPACE BETWEEN THE SIDEWALK AND THE WALL. ELBOW CONNECTORS WILL NEED TO BE USED TO BEND THE CONDUIT AT THE POWER SOURCE AND AROUND THE NORTHERN END OF THE WALL TO THE SERVICE DISCONNECT PEDESTAL.

15. INSTALL TYPE 4 ANCHOR BOLTS ON TYPE 6 POLE BASE FOUNDATIONS.

16. INSTALL THE TYPE P CABINET ON A 58"X58" TYPE M FOUNDATION.

17. CONTACT NICK MOGLE (302-760-2589) BEFORE POURING THE CABINET BASE TO DETERMINE THE CONDUIT SIZE NEEDED TO CONNECT INTO THE CABINET.

18. PLACE PEDESTRIAN SIGNAL HEAD FOR PEDESTRIAN SCRAMBLE PHASE ABOVE THE OTHER PEDESTRIAN SIGNAL HEADS.

19. THE ENGINEER SHALL NOTIFY DELDOT TRAFFIC/TMC AT LEAST 10 DAYS PRIOR TO ANY CHANGES TO THE TRAFFIC SIGNAL OPERATION. THE CONTRACTOR SHALL HAVE CORRESPONDING SIGNAL TIMESHEET ISSUED VIA DELDOT TRAFFIC/TMC PRIOR TO MODIFYING THE TRAFFIC SIGNAL OPERATION.

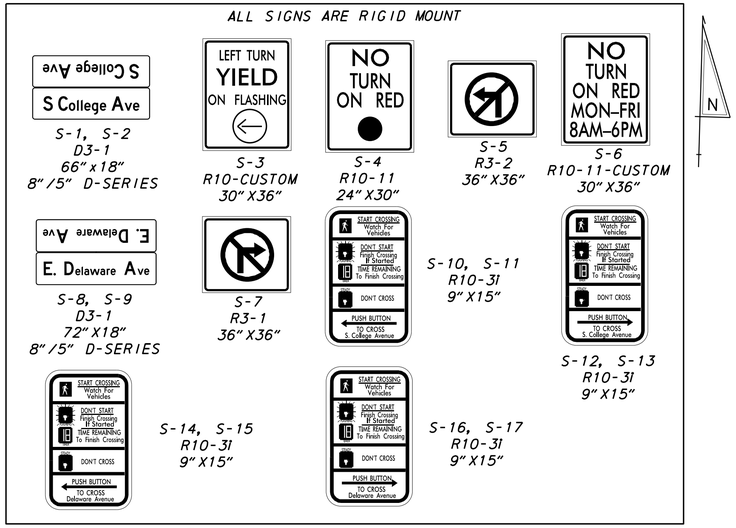
20. COORDINATE WITH BHADRESH PATEL (302-366-7000) AT THE CITY OF NEWARK TO ADJUST THE SECONDARY ELECTRICAL CABLES PRIOR TO INSTSTALLING MAST ARM *1.

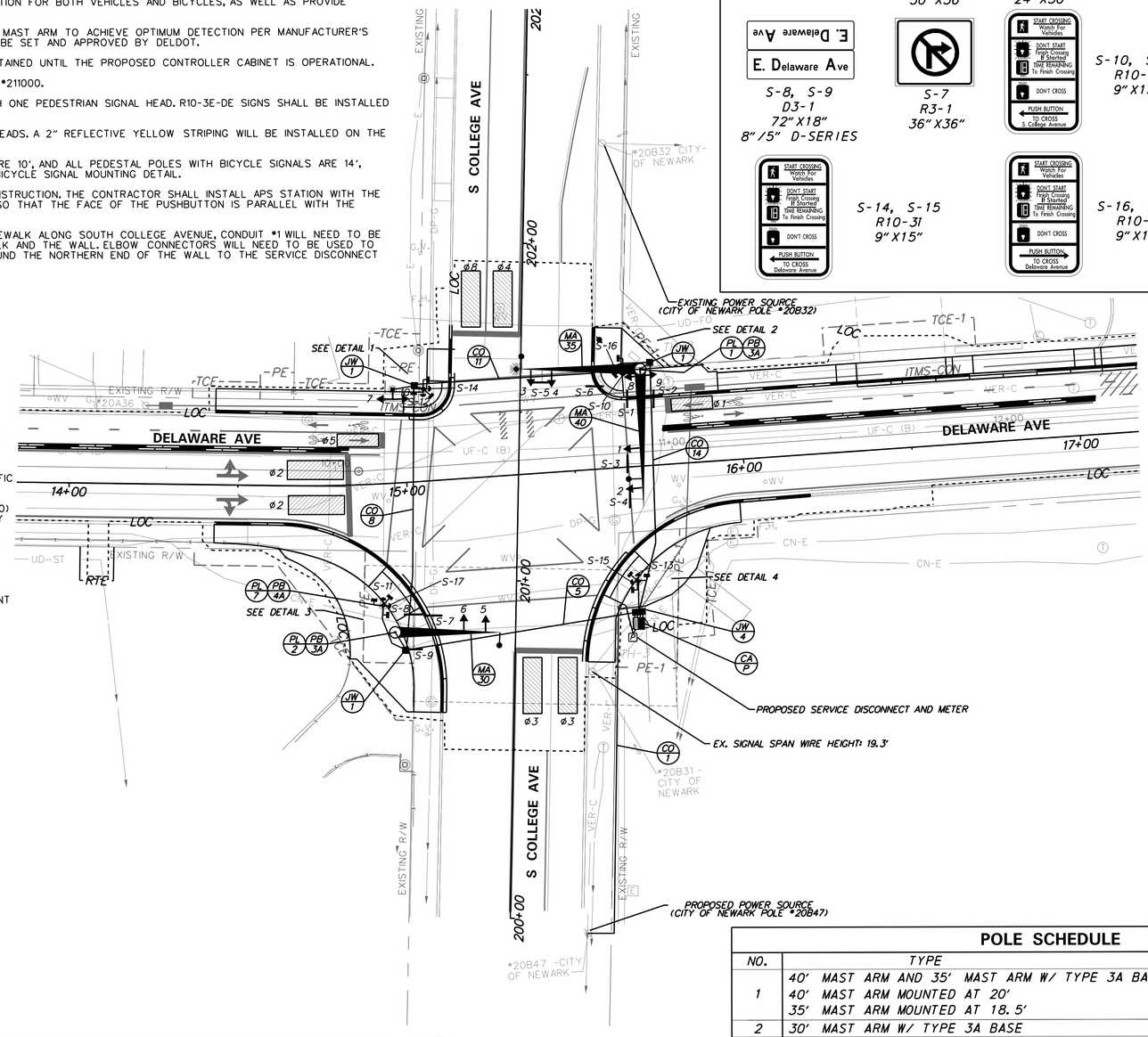
21. THE FURNISHING AND INSTALLATION OF THE 8" BICYCLE SIGNAL HEADS SHALL BE PAID UNDER ITEM *837001 - FURNISH AND INSTALL 8" SIGNAL HEAD RIDIGID MOUNT. THE SIGNAL HEAD SHALL HAVE BICYCLE SYMBOL LENS INSTALLED AS PER REQUIREMENT OF THE PLANS.

SIGN DETAILS

ULTIMATE

ALL SIGNS ARE RIGID MOUNT





ADDITIONAL LEGEND

- MINIMUM DETECTION ZONE
- FISHEYE VIDEO DETECTION

MAST ARM SCHEDULE

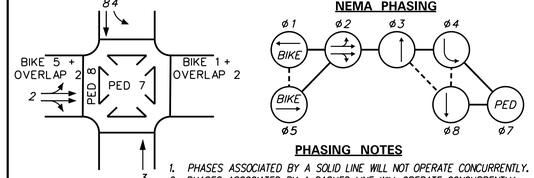
NO.	LENGTH	NO. OF SIGNAL HEADS	S.F. OF SIGNAGE
1	40' MAST ARM	1 - 3 SECTION, 1 - 5 SECTION	23.25 SF
2	35' MAST ARM	2 - 3 SECTION	15.75 SF
3	30' MAST ARM	1 - 3 SECTION, 1 - 5 SECTION	17.25 SF

POLE SCHEDULE

NO.	TYPE	STATION	OFFSET
1	40' MAST ARM AND 35' MAST ARM W/ TYPE 3A BASE 40' MAST ARM MOUNTED AT 20' 35' MAST ARM MOUNTED AT 18.5'	15+71	29' LT
2	30' MAST ARM W/ TYPE 3A BASE	14+93	44' RT
3	14' PEDESTAL POLE W/ TYPE 6 BASE	14+98	28' LT
4	14' PEDESTAL POLE W/ TYPE 4A BASE	15+07	27' LT
5	14' PEDESTAL POLE W/ TYPE 4A BASE	15+66	29' LT
6	14' PEDESTAL POLE W/ TYPE 4A BASE	15+66	35' RT
7	14' PEDESTAL POLE W/ TYPE 4A BASE	14+91	36' RT

THE 14' PEDESTAL POLES SHALL BE SPUN ALUMINUM, SCHEDULE 80.
MAST ARM MOUNTING HEIGHTS ARE APPROXIMATE AND SHOULD BE FIELD ADJUSTED.

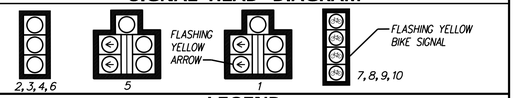
SIGNAL PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

AB	ABANDON	OH	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO *	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO *	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (* OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (* OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1	⬚	□
LOOP DETECTOR, TYPE 2	⬚	▭
LUMINAIRE	—○	—◆
MAST ARM	➢	➤
MICROWAVE DETECTION	◂	◂
OPTICOM RECEIVER	—○	—●
OVERHEAD SIGNING		—|
PEDESTRIAN POLE/BASE	◎	◉
PEDESTRIAN PUSHBUTTON	—▷	—▶
PEDESTRIAN SIGNAL HEAD	▱	▰
RIGHT-OF-WAY	— — —	—R/W—
SERVICE PEDESTAL		Ⓟ
SIGNAL CABINET	▯	▮
SIGNAL HEAD	—▷	→
SIGNAL POLE/BASE	⊗	⊙
CCTV CAMERA	CCTV	■◂
SPAN WIRE	—XX—	—◇—
UTILITY POLE	⦸	◥
VIDEO DETECTION	◧	◧

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.

PREPARED BY
JMT

Mir Wahed — 07/20/2021
THIS SEAL APPLIES TO ALL SHEETS BEARING THE "JMT" SECTION DESIGNATION. — DATE

MIR A. WAHED LICENSE No. 14810 DELAWARE PROFESSIONAL ENGINEER
SEAL

CONCURRENCE FOR INSTALLATION

CHIEF TRAFFIC ENGINEER — 7/28/2021 DATE

ADDENDA / REVISIONS

SCALE 0 20 40 60 FEET

DELAWARE AVENUE SEPARATED BIKEWAY- ORCHARD ROAD TO LIBRARY AVENUE

CONTRACT	PERMIT NO.	N428T
T201801501	DESIGNED BY: J.SMITH	
COUNTY	CHECKED BY: M.WAHED	
NEW CASTLE		

SIGNAL PLAN DELAWARE AVE AND S. COLLEGE AVE

SECTION	JMT
SHEET NO.	175

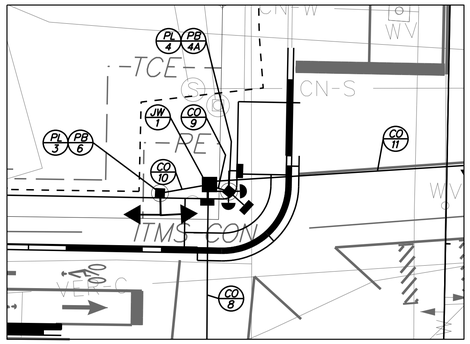
PLOTTED BY: JDSMITH DATE: 7/13/2021
FILE LOCATION: Q:\NDE\140659_032_DELAWARE_AVENUE_SEPARATED_BIKEWAY_DESIGN\CADD\SG_S COLLEGE AVE.DGN [SHEET: SG11]

ULTIMATE

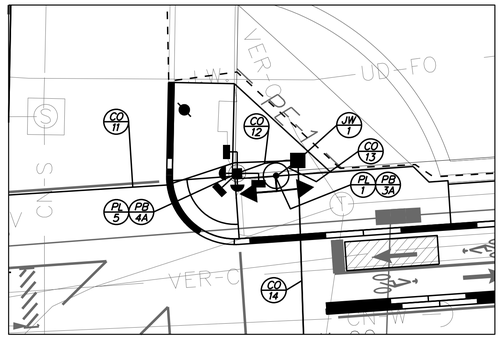
CONDUIT RUN SCHEDULE

CR#	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE / WIRE
1	1 (GALV. STEEL)	2"	115'	*T	(1)#8 THHN
2	1 (GALV. STEEL)	2"	10'	T	(1)2/#8 U.F. W/GROUND
3	4	4"	5'	T	(12)5/#14, (5)9/#14, (1)16/#14, (3)4/#18, GRIDSMART CAT5E CABLE, (4)1/#6 GRD
4	1	2.5"	10'	T	(3)5/#14, (1)1/#6 GRD
5	1 (SCH 80 HDPE)	4"	70'	B	(6)5/#14, (3)9/#14, (1)4/#18, (1)1/#6 GRD
6	1	3"	10'	O	(1)9/#14, (1)4/#18. (1)1/#6 GRD
7	1	2.5"	20'	O	(3)5/#14, (1)1/#6 GRD
8	1 (SCH 80 HDPE)	4"	80'	B	(3)5/#14, (2)9/#14, (1)1/#6 GRD
9	1	2.5"	5'	O	(5)5/#14, (1)1/#6 GRD
10	1	2.5"	10'	O	(2)9/#14, (1)1/#6 GRD
11	1 (SCH 80 HDPE)	4"	75'	B	EMPTY
12	1	2.5"	10'	O	(3)5/#14, (1)1/#6 GRD
13	1	3"	5'	O	(2)9/#14, (1)16/#14, (2)4/#18, GRIDSMART CAT5E CABLE, (1)1/#6 GRD
14	1 (SCH 80 HDPE)	4"	75'	B	(3)5/#14, (2)9/#14, (1)16/#14, (2)4/#18, GRIDSMART CAT5E CABLE, (1)1/#6 GRD

NOTE: ALL CONDUIT SHALL BE SCHEDULE 80 PVC UNLESS OTHERWISE NOTED.
B=BORE, T=TRENCH, O=OPEN CUT
* - HAND TRENCHED

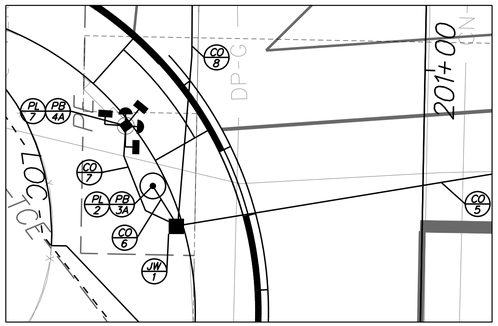


DETAIL 1 – NORTHWEST CORNER
SCALE: 1" = 10'



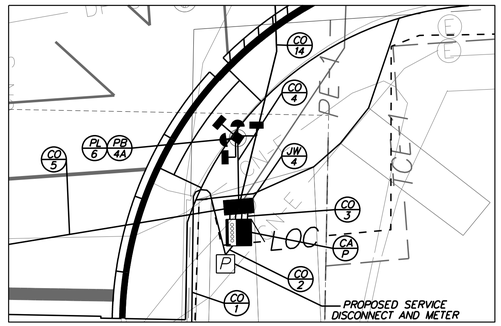
DETAIL 2 – NORTHEAST CORNER
SCALE: 1" = 10'

NOTE: FOR CLARITY OF THE DETAILS, MAST ARMS ARE NOT SHOWN.
ONLY THE POLE BASE LOCATION IS SHOWN ON THE DETAIL.



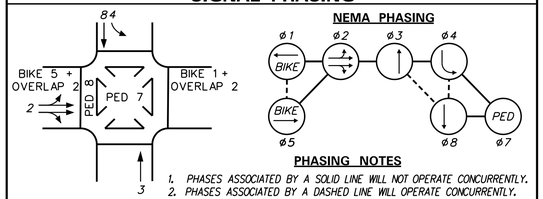
DETAIL 3 – SOUTHWEST CORNER
SCALE: 1" = 10'

NOTE: FOR CLARITY OF THE DETAILS, MAST ARMS ARE NOT SHOWN.
ONLY THE POLE BASE LOCATION IS SHOWN ON THE DETAIL.



DETAIL 4 – SOUTHEAST CORNER
SCALE: 1" = 10'

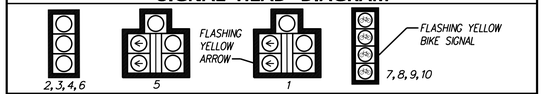
SIGNAL PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

AB	ABANDON	OH •	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH •	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO •	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO •	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (TYPE OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (* OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL		P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
CCTV CAMERA		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.

PREPARED BY
JMT

Mir Wahed — 07/20/2021
THIS SEAL APPLIES TO ALL SHEETS BEARING THE "JMT" SECTION DESIGNATION. — DATE

MIR A. WAHED — LICENSE — No. 14810 — DELAWARE PROFESSIONAL ENGINEER
SEAL

CONCURRENCE FOR INSTALLATION

CHIEF TRAFFIC ENGINEER — 7/28/2021 DATE

ADDENDA / REVISIONS							

N.T.S.

DELAWARE AVENUE SEPARATED BIKEWAY– ORCHARD ROAD TO LIBRARY AVENUE

CONTRACT	PERMIT NO.	N428T
T201801501	DESIGNED BY: J.SMITH	
COUNTY	CHECKED BY: M.WAHED	
NEW CASTLE		

SIGNAL PLAN
DELAWARE AVE AND S. COLLEGE AVE

SECTION	SHEET NO.
JMT	176

PLOTTED BY: JDSMITH DATE: 7/13/2021
FILE LOCATION: Q:\NDE\1140659_032_DELAWARE_AVENUE_SEPARATED_BIKEWAY_DESIGN\CADD\SG_S COLLEGE AVE.DGN [SHEET: SG12]

6 NEW SHEET

CONDUIT RUN SCHEDULE

CO#	# OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/WIRE
XIA	1	2"	GALV	25'/30'	-	REMOVE (1)12/#8 U.F.W/GRND NEW (1)12/#8 U.F.W/GRND
XIB	1	2"	GALV	30'	-	REMOVE (1)12/#8 U.F.W/GRND
IC	1	2"	GALV	15'	T	NEW (1)12/#8 U.F.W/GRND
2	3	4"	PVC	5'	T	NEW (3)14/#18 (2)16/#14 (1)VIDEO DETECTION HOME-RUN CABLE (2)#6 BSC)
3	1	4"	HDPE	90'	B	NEW (12)14/#18 (1)16/#14 (1)VIDEO DETECTION HOME-RUN CABLE (1)#6 BSC)
4	1	3"	PVC	20'	T	NEW (12)14/#18 (1)16/#14 (1)VIDEO DETECTION HOME-RUN CABLE (1)#6 BSC)
5	1	4"	HDPE	95'	B	NEW (1)14/#18 (1)16/#14 (1)#6 BSC)
6	1	3"	PVC	10'	T	NEW (1)14/#18 (1)16/#14 (1)#6 BSC)
X7	1	2.5"	PVC	45'	-	EMPTY
X8	1	2.5"	PVC	8'	-	EMPTY
X9	1	2.5"	PVC	21'	-	EMPTY

LEGEND
X- DENOTES EXISTING

B- BORE
T- TRENCH
O- OPEN CUT
P- ATTACH TO POLE

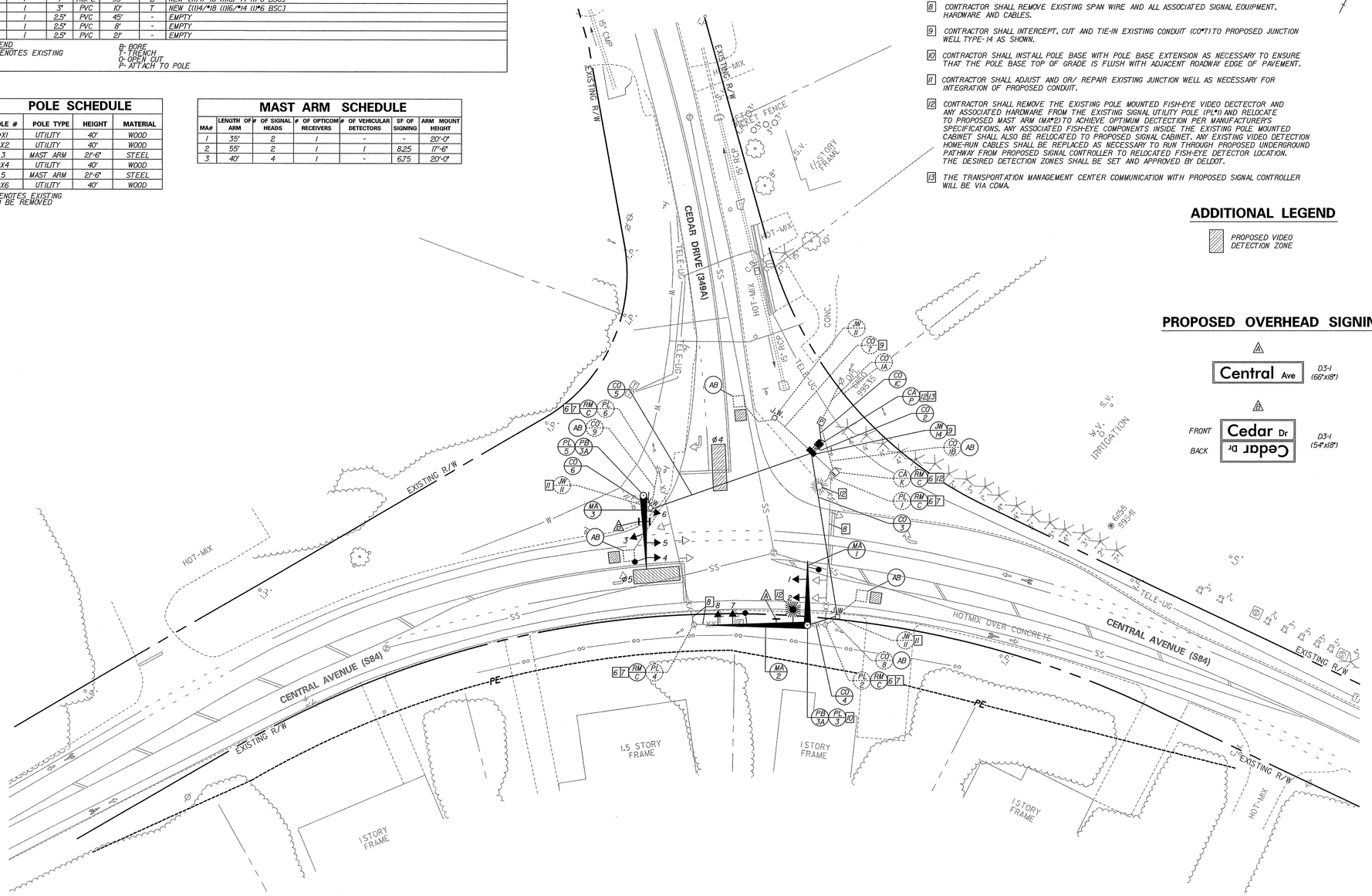
POLE SCHEDULE

POLE #	POLE TYPE	HEIGHT	MATERIAL
*X1	UTILITY	40'	WOOD
*X2	UTILITY	40'	WOOD
3	MAST ARM	21'-6"	STEEL
*X4	UTILITY	40'	WOOD
5	MAST ARM	21'-6"	STEEL
*X6	UTILITY	40'	WOOD

X- DENOTES EXISTING
* TO BE REMOVED

MAST ARM SCHEDULE

MA#	LENGTH OF ARM	# OF SIGNAL HEADS	# OF OPTICOM RECEIVERS	# OF VEHICULAR DETECTORS	SF OF SIGNING	ARM MOUNT HEIGHT
1	35'	2	1	-	-	20'-0"
2	55'	2	1	1	8.25	17'-6"
3	40'	4	1	-	6.75	20'-0"



ADDITIONAL SIGNAL NOTES

6 ALL EXISTING VEHICULAR SIGNAL COMPONENTS CALLED OUT FOR REMOVAL OR ABANDONMENT SHALL REMAIN INTACT AND FULLY FUNCTIONAL UNTIL ALL PROPOSED VEHICULAR SIGNAL COMPONENTS INSTALLATIONS ARE READY TO BE COMMISSIONED. CONTRACTOR SHALL ENSURE THAT SIGNAL DOWNTIME DURING DECOMMISSIONING OF THE EXISTING AND COMMISSIONING OF THE PROPOSED SIGNAL INSTALLATION IS MINIMAL.

7 CONTRACTOR SHALL REMOVE EXISTING SIGNAL UTILITY WOOD POLE. AFTER REMOVAL, THE AREA SHALL BE RESTORED TO MATCH EXISTING ADJACENT CONDITIONS.

8 CONTRACTOR SHALL REMOVE EXISTING SPAN WIRE AND ALL ASSOCIATED SIGNAL EQUIPMENT, HARDWARE AND CABLES.

9 CONTRACTOR SHALL INTERCEPT, CUT AND TIE-IN EXISTING CONDUIT (CO*7) TO PROPOSED JUNCTION WELL TYPE-14 AS SHOWN.

10 CONTRACTOR SHALL INSTALL POLE BASE WITH POLE BASE EXTENSION AS NECESSARY TO ENSURE THAT THE POLE BASE TOP OF GRADE IS FLUSH WITH ADJACENT ROADWAY EDGE OF PAVEMENT.

11 CONTRACTOR SHALL ADJUST AND OR/ REPAIR EXISTING JUNCTION WELL AS NECESSARY FOR INTEGRATION OF PROPOSED CONDUIT.

12 CONTRACTOR SHALL REMOVE THE EXISTING POLE MOUNTED FISH-EYE VIDEO DECTECTOR AND ANY ASSOCIATED HARDWARE FROM THE EXISTING SIGNAL UTILITY POLE (PL*1) AND RELOCATE TO PROPOSED MAST ARM (MA*2) TO ACHIEVE OPTIMUM DECTECTION PER MANUFACTURER'S SPECIFICATIONS. ANY ASSOCIATED FISH-EYE COMPONENTS INSIDE THE EXISTING POLE MOUNTED CABINET SHALL ALSO BE RELOCATED TO PROPOSED SIGNAL CABINET. ANY EXISTING VIDEO DETECTION HOME-RUN CABLES SHALL BE REPLACED AS NECESSARY TO RUN THROUGH PROPOSED UNDERGROUND PATHWAY FROM PROPOSED SIGNAL CONTROLLER TO RELOCATED FISH-EYE DETECTOR LOCATION. THE DESIRED DETECTION ZONES SHALL BE SET AND APPROVED BY DELDOT.

13 THE TRANSPORTATION MANAGEMENT CENTER COMMUNICATION WITH PROPOSED SIGNAL CONTROLLER WILL BE VIA CDMA.

ADDITIONAL LEGEND

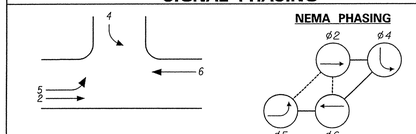
PROPOSED VIDEO DETECTION ZONE

PROPOSED OVERHEAD SIGNING

A — Central Ave — D3-1 (66"x18")

B — FRONT Cedar Dr / BACK Cedar Dr — D3-1 (54"x18")

SIGNAL PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

PROPOSED SIGNAL CABINET	(RM C) REMOVE BY CONTRACTOR
EXISTING SIGNAL CABINET	(RM O) REMOVE BY OTHERS
PROPOSED SIGNAL POLE BASE	(AB) ABANDON
EXISTING SIGNAL POLE BASE	(PB X) PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
PROPOSED PEDESTRIAN POLE BASE	(PB X) EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
EXISTING PEDESTRIAN POLE BASE	(PL X) PROPOSED POLE IDENTIFIER (* OF POLE)
PROPOSED WOOD POLE	(PL X) EXISTING POLE IDENTIFIER (* OF POLE)
EXISTING WOOD POLE	(JW X) PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
PROPOSED JUNCTION WELL	(JW X) EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
EXISTING JUNCTION WELL	(CO •) PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
PROPOSED SIGNAL HEAD	(CO •) EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
EXISTING SIGNAL HEAD	(OH •) PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
PROPOSED PEDESTRIAN SIGNAL HEAD	(OH •) EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
EXISTING PEDESTRIAN SIGNAL HEAD	(MA XX) PROPOSED MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
PROPOSED PEDESTRIAN PUSHBUTTON	(MA XX) EXISTING MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
EXISTING PEDESTRIAN PUSHBUTTON	(CA X) PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
PROPOSED VIDEO DETECTION	(CA X) EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
EXISTING VIDEO DETECTION	PROPOSED SPAN WIRE
PROPOSED MICROWAVE DETECTION	XX EXISTING SPAN WIRE
EXISTING MICROWAVE DETECTION	RIGHT-OF-WAY OR PROPERTY LINE
OVERHEAD SIGNING	PROPOSED SPAN INSULATOR
PROPOSED OPTICOM RECEIVER	EXISTING SPAN INSULATOR
EXISTING OPTICOM RECEIVER	P SERVICE PEDESTAL
PROPOSED MAST ARM	PROPOSED CCTV
EXISTING MAST ARM	EXISTING CCTV
PROPOSED LUMINAIRE	PROPOSED PLASTIC DRUMS
EXISTING LUMINAIRE	EXISTING PLASTIC DRUMS
PROPOSED LOOP DETECTOR (TYPE 1 OR 2)	
EXISTING LOOP DETECTOR (TYPE 1 OR 2)	

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-DOVER, DELAWARE
2. POLE BASES, CABINET BASE, AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED EXCEPT WHERE SHOWN.
3. ALL GALVANIZED RIGID CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
4. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY FOR THE UTILITY MARKOUTS PRIOR TO THE BEGINNING OF CONSTRUCTION. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
5. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.

RECOMMENDED _____ DATE: _____

RECOMMENDED _____ DATE: _____

RECOMMENDED [signature] DATE: 4/11/16

APPROVED TRAFFIC ENGINEER [signature] DATE: 4/13/16

APPROVED FOR INSTALLATION
CHIEF TRAFFIC ENGINEER [signature] DATE: 4/13/16

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

6 ADDED PERMANENT TRAFFIC SIGNAL 4/12/16 TMB	

SCALE
0 30 60 90
FEET

SR 26, ATLANTIC AVENUE FROM CLARKSVILLE TO ASSAWOMAN CANAL

CONTRACT	T200411210
COUNTY	SUSSEX
PERMIT NO.	S329
DESIGNED BY:	MSK
CHECKED BY:	BAM

SIGNAL PLAN
RD S84 (CENTRAL AVENUE)
& RD 349A (CEDAR DRIVE)

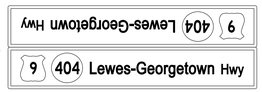
SHEET NO.	547A
TOTAL SHTS.	589

4/7/2016
I:\PROJECTS\sr26malnline\Survey\signal_cedar centralnew.dgn
8:32:46 AM

EXISTING OVERHEAD SIGNING

A

D3-1
108" X 18"



B

D3-1
72" X 18"

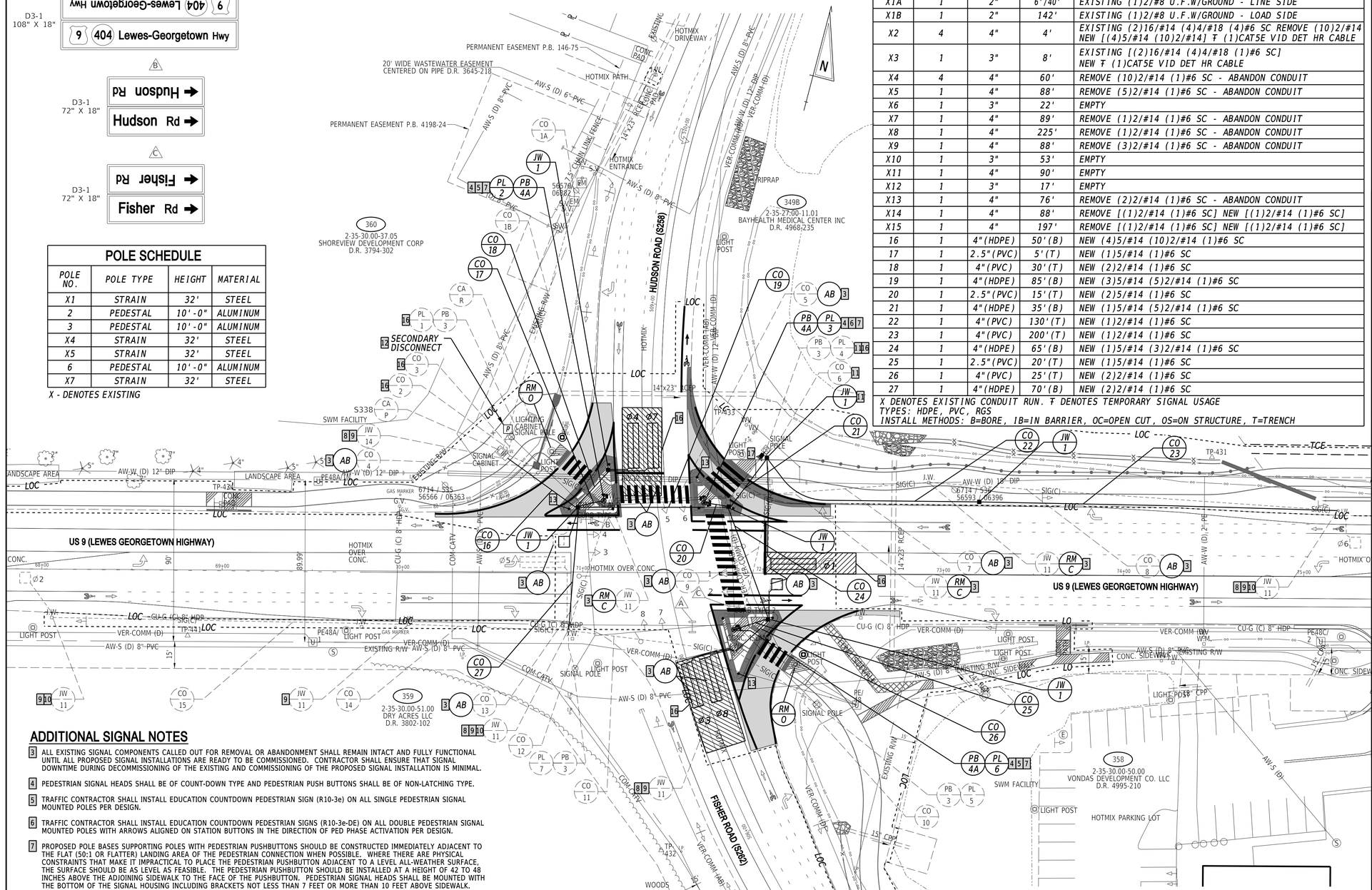
C

D3-1
72" X 18"

POLE SCHEDULE

POLE NO.	POLE TYPE	HEIGHT	MATERIAL
X1	STRAIN	32'	STEEL
2	PEDESTAL	10'-0"	ALUMINUM
3	PEDESTAL	10'-0"	ALUMINUM
X4	STRAIN	32'	STEEL
X5	STRAIN	32'	STEEL
6	PEDESTAL	10'-0"	ALUMINUM
X7	STRAIN	32'	STEEL

X - DENOTES EXISTING

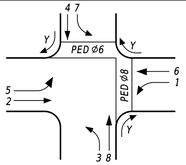


CONDUIT RUN SCHEDULE

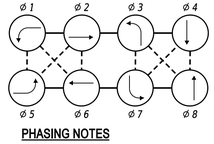
CR NO.	NO. OF CONDUITS	SIZE (TYPE)	LENGTH (B/T/O/P)	AMOUNT AND TYPE OF CABLE / WIRE
X1A	1	2"	6'/40'	EXISTING (1)2/#8 U.F.W/GROUND - LINE SIDE
X1B	1	2"	142'	EXISTING (1)2/#8 U.F.W/GROUND - LOAD SIDE
X2	4	4"	4'	EXISTING (2)16/#14 (4)4/#18 (4)#6 SC REMOVE (10)2/#14 NEW [(4)5/#14 (10)2/#14] ₸ (1)CAT5E VID DET HR CABLE
X3	1	3"	8'	EXISTING [(2)16/#14 (4)4/#18 (1)#6 SC] NEW ₸ (1)CAT5E VID DET HR CABLE
X4	4	4"	60'	REMOVE (10)2/#14 (1)#6 SC - ABANDON CONDUIT
X5	1	4"	88'	REMOVE (5)2/#14 (1)#6 SC - ABANDON CONDUIT
X6	1	3"	22'	EMPTY
X7	1	4"	89'	REMOVE (1)2/#14 (1)#6 SC - ABANDON CONDUIT
X8	1	4"	225'	REMOVE (1)2/#14 (1)#6 SC - ABANDON CONDUIT
X9	1	4"	88'	REMOVE (3)2/#14 (1)#6 SC - ABANDON CONDUIT
X10	1	3"	53'	EMPTY
X11	1	4"	90'	EMPTY
X12	1	3"	17'	EMPTY
X13	1	4"	76'	REMOVE (2)2/#14 (1)#6 SC - ABANDON CONDUIT
X14	1	4"	88'	REMOVE [(1)2/#14 (1)#6 SC] NEW [(1)2/#14 (1)#6 SC]
X15	1	4"	197'	REMOVE [(1)2/#14 (1)#6 SC] NEW [(1)2/#14 (1)#6 SC]
16	1	4"(HDPE)	50'(B)	NEW (4)5/#14 (10)2/#14 (1)#6 SC
17	1	2.5"(PVC)	5'(T)	NEW (1)5/#14 (1)#6 SC
18	1	4"(PVC)	30'(T)	NEW (2)2/#14 (1)#6 SC
19	1	4"(HDPE)	85'(B)	NEW (3)5/#14 (5)2/#14 (1)#6 SC
20	1	2.5"(PVC)	15'(T)	NEW (2)5/#14 (1)#6 SC
21	1	4"(HDPE)	35'(B)	NEW (1)5/#14 (5)2/#14 (1)#6 SC
22	1	4"(PVC)	130'(T)	NEW (1)2/#14 (1)#6 SC
23	1	4"(PVC)	200'(T)	NEW (1)2/#14 (1)#6 SC
24	1	4"(HDPE)	65'(B)	NEW (1)5/#14 (3)2/#14 (1)#6 SC
25	1	2.5"(PVC)	20'(T)	NEW (1)5/#14 (1)#6 SC
26	1	4"(PVC)	25'(T)	NEW (2)2/#14 (1)#6 SC
27	1	4"(HDPE)	70'(B)	NEW (2)2/#14 (1)#6 SC

X DENOTES EXISTING CONDUIT RUN. ₸ DENOTES TEMPORARY SIGNAL USAGE
TYPES: HDPE, PVC, RGS
INSTALL METHODS: B=BORE, IB=IN BARRIER, OC=OPEN CUT, OS=ON STRUCTURE, T=TRENCH

SIGNAL PHASING



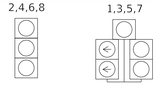
NEMA PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

AB	ABANDON	OH #	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH #	PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (# OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (# OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
CCTV CAMERA		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION		

ADDITIONAL SIGNAL NOTES

3 ALL EXISTING SIGNAL COMPONENTS CALLED OUT FOR REMOVAL OR ABANDONMENT SHALL REMAIN INTACT AND FULLY FUNCTIONAL UNTIL ALL PROPOSED SIGNAL INSTALLATIONS ARE READY TO BE COMMISSIONED. CONTRACTOR SHALL ENSURE THAT SIGNAL DOWNTIME DURING DECOMMISSIONING OF THE EXISTING AND COMMISSIONING OF THE PROPOSED SIGNAL INSTALLATION IS MINIMAL.

4 PEDESTRIAN SIGNAL HEADS SHALL BE OF COUNT-DOWN TYPE AND PEDESTRIAN PUSH BUTTONS SHALL BE OF NON-LATCHING TYPE.

5 TRAFFIC CONTRACTOR SHALL INSTALL EDUCATION COUNTDOWN PEDESTRIAN SIGN (R10-3e) ON ALL SINGLE PEDESTRIAN SIGNAL MOUNTED POLES PER DESIGN.

6 TRAFFIC CONTRACTOR SHALL INSTALL EDUCATION COUNTDOWN PEDESTRIAN SIGNS (R10-3e-DE) ON ALL DOUBLE PEDESTRIAN SIGNAL MOUNTED POLES WITH ARROWS ALIGNED ON STATION BUTTONS IN THE DIRECTION OF PED PHASE ACTIVATION PER DESIGN.

7 PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHOULD BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (50:1 OR FLATTER) LANDING AREA OF THE PEDESTRIAN CONNECTION WHEN POSSIBLE. WHERE THERE ARE PHYSICAL CONSTRAINTS THAT MAKE IT IMPRACTICAL TO PLACE THE PEDESTRIAN PUSHBUTTON ADJACENT TO A LEVEL ALL-WEATHER SURFACE, THE SURFACE SHOULD BE AS LEVEL AS FEASIBLE. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE ADJOINING SIDEWALK TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK.

8 CONTRACTOR SHALL ADJUST AND/OR REPAIR EXISTING JUNCTION WELL AS NECESSARY FOR INTEGRATION OF PROPOSED CONDUITS AND/OR FINISH FLUSH WITH FINAL GRADES.

9 CONTRACTOR SHALL REMOVE EXISTING JUNCTION WELL COMPOSITE FRAME AND LID AND REPLACE WITH CAST IRON FRAME AND LID.

10 CONTRACTOR SHALL CUT EXISTING LOOP WIRES AND SPLICE TO PROPOSED HOME-RUN LOOP CABLE.

11 CONTRACTOR SHALL INTERCEPT EXISTING CONDUIT (CO#6) WITH PROPOSED JUNCTION WELL AS SHOWN FOR PATHWAY TO EXISTING POLE BASE AND POLE (PL#4).

12 CONTRACTOR SHALL INTERCEPT EXISTING CONDUIT (CO#1B) AND INSTALL A SECONDARY DISCONNECT SWITCH.

13 CONTRACTOR SHALL INSTALL CORNER TUBULAR MARKERS ON PROPOSED ISLAND (TYPICAL).

14 REFER TO M.O.T. PLANS FOR TRAFFIC CONTROL AND LANE RESTRICTIONS DURING SIGNAL CONSTRUCTION.

15 SURVEY DATA WAS OBTAINED BY CENTURY ENGINEERING INC.

TEMPORARY SIGNAL NOTES

16 PROPOSED VIDEO DETECTOR, APPROVED BY DELDOT SIGNAL MAINTENANCE, SHALL BE LOCATED, MOUNTED AND ORIENTED TO ACHIEVE OPTIMUM VEHICULAR DETECTION FOR PHASES 1, 3, 4, 7 & 8 PER MANUFACTURER'S SPECIFICATIONS. VIDEO DETECTOR MOUNTED ON EXISTING STRAIN POLE (PL#4) SHALL HAVE THE CAT5E VIDEO DETECTOR HOMERUN CABLE RUN ALONG THE EXISTING SPAN WIRE WITH MESSENGER CABLE, THEN THE CAT5E VIDEO DETECTOR HOMERUN CABLE SHALL RUN DOWN EXISTING STRAIN POLE (PL#1), THROUGH EXISTING CONDUIT (CO#3) AND THROUGH EXISTING CONDUIT (CO#2) TO EXISTING CABINET.

17 PROPOSED VIDEO DETECTION SHALL BECOME OPERATIONAL PRIOR TO COMMENCEMENT OF INTERSECTION CONSTRUCTION. VIDEO DETECTION SHALL REMAIN IN PLACE AND ADJUSTED AS NECESSARY DURING CONSTRUCTION. ONCE CONSTRUCTION HAS COMPLETED AND SAW CUT LOOP DETECTORS HAVE BEEN FULLY IMPLEMENTED, THE CONTRACTOR SHALL REMOVE VIDEO DETECTOR SYSTEM INCLUDING CAT5E VIDEO DETECTOR HOMERUN CABLE FROM THE CONDUITS AND SPAN WIRE.

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.

PREPARED BY
CENTURY ENGINEERING

B.A. MARTINE — 7/14/2021
THIS SEAL APPLIES TO THIS SHEET ONLY. — DATE

B.A. MARTINE No. 11947 PROFESSIONAL ENGINEER — SEAL

CONCURRENCE FOR INSTALLATION

CHIEF OF TRAFFIC ENGINEERING — 8/4/2021 DATE

ADDENDA / REVISIONS	

SCALE
0 30 60 90
FEET

GEORGETOWN TO LEWES TRAIL, COOL SPRING ROAD TO FISHER ROAD

CONTRACT	T202030001	PERMIT NO.	S338
COUNTY	SUSSEX	DESIGNED BY:	M.KUBOVCIK
		CHECKED BY:	B.MARTINE

SIGNAL PLAN
US 9 (LEWES-GEORGETOWN HWY) @ HUDSON ROAD (S258)/ FISHER ROAD (S262)

SECTION	
CEI	
SHEET NO.	
121	

LAST REVISED: 9/11/2018
PLOT DATE: 7/14/2021
15:58:40
\\solomon.centuryeng.com\global-ceiDO-ProjectData\Projects\185003.00 Agmt 1834 TAP\185003.13 (Task 13 - GL Log Cabin)\CADD FILES\Sheets\SGlog_S338_US9 & Hudson Rd .dgn

NEW CONDUIT RUN SCHEDULE

CR NO.	NO. OF CONDUITS	SIZE	LENGTH	B/T	AMOUNT AND TYPE OF CABLE / WIRE	
1	1	2"	4'	T	NEW (1) 2/#8 UF W/GROUND	
2	2	2.5"	52'	T	NEW (3) 9/#14, (1) #6 GROUND	SCHEDULE 80 CPV
3	1	2.5"	24'	T	NEW (2) 9/#14, (1) #6 GROUND	SCHEDULE 80 CPV
4	1	4"	52'	B	NEW (2) 9/#14, (1) #6 GROUND	HDPE SDR-13.5 SCH 80 CPV
5	1	4"	38'	B	NEW (1) 9/#14, (1) #6 GROUND	HDPE SDR-13.5 SCH 80 CPV
6	1	2.5"	20'	T	NEW (1) 9/#14, (1) #6 GROUND	SCHEDULE 80 CPV
7	1	2.5"	18'	T	NEW (1) 9/#14, (1) #6 GROUND	
8	1	2.5"	4'	T	NEW (1) 9/#14, (1) #6 GROUND	

B = BORE, T = TRENCH

GENERAL SIGNAL NOTES (CONT.)

3. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED, AND COMPRESSION FITTING ARE NOT ACCEPTABLE.

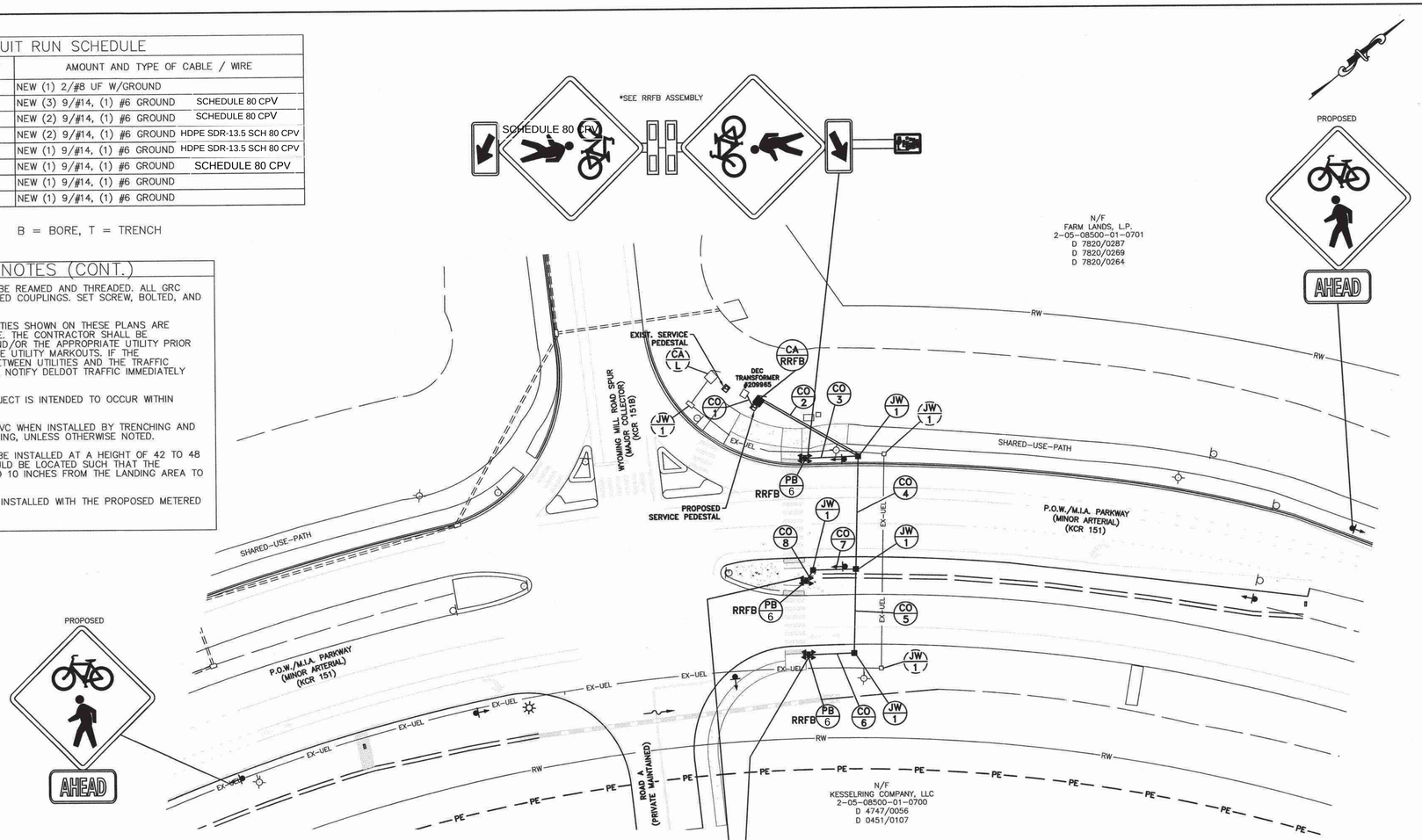
4. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.

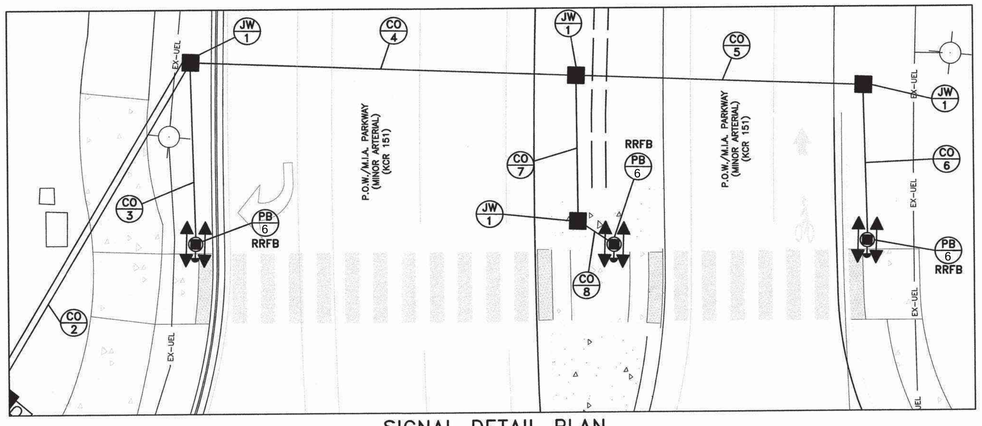
5. ALL WORK PERFORMED UNDER THIS PROJECT IS INTENDED TO OCCUR WITHIN DELDOT'S EXISTING RIGHT-OF-WAY.

6. ALL CONDUIT SHALL BE SCHEDULE 80 PVC WHEN INSTALLED BY TRENCHING AND SCHEDULE 80 HDPE WHEN INSTALLED BY BORING, UNLESS OTHERWISE NOTED.

7. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA AND SHOULD BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE DOES NOT EXCEED 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON.

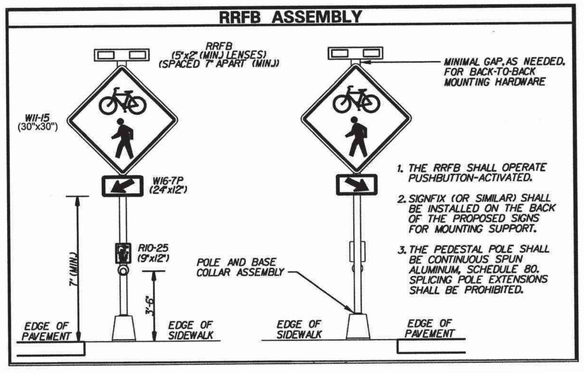
8. PROPOSED FLASHER CABINET SHALL BE INSTALLED WITH THE PROPOSED METERED SERVICE PEDESTAL.





SIGNAL DETAIL PLAN

SCALE: 1"=10'



RRFB TIMESHEET PARAMETERS

89-FOOT PEDESTRIAN CLEARANCE

33-SECOND WARNING/FLASH TIME

1-6

ALTERNATELY FLASHING (WW+S PATTERN YELLOW RRFB BEACONS

LEGEND

AB	ABANDON	OH/#	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA/X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH/#	PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA/X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB/X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO/#	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PB/X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO/#	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PL/X	EXISTING POLE IDENTIFIER (# OF POLE)
JW/X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL/X	PROPOSED POLE IDENTIFIER (# OF POLE)
JW/X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM/C	REMOVE BY CONTRACTOR
MA/XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM/O	REMOVE BY OTHERS
MA/XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM/TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	▫	■
LOOP DETECTOR, TYPE 1	□	□
LOOP DETECTOR, TYPE 2	⊟	▭
LUMINAIRE	—○	—●
MAST ARM	▷	➤
MICROWAVE DETECTION	—▯	—■
OPTICOM RECEIVER	—○	—●
OVERHEAD SIGNING	⊐	⊣
PEDESTRIAN POLE/BASE	◎	◉
PEDESTRIAN PUSHBUTTON	—▷	—▶
PEDESTRIAN SIGNAL HEAD	—▭	—▬
RIGHT-OF-WAY	———	—R/W—
SERVICE PEDESTAL		P
SIGNAL CABINET	▯	■
SIGNAL HEAD	—▷	—▶
SIGNAL POLE/BASE	⊗	⊙
CCTV CAMERA	▭	▬
SPAN WIRE	—XX—	—◇—
UTILITY POLE	⊘	●
VIDEO DETECTION	◁	◀

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.

2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.

DAVIS, BOWEN & FRIEDEL, INC.
ARCHITECTS, ENGINEERS & SURVEYORS
SALISBURY, MARYLAND (410) 543-9091
MILFORD, DELAWARE (302) 424-1441
EASTON, MARYLAND (410) 770-4744

WENDY J. CARPENTER — LICENSED — No. 21708 — DELAWARE — PROFESSIONAL ENGINEER

THIS SEAL APPLIES TO ALL SHEETS BEARING THE "DBF" SECTION DESIGNATION.

4/30/2020 DATE

SEAL

APPROVED FOR INSTALLATION

Peter Haag DelDOT 5/5/2020

CHIEF TRAFFIC ENGINEER DATE

ADDENDA / REVISIONS

SCALE 0 30 60 90 FEET

CONTRACT	PERMIT NO.	K330
N/A	DESIGNED BY: DJR (DBF)	
COUNTY	CHECKED BY: WJC (DBF)	
KENT		

RRFB SIGNAL PLAN
POW/MIA PARKWAY & WYOMING MILL SPUR ROAD

SECTION
DBF
SHEET NO.
1

CONDUIT RUN SCHEDULE

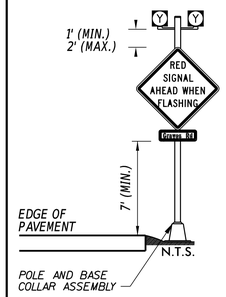
CR NO.	NO. OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE / WIRE
1*	1	2.0 IN	25 FT	-	<REMOVE EX. (1) 2/#8 U.F. W/GROUND>
2*	1	2.5 IN	3 FT	-	[NEW (2) 16/#14, (4) 4/#18, (1) #6 GROUND], <REMOVE EX. (2) 16/#14>
3*	2	2.5 IN	3 FT	-	[NEW (2) 2/#14, (2) 4/#14, (1) 2/#8 U.F. W/GROUND - LOAD SIDE, (2) #6 GROUND], (6) 4/#18 - TO REMAIN
4*	1	2.5 IN	86 FT	-	(2) 4/#18 - TO REMAIN
5*	1	2.5 IN	135 FT	-	(1) 4/#18 - TO REMAIN
6*	1	2.5 IN	66 FT	-	[NEW (1) 2/#14, (1) #6 GROUND], (3) 4/#18 - TO REMAIN
7*	1	2.5 IN	85 FT	-	[NEW (1) 2/#14, (1) #6 GROUND], (1) 4/#18 - TO REMAIN
8*	1	2.5 IN	157 FT	-	(1) 4/#18 - TO REMAIN
9	1	4.0 IN	76 FT	T	[NEW (2) 4/#14, (1) #6 GROUND]
10	1	4.0 IN	30 FT	B	[NEW (2) 4/#14, (1) #6 GROUND]
11	1	4.0 IN	150 FT	T	[NEW (2) 4/#14, (1) #6 GROUND]
12	1	4.0 IN	95 FT	B	[NEW (2) 4/#14, (1) #6 GROUND]
13	1	4.0 IN	225 FT	T	[NEW (2) 4/#14, (1) #6 GROUND]
14	1	3.0 IN	4 FT	T	[NEW (1) 4/#14, (1) #6 GROUND]
15	1	4.0 IN	54 FT	B	[NEW (1) 4/#14, (1) #6 GROUND]
16	1	3.0 IN	15 FT	T	[NEW (1) 4/#14, (1) #6 GROUND]
17*	1	2.0 IN	5 FT	-	<REMOVE EX. (1) 2/#8 U.F. W/GROUND>
18*	1	2.0 IN	42 FT	-	<REMOVE EX. (1) 2/#8 U.F. W/GROUND>
19**	1	2.0 IN	23 FT	T	[NEW (1) 2/#8 U.F. W/GROUND - LOAD SIDE]
20**	1	2.0 IN	6 FT	T	[NEW (3) 1/#8 THHN - LINE SIDE]

* DENOTES EXISTING CONDUIT

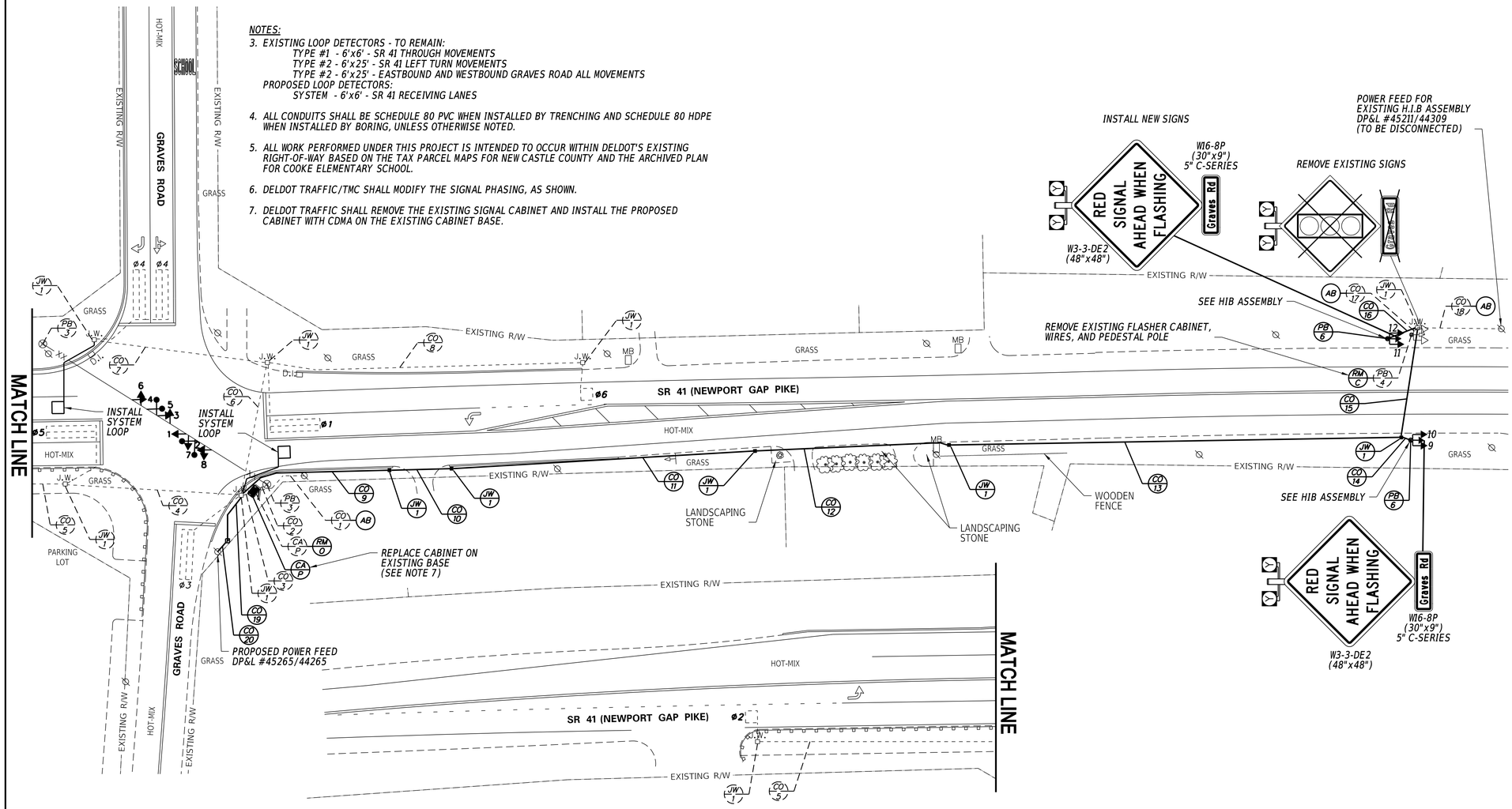
B = BORE, T = TRENCH, O = OPEN CUT

** RIGID GALVANIZED STEEL CONDUIT

H.I.B. ASSEMBLY



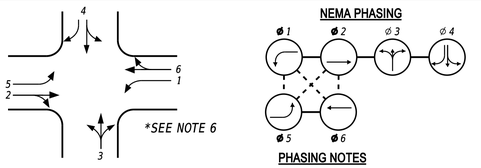
1. HAZARD IDENTIFICATION BEACON (H.I.B.) ASSEMBLIES SHALL CONSIST OF DUAL FLASHING YELLOW BEACONS, RED SIGNAL AHEAD WHEN FLASHING SIGN (W3-3-DE2, 48" x 48", WITH AN ADVANCE STREET NAME PLAQUE SIGN (W16-8P, 30" x 9") MOUNTED ON A PEDESTAL POLE.
2. THE BEACONS SHALL BE DUAL 12-INCH YELLOW L.E.D. ONE-SECTION TRAFFIC SIGNAL HEADS.
3. THE BEACONS SHALL OPERATE 24 HOURS A DAY, 7 DAYS A WEEK.
4. THE FLASHING RATE SHALL NOT BE LESS THAN 50 NOR MORE THAN 60 TIMES PER MINUTE.
5. THE ILLUMINATED PERIOD OF EACH FLASH SHALL NOT BE LESS THAN 1/2 NOR MORE THAN 2/3 OF THE FLASH CYCLE.
6. SIGNFIX (OR SIMILAR) SHALL BE INSTALLED ON THE BACK OF THE PROPOSED SIGNS FOR MOUNTING SUPPORT.
7. THE PEDESTAL POLES SHALL BE CONTINUOUS SPUN ALUMINUM. SCHEDULE 80. SPLICING POLE EXTENSIONS SHALL BE PROHIBITED.



NOTES:

3. *EXISTING LOOP DETECTORS - TO REMAIN:*
   TYPE #1 - 6'x6' - SR 41 THROUGH MOVEMENTS
   TYPE #2 - 6'x25' - SR 41 LEFT TURN MOVEMENTS
   TYPE #2 - 6'x25' - EASTBOUND AND WESTBOUND GRAVES ROAD ALL MOVEMENTS
   PROPOSED LOOP DETECTORS:
   SYSTEM - 6'x6' - SR 41 RECEIVING LANES
4. *ALL CONDUITS SHALL BE SCHEDULE 80 PVC WHEN INSTALLED BY TRENCHING AND SCHEDULE 80 HDPE WHEN INSTALLED BY BORING, UNLESS OTHERWISE NOTED.*
5. *ALL WORK PERFORMED UNDER THIS PROJECT IS INTENDED TO OCCUR WITHIN DELDOT'S EXISTING RIGHT-OF-WAY BASED ON THE TAX PARCEL MAPS FOR NEW CASTLE COUNTY AND THE ARCHIVED PLAN FOR COOKE ELEMENTARY SCHOOL.*
6. *DELDOT TRAFFIC/TMC SHALL MODIFY THE SIGNAL PHASING, AS SHOWN.*
7. *DELDOT TRAFFIC SHALL REMOVE THE EXISTING SIGNAL CABINET AND INSTALL THE PROPOSED CABINET WITH CDMA ON THE EXISTING CABINET BASE.*

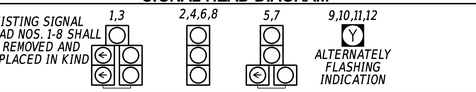
SIGNAL PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

AB	ABANDON	OH #	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH #	*PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)*
CA X	*PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)*	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PB X	*PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)*
CO #	*PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)*	PL X	EXISTING POLE IDENTIFIER (# OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	*PROPOSED POLE IDENTIFIER (# OF POLE)*
JW X	*PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)*	RM C	*REMOVE BY CONTRACTOR*
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	*REMOVE BY OTHERS*
MA XX	*PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)*	RM TC	*REMOVE BY TRAFFIC CONTRACTOR*

	EXISTING SYMBOL	*PROPOSED SYMBOL*
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
CCTV CAMERA		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION		

GENERAL SIGNAL NOTES

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PREPARED BY

Whitman, Requardt and Associates, LLP
Engineers • Architects • Environmental Planners Est. 1915

4/5/2021
DATE

THIS SEAL APPLIES TO ALL SHEETS BEARING THE "WRA" SECTION DESIGNATION.

MATTHEW J.A. BUCKLEY — No. 16224 — PROFESSIONAL ENGINEER
SEAL

CONCURRENCE FOR INSTALLATION

CHIEF OF TRAFFIC ENGINEERING

4/5/2021
DATE

ADDENDA / REVISIONS

1 *MODIFIED EXISTING HIB ASSEMBLY TO ACTIVE WARNING HIB ASSEMBLY, INSTALLED NEW ACTIVE WARNING HIB ASSEMBLY ON SB SR 41, INSTALLED OPTICOMS FOR ALL DIRECTIONS, INSTALLED SYSTEM LOOPS FOR SR 41 RECEIVING LANES, AND REPLACED HEADS AND CABLES. B.M.W. (WRA) 03-21 (CONTRACT #T200308302)*

SCALE
0 30 60 90
FEET

RED LIGHT RUNNING, STATEWIDE

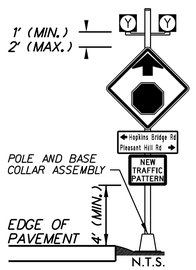
CONTRACT	T200308302
COUNTY	NEW CASTLE
PERMIT NO.	N491
DESIGNED BY:	B. WALKER
CHECKED BY:	M. BUCKLEY

SIGNAL PLAN SR 41 (NEWPORT GAP PIKE) @ GRAVES ROAD

SECTION	WRA
SHEET NO.	1

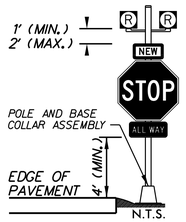
LAST REVISED: 9/11/2018
4/2/2021
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N:\321200\01\CADD\SIG01_SR 41 at Graves.dgn

H.I.B. ASSEMBLY



1. HAZARD IDENTIFICATION BEACON (H.I.B.) ASSEMBLY SHALL CONSIST OF TWO ALTERNATELY FLASHING YELLOW BEACONS, A STOP AHEAD SIGN (W3-1, 48"x48"), AN ADVANCED STREET NAME PLAQUE (W16-8aP, 48"X18"), AND A NEW TRAFFIC PATTERN PLAQUE (W23-2P-DE, 30"x24") MOUNTED ON A PEDESTAL POLE.
2. THE BEACON SHALL BE A 12-INCH YELLOW L.E.D. TWO-SECTION TRAFFIC SIGNAL HEAD.
3. THE BEACON SHALL OPERATE 24 HOURS A DAY, 7 DAYS A WEEK.
4. THE FLASHING RATE SHALL NOT BE LESS THAN 50 NOR MORE THAN 60 TIMES PER MINUTE.
5. THE ILLUMINATED PERIOD OF EACH FLASH SHALL NOT BE LESS THAN 1/2 NOR MORE THAN 2/3 OF THE FLASH CYCLE.
6. SIGNFIX (OR SIMILAR) SHALL BE INSTALLED ON THE BACK OF THE PROPOSED SIGNS FOR MOUNTING SUPPORT.
7. THE PEDESTAL POLE SHALL BE CONTINUOUS SPUN ALUMINUM, SCHEDULE 80. SPLICING POLE EXTENSIONS SHALL BE PROHIBITED.

I.C.B. ASSEMBLY



1. INTERSECTION CONTROL BEACON (I.C.B.) ASSEMBLY SHALL CONSIST OF TWO SIMULTANEOUSLY FLASHING RED BEACONS, A "NEW" PLAQUE (W16-15P, 24"x12"), A STOP SIGN (R1-1, 48"x48"), AND AN ALL WAY PLAQUE (R1-3P, 30"x12"), MOUNTED ON A PEDESTAL POLE.
2. THE BEACON SHALL BE A 12-INCH RED L.E.D. TWO-SECTION TRAFFIC SIGNAL HEAD.
3. THE BEACON SHALL OPERATE 24 HOURS A DAY, 7 DAYS A WEEK.
4. THE FLASHING RATE SHALL NOT BE LESS THAN 50 NOR MORE THAN 60 TIMES PER MINUTE.
5. THE ILLUMINATED PERIOD OF EACH FLASH SHALL NOT BE LESS THAN 1/2 NOR MORE THAN 2/3 OF THE FLASH CYCLE.
6. SIGNFIX (OR SIMILAR) SHALL BE INSTALLED ON THE BACK OF THE PROPOSED SIGNS FOR MOUNTING SUPPORT.
7. THE PEDESTAL POLE SHALL BE CONTINUOUS SPUN ALUMINUM, SCHEDULE 80. SPLICING POLE EXTENSIONS SHALL BE PROHIBITED.

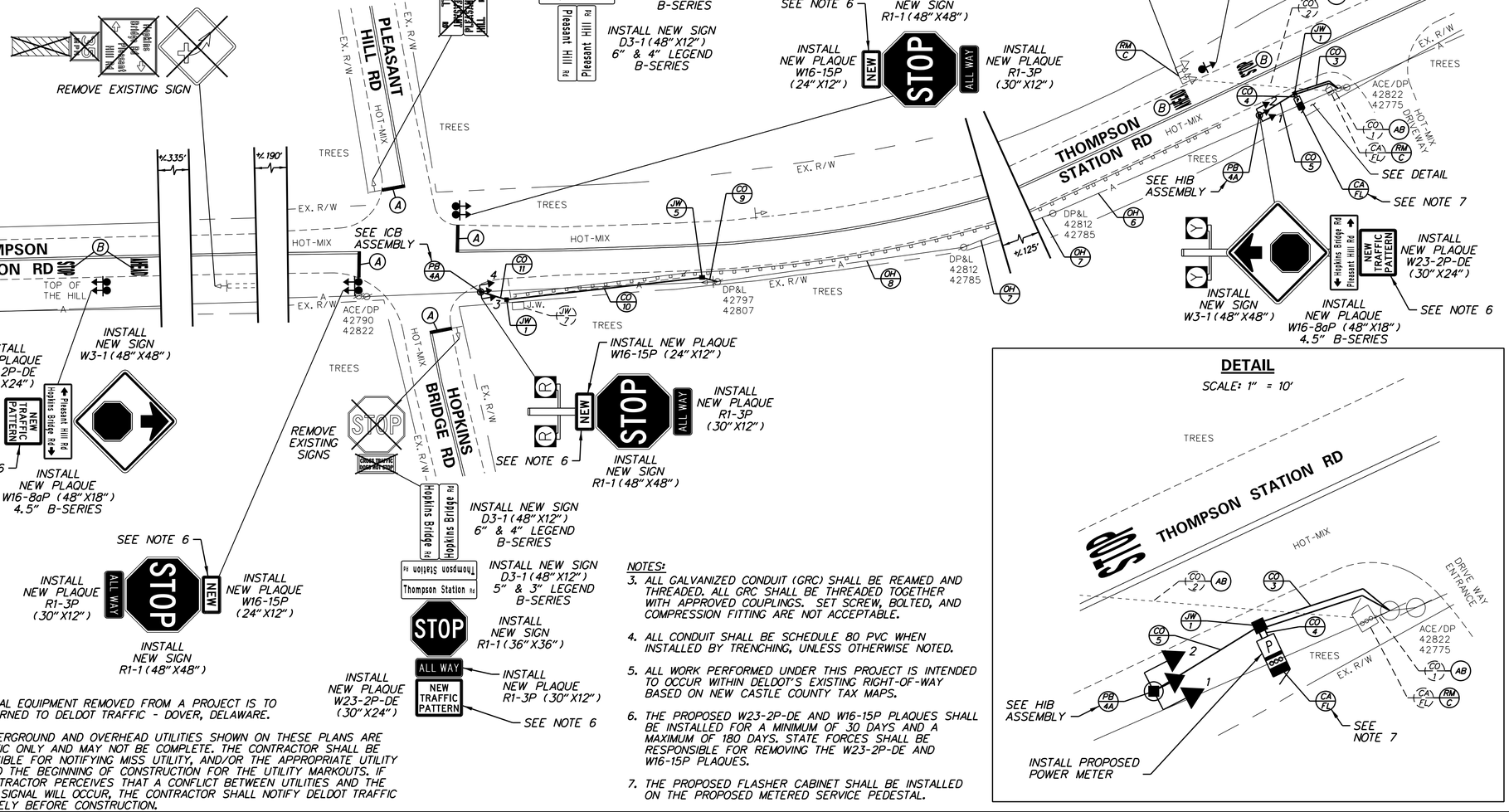
CONDUIT RUN SCHEDULE

CO*	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
1*	1	2.0 IN	2 FT	-	<REMOVE EX. (1) 2/*8 U.F. W/GROUND>
2*	1	2.5 IN	70 FT	-	<REMOVE EX. (1) 4/*14>
3**	2	2.0 IN	23 FT	T	[NEW (1) 2/*8 U.F. W/GROUND]
					[NEW (1) 4/*14, (1) *6 GROUND]
4**	2	2.0 IN	2 FT	T	[NEW (1) 2/*8 U.F. W/GROUND]
					[NEW (2) 4/*14, (1) *6 GROUND]
5	1	2.5 IN	20 FT	T	[NEW (1) 4/*14, (1) *6 GROUND]
OH6	AERIAL	-	149 FT	AERIAL	[NEW (1) 4/*14]
OH7	AERIAL	-	156 FT	AERIAL	[NEW (1) 4/*14]
OH8	AERIAL	-	119 FT	AERIAL	[NEW (1) 4/*14]
9**	1	2.0 IN	8 FT	T	[NEW (1) 4/*14, (1) *6 GROUND]
10	1	4.0 IN	94 FT	T	[NEW (1) 4/*14, (1) *6 GROUND]
11	1	2.5 IN	13 FT	T	[NEW (1) 4/*14, (1) *6 GROUND]

* DENOTES EXISTING CONDUIT
B = BORE, T = TRENCH, O = OPEN CUT
** RIGID GALVANIZED STEEL

PAVEMENT MARKINGS LEGEND

SYMBOL	ITEM	QUANTITY
(A)	16" PERMANENT PAVEMENT STRIPING, SYMBOL, ALKYD-THERMOPLASTIC, WHITE (ITEM# 817002)	62.5 SF
(B)	PERMANENT PAVEMENT STRIPING, LEGEND, ALKYD-THERMOPLASTIC, WHITE (ITEM# 817002)	52 SF



NOTES:
1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.
3. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED, AND COMPRESSION FITTING ARE NOT ACCEPTABLE.
4. ALL CONDUIT SHALL BE SCHEDULE 80 PVC WHEN INSTALLED BY TRENCHING, UNLESS OTHERWISE NOTED.
5. ALL WORK PERFORMED UNDER THIS PROJECT IS INTENDED TO OCCUR WITHIN DELDOT'S EXISTING RIGHT-OF-WAY BASED ON NEW CASTLE COUNTY TAX MAPS.
6. THE PROPOSED W23-2P-DE AND W16-15P PLAQUES SHALL BE INSTALLED FOR A MINIMUM OF 30 DAYS AND A MAXIMUM OF 180 DAYS. STATE FORCES SHALL BE RESPONSIBLE FOR REMOVING THE W23-2P-DE AND W16-15P PLAQUES.
7. THE PROPOSED FLASHER CABINET SHALL BE INSTALLED ON THE PROPOSED METERED SERVICE PEDESTAL.

DETAIL

SCALE: 1" = 10'

SIGNAL PHASING

SIGNAL HEAD DIAGRAM

ALTERNATELY FLASHING YELLOW — 1,2 (Y)
3,4 (R) — SIMULTANEOUSLY FLASHING RED

LEGEND

AB	ABANDON	OH (•/)	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA (X/)	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH (•)	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA (X)	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB (X/)	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO (•/)	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PB (X)	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO (•)	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PL (X/)	EXISTING POLE IDENTIFIER (* OF POLE)
JW (X/)	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL (X)	PROPOSED POLE IDENTIFIER (* OF POLE)
JW (X)	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM (C)	REMOVE BY CONTRACTOR
MA (XX/)	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM (O)	REMOVE BY OTHERS
MA (XX)	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM (TC)	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		□
LOOP DETECTOR, TYPE 2		▭
LUMINAIRE	—○	—✦
MAST ARM	➢	➤
MICROWAVE DETECTION	—◂	—◂
OPTICOM RECEIVER	—○	—●
OVERHEAD SIGNING		—⊣
PEDESTRIAN POLE/BASE	◎	◉
PEDESTRIAN PUSHBUTTON	—▷	—▶
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY	——	—R/W—
SERVICE PEDESTAL		P
SIGNAL CABINET		■
SIGNAL HEAD	—▷	—▶
SIGNAL POLE/BASE	⊗	⊙
CCTV CAMERA	CCTV	■
SPAN WIRE	—XX—	—◇—
UTILITY POLE	⊘	●
VIDEO DETECTION		◀

PREPARED BY

Whitman, Requardt and Associates, LLP
Engineers • Architects • Environmental Planners Est. 1915

11/6/18
DATE

THIS SEAL APPLIES TO ALL SHEETS BEARING THE "WRA" SECTION DESIGNATION.

MATTHEW J.A. BUCKLEY LICENSE No. 15224 PROFESSIONAL ENGINEER
SEAL

APPROVED FOR INSTALLATION

CHIEF TRAFFIC ENGINEER — 11/9/18 DATE

ADDENDA / REVISIONS

1 REPLACED CURVE / INTERSECTION HIB WITH HIB / ICB FOR AWSC CONVERSION - D.C.G. (WRA) 9/18 (T201904103)

SCALE 0 30 60 90 FEET

CONTRACT	PERMIT NO.	N622
T201904103	DESIGNED BY: D.C.G. (WRA)	
COUNTY	CHECKED BY: M.J.B. (WRA)	
NEW CASTLE		

ICB /HIB PLAN THOMPSON STATION ROAD @ HOPKINS BRIDGE ROAD /PLEASANT HILL ROAD

SECTION WRA
SHEET NO. 1

N:\32028-007\CADD\SC01_Thompson Rd.dgn
6/4/2019 3:53:05 PM

FINAL PLANS

ADDITIONAL GENERAL SIGNAL NOTES

4. THE PROPOSED FLASHER CABINET SHALL BE INSTALLED ON THE PROPOSED METER SERVICE PEDESTAL. AN ENCLOSED DISCONNECT FUSE IN AN IN-LINE CONDULET BODY SHALL BE UTILIZED IN LIEU OF DISCONNECT SWITCH/LEVER.

5. REFER TO THE SIGNING AND STRIPING PLAN SHEETS FOR ADDITIONAL INFORMATION REGARDING THE SIGNS.

6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF ALL UNDERGROUND SIGNAL EQUIPMENT SUCH AS JUNCTION WELLS, CABINET AND POLE BASES, LOOP DETECTORS, AND CONDUIT. DELDOT'S TRAFFIC CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF ALL ELECTRICAL CABLES AND ABOVE GROUND SIGNAL EQUIPMENT SUCH AS MAST ARMS, POLES, CABINET, SERVICE PEDESTAL, AND SIGNAL HEADS.

5. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (5O:1 OR FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THE PEDSTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON.

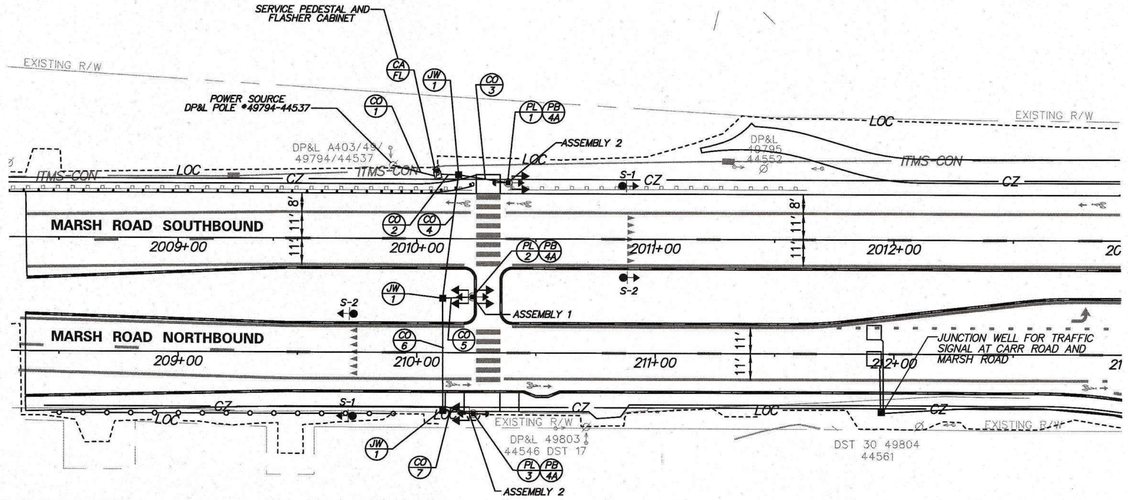
CONDUIT RUN SCHEDULE

CR#	# OF CONDUITS	B/T/O	SIZE	LENGTH	AMOUNT AND TYPE OF CABLE / WIRE
1	1 (GALV. STEEL)	T	2"	20'	(1)2/#8 U.F. W/GROUND
2	1	T	4"	10'	(1)9/#14, (2)5/#14, (1)1/#6 GRD
3	1	T	2.5"	25'	(1)5/#14, (1)1/#6 GRD
4	1 (SCHD 80 HDPE)	B	4"	55'	(1)9/#14, (1)5/#14, (1)1/#6 GRD
5	1	T	2.5"	15'	(1)9/#14, (1)1/#6 GRD
6	1 (SCHD 80 HDPE)	B	4"	50'	(1)5/#14, (1)1/#6 GRD
7	1	T	2.5"	15'	(1)5/#14, (1)1/#6 GRD

NOTE: ALL CONDUITS TO BE SCHEDULE 80 UNLESS OTHERWISE NOTED
B=BORE, T=TRENCH, O=OPEN CUT

N

ULTIMATE



SIGN DETAILS

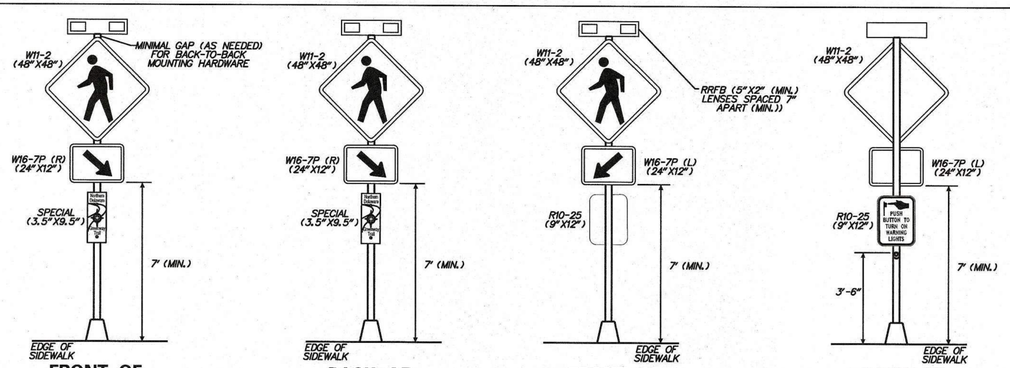


S-1
R1-5L
36"x36"



S-2
R1-5R
36"x36"

RRFB ASSEMBLIES



1. THE RRFB SHALL OPERATE PUSHBUTTON-ACTIVATED.
2. SIGNFIX (OR SIMILAR) SHALL BE INSTALLED ON THE BACK OF THE PROPOSED SIGNS FOR MOUNTING SUPPORT.
3. THE PEDESTAL POLE SHALL BE CONTINUOUS SPUN ALUMINUM, SCHEDULE 80. SPLICING POLE EXTENSIONS SHALL BE PROHIBITED.

JUNCTION WELL AND CABINET SCHEDULE

NO.	STATION	OFFSET
JW1	2010+17	27' LT
JW1	2010+11	25' RT
JW1	210+11	24' RT
CA	2010+09	27' LT

POLE SCHEDULE

NO.	TYPE	STATION	OFFSET
1	PEDESTRIAN POLE W/ TYPE 4A BASE	2010+38	24' LT
2	PEDESTRIAN POLE W/ TYPE 4A BASE	2010+23	24' RT
3	PEDESTRIAN POLE W/ TYPE 4A BASE	210+24	23' RT

SIGNAL PHASING

SIGNAL HEAD DIAGRAM

ALTERNATELY FLASHING
(WW+S PATTERN)
YELLOW RRFB BEACONS



LEGEND

AB	ABANDON
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
CO •	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)
CO •	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)
MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)
OH •	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
OH •	PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
PL X	EXISTING POLE IDENTIFIER (# OF POLE)
PL X	PROPOSED POLE IDENTIFIER (# OF POLE)
RM C	REMOVE BY CONTRACTOR
RM O	REMOVE BY OTHERS
RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL		P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
SPAN INSULATOR		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION		

GENERAL SIGNAL NOTES

1. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED, AND COMPRESSION FITTING ARE NOT ACCEPTABLE.

2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.

3. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (5O:1 OR FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BETS PRACTICES.

RECOMMENDED Mir Wakad DATE: 2/1/18

RECOMMENDED [signature] DATE: 2/6/18

RECOMMENDED _____ DATE: _____

APPROVED TRAFFIC ENGINEER [signature] DATE: 02/07/2018

APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER [signature] DATE: 2/8/18

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SCALE 0 30 60 90 FEET

HSIP NCC, I-95, N213 CARR ROAD AND SR 3 MARSH ROAD, INTERCHANGE IMPROVEMENTS

CONTRACT	PERMIT NO.	N829
T200809001	DESIGNED BY: JDS (JMT)	
COUNTY	CHECKED BY: MAW (JMT)	
NEW CASTLE		

SR 3 MARSH ROAD @ NORTHERN DELAWARE GREENWAY TRAIL

SHEET NO. 207
TOTAL SHTS. 208

PLOTTED BY: KBLAKE DATE: 2/2/2018
FILE LOCATION: Q:\NDE\110500_018_I-95_CARR_ROAD_MARSH\CADD\SG_RRFB AND RAMP A.DGN [SHEET: RRFB_1]

CONDUIT RUN SCHEDULE

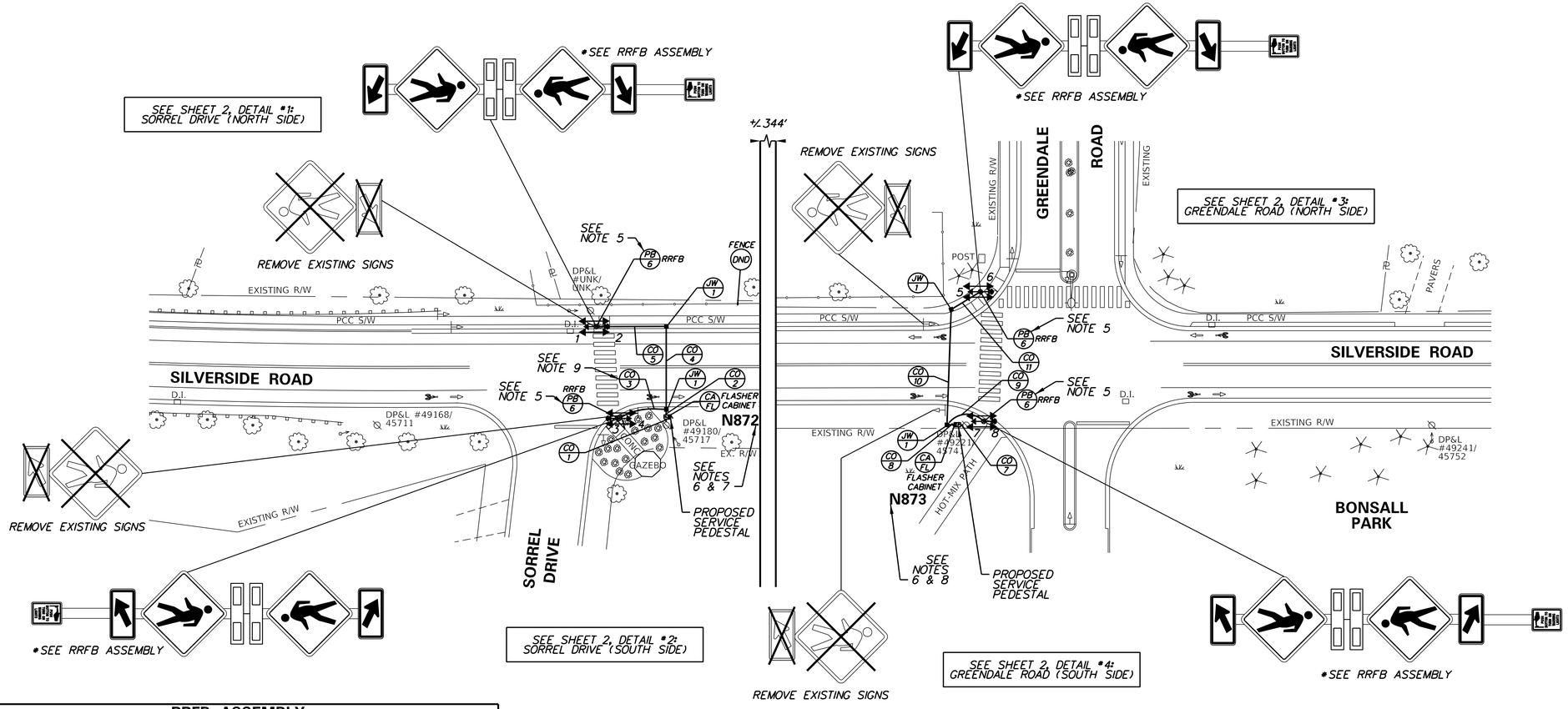
CO*	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
1*	1	2.0 IN	10 FT	T	[NEW (3) #8 THHN - LINE SIDE]
2*	1	2.0 IN	10 FT	T	[NEW (2) 9/#14, (1) #6 GROUND]
3**	1	3.0 IN	25 FT	T	[NEW (1) 9/#14, (1) #6 GROUND]
4	1	4.0 IN	40 FT	B	[NEW (1) 9/#14, (1) #6 GROUND]
5	1	3.0 IN	35 FT	T/O	[NEW (1) 9/#14, (1) #6 GROUND]
-	-	-	-	-	THIS SPACE INTENTIONALLY LEFT BLANK
7*	1	2.0 IN	10 FT	T	[NEW (3) #8 THHN - LINE SIDE]
8*	1	2.0 IN	10 FT	T	[NEW (2) 9/#14, (1) #6 GROUND]
9	1	3.0 IN	20 FT	T	[NEW (1) 9/#14, (1) #6 GROUND]
10	1	4.0 IN	55 FT	B	[NEW (1) 9/#14, (1) #6 GROUND]
11	1	3.0 IN	10 FT	T	[NEW (1) 9/#14, (1) #6 GROUND]

* PROPOSED RIGID GALVANIZED STEEL CONDUIT B = BORE, T = TRENCH, O = OPEN CUT

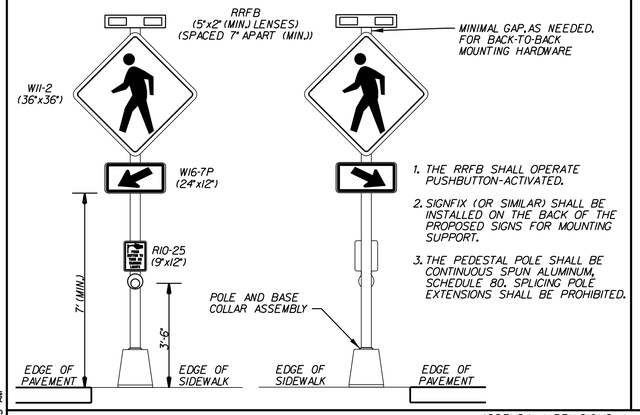
** SEE NOTE 9

NOTES:

1. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED, AND COMPRESSION FITTING ARE NOT ACCEPTABLE.
2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.
3. ALL CONDUIT SHALL BE SCHEDULE 80 PVC WHEN INSTALLED BY TRENCHING/OPEN CUT AND HDPE SDR-13.5 WHEN INSTALLED BY BORING, UNLESS OTHERWISE NOTED.
4. ALL WORK PERFORMED UNDER THIS PROJECT IS INTENDED TO OCCUR WITHIN DELDOT'S EXISTING RIGHT-OF-WAY BASED ON THE NEW CASTLE COUNTY TAX PARCEL MAP.
5. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA AND SHOULD BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE DOES NOT EXCEED 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON.
6. THE PROPOSED FLASHER CABINETS SHALL BE INSTALLED ON THE PROPOSED SERVICE PEDESTALS.



RRFB ASSEMBLY



1. THE RRFB SHALL OPERATE PUSHBUTTON-ACTIVATED.
2. SIGNFIX (OR SIMILAR) SHALL BE INSTALLED ON THE BACK OF THE PROPOSED SIGNS FOR MOUNTING SUPPORT.
3. THE PEDESTAL POLE SHALL BE CONTINUOUS SPUN ALUMINUM, SCHEDULE 80. SPLICING POLE EXTENSIONS SHALL BE PROHIBITED.

NOTES (CONTINUED):

7. N872 POWER SOURCE - DELMARVA POLE #49180/45717
8. N873 POWER SOURCE - DELMARVA POLE #49221/45741
9. CAREFULLY TRENCH PROPOSED CONDUIT RUN #3 DIRECTLY BEHIND CURB TO MINIMIZE IMPACTS TO LANDSCAPED AREAS, PLANTS AND DECOR.

RRFB TIMESHEET PARAMETERS

40-FOOT PEDESTRIAN CLEARANCE

19-SECOND WARNING/FLASH TIME

SIGNAL HEAD DIAGRAM

1-8

ALTERNATELY FLASHING (WW+S PATTERN) YELLOW RRFB BEACONS

LEGEND

AB	ABANDON	OH(•)	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA(X)	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH(•)	PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA(X)	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB(X)	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO(•)	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PB(X)	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO(•)	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PL(X)	EXISTING POLE IDENTIFIER (# OF POLE)
JW(X)	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL(X)	PROPOSED POLE IDENTIFIER (# OF POLE)
JW(X)	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM(C)	REMOVE BY CONTRACTOR
MA(XX)	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM(O)	REMOVE BY OTHERS
MA(XX)	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM(TC)	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
CCTV CAMERA		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION		

PREPARED BY

Whitman, Requardt and Associates, LLP
Engineers Architects Environmental Planners Est. 1915

9/10/2021
DATE

THIS SEAL APPLIES TO ALL SHEETS BEARING THE "WRA" SECTION DESIGNATION.

MATTHEW J.A. BUCKLEY No. 16224 PROFESSIONAL ENGINEER
SEAL

CONCURRENCE FOR INSTALLATION

9/10/2021
DATE

CHIEF OF TRAFFIC ENGINEERING

ADDENDA / REVISIONS

SCALE
0 30 60 90
FEET

CONTRACT T202204001	PERMIT NO. N872, N873	RRFB SIGNAL PLAN SILVERSIDE ROAD AT SORREL DRIVE / GREENDALE ROAD
COUNTY NEW CASTLE	DESIGNED BY: D HEHMAN	SECTION WRA
	CHECKED BY: M BUCKLEY	SHEET NO. 1

N:\32155-005\CADD\Traffic\Silverside Rd RRFBs\SG01b_Silverside Rd RRFBs.dgn
9/10/2021 7:03:25 AM

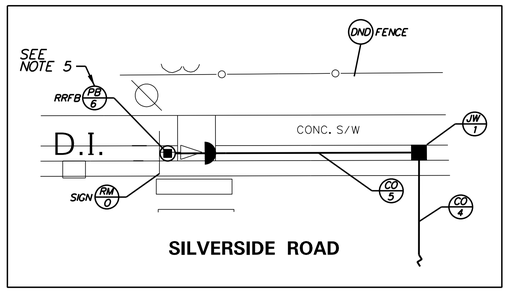
CONDUIT RUN SCHEDULE

CO*	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
1*	1	2.0 IN	10 FT	T	(NEW (3) #8 THHN - LINE SIDE)
2*	1	2.0 IN	10 FT	T	(NEW (2) 9/#14, (1) #6 GROUND)
3**	1	3.0 IN	25 FT	T	(NEW (1) 9/#14, (1) #6 GROUND)
4	1	4.0 IN	40 FT	B	(NEW (1) 9/#14, (1) #6 GROUND)
5	1	3.0 IN	35 FT	T/O	(NEW (1) 9/#14, (1) #6 GROUND)
-	-	-	-	-	THIS SPACE INTENTIONALLY LEFT BLANK
7*	1	2.0 IN	10 FT	T	(NEW (3) #8 THHN - LINE SIDE)
8*	1	2.0 IN	10 FT	T	(NEW (2) 9/#14, (1) #6 GROUND)
9	1	3.0 IN	20 FT	T	(NEW (1) 9/#14, (1) #6 GROUND)
10	1	4.0 IN	55 FT	B	(NEW (1) 9/#14, (1) #6 GROUND)
11	1	3.0 IN	10 FT	T	(NEW (1) 9/#14, (1) #6 GROUND)

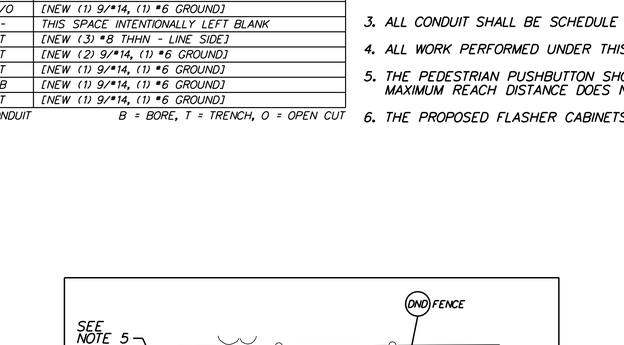
* PROPOSED RIGID GALVANIZED STEEL CONDUIT B = BORE, T = TRENCH, O = OPEN CUT
** SEE NOTE 9

NOTES:

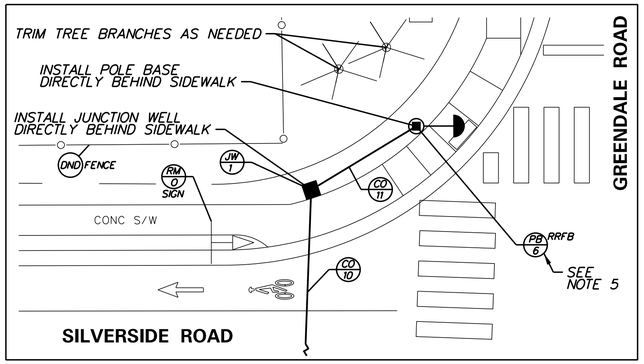
1. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED, AND COMPRESSION FITTING ARE NOT ACCEPTABLE.
2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.
3. ALL CONDUIT SHALL BE SCHEDULE 80 PVC WHEN INSTALLED BY TRENCHING/OPEN CUT AND HDPE SDR-13.5 WHEN INSTALLED BY BORING, UNLESS OTHERWISE NOTED.
4. ALL WORK PERFORMED UNDER THIS PROJECT IS INTENDED TO OCCUR WITHIN DELDOT'S EXISTING RIGHT-OF-WAY BASED ON THE NEW CASTLE COUNTY TAX PARCEL MAP.
5. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA AND SHOULD BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE DOES NOT EXCEED 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON.
6. THE PROPOSED FLASHER CABINETS SHALL BE INSTALLED ON THE PROPOSED SERVICE PEDESTALS.



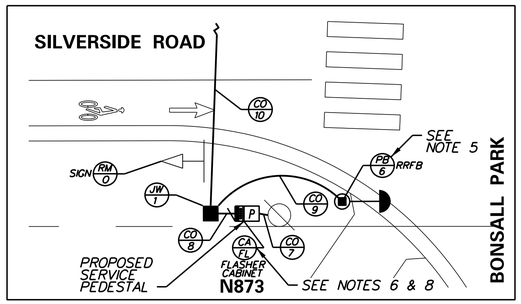
DETAIL 1: SORREL DRIVE (NORTH SIDE)
SCALE: 1" = 10'



DETAIL 2: SORREL DRIVE (SOUTH SIDE)
SCALE: 1" = 10'



DETAIL 3: GREENDALE ROAD (NORTH SIDE)
SCALE: 1" = 10'



DETAIL 4: GREENDALE ROAD (SOUTH SIDE)
SCALE: 1" = 10'

NOTES (CONTINUED):

7. N872 POWER SOURCE - DELMARVA POLE #49180/45717
8. N873 POWER SOURCE - DELMARVA POLE #49221/45741
9. CAREFULLY TRENCH PROPOSED CONDUIT RUN #3 DIRECTLY BEHIND CURB TO MINIMIZE IMPACTS TO LANDSCAPED AREAS, PLANTS AND DECOR.

RRFB TIMESHEET PARAMETERS

40-FOOT PEDESTRIAN CLEARANCE
19-SECOND WARNING/FLASH TIME

SIGNAL HEAD DIAGRAM

1-8

ALTERNATELY FLASHING
(WW+S PATTERN)
YELLOW RRFB BEACONS

LEGEND

AB	ABANDON	OH	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH *	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO *	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO *	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (* OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (* OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1	⬚	▭
LOOP DETECTOR, TYPE 2	⬚⬚	▭▭
LUMINAIRE	—○—	—●—
MAST ARM	⊳	➤
MICROWAVE DETECTION	—◂	—◂
OPTICOM RECEIVER	—○	—●
OVERHEAD SIGNING	—⊣	—⊣
PEDESTRIAN POLE/BASE	◎	◉
PEDESTRIAN PUSHBUTTON	—▷	—▶
PEDESTRIAN SIGNAL HEAD	⊐	⊐
RIGHT-OF-WAY	———	——R/W——
SERVICE PEDESTAL	P	P
SIGNAL CABINET	▯	▮
SIGNAL HEAD	▷	▶
SIGNAL POLE/BASE	⊗	⊙
CCTV CAMERA	CCTV◁	■◁
SPAN WIRE	—XX—	—◇—
UTILITY POLE	⊘	●
VIDEO DETECTION	◁	◀

PREPARED BY

Whitman, Requardt and Associates, LLP
Engineers Architects Environmental Planners Est. 1915

9/10/2021
DATE

THIS SEAL APPLIES TO ALL SHEETS BEARING THE "WRA" SECTION DESIGNATION.

MATTHEW J.A. BUCKLEY — No. 16224 — PROFESSIONAL ENGINEER

SEAL

CONCURRENCE FOR INSTALLATION

CHIEF OF TRAFFIC ENGINEERING

9/10/2021
DATE

ADDENDA / REVISIONS	

SCALE
0 10 20 30
FEET

CONTRACT	PERMIT NO.	N872, N873	RRFB DETAILS SILVERSIDE ROAD AT SORREL DRIVE / GREENDALE ROAD
T202204001	DESIGNED BY: D HEHMAN		
COUNTY	CHECKED BY: M BUCKLEY		
NEW CASTLE			

SECTION: WRA
SHEET NO.: 2

N:\32155-005\CADD\Traffic\Silverside Rd RRFBs\SC02B_Silverside Rd RRFBs.dgn
9/10/2021 7:12:58 AM

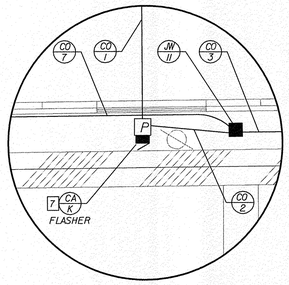
CONDUIT RUN SCHEDULE

CO#	# OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/WIRE
1	1	2"	GALV	60'/30'	B/P	NEW (1)12/#8 U.F.W/GRND
2	1	2"	GALV	15'	T	NEW (2)3/#8 U.F.W/GRND
3	1	2"	GALV	265'	T	NEW (1)3/#8 U.F.W/GRND
4	1	2"	GALV	50'	B	NEW (1)3/#8 U.F.W/GRND
5	1	2"	GALV	255'	B	NEW (1)3/#8 U.F.W/GRND
6	1	2.5"	GALV	10'	T	NEW (1)3/#8 U.F.W/GRND
7	1	2"	GALV	205'	T	NEW (1)3/#8 U.F.W/GRND
8	1	2"	GALV	255'	B	NEW (1)3/#8 U.F.W/GRND
9	1	2.5"	GALV	10'	T	NEW (1)3/#8 U.F.W/GRND

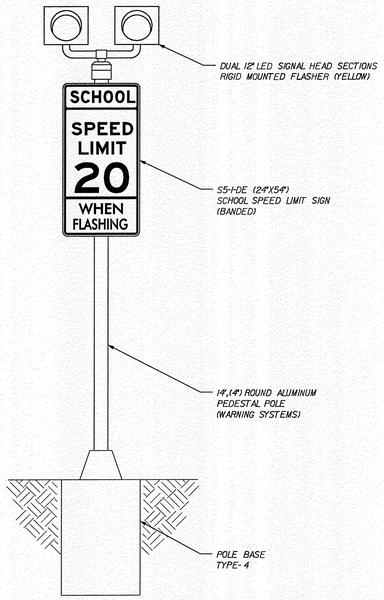
LEGEND
B- BORE O- OPEN CUT
T- TRENCH P- ATTACH TO POLE

POLE SCHEDULE

POLE #	POLE TYPE	HEIGHT	MATERIAL
1	PEDESTAL	14'	ALUMINUM
2	PEDESTAL	14'	ALUMINUM



SERVICE PEDESTAL ENLARGEMENT
SCALE: 1" = 10'



PERMANENT SCHOOL SPEED LIMIT SIGN BEACON DETAIL
N.T.S.

ADDITIONAL SIGNAL NOTES

6 NEW SHEET

5 TRAFFIC CONTRACTOR SHALL RELOCATE EXISTING S5-1-DE "SCHOOL SPEED LIMIT 20 WHEN FLASHING" SIGN, ~~EXISTING 12" LED SIGNAL HEAD SECTIONS, AND EXISTING POLE MOUNTED FLASHER CABINET~~ TO PROPOSED WARNING POLE LOCATION (PL#1) AS SHOWN ON PLAN.

6 CONTRACTOR SHALL ENSURE THAT PROPOSED POLE BASES ARE FLUSH WITH ADJACENT SIDEWALK GRADES.

7 COMPACT FLASHER CABINET (18"W X 12.5"H X 16.25"D) SHALL BE ATTACHED TO THE BACK SIDE OF THE SERVICE PEDESTAL RISER FACING THE SCHOOL SIDE. LOCATION OF THE SERVICE PEDESTAL RISER SHALL BE INSTALLED SUCH THAT THE EXISTING SIDEWALK IS CLEAR FROM THE ATTACHED FLASHER CABINET.

EXISTING SIGNING TO BE RELOCATED

A

SCHOOL
SPEED
LIMIT
20
WHEN
FLASHING

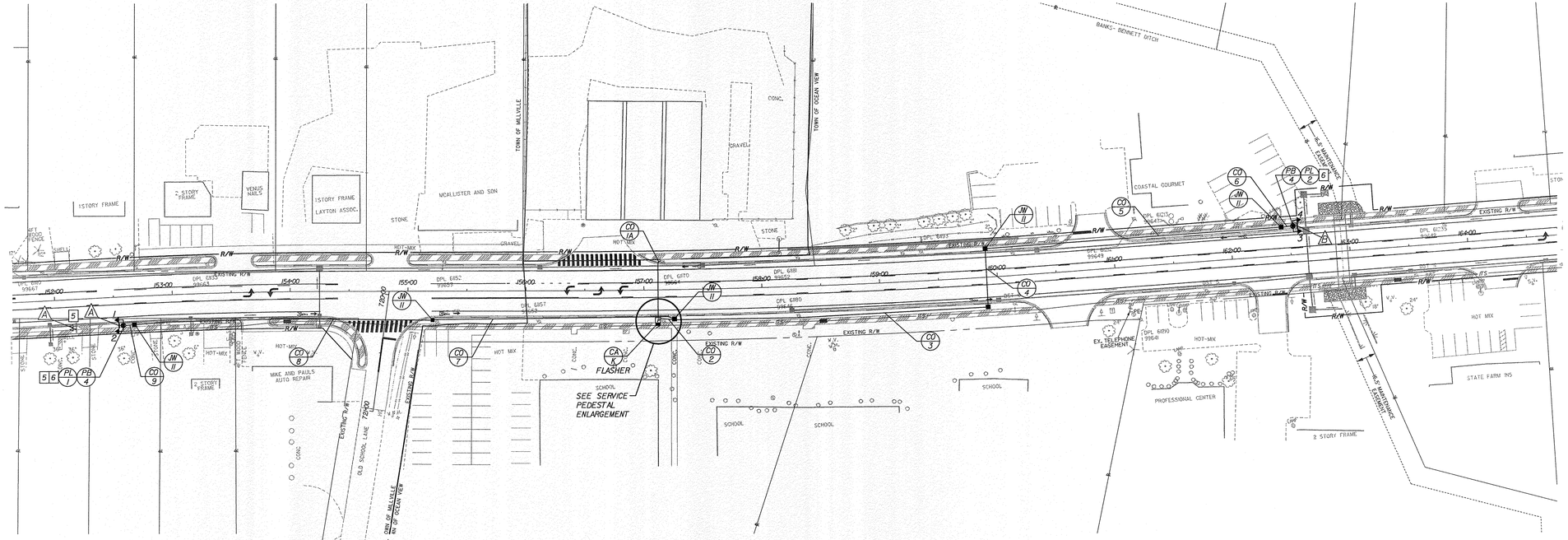
S5-1-DE
24"X54"

PROPOSED SIGNING

B

SCHOOL
SPEED
LIMIT
20
WHEN
FLASHING

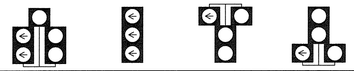
S5-1-DE
24"X54"



SIGNAL PHASING

THE TWO SIGNAL INDICATIONS FOR EACH SIGN SHALL FLASH YELLOW ALTERNATELY DURING TIMES THE SCHOOL SPEED IS IN EFFECT. THE INDICATIONS SHALL REMAIN DARK AT ALL OTHER TIMES.

SIGNAL HEAD DIAGRAM



LEGEND

	PROPOSED SIGNAL CABINET	RM C	REMOVE BY CONTRACTOR
	EXISTING SIGNAL CABINET	RM O	REMOVE BY OTHERS
	PROPOSED SIGNAL POLE BASE	AB	ABANDON
	EXISTING SIGNAL POLE BASE	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	PROPOSED PEDESTRIAN POLE BASE	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	EXISTING PEDESTRIAN POLE BASE	PL X	PROPOSED POLE IDENTIFIER (# OF POLE)
	PROPOSED WOOD POLE	PL X	EXISTING POLE IDENTIFIER (# OF POLE)
	EXISTING WOOD POLE	JM X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	PROPOSED JUNCTION WELL	JM X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	EXISTING JUNCTION WELL	CO #	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)
	PROPOSED SIGNAL HEAD	CO #	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)
	EXISTING SIGNAL HEAD	OH #	PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
	PROPOSED PEDESTRIAN SIGNAL HEAD	OH #	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
	EXISTING PEDESTRIAN SIGNAL HEAD	MA XX	PROPOSED MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	PROPOSED PEDESTRIAN PUSHBUTTON	MA XX	EXISTING MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	EXISTING PEDESTRIAN PUSHBUTTON	CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
	PROPOSED VIDEO DETECTION	CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
	EXISTING VIDEO DETECTION		PROPOSED SPAN WIRE
	PROPOSED MICROWAVE DETECTION	XX	EXISTING SPAN WIRE
	EXISTING MICROWAVE DETECTION		RIGHT-OF-WAY OR PROPERTY LINE
	OVERHEAD SIGNING		PROPOSED SPAN INSULATOR
	PROPOSED OPTICOM RECEIVER		EXISTING SPAN INSULATOR
	EXISTING OPTICOM RECEIVER	P	SERVICE PEDESTAL
	PROPOSED MAST ARM		PROPOSED CCTV
	EXISTING MAST ARM		EXISTING CCTV
	PROPOSED LUMINAIRE		PROPOSED PLASTIC DRUMS
	EXISTING LUMINAIRE		EXISTING PLASTIC DRUMS
	PROPOSED LOOP DETECTOR (TYPE 1 OR 2)		
	EXISTING LOOP DETECTOR (TYPE 1 OR 2)		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC- DOVER, DELAWARE
2. ALL GALVANIZED RIGID CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
3. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY FOR THE UTILITY MARKOUTS PRIOR TO THE BEGINNING OF CONSTRUCTION. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
4. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.

RECOMMENDED _____ DATE: _____

RECOMMENDED _____ DATE: _____

RECOMMENDED [signature] DATE: 4/15/16

APPROVED TRAFFIC ENGINEER _____ DATE: _____

APPROVED FOR INSTALLATION
CHIEF TRAFFIC ENGINEER [signature] DATE: 4/15/16

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

6 ADDED PERMANENT SCHOOL FLASHERS 4/12/16 TMB	
REVISED NOTE #5 PER CONSTRUCTION COMMENTS 5/9/16 MSK	

SCALE
0 50 100 150
FEET

SR 26, ATLANTIC AVENUE FROM CLARKSVILLE TO ASSAWOMAN CANAL

CONTRACT	T200411210	PERMIT NO.	S152
COUNTY	SUSSEX	DESIGNED BY:	MSK
		CHECKED BY:	BAM

SIGNAL PLAN
SR 26 @
LORD BALTIMORE SCHOOL

SHEET NO.	547B
TOTAL SHTS.	589

4/15/2016
I:\PROJECTS\sr26mainline\Survey\tp_signal_lord baltimore_permanent.dgn
mssavit AM

CONDUIT RUN SCHEDULE

CO*	* OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
1**	1	2.0 IN	6 FT	T	(3) #8 THHN
2**	1	2.0 IN	45 FT	T	(1) 2/#8 U.F. W/GROUND - LOAD SIDE
3*	1	4.0 IN	23 FT	-	(1) 2/#8 U.F. W/GROUND - LOAD SIDE, (1) 9/#14, (1) 4/#14, (1) #6 GROUND
4	1	3.0 IN	5 FT	T	(1) 9/#14, (1) #6 GROUND
5	1	3.0 IN	4 FT	T	(1) 4/#14, (1) #6 GROUND
6	1	3.0 IN	9 FT	T	(1) 2/#8 U.F. W/GROUND - LOAD SIDE, (2) 9/#14, (2) 4/#14, (1) #6 GROUND
7*	1	4.0 IN	24 FT	-	(1) 9/#14, (1) 4/#14, (1) #6 GROUND
8*	1	4.0 IN	23 FT	-	(1) 9/#14, (1) 4/#14, (1) #6 GROUND
9	1	3.0 IN	5 FT	T	(1) 9/#14, (1) #6 GROUND
10	1	3.0 IN	5 FT	T	(1) 4/#14, (1) #6 GROUND

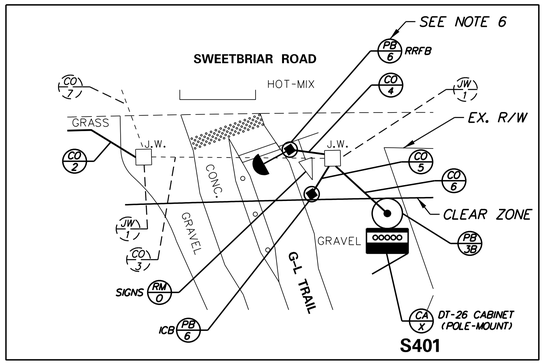
ALL CABLES ARE NEW — B = BORE, T = TRENCH, O = OPEN CUT

* DENOTES EXISTING CONDUIT

** PROPOSED RIGID GALVANIZED STEEL

NOTES:

3. PROPOSED FISHEYE DETECTION ZONES:
   TYPE #2 - 10' x 25' - TO BE INSTALLED ON EASTBOUND AND WESTBOUND GEORGETOWN-LEWES TRAIL 100' UPSTREAM, AS SHOWN.
4. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED, AND COMPRESSION FITTING ARE NOT ACCEPTABLE.
5. ALL CONDUIT SHALL BE SCHEDULE 80 PVC WHEN INSTALLED BY TRENCHING/OPEN CUT AND HDPE SDR-13.5 WHEN INSTALLED BY BORING, UNLESS OTHERWISE NOTED.
6. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA AND SHOULD BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE DOES NOT EXCEED 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON.
7. THE CONTRACTOR SHALL INSTALL A FISHEYE DETECTOR WITH AN 8-FOOT BRACKET ARM MOUNT ON MAST ARM NO. 1.
8. ALL WORK PERFORMED UNDER THIS PROJECT IS INTENDED TO OCCUR WITHIN DELDOT'S EXISTING RIGHT-OF-WAY BASED ON THE SUSSEX COUNTY TAX PARCEL MAP.

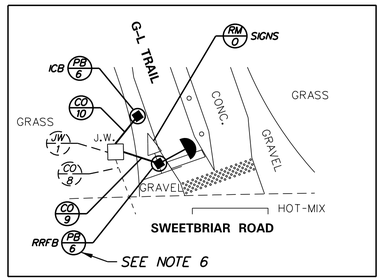


DETAIL 1 – WEST LEG
SCALE: 1" = 10'

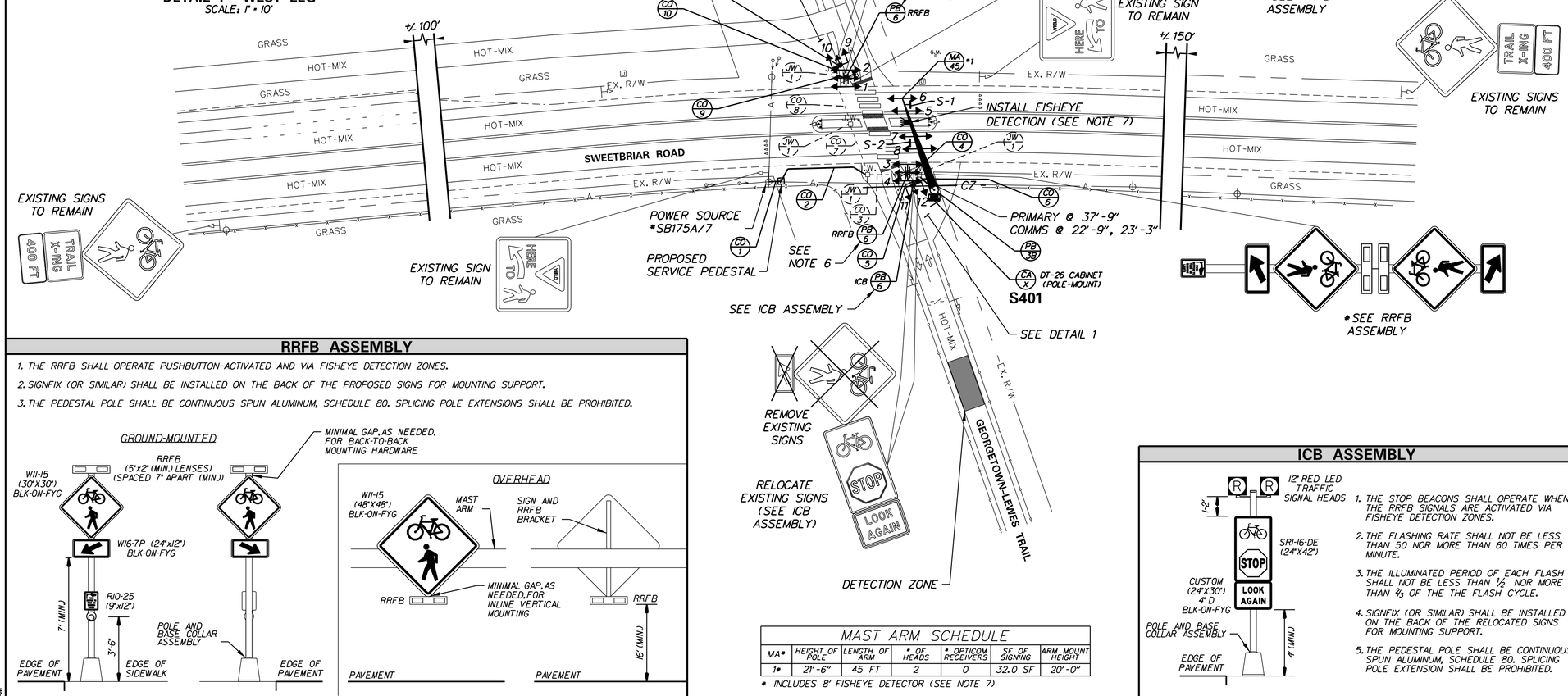
PROPOSED OVERHEAD SIGNS



S-1, S-2
W11-15 (48"x48")
BLK-ON-FYG



DETAIL 2 – EAST LEG
SCALE: 1" = 10'



MAST ARM SCHEDULE

MA*	HEIGHT OF POLE	LENGTH OF ARM	* OF HEADS	* OPTICOM RECEIVERS	SF OF SIGNING	ARM MOUNT HEIGHT
1*	21'-6"	45 FT	2	0	32.0 SF	20'-0"

* INCLUDES 8' FISHEYE DETECTOR (SEE NOTE 7)

RRFB ASSEMBLY

1. THE RRFB SHALL OPERATE PUSHBUTTON-ACTIVATED AND VIA FISHEYE DETECTION ZONES.
2. SIGNFIX (OR SIMILAR) SHALL BE INSTALLED ON THE BACK OF THE PROPOSED SIGNS FOR MOUNTING SUPPORT.
3. THE PEDESTAL POLE SHALL BE CONTINUOUS SPUN ALUMINUM, SCHEDULE 80. SPLICING POLE EXTENSIONS SHALL BE PROHIBITED.

ICB ASSEMBLY

1. THE STOP BEACONS SHALL OPERATE WHEN THE RRFB SIGNALS ARE ACTIVATED VIA FISHEYE DETECTION ZONES.
2. THE FLASHING RATE SHALL NOT BE LESS THAN 50 NOR MORE THAN 60 TIMES PER MINUTE.
3. THE ILLUMINATED PERIOD OF EACH FLASH SHALL NOT BE LESS THAN ½ NOR MORE THAN ⅔ OF THE THE FLASH CYCLE.
4. SIGNFIX (OR SIMILAR) SHALL BE INSTALLED ON THE BACK OF THE RELOCATED SIGNS FOR MOUNTING SUPPORT.
5. THE PEDESTAL POLE SHALL BE CONTINUOUS SPUN ALUMINUM, SCHEDULE 80. SPLICING POLE EXTENSION SHALL BE PROHIBITED.

RRFB TIMESHEET PARAMETERS

39-FOOT PEDESTRIAN CLEARANCE

18-SECOND WARNING/FLASH TIME

*ACTIVATED VIA FISHEYE DETECTION ZONES & PUSHBUTTONS

SIGNAL HEAD DIAGRAM

1-8 — ALTERNATELY FLASHING (WW+S PATTERN) YELLOW RRFB BEACONS
*5-8 ARE OVERHEAD

9-12 (R) — SIMULTANEOUSLY FLASHING BEACON

LEGEND

AB	ABANDON	OH •	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH •	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO •	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO •	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (* OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (* OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
CCTV CAMERA		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION (FISHEYE)		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.

PREPARED BY

Whitman, Requardt and Associates, LLP
Engineers Architects Environmental Planners Est. 1915

THIS SEAL APPLIES TO ALL SHEETS BEARING THE "WRA" SECTION DESIGNATION.

7/8/2021
DATE



SEAL

CONCURRENCE FOR INSTALLATION

CHIEF OF TRAFFIC ENGINEERING

7/12/2021
DATE

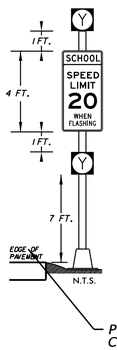
ADDENDA / REVISIONS

SCALE
0 30 60 90
FEET

CONTRACT	PERMIT NO.	S401	RRFB/ICB SIGNAL PLAN SWEETBRIAR ROAD AT GEORGETOWN–LEWES TRAIL	SECTION
T202204001	DESIGNED BY: A. DOELP			WRA
COUNTY	CHECKED BY: M. BUCKLEY			SHEET NO.
SUSSEX				1

N:\32155-005\C400\SG01_LGT @ Sweetbrior Rd_RRFB.dgn
7/8/2021 11:31:56 AM

BEACON ASSEMBLY



1. SCHOOL SPEED LIMIT BEACON ASSEMBLY SHALL CONSIST OF A PAIR OF ALTERNATELY FLASHING BEACONS AND A SCHOOL SPEED LIMIT 20 WHEN FLASHING SIGN (S5-1 24"x48") MOUNTED ON A PEDESTAL POLE.
2. THE BEACONS SHALL BE 12-INCH YELLOW LE.D.ONE-SECTION TRAFFIC SIGNAL HEADS.
3. THE BEACONS SHALL OPERATE ONLY DURING ACTIVE SCHOOL HOURS WHEN ACTIVATED BY A CROSSING GUARD.
4. THE FLASHING RATE SHALL NOT BE LESS THAN 50 NOR MORE THAN 60 TIMES PER MINUTE.
5. THE ILLUMINATED PERIOD OF EACH FLASH SHALL NOT BE LESS THAN 1/2 NOR MORE THAN 2/3 OF THE FLASH CYCLE.
6. SIGNFIX (OR SIMILAR) SHALL BE INSTALLED ON THE BACK OF THE PROPOSED SIGN FOR MOUNTING SUPPORT.
7. THE PEDESTAL POLE SHALL BE CONTINUOUS SPUN ALUMINUM, SCHEDULE 80. SPLICING POLE EXTENSIONS SHALL BE PROHIBITED.

NOTES:

1. *ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.*
2. *ALL WORK PERFORMED UNDER THIS PROJECT IS INTENDED TO OCCUR WITHIN DELDOT'S EXISTING RIGHT-OF-WAY BASED ON THE SUSSEX COUNTY TAX PARCEL MAP AND DEVELOPMENT PLAN.*
3. *ALL CONDUIT SHALL BE SCHEDULE 80 PVC WHEN INSTALLED BY TRENCHING/OPEN CUT AND HDPE SDR-13.5 WHEN INSTALLED BY BORING, UNLESS OTHERWISE NOTED.*
4. *DELDOT TRAFFIC SHALL INSTALL THE PROPOSED CABINET, TYPE G, ON THE PROPOSED DISCONNECT SWITCH PEDESTAL.*

PAVEMENT MARKINGS LEGEND

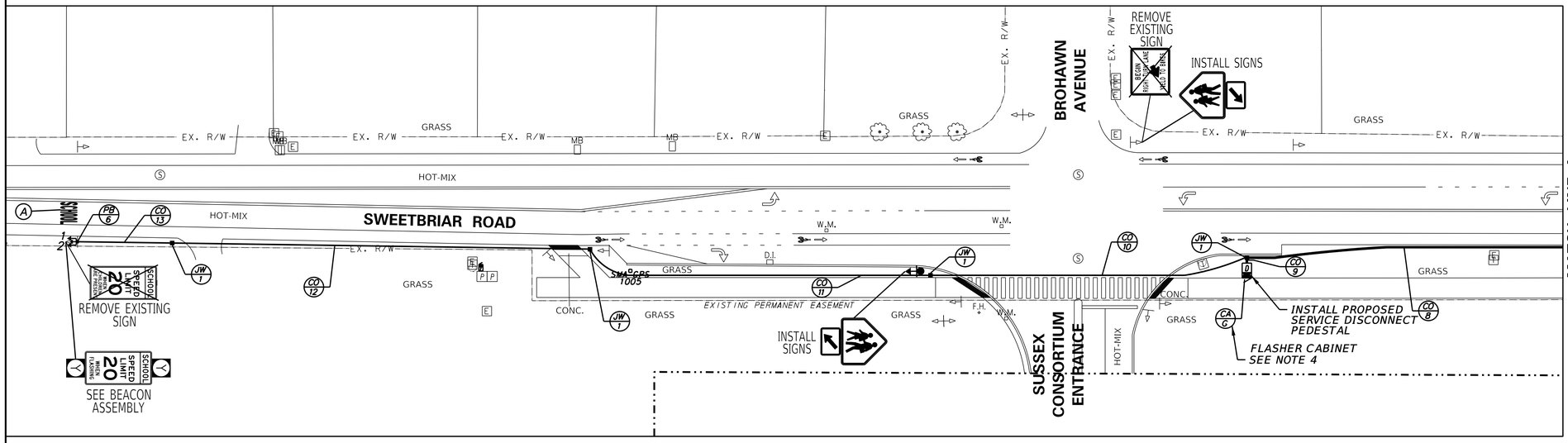
SYMBOL	ITEM	QUANTITY
(A)	PERMANENT PAVEMENT STRIPING, 8' TALL SCHOOL PAVEMENT MARKINGS, ALKYD-THERMOPLASTIC, WHITE, (ITEM 817002)	54 SF

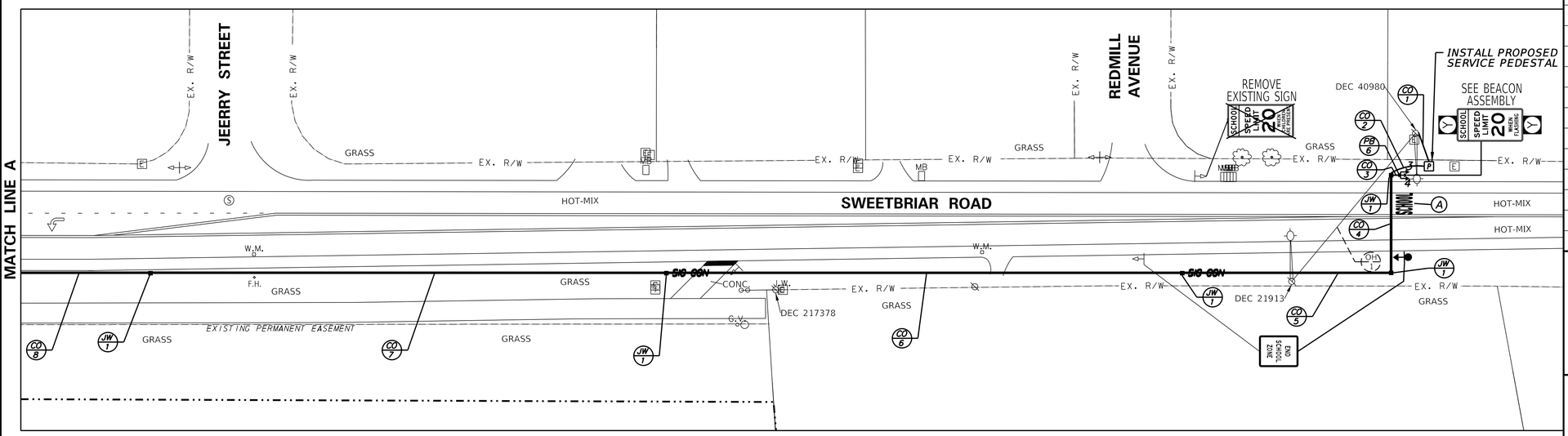
** QUANTITY REFLECTS TOTAL AMOUNT USED*

CONDUIT RUN SCHEDULE

CO#	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
*1	1	2.0 IN	15 FT	T	[NEW (3) #8 THHN] - LINE SIDE
*2	1	2.0 IN	17 FT	T	[NEW (1) 2/#8 U.F. W/ GRD] - LOAD SIDE
3	1	3.0 IN	5 FT	T	[NEW (1) 4/#14, (1) #6 GROUND]
4	2	4.0 IN	48 FT	B	[NEW (1) 2/#8 U.F. W/ GRD - LOAD SIDE, NEW (1) 4/#14, (1) #6 GROUND]
5	2	4.0 IN	102 FT	T	[NEW (1) 2/#8 U.F. W/ GRD - LOAD SIDE, NEW (1) 4/#14, (1) #6 GROUND]
6	2	4.0 IN	250 FT	B	[NEW (1) 2/#8 U.F. W/ GRD - LOAD SIDE, NEW (1) 4/#14, (1) #6 GROUND]
7	2	4.0 IN	250 FT	T	[NEW (1) 2/#8 U.F. W/ GRD - LOAD SIDE, NEW (1) 4/#14, (1) #6 GROUND]
8	2	4.0 IN	191 FT	T	[NEW (1) 2/#8 U.F. W/ GRD - LOAD SIDE, NEW (1) 4/#14, (1) #6 GROUND]
*9	2	2.0 IN	3 FT	T	[NEW (1) 2/#8 U.F. W/ GRD - LOAD SIDE, NEW (2) 4/#14, (1) #6 GROUND]
10	1	4.0 IN	153 FT	B	[NEW (1) 4/#14, (1) #6 GROUND]
11	1	4.0 IN	167 FT	T	[NEW (1) 4/#14, (1) #6 GROUND]
12	1	4.0 IN	201 FT	B	[NEW (1) 4/#14, (1) #6 GROUND]
13	1	3.0 IN	46 FT	T	[NEW (1) 4/#14, (1) #6 GROUND]

** RIGID GALVANIZED STEEL CONDUIT* *B = BORE, T = TRENCH, O = OPEN CUT*





SIGNAL PHASING

SIGNAL HEAD DIAGRAM

1-4

ALTERNATELY FLASHING BEACONS

LEGEND

AB	ABANDON	OH #	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH #	PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (# OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (# OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE DISCONNECT PEDESTAL	D	D
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
CCTV CAMERA		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION		

PREPARED BY

WRA Whitman, Requardt and Associates, LLP
Engineers • Architects • Environmental Planners Est. 1915

THIS SEAL APPLIES TO ALL SHEETS BEARING THE "WRA" SECTION DESIGNATION.

8/19/2021
DATE

MATTHEW JA BUCKLEY No. 16234 PROFESSIONAL ENGINEER
SEAL

CONCURRENCE FOR INSTALLATION

CHIEF OF TRAFFIC ENGINEERING — 8/25/21 DATE

ADDENDA / REVISIONS

1 REPLACED STATIC SCHOOL SPEED LIMIT SIGNS WITH SCHOOL SPEED LIMIT FLASHING BEACONS. A.J.W. (WRA) 04-21 (CONTRACT T202204304)

SCALE 0 30 60 90 FEET

CTF (SENATOR LOPEZ)

CONTRACT	T202204304	PERMIT NO.	S412
COUNTY	SUSSEX	DESIGNED BY: A. WITHERS	
		CHECKED BY: M. BUCKLEY	

SCHOOL SPEED LIMIT BEACON PLAN SWEETBRIAR ROAD @ SUSSEX CONSORTIUM

SECTION: WRA
SHEET NO.: 1

8/19/2021
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ITMS NOTES:

1. H.I.B. ASSEMBLY, SOLAR PANELS AND FIBER BY DELDOT FORCES. H.I.B. ASSEMBLY SHOWN ON SIGN DETAIL SHEET.
2. SOLAR PANELS TO BE INSTALLED ON 40-FOOT POLE TO FACE SOUTH, BY DELDOT FORCES.
3. CONSTRUCT JUNCTION WELL TYPE 7 ON TOP OF THE EXISTING DIRECT BURIED INNER DUCTS.

CONDUIT RUN SCHEDULE

CO NO.	NO. OF CONDUITS	SIZE/TYPE	LENGTH	INSTALL METHOD	AMOUNT AND TYPE OF CABLE / WIRE [1]
1	1	2.5"-PVC	(5')	T	(1) 4/#14, (1) #6 GROUND
2	1	4"-HDPE	72'	B	(1) 4/#14, (1) #6 GROUND
3	1	3"-PVC	(5')	T	(1) 4/#14, (1) #6 GROUND
4	1	3"-PVC	115'	T	BRANCH FIBER BY DELDOT FORCES

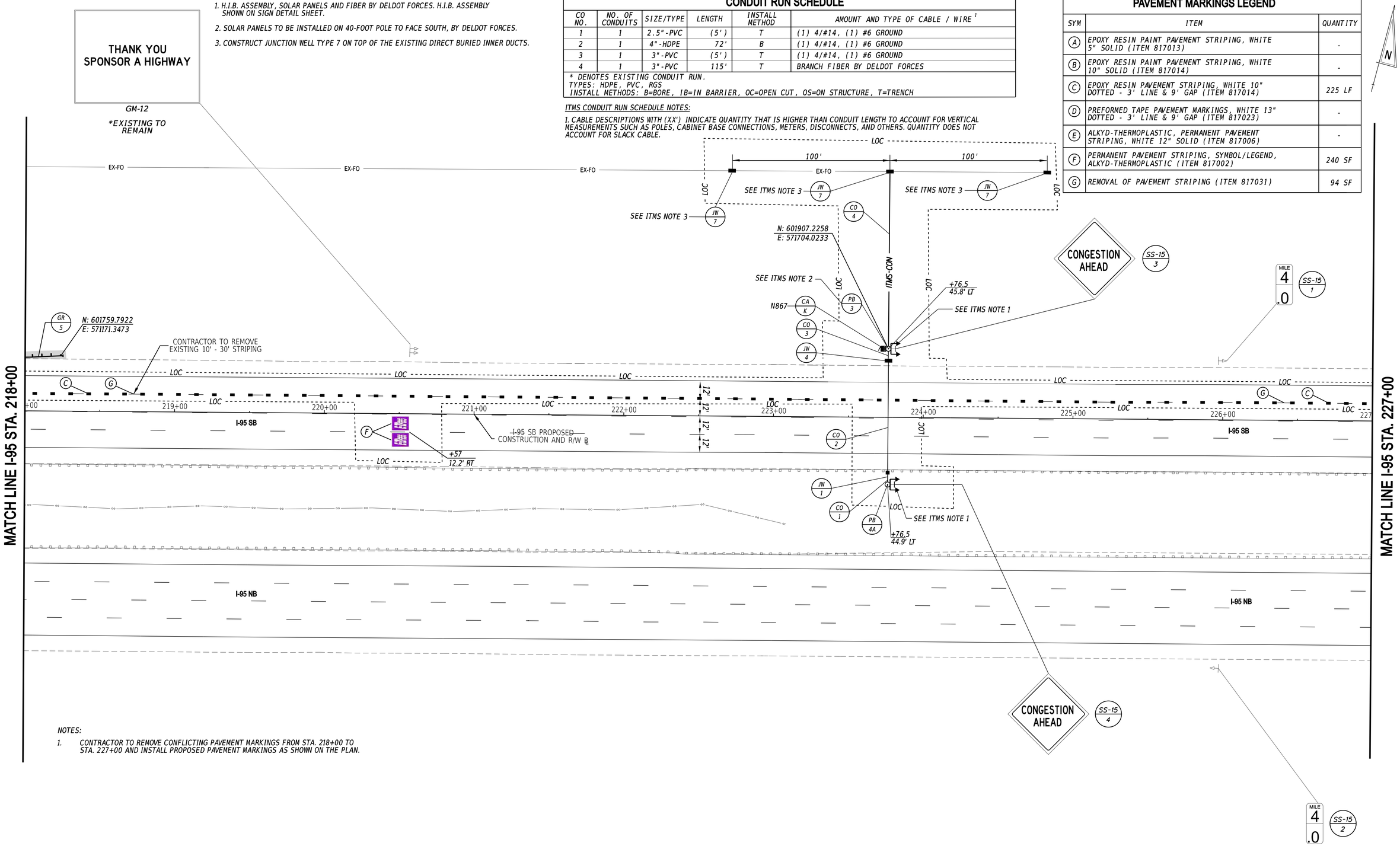
* DENOTES EXISTING CONDUIT RUN.
TYPES: HDPE, PVC, RGS
INSTALL METHODS: B=BORE, IB=IN BARRIER, OC=OPEN CUT, OS=ON STRUCTURE, T=TRENCH

ITMS CONDUIT RUN SCHEDULE NOTES:

1. CABLE DESCRIPTIONS WITH (XX') INDICATE QUANTITY THAT IS HIGHER THAN CONDUIT LENGTH TO ACCOUNT FOR VERTICAL MEASUREMENTS SUCH AS POLES, CABINET BASE CONNECTIONS, METERS, DISCONNECTS, AND OTHERS. QUANTITY DOES NOT ACCOUNT FOR SLACK CABLE.

PAVEMENT MARKINGS LEGEND

SYM	ITEM	QUANTITY
A	EPOXY RESIN PAINT PAVEMENT STRIPING, WHITE 5" SOLID (ITEM 817013)	-
B	EPOXY RESIN PAINT PAVEMENT STRIPING, WHITE 10" SOLID (ITEM 817014)	-
C	EPOXY RESIN PAVEMENT STRIPING, WHITE 10" DOTTED - 3' LINE & 9' GAP (ITEM 817014)	225 LF
D	PREFORMED TAPE PAVEMENT MARKINGS, WHITE 13" DOTTED - 3' LINE & 9' GAP (ITEM 817023)	-
E	ALKYD-THERMOPLASTIC, PERMANENT PAVEMENT STRIPING, WHITE 12" SOLID (ITEM 817006)	-
F	PERMANENT PAVEMENT STRIPING, SYMBOL/LEGEND, ALKYD-THERMOPLASTIC (ITEM 817002)	240 SF
G	REMOVAL OF PAVEMENT STRIPING (ITEM 817031)	94 SF



NOTES:

1. CONTRACTOR TO REMOVE CONFLICTING PAVEMENT MARKINGS FROM STA. 218+00 TO STA. 227+00 AND INSTALL PROPOSED PAVEMENT MARKINGS AS SHOWN ON THE PLAN.

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ADDENDA / REVISIONS

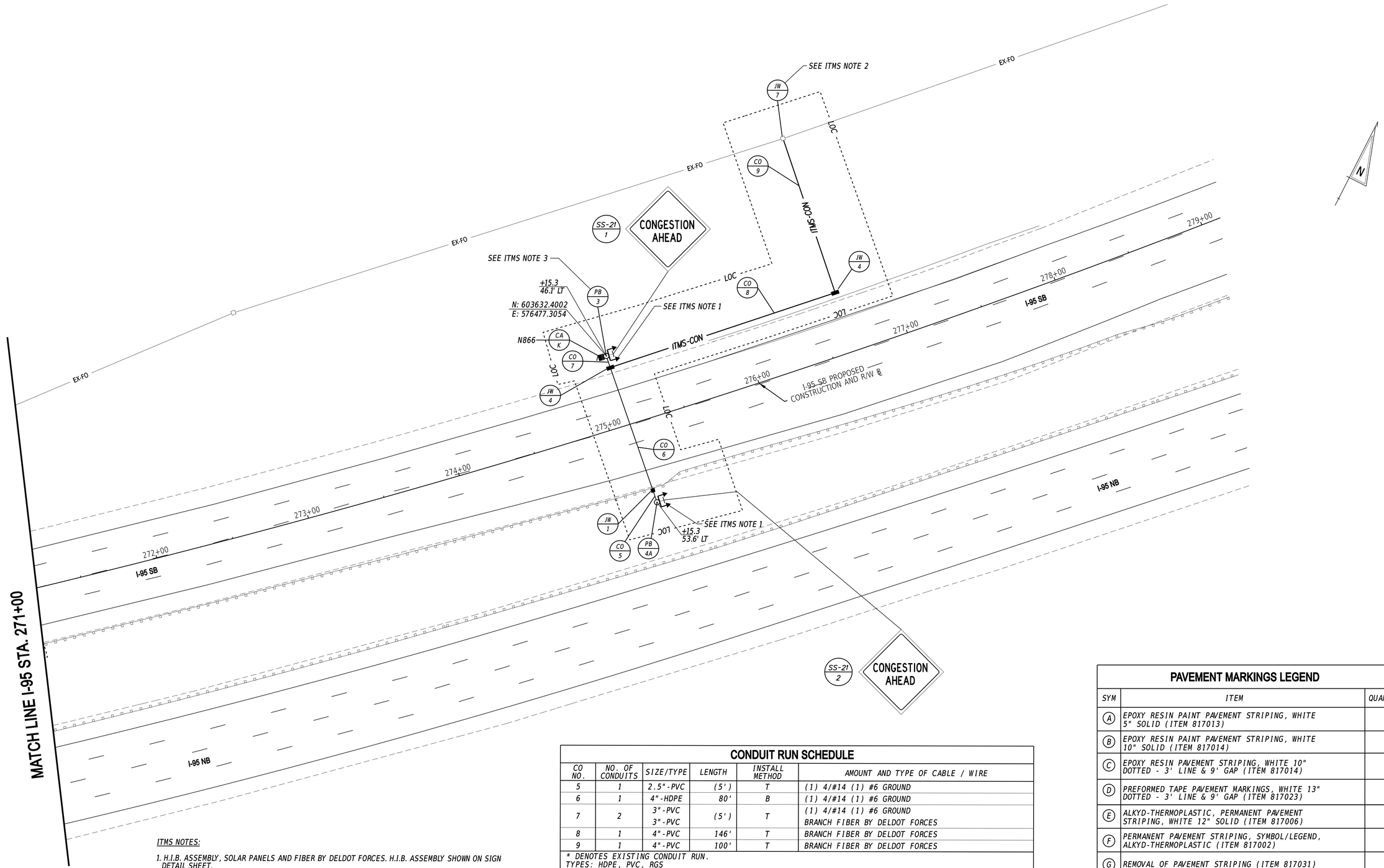
SCALE
0 30 60 90
FEET

PAVEMENT AND REHABILITATION SOUTHBOUND I-95, 2020

CONTRACT	T202001102	BRIDGE NO.	N/A
COUNTY	NEW CASTLE	DESIGNED BY:	W.DAI
		CHECKED BY:	J. VARGAS

SIGNING AND STRIPING PLAN

SECTION	SS-15
SHEET NO.	WM
	26



CONDUIT RUN SCHEDULE

CO NO.	NO. OF CONDUITS	SIZE/TYPE	LENGTH	INSTALL METHOD	AMOUNT AND TYPE OF CABLE / WIRE
5	1	2.5"-PVC	(5')	T	(1) 4/#14 (1) #6 GROUND
6	1	4"-HDPE	80'	B	(1) 4/#14 (1) #6 GROUND
7	2	3"-PVC 3"-PVC	(5')	T	(1) 4/#14 (1) #6 GROUND BRANCH FIBER BY DELDOT FORCES
8	1	4"-PVC	146'	T	BRANCH FIBER BY DELDOT FORCES
9	1	4"-PVC	100'	T	BRANCH FIBER BY DELDOT FORCES

* DENOTES EXISTING CONDUIT RUN.
TYPES: HDPE, PVC, RGS
INSTALL METHODS: B=BORE, IB=IN BARRIER, OC=OPEN CUT, OS=ON STRUCTURE, T=TRENCH

ITMS CONDUIT RUN SCHEDULE NOTES:

1. CABLE DESCRIPTIONS WITH (XX') INDICATE QUANTITY THAT IS HIGHER THAN CONDUIT LENGTH TO ACCOUNT FOR VERTICAL MEASUREMENTS SUCH AS POLES, CABINET BASE CONNECTIONS, METERS, DISCONNECTS, AND OTHERS. QUANTITY DOES NOT ACCOUNT FOR SLACK CABLE.

PAVEMENT MARKINGS LEGEND

SYM	ITEM	QUANTITY
A	EPOXY RESIN PAINT PAVEMENT STRIPING, WHITE 5" SOLID (ITEM 817013)	-
B	EPOXY RESIN PAINT PAVEMENT STRIPING, WHITE 10" SOLID (ITEM 817014)	-
C	EPOXY RESIN PAVEMENT STRIPING, WHITE 10" DOTTED - 3' LINE & 9' GAP (ITEM 817014)	-
D	PREFORMED TAPE PAVEMENT MARKINGS, WHITE 13" DOTTED - 3' LINE & 9' GAP (ITEM 817023)	-
E	ALKYD-THERMOPLASTIC, PERMANENT PAVEMENT STRIPING, WHITE 12" SOLID (ITEM 817006)	-
F	PERMANENT PAVEMENT STRIPING, SYMBOL/LEGEND, ALKYD-THERMOPLASTIC (ITEM 817002)	-
G	REMOVAL OF PAVEMENT STRIPING (ITEM 817031)	-

ITMS NOTES:

1. H.I.B. ASSEMBLY, SOLAR PANELS AND FIBER BY DELDOT FORCES. H.I.B. ASSEMBLY SHOWN ON SIGN DETAIL SHEET.
2. MODIFY EXISTING JUNCTION WELL TYPE-7 TO ACCEPT PROPOSED CONDUIT. PAY UNDER ITEM 830008.
3. SOLAR PANELS TO BE INSTALLED ON 40-FOOT POLE TO FACE SOUTH, BY DELDOT FORCES.

ADDENDA / REVISIONS

SCALE
0 30 60 90
FEET

PAVEMENT AND REHABILITATION SOUTHBOUND I-95, 2020

CONTRACT	BRIDGE NO.	N/A
T202001102	DESIGNED BY:	W.DAI
COUNTY	CHECKED BY:	J. VARGAS
NEW CASTLE		

SIGNING AND STRIPING PLAN

SS-21
SECTION
WM
SHEET NO.
32

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CONDUIT RUN SCHEDULE CONT.

CO*	* OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/WIRE
1	1	2"	GALV	10'/30'	T/P	(1)12/#8 U.F.W./GROUND *(SEE UTILITY & ITMS PLANS)
1A	1	2"	GALV	45'	T	(1)12/#8 U.F.W./GROUND *(SEE UTILITY & ITMS PLANS)
1B	1	2"	GALV	80'	T	*(SEE UTILITY & ITMS PLANS)
2	3	4"	PVC	10'	T	(3)4/#18 (1)4/#14 (1)9/#14 #12 CNT SM (1)#6 BSC
3	1	2.5"	PVC	15'	T	(1)9/#14 (1)#6 BSC
3A	1	2"	-	10'	-	*(SEE UTILITY & ITMS PLANS)
3B	1	2"	-	320'	-	*(SEE UTILITY & ITMS PLANS)
3C	1	2"	-	325'	-	*(SEE UTILITY & ITMS PLANS)
4	1	2.5"	PVC	30'	T	(1)4/#14 (1)#6 BSC
5	1	2.5"	PVC	30'	T	(1)4/#18 (1)#6 BSC
6	1	2.5"	PVC	25'	T	(2)4/#18 (1)#6 BSC
F5	1	xx4"	-	495'	-	*(SEE UTILITY AND ITMS PLANS)
F6	1	xx4"	-	190'	-	*(SEE UTILITY AND ITMS PLANS)
F7	1	xx4"	-	295'	-	*(SEE UTILITY AND ITMS PLANS)
F40	1	xx3"	-	6'	-	*(SEE UTILITY AND ITMS PLANS)
F40A	1	xx3"	-	6'	-	*(SEE UTILITY AND ITMS PLANS)
F40B	1	xx3"	-	10'	-	*(SEE UTILITY AND ITMS PLANS)
F41	1	xx4"	-	45'	-	*(SEE UTILITY AND ITMS PLANS)
F58	1	xx4"	-	322'	-	*(SEE UTILITY AND ITMS PLANS)

LEGEND

x DENOTES EXISTING

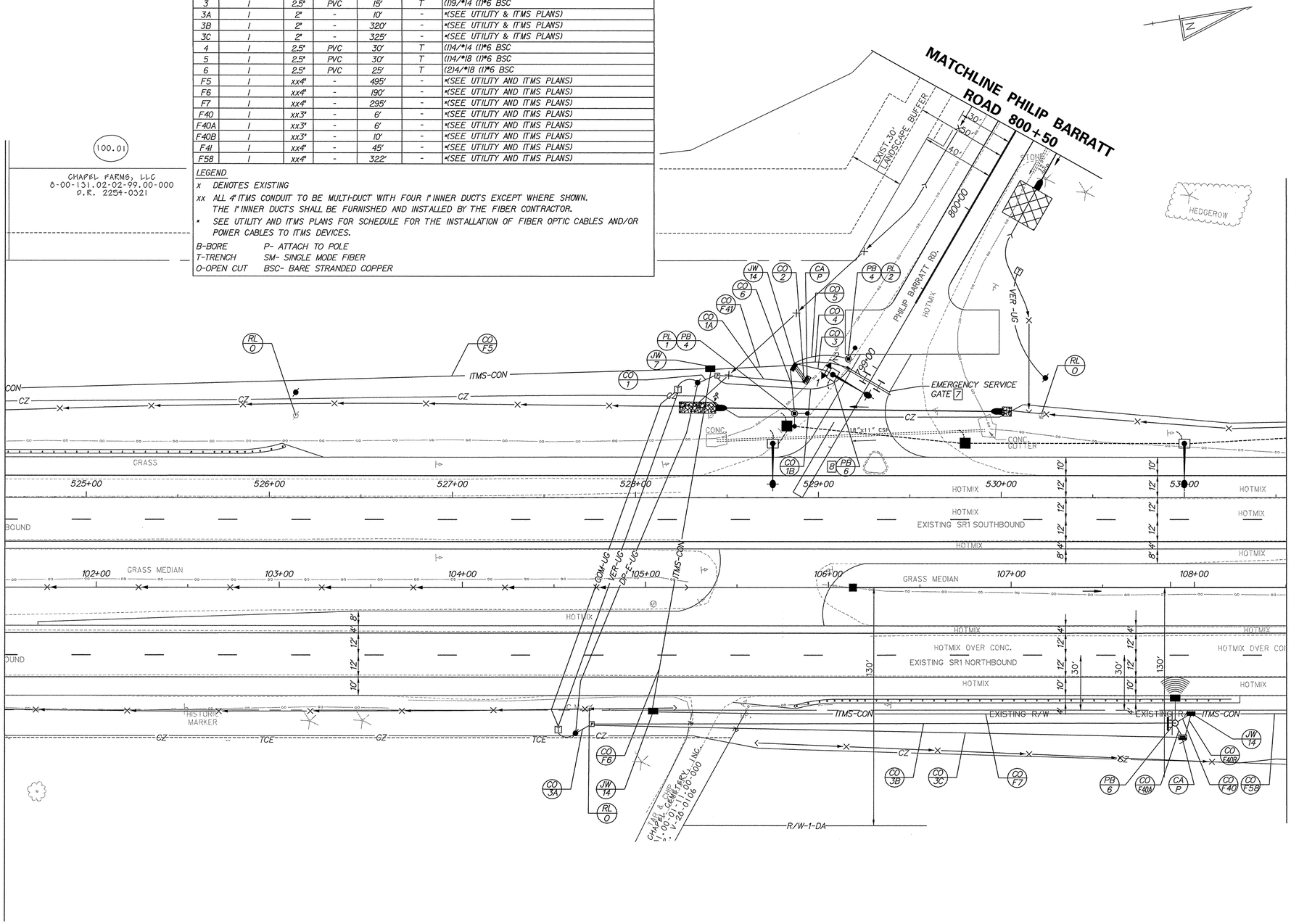
xx ALL 4" ITMS CONDUIT TO BE MULTI-DUCT WITH FOUR 1" INNER DUCTS EXCEPT WHERE SHOWN. THE 1" INNER DUCTS SHALL BE FURNISHED AND INSTALLED BY THE FIBER CONTRACTOR.

* SEE UTILITY AND ITMS PLANS FOR SCHEDULE FOR THE INSTALLATION OF FIBER OPTIC CABLES AND/OR POWER CABLES TO ITMS DEVICES.

B-BORE P- ATTACH TO POLE
T-TRENCH SM- SINGLE MODE FIBER
O-OPEN CUT BSC- BARE STRANDED COPPER

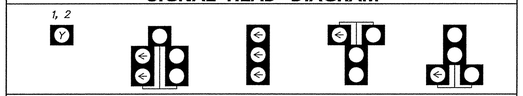
POLE SCHEDULE

POLE #	POLE TYPE	HEIGHT	MATERIAL
1	PEDESTAL	14'	ALUMINUM
2	PEDESTAL	14'	ALUMINUM



SIGNAL PHASING

SIGNAL HEAD DIAGRAM



LEGEND

AB	ABANDON	OH (*)	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH (*)	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO (*)	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO (*)	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (* OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (* OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA X	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA X	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
SPAN INSULATOR		
SPAN WIRE	XX	
UTILITY POLE		
CAMERA (CCTV)		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-DOVER, DELAWARE.
2. POLE BASES, CABINET BASE AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.
3. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (5%1 FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL.
4. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
5. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
6. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.

ADDITIONAL SIGNAL NOTES

[7] SIGNAL INSTALLATION TO BE DONE BY DELDOT TRAFFIC CONTRACTOR.

[8] THE EMERGENCY SERVICE GATE SIGNAL HEADS SHALL BE MOUNTED ON THE PROPOSED LIGHTING POLE.

RECOMMENDED _____ DATE: _____

RECOMMENDED Mark SAINTIL DATE: 12/5/14

RECOMMENDED BSchuette DATE: 12/2/14

APPROVED TRAFFIC ENGINEER Marvin C. Howard, II DATE: 12/5/14

APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER Neil Fegley DATE: 12/9/14

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SCALE 0 30 60 90 FEET

SR1, LITTLE HEAVEN GRADE SEPARATED INTERSECTION

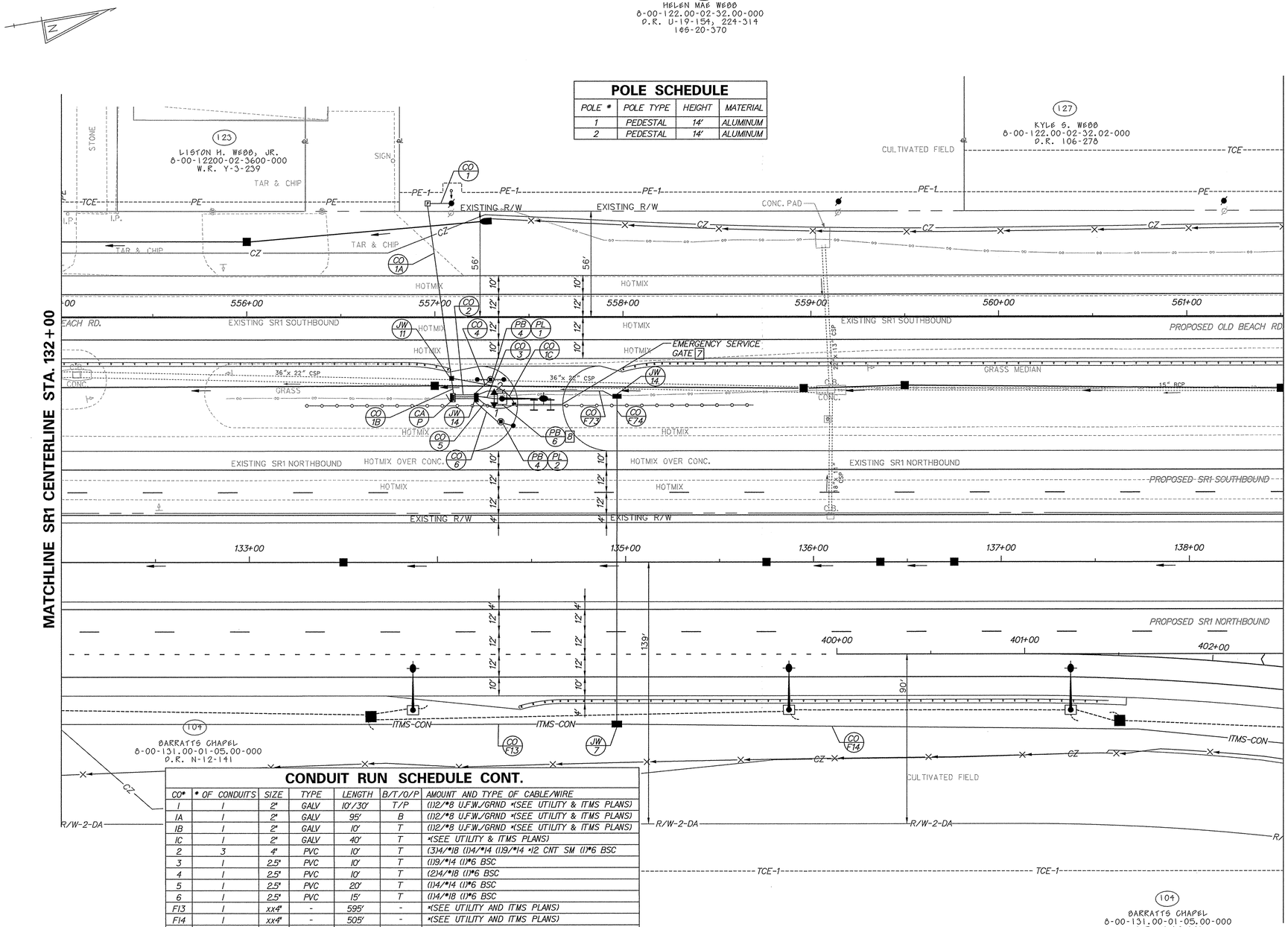
CONTRACT	T200412202	PERMIT NO.	K298
COUNTY	KENT	DESIGNED BY:	MSK
		CHECKED BY:	BAM

SIGNAL PLAN

SR1 EMERGENCY EXIT @ OLD BARRATTS CHAPEL RD

SHEET NO.	614
TOTAL SHTS.	641

12/2/2014
C:\PROJECTS\03517.00 (DELDOT ADMT 1223 DOTS Open End)\03517.16 SR1, LITTLE HEAVEN FINAL DESIGN\DGN Files\signal_contlevergate01.dgn
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MATCHLINE SR1 CENTERLINE STA. 132+00

MATCHLINE SR1 CENTERLINE STA. 138+50

POLE SCHEDULE

POLE #	POLE TYPE	HEIGHT	MATERIAL
1	PEDESTAL	14'	ALUMINUM
2	PEDESTAL	14'	ALUMINUM

CONDUIT RUN SCHEDULE CONT.

CO*	* OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/WIRE
1	1	2"	GALV	10'/30'	T/P	(1)12/*8 U.F.W./GRND *(SEE UTILITY & ITMS PLANS)
1A	1	2"	GALV	95'	B	(1)12/*8 U.F.W./GRND *(SEE UTILITY & ITMS PLANS)
1B	1	2"	GALV	10'	T	(1)12/*8 U.F.W./GRND *(SEE UTILITY & ITMS PLANS)
1C	1	2"	GALV	40'	T	*(SEE UTILITY & ITMS PLANS)
2	3	4"	PVC	10'	T	(3)4/*18 (1)4/*14 (1)9/*14 +12 CNT SM (1)*6 BSC
3	1	2.5"	PVC	10'	T	(1)9/*14 (1)*6 BSC
4	1	2.5"	PVC	10'	T	(2)4/*18 (1)*6 BSC
5	1	2.5"	PVC	20'	T	(1)4/*14 (1)*6 BSC
6	1	2.5"	PVC	15'	T	(1)4/*18 (1)*6 BSC
F13	1	xx4"	-	595'	-	*(SEE UTILITY AND ITMS PLANS)
F14	1	xx4"	-	505'	-	*(SEE UTILITY AND ITMS PLANS)
F73	1	xx4"	-	75'	-	*(SEE UTILITY AND ITMS PLANS)
F74	1	xx4"	-	175'	-	*(SEE UTILITY AND ITMS PLANS)

LEGEND

x DENOTES EXISTING

xx ALL 4" ITMS CONDUIT TO BE MULTI-DUCT WITH FOUR 1" INNER DUCTS EXCEPT WHERE SHOWN. THE 1" INNER DUCTS SHALL BE FURNISHED AND INSTALLED BY THE FIBER CONTRACTOR.

* SEE UTILITY AND ITMS PLANS FOR SCHEDULE FOR THE INSTALLATION OF FIBER OPTIC CABLES AND/OR POWER CABLES TO ITMS DEVICES.

B-BORE P- ATTACH TO POLE

T-TRENCH SM- SINGLE MODE FIBER

O-OPEN CUT BSC- BARE STRANDED COPPER

ADDITIONAL SIGNAL NOTES

7 SIGNAL INSTALLATION TO BE DONE BY DELDOT TRAFFIC CONTRACTOR.

8 THE EMERGENCY SERVICE GATE SIGNAL HEADS SHALL BE MOUNTED ON THE PROPOSED LIGHTING POLE.

SIGNAL PHASING

PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

AB	ABANDON	OH-*	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA-X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH-*	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA-X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB-X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO-*	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PB-X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO-*	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PL-X	EXISTING POLE IDENTIFIER (* OF POLE)
JW-X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL-X	PROPOSED POLE IDENTIFIER (* OF POLE)
JW-X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM-C	REMOVE BY CONTRACTOR
MA-X	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM-O	REMOVE BY OTHERS
MA-X	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM-TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1	□	□
LOOP DETECTOR, TYPE 2	▭	▭
LUMINAIRE	—○	—●
MAST ARM	▷	▶
MICROWAVE DETECTION	—◀	—◀
OPTICOM RECEIVER	—○	—●
OVERHEAD SIGNING	—⊣	—⊣
PEDESTRIAN POLE/BASE	⊙	◉
PEDESTRIAN PUSHBUTTON	—D	—▶
PEDESTRIAN SIGNAL HEAD	⊐	⊐
RIGHT-OF-WAY	—— — ——	—— — ——
SERVICE PEDESTAL	P	P
SIGNAL CABINET	XXXX	XXXX
SIGNAL HEAD	—▷	—▶
SIGNAL POLE/BASE	⊗	⊙
SPAN INSULATOR	◇	◆
SPAN WIRE	—XX—	——
UTILITY POLE	⊘	●
CAMERA (CCTV)	—◀	—◀

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-DOVER, DELAWARE.
2. POLE BASES, CABINET BASE AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.
3. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (50:1 FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES, THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAT 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL.
4. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
5. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
6. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.

RECOMMENDED _____ DATE: _____

RECOMMENDED Max Saintil DATE: 12/5/14

RECOMMENDED B.C.A. DATE: 12/2/14

APPROVED TRAFFIC ENGINEER William C. Hatfield DATE: 12/5/14

APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER Neil Lyons DATE: 12/9/14

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SCALE 0 30 60 90 FEET

SR1, LITTLE HEAVEN GRADE SEPARATED INTERSECTION

CONTRACT	T200412202	PERMIT NO.	K299
COUNTY	KENT	DESIGNED BY:	MSK
		CHECKED BY:	BAM

SIGNAL PLAN

SR1 SB EMERGENCY EXIT @ OLD BEACH RD

SHEET NO.	TOTAL SHTS.
615	641

12/2/2014
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POLE SCHEDULE

POLE #	POLE TYPE	HEIGHT	MATERIAL
1	PEDESTAL	14'	ALUMINUM
2	PEDESTAL	14'	ALUMINUM

CONDUIT RUN SCHEDULE CONT.

CO#	# OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	
1	1	2"	GALV	10'/30'	T/P	(1)12/#8 U.F.W./GRND *(SEE UTILITY & ITMS PLANS)
1A	1	2"	GALV	70'	T	(1)12/#8 U.F.W./GRND *(SEE UTILITY & ITMS PLANS)
1B	1	2"	GALV	75'	T	(1)12/#8 U.F.W./GRND *(SEE UTILITY & ITMS PLANS)
1C	1	2"	GALV	100'	T	(1)12/#8 U.F.W./GRND *(SEE UTILITY & ITMS PLANS)
1D	1	2"	GALV	150'	T	*(SEE UTILITY & ITMS PLANS)
1E	1	2"	GALV	305'	T	*(SEE UTILITY & ITMS PLANS)
2	3	4"	PVC	10'	T	(3)4/#18 (1)4/#14 (1)9/#14 #12 CNT SM (1)#6 BSC
3	1	2.5"	PVC	25'	T	(1)9/#14 (1)#6 BSC
4	1	2.5"	PVC	40'	T	(1)4/#14 (1)#6 BSC
5	1	2.5"	PVC	45'	T	(1)4/#18 (1)#6 BSC
6	1	2.5"	PVC	20'	T	(2)4/#18 (1)#6 BSC
F26	1	xx4"	-	5'	-	*(SEE UTILITY AND ITMS PLANS)
F27	1	xx4"	-	360'	-	*(SEE UTILITY AND ITMS PLANS)
F60	1	xx3"	-	160'	-	*(SEE UTILITY AND ITMS PLANS)
F60A	1	xx3"	-	10'	-	*(SEE UTILITY AND ITMS PLANS)
F68	1	xx4"	-	35'	-	*(SEE UTILITY AND ITMS PLANS)
F69	1	xx4"	-	190'	-	*(SEE UTILITY AND ITMS PLANS)

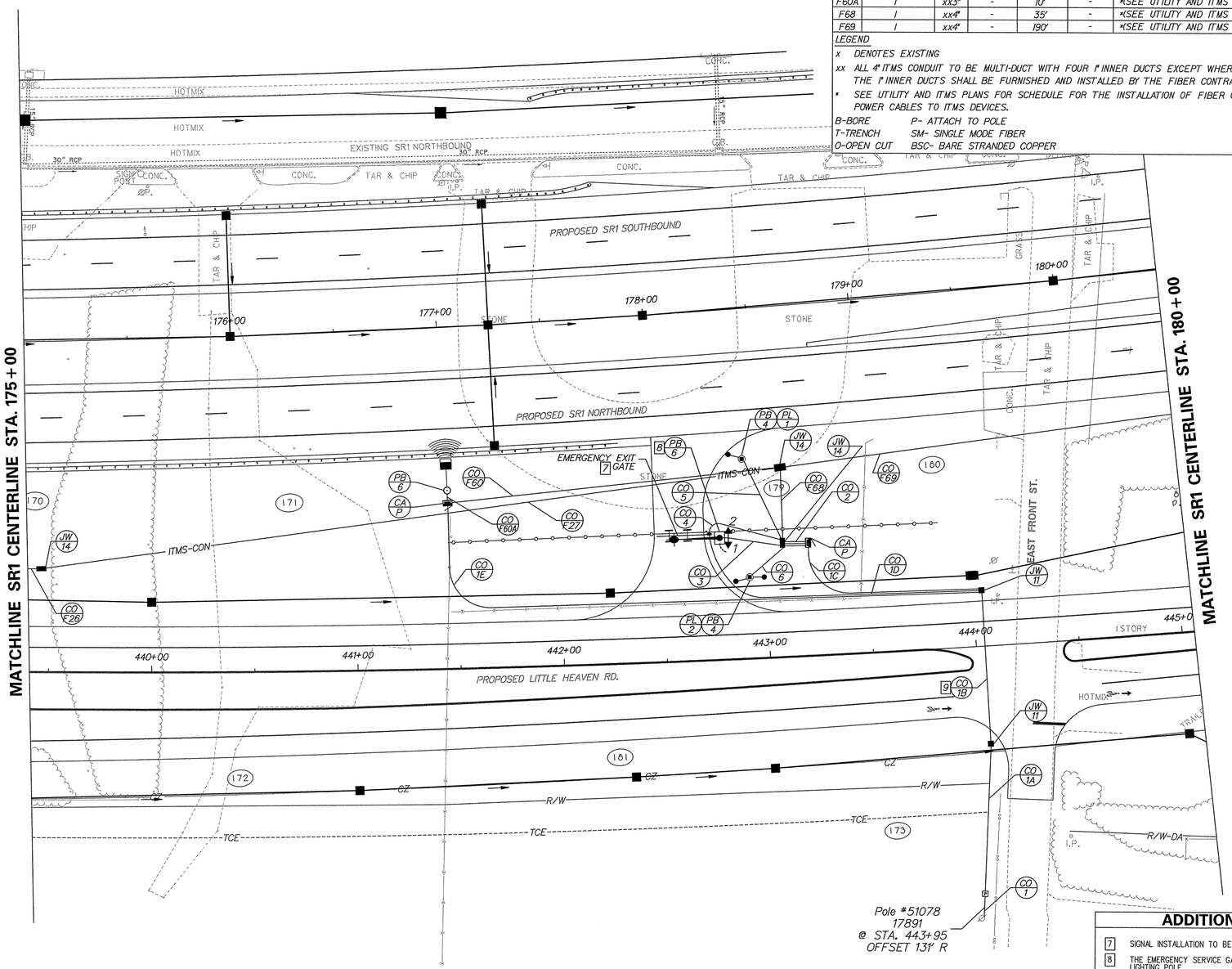
LEGEND

x DENOTES EXISTING

xx ALL 4" ITMS CONDUIT TO BE MULTI-DUCT WITH FOUR 1" INNER DUCTS EXCEPT WHERE SHOWN. THE 1" INNER DUCTS SHALL BE FURNISHED AND INSTALLED BY THE FIBER CONTRACTOR.

* SEE UTILITY AND ITMS PLANS FOR SCHEDULE FOR THE INSTALLATION OF FIBER OPTIC CABLES AND/OR POWER CABLES TO ITMS DEVICES.

B-BORE P- ATTACH TO POLE
T-TRENCH SM- SINGLE MODE FIBER
O-OPEN CUT BSC- BARE STRANDED COPPER

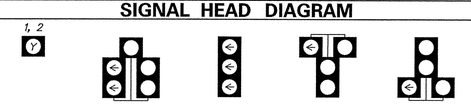


SIGNAL PHASING

PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

AB	ABANDON	OH#	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH#	PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (# OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (# OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA X	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA X	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
SPAN INSULATOR		
SPAN WIRE	XX	
UTILITY POLE		
CAMERA (CCTV)		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-DOVER, DELAWARE.
2. POLE BASES, CABINET BASE AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.
3. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (5% FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES, THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK,AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAT 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL.
4. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
5. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
6. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.

ADDITIONAL SIGNAL NOTES

7 SIGNAL INSTALLATION TO BE DONE BY DELDOT TRAFFIC CONTRACTOR.

8 THE EMERGENCY SERVICE GATE SIGNAL HEADS SHALL BE MOUNTED ON THE PROPOSED LIGHTING POLE.

9 CONTRACTOR SHALL TRENCH AS DEEP AS REQUIRED TO PREVENT CRUSHING OF CONDUIT DURING CONSTRUCTION OF PROPOSED LITTLE HEAVEN ROAD.

RECOMMENDED _____ DATE: _____

RECOMMENDED Jack SAINTIL DATE: 12/5/14

RECOMMENDED [illegible] DATE: 12/2/14

APPROVED TRAFFIC ENGINEER Thomas C. Fruehe DATE: 12/5/14

APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER [illegible] DATE: 12/9/14

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SCALE 0 30 60 90 FEET

SR1, LITTLE HEAVEN GRADE SEPARATED INTERSECTION

CONTRACT	PERMIT NO.	K300
T200412202	DESIGNED BY:	MSK
COUNTY	CHECKED BY:	BAM
KENT		

SIGNAL PLAN

SR1 NB EMERGENCY EXIT @ LITTLE HEAVEN RD

SHEET NO.	TOTAL SHTS.
616	641

12/2/2014
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CONDUIT RUN SCHEDULE

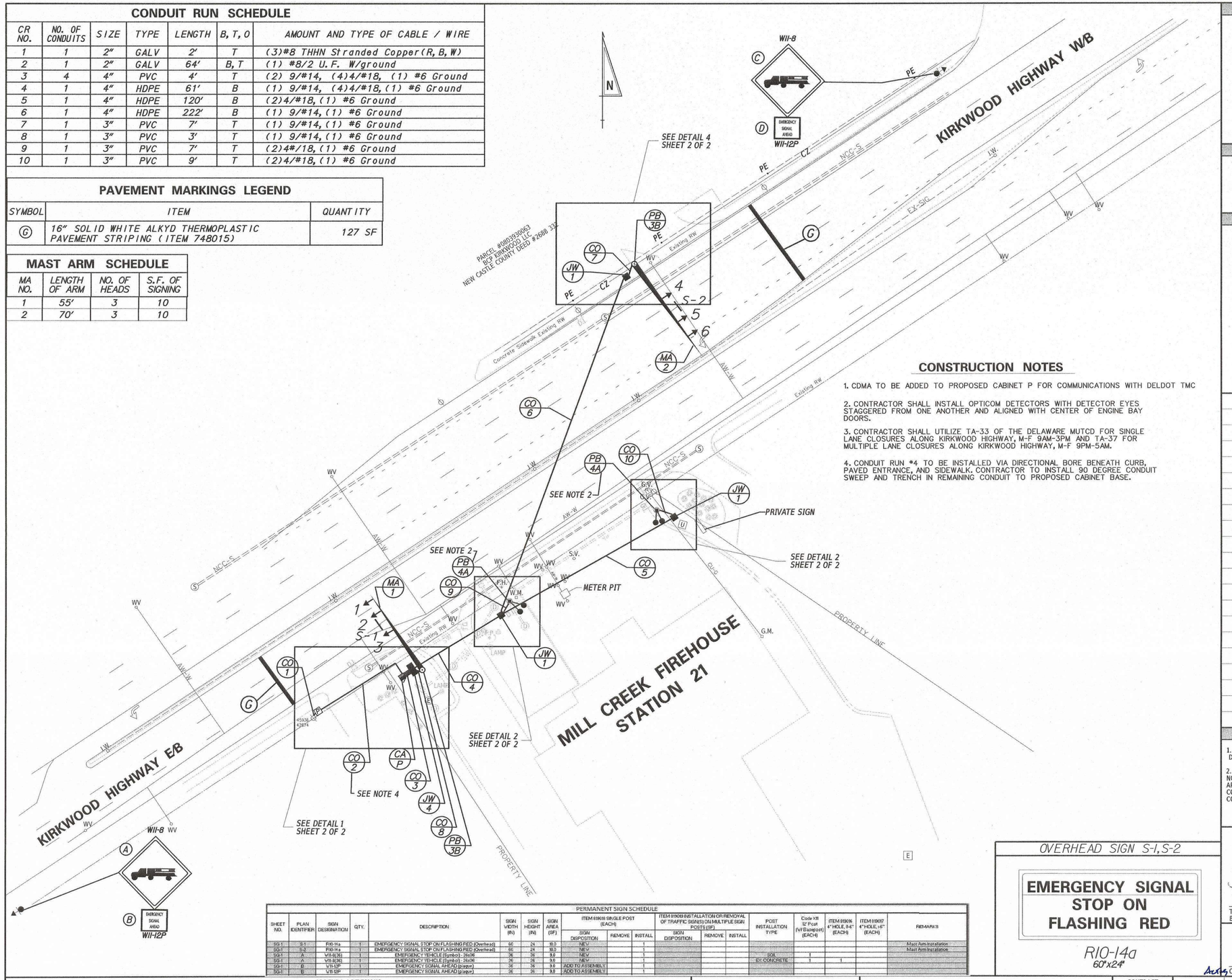
CR NO.	NO. OF CONDUITS	SIZE	TYPE	LENGTH	B, T, O	AMOUNT AND TYPE OF CABLE / WIRE
1	1	2"	GALV	2'	T	(3)#8 THHN Stranded Copper(R, B, W)
2	1	2"	GALV	64'	B, T	(1) #8/2 U.F. W/ground
3	4	4"	PVC	4'	T	(2) 9/#14, (4)4/#18, (1) #6 Ground
4	1	4"	HDPE	61'	B	(1) 9/#14, (4)4/#18, (1) #6 Ground
5	1	4"	HDPE	120'	B	(2)4/#18, (1) #6 Ground
6	1	4"	HDPE	222'	B	(1) 9/#14, (1) #6 Ground
7	1	3"	PVC	7'	T	(1) 9/#14, (1) #6 Ground
8	1	3"	PVC	3'	T	(1) 9/#14, (1) #6 Ground
9	1	3"	PVC	7'	T	(2)4#/18, (1) #6 Ground
10	1	3"	PVC	9'	T	(2)4/#18, (1) #6 Ground

PAVEMENT MARKINGS LEGEND

SYMBOL	ITEM	QUANTITY
G	16" SOLID WHITE ALKYD THERMOPLASTIC PAVEMENT STRIPING (ITEM 748015)	127 SF

MAST ARM SCHEDULE

MA NO.	LENGTH OF ARM	NO. OF HEADS	S.F. OF SIGNING
1	55'	3	10
2	70'	3	10



CONSTRUCTION NOTES

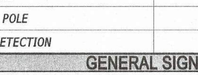
1. CDMA TO BE ADDED TO PROPOSED CABINET P FOR COMMUNICATIONS WITH DELDOT TMC
2. CONTRACTOR SHALL INSTALL OPTICOM DETECTORS WITH DETECTOR EYES STAGGERED FROM ONE ANOTHER AND ALIGNED WITH CENTER OF ENGINE BAY DOORS.
3. CONTRACTOR SHALL UTILIZE TA-33 OF THE DELAWARE MUTCD FOR SINGLE LANE CLOSURES ALONG KIRKWOOD HIGHWAY, M-F 9AM-3PM AND TA-37 FOR MULTIPLE LANE CLOSURES ALONG KIRKWOOD HIGHWAY, M-F 9PM-5AM.
4. CONDUIT RUN #4 TO BE INSTALLED VIA DIRECTIONAL BORE BENEATH CURB, PAVED ENTRANCE, AND SIDEWALK. CONTRACTOR TO INSTALL 90 DEGREE CONDUIT SWEEP AND TRENCH IN REMAINING CONDUIT TO PROPOSED CABINET BASE.

SIGNAL PHASING

IN NON PREEMPT MODE SIGNALS 1, 2, 3, 4, 5 AND 6 SHALL DISPLAY DARK. WHEN PREEMPTED A FLASHING YELLOW IS DISPLAYED FOLLOWED BY A STEADY YELLOW DURING THE CHANGE INTERVAL.
THEN TWO FLASHING RED INDICATIONS DISPLAY UNTIL THE PREEMPTION IS OVER.

SIGNAL HEAD DIAGRAM

1, 2, 3, 4, 5, 6



LEGEND

AB	ABANDON	OH #	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH #	*PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)*
CA X	*PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)*	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PB X	*PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)*
CO #	*PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)*	PL X	EXISTING POLE IDENTIFIER (# OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	*PROPOSED POLE IDENTIFIER (# OF POLE)*
JW X	*PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)*	RM C	*REMOVE BY CONTRACTOR*
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	*REMOVE BY OTHERS*
MA XX	*PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)*	RM TC	*REMOVE BY TRAFFIC CONTRACTOR*

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL		P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
CCTV CAMERA		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION		

GENERAL SIGNAL NOTES

1. RIGHT OF WAY & PERMANENT EASEMENTS DERIVED FROM R.O.W. PLANS, CONTRACT #85-099-29, DATED 7/10/1986.
2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.

PERMANENT SIGN SCHEDULE

SHEET NO.	PLAN IDENTIFIER	SIGN DESIGNATION	QTY.	DESCRIPTION	SIGN WIDTH (IN)	SIGN HEIGHT (IN)	SIGN AREA (SF)	ITEM 619018 SINGLE POST (EACH) SIGN DISPOSITION	REMOVE	INSTALL	ITEM 619018 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE (SIGN) POSTS (SF) SIGN DISPOSITION	REMOVE	INSTALL	POST INSTALLATION TYPE	Code XII 12' Post (W Baseport) (EACH)	ITEM 619016 4" HOLE, 0-6' (EACH)	ITEM 619017 4" HOLE, >6' (EACH)	REMARKS
SG-1	S-1	R10-14a	1	EMERGENCY SIGNAL STOP ON FLASHING RED (Overhead)	60	24	10.0	NEW		1								Mast Arm Installation
SG-1	S-2	R10-14a	1	EMERGENCY SIGNAL STOP ON FLASHING RED (Overhead)	60	24	10.0	NEW		1								Mast Arm Installation
SG-1	A	W11-8(36)	1	EMERGENCY VEHICLE (Symbol) - 36x36	36	36	9.0	NEW		1				SOIL		1		
SG-1	A	W11-8(36)	1	EMERGENCY VEHICLE (Symbol) - 36x36	36	36	9.0	NEW		1				EX. CONCRETE	1		1	
SG-1	B	W11-12P	1	EMERGENCY SIGNAL AHEAD (plaque)	36	36	9.0	ADD TO ASSEMBLY		1								
SG-1	B	W11-12P	1	EMERGENCY SIGNAL AHEAD (plaque)	36	36	9.0	ADD TO ASSEMBLY		1								

OVERHEAD SIGN S-1, S-2

EMERGENCY SIGNAL STOP ON FLASHING RED

R10-14a
60"x24"

PREPARED BY
DELDOT - TRANSPORTATION SOLUTIONS
TRAFFIC DESIGN

Nan-Atsiwei Tetteh — 10/08/2019
THIS SEAL APPLIES TO ALL SHEETS BEARING THE "TD" SECTION DESIGNATION. — DATE

NAN-ATSIWEI TETTEH LICENSE No. 14933 DELAWARE PROFESSIONAL ENGINEER — SEAL

CONCURRENCE FOR INSTALLATION

ACTING CHIEF TRAFFIC ENGINEER — 10/10/19 DATE

ADDENDA / REVISIONS

SCALE 0 30 60 90 FEET

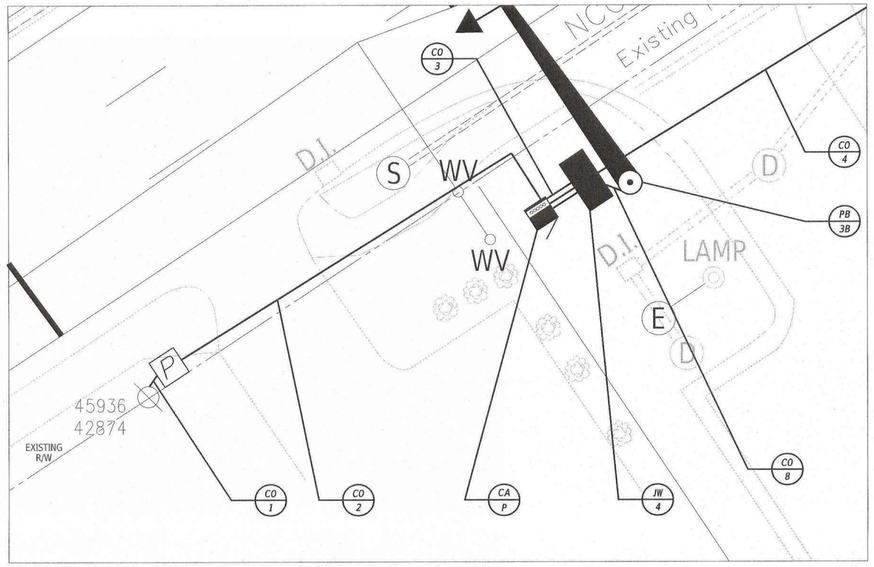
MILL CREEK FIRE STATION SIGNAL IMPOVEMENTS

CONTRACT	T201909906	PERMIT NO.	N837
COUNTY	New Castle	DESIGNED BY: MF/KLR	
		CHECKED BY: NT	

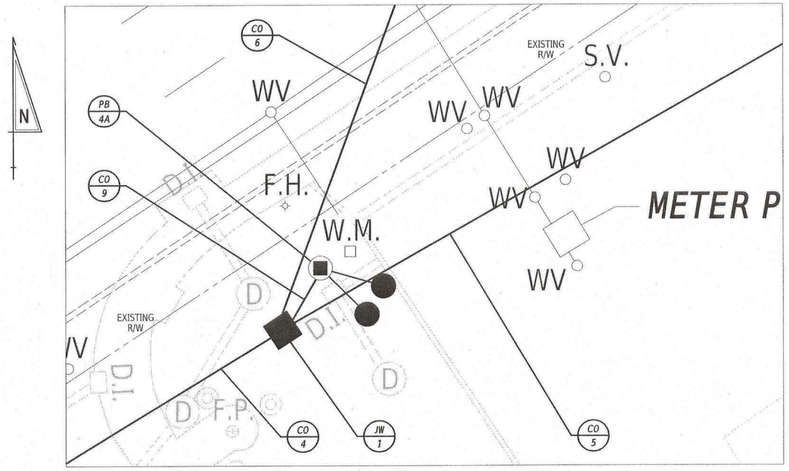
MILL CREEK FIRE STATION 21
3808 KIRKWOOD HWY
MARSHALLTON, DE 19808

SECTION: TD
SHEET NO.: 1 OF 2

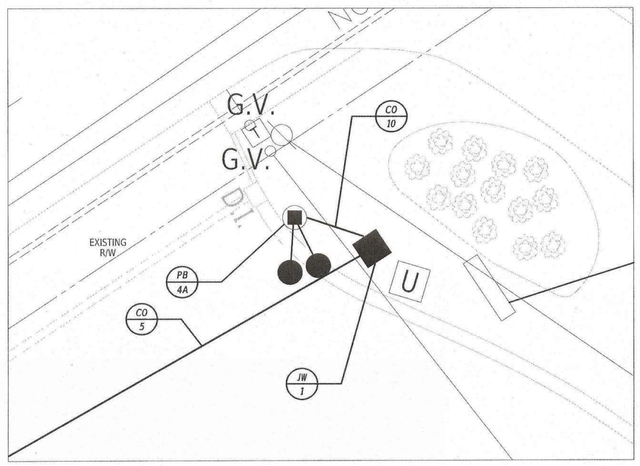
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DATE: 10/7/2019
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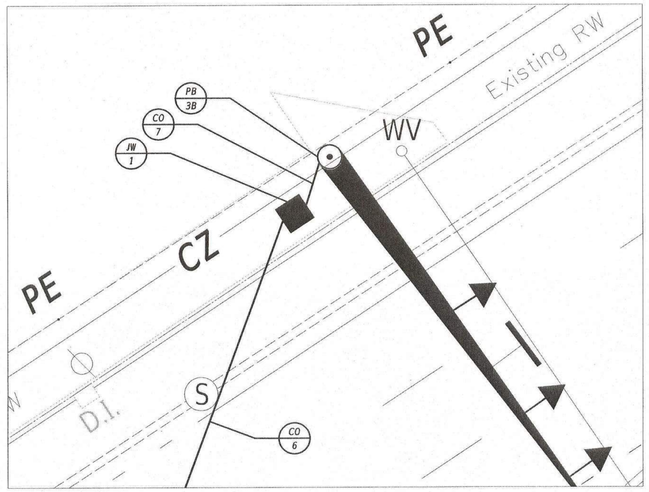
DETAIL 1



DETAIL 2



DETAIL 3



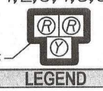
DETAIL 4

SIGNAL PHASING

IN NON PREEMPT MODE SIGNALS 1, 2, 3, 4, 5 AND 6 SHALL DISPLAY DARK. WHEN PREEMPTED A FLASHING YELLOW IS DISPLAYED FOLLOWED BY A STEADY YELLOW DURING THE CHANGE INTERVAL.
THEN TWO FLASHING RED INDICATIONS DISPLAY UNTIL THE PREEMPTION IS OVER.

SIGNAL HEAD DIAGRAM

1, 2, 3, 4, 5, 6



LEGEND

AB	ABANDON	OH #	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH #	*PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)*
CA X	*PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)*	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PB X	*PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)*
CO #	*PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)*	PL X	EXISTING POLE IDENTIFIER (# OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	*PROPOSED POLE IDENTIFIER (# OF POLE)*
JW X	*PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)*	RM C	*REMOVE BY CONTRACTOR*
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	*REMOVE BY OTHERS*
MA XX	*PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)*	RM TC	*REMOVE BY TRAFFIC CONTRACTOR*

	EXISTING SYMBOL	*PROPOSED SYMBOL*
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		□
LOOP DETECTOR, TYPE 2		▭
LUMINAIRE	—○—	—✦—
MAST ARM	—◁	—▶
MICROWAVE DETECTION	—◀	—◀
OPTICOM RECEIVER	—○	—●
OVERHEAD SIGNING		—▮
PEDESTRIAN POLE/BASE	○	◉
PEDESTRIAN PUSHBUTTON	—▷	—▶
PEDESTRIAN SIGNAL HEAD	—▭	—▀
RIGHT-OF-WAY	———	——R/W——
SERVICE PEDESTAL		P
SIGNAL CABINET	▭	▮
SIGNAL HEAD	—▷	—▶
SIGNAL POLE/BASE	⊗	⊙
CCTV CAMERA		▬◀
SPAN WIRE	—— XX ——	——◇——
UTILITY POLE	⊘	◥
VIDEO DETECTION	◀	◀

GENERAL SIGNAL NOTES

1. RIGHT OF WAY & PERMANENT EASEMENTS DERIVED FROM R.O.W. PLANS, CONTRACT #85-099-29, DATED 7/10/1986.

2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.

PREPARED BY
DELDOT - TRANSPORTATION SOLUTIONS
TRAFFIC DESIGN

THIS SEAL APPLIES TO ALL SHEETS BEARING THE "TD" SECTION DESIGNATION.

DATE

SEAL

CONCURRENCE FOR INSTALLATION

CHIEF TRAFFIC ENGINEER — DATE 10/8/19

LAST REVISED: 9/11/2018
07-OCT-2019
14:44
Y:\Traffic\Signals\New Castle\N837\Design\CADD_DGN\SG02_Mill_Creek.dgn

ADDENDA / REVISIONS

SCALE
0 10 20 30
FEET

MILL CREEK FIRE STATION SIGNAL IMPOVEMENTS

CONTRACT	T201909906
COUNTY	New Castle
PERMIT NO.	N837
DESIGNED BY:	MF/KLR
CHECKED BY:	NT

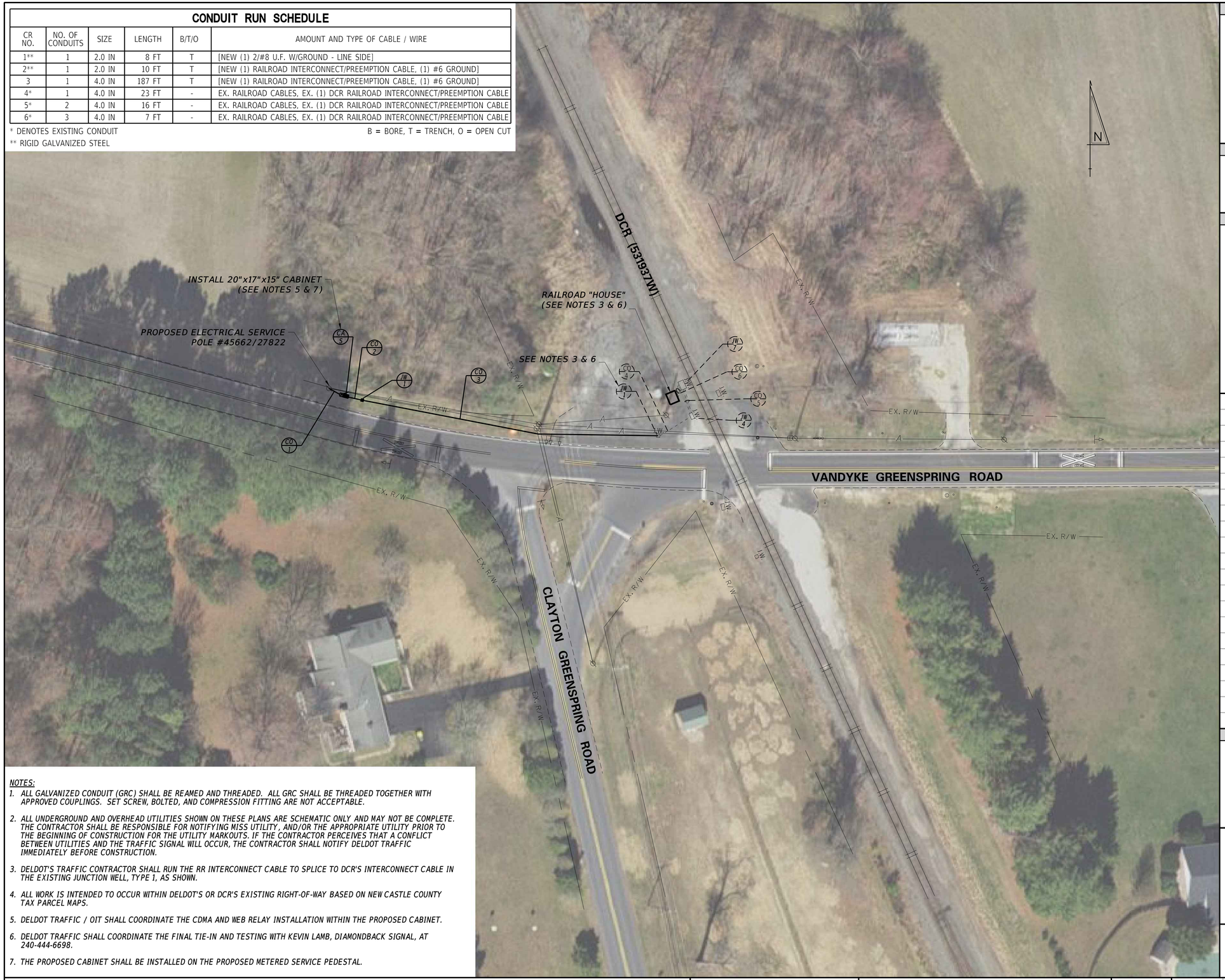
MILL CREEK FIRE STATION 21
3808 KIRKWOOD HWY
MARSHALLTON, DE 19808

SECTION	TD
SHEET NO.	2 OF 2

CONDUIT RUN SCHEDULE

CR NO.	NO. OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE / WIRE
1**	1	2.0 IN	8 FT	T	[NEW (1) 2/#8 U.F. W/GROUND - LINE SIDE]
2**	1	2.0 IN	10 FT	T	[NEW (1) RAILROAD INTERCONNECT/PREEMPTION CABLE, (1) #6 GROUND]
3	1	4.0 IN	187 FT	T	[NEW (1) RAILROAD INTERCONNECT/PREEMPTION CABLE, (1) #6 GROUND]
4*	1	4.0 IN	23 FT	-	EX. RAILROAD CABLES, EX. (1) DCR RAILROAD INTERCONNECT/PREEMPTION CABLE
5*	2	4.0 IN	16 FT	-	EX. RAILROAD CABLES, EX. (1) DCR RAILROAD INTERCONNECT/PREEMPTION CABLE
6*	3	4.0 IN	7 FT	-	EX. RAILROAD CABLES, EX. (1) DCR RAILROAD INTERCONNECT/PREEMPTION CABLE

* DENOTES EXISTING CONDUIT
** RIGID GALVANIZED STEEL
B = BORE, T = TRENCH, O = OPEN CUT



NOTES:

1. *ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED, AND COMPRESSION FITTING ARE NOT ACCEPTABLE.*
2. *ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.*
3. *DELDOT'S TRAFFIC CONTRACTOR SHALL RUN THE RR INTERCONNECT CABLE TO SPLICE TO DCR'S INTERCONNECT CABLE IN THE EXISTING JUNCTION WELL, TYPE 1, AS SHOWN.*
4. *ALL WORK IS INTENDED TO OCCUR WITHIN DELDOT'S OR DCR'S EXISTING RIGHT-OF-WAY BASED ON NEW CASTLE COUNTY TAX PARCEL MAPS.*
5. *DELDOT TRAFFIC / OIT SHALL COORDINATE THE CDMA AND WEB RELAY INSTALLATION WITHIN THE PROPOSED CABINET.*
6. *DELDOT TRAFFIC SHALL COORDINATE THE FINAL TIE-IN AND TESTING WITH KEVIN LAMB, DIAMONDBACK SIGNAL, AT 240-444-6698.*
7. *THE PROPOSED CABINET SHALL BE INSTALLED ON THE PROPOSED METERED SERVICE PEDESTAL.*

SIGNAL PHASING

SIGNAL HEAD DIAGRAM

LEGEND

AB	*ABANDON*	OH #	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH #	*PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)*
CA X	*PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)*	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PB X	*PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)*
CO #	*PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)*	PL X	EXISTING POLE IDENTIFIER (# OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	*PROPOSED POLE IDENTIFIER (# OF POLE)*
JW X	*PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)*	RM C	*REMOVE BY CONTRACTOR*
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	*REMOVE BY OTHERS*
MA XX	*PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)*	RM TC	*REMOVE BY TRAFFIC CONTRACTOR*

	EXISTING SYMBOL	*PROPOSED SYMBOL*
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
CCTV CAMERA		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION		

GENERAL SIGNAL NOTES

PREPARED BY

Whitman, Requardt and Associates, LLP
Engineers • Architects • Environmental Planners Est. 1915

7/23/2021
DATE

THIS SEAL APPLIES TO ALL SHEETS BEARING THE "WRA" SECTION DESIGNATION.

MATTHEW A. BUCKLEY — No. 16224 — PROFESSIONAL ENGINEER
SEAL

CONCURRENCE FOR INSTALLATION

CHIEF OF TRAFFIC ENGINEERING

7/23/2021
DATE

ADDENDA / REVISIONS

SCALE
0 30 60 90
FEET

VANDYKE GREENSPRING ROAD RAILROAD CROSSING SAFETY IMPROVEMENTS

CONTRACT	T202000506
COUNTY	NEW CASTLE
PERMIT NO.	N871
DESIGNED BY:	A. PHILLIPPI
CHECKED BY:	M. BUCKLEY

RAILROAD GRADE CROSSING MONITORING PLAN
VANDYKE GREENSPRING ROAD @ DCR RR(CROSSING 531937W)

SECTION	WRA
SHEET NO.	1

LAST REVISED: 9/11/2018
6/28/2021
11:51:22 AM
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CONDUIT RUN SCHEDULE

CO*	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
1*	1	1.5 IN	32 FT	-	<REMOVE EX. (1) 2/*8 U.F. W/ GROUND>
2*	1	1.5 IN	55 FT	-	<REMOVE EX. (1) 2/*8 U.F. W/ GROUND, EX. (1) 16/*14, EX. (1) 9/*14>
3*	1	1.5 IN	16 FT	-	<REMOVE EX. (1) 2/*8 U.F. W/ GROUND, EX. (1) 16/*14, EX. (1) 9/*14>
4*	1	2.5 IN	4 FT	-	<REMOVE EX. (1) 2/*8 U.F. W/ GROUND, EX. (2) 16/*14>
5*	2	1.5 IN	ON POLE	-	<REMOVE EX. (1) 4/*14>
		2.5 IN			<REMOVE EX. (1) 2/*8 U.F. W/ GROUND, EX. (1) 16/*14, (1) 9/*14, (1) COMM.-DISCONNECTED>
6*	1	4.0 IN	128 FT	-	<REMOVE EX. (1) 4/*14>
7*	1	1.5 IN	10 FT	-	<REMOVE EX. (1) 9/*14>
8*	1	1.5 IN	39 FT	-	<REMOVE EX. (1) 9/*14>
9*	1	1.5 IN	3 FT	-	<REMOVE EX. (1) 9/*14>
10*	1	1.5 IN	40 FT	-	<REMOVE EX. (1) 9/*14>
OH-11	-	AERIAL	73 FT	-	<REMOVE EX. (1) 16/*14, (1) COMM.-DISCONNECTED>
OH-12	-	AERIAL	63 FT	-	<REMOVE EX. (1) 16/*14, (1) COMM.-DISCONNECTED>
OH-13	-	AERIAL	81 FT	-	<REMOVE EX. (1) 9/*14, (1) 4/*14>
14**	1	2.0 IN	14 FT	T	[NEW (3) 1/*8 THHN - LINE SIDE]
15**	2	2.0 IN	6 FT	T	[NEW (3) 1/*8 THHN - LINE SIDE, (1) 2/*8 U.F. W/GROUND - LOAD SIDE]
16	1	2.0 IN	106 FT	B	[NEW (1) 2/*8 U.F. W/ GROUND - LOAD SIDE]
17**	1	2.0 IN	9 FT	T	[NEW (1) 2/*8 U.F. W/ GROUND - LOAD SIDE]

* DENOTES EXISTING CONDUIT
** GALVANIZED STEEL CONDUIT
B = BORE, T = TRENCH, O = OPEN CUT

CONDUIT RUN SCHEDULE

CO*	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
18	4	4.0 IN	5 FT	T	[NEW (3) 9/*14, (7) 5/*14, (7) 4/*14, (4) *6 GROUND, (1) CCTV CABLE]
19	1	3.0 IN	35 FT	T	[NEW (1) 9/*14, (1) 4/*14, (1) *6 GROUND]
20	1	4.0 IN	85 FT	B	[NEW (1) 9/*14, (2) 5/*14, (1) 4/*14, (1) *6 GROUND, (1) CCTV CABLE]
21	1	3.0 IN	8 FT	T	[NEW (1) 9/*14, (1) 4/*14, (1) *6 GROUND, (1) CCTV CABLE]
22	1	2.5 IN	14 FT	T	[NEW (1) 5/*14, (1) *6 GROUND]
23	1	2.5 IN	5 FT	T	[NEW (2) 5/*14, (1) *6 GROUND]
24	1	4.0 IN	78 FT	B	[NEW (1) 9/*14, (3) 5/*14, (3) 4/*14, (1) *6 GROUND]
25	1	2.5 IN	7 FT	O	[NEW (2) 5/*14, (1) *6 GROUND]
26	1	2.5 IN	21 FT	O	[NEW (1) 4/*14, (1) *6 GROUND]
27	1	4.0 IN	31 FT	B	[NEW (1) 9/*14, (1) 5/*14, (2) 4/*14, (1) *6 GROUND]
28	1	3.0 IN	21 FT	T	[NEW (1) 9/*14, (1) *6 GROUND]
29	1	2.5 IN	10 FT	T	[NEW (1) 5/*14, (1) 4/*14, (1) *6 GROUND]
30	1	4.0 IN	180 FT	B	[NEW (1) 4/*14, (1) *6 GROUND]

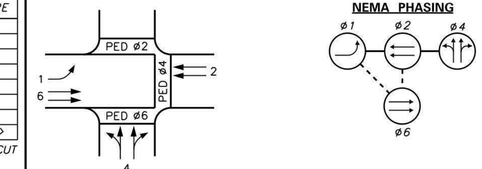
* DENOTES EXISTING CONDUIT
** GALVANIZED STEEL CONDUIT
B = BORE, T = TRENCH, O = OPEN CUT

CONDUIT RUN SCHEDULE

CO*	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
31	1	2.5 IN	5 FT	O	[NEW (1) 4/*14, (1) *6 GROUND]
32	1	4.0 IN	131 FT	B	[NEW (1) 4/*14, (1) *6 GROUND]
33	1	2.5 IN	6 FT	T	[NEW (1) 4/*14, (1) *6 GROUND]
34	1	2.5 IN	8 FT	T	[NEW (1) 4/*14, (1) *6 GROUND]
35	1	4.0 IN	95 FT	B	[NEW (1) 5/*14, (1) *6 GROUND]
36	1	2.5 IN	7 FT	O	[NEW (1) 5/*14, (1) *6 GROUND]
37**	1	2.0 IN	31 FT	T	EMPTY - FUTURE CoW COMM CABLE
OH-38	-	AERIAL	23 FT	-	<REMOVE EX. (1) COMM.-DISCONNECTED>

* DENOTES EXISTING CONDUIT
** GALVANIZED STEEL CONDUIT
B = BORE, T = TRENCH, O = OPEN CUT

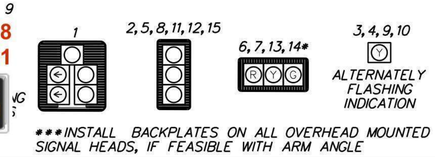
SIGNAL PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM

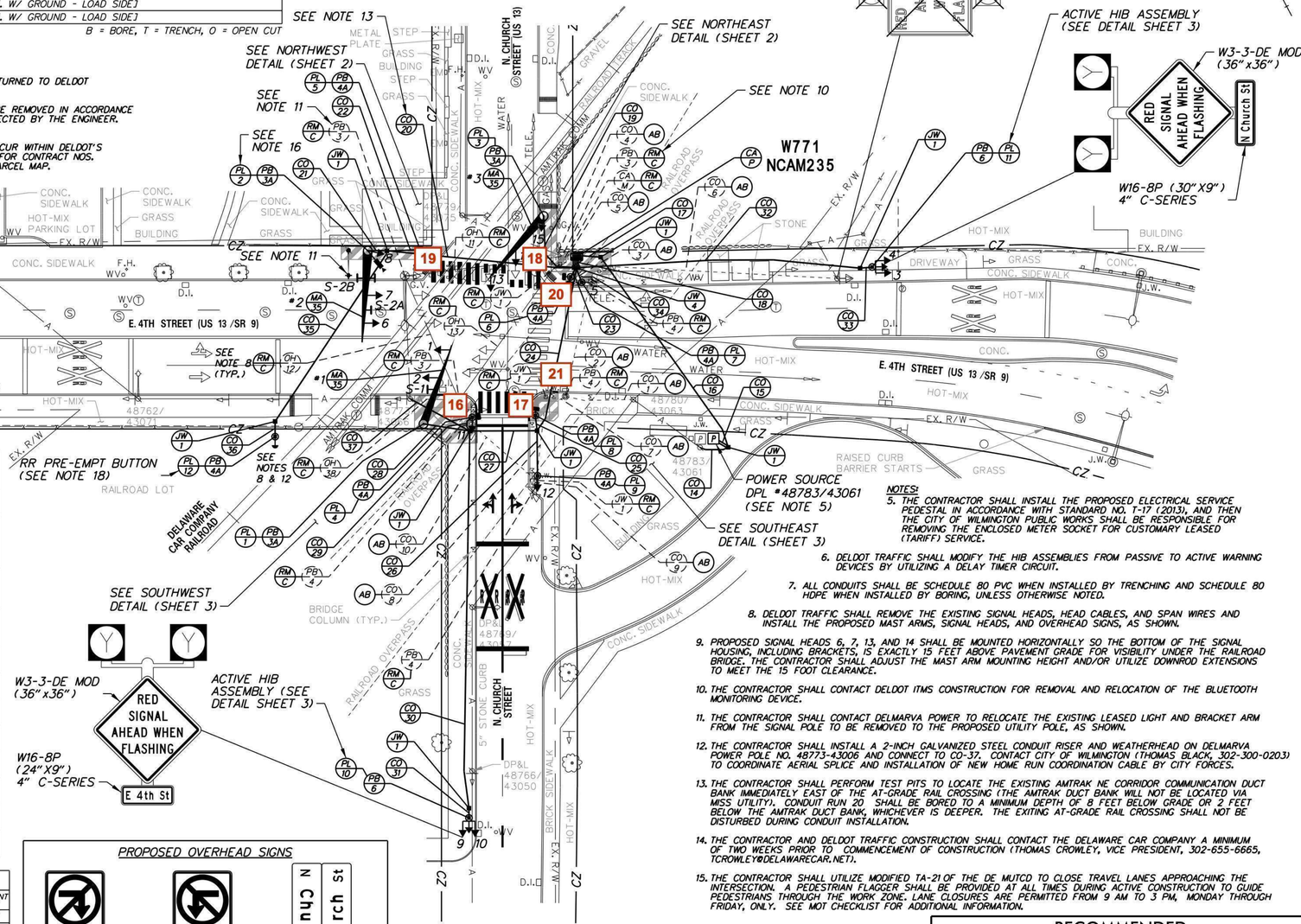


***INSTALL BACKPLATES ON ALL OVERHEAD MOUNTED SIGNAL HEADS, IF FEASIBLE WITH ARM ANGLE

LEGEND

AB	ABANDON	OH-X	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA-X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH-X	PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA-X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB-X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO-X	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PB-X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO-X	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PL-X	EXISTING POLE IDENTIFIER (# OF POLE)
JW-X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL-X	PROPOSED POLE IDENTIFIER (# OF POLE)
JW-X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM-C	REMOVE BY CONTRACTOR
MA-XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM-O	REMOVE BY OTHERS
MA-XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM-TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL		P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
CCTV CAMERA		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION		



POLE SCHEDULE

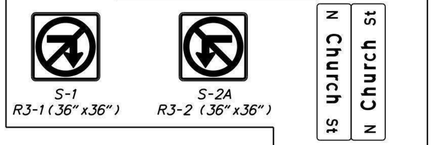
NO.	TYPE
1	PROPOSED 35' MAST ARM & (2) VEHICLE SIGNAL HEADS, 21'-6" POLE W/ TYPE 3A BASE
2	PROPOSED 35' MAST ARM, (2) VEHICLE SIGNAL HEADS, (1) SUPPLEMENTAL POLE-MOUNTED VEHICLE SIGNAL HEAD, & (1) DAVIT ARM CCTV CAMERA 21'-6" POLE W/ TYPE 3A BASE
3	PROPOSED 35' MAST ARM, (2) VEHICLE SIGNAL HEADS, & (1) SUPPLEMENTAL POLE-MOUNTED VEHICLE SIGNAL HEAD 21'-6" POLE W/ TYPE 3A BASE
4	PROPOSED (1) PEDESTRIAN SIGNAL HEAD & (1) SUPPLEMENTAL POLE-MOUNTED VEHICLE SIGNAL HEAD 14' POLE W/ TYPE 4A BASE
5	PROPOSED (1) PEDESTRIAN SIGNAL HEAD 10' POLE W/ TYPE 4A BASE
6	PROPOSED (2) PEDESTRIAN SIGNAL HEADS 10' POLE W/ TYPE 4A BASE
7	PROPOSED (1) SUPPLEMENTAL VEHICLE SIGNAL HEAD 10' POLE W/ TYPE 4A BASE
8	PROPOSED (2) PEDESTRIAN SIGNAL HEADS 10' POLE W/ TYPE 4A BASE
9	PROPOSED (1) SUPPLEMENTAL VEHICLE SIGNAL HEAD 10' POLE W/ TYPE 4A BASE
10	PROPOSED (1) ACTIVE HIB ASSEMBLY 14' POLE W/ TYPE 6 BASE
11	PROPOSED (1) ACTIVE HIB ASSEMBLY 14' POLE W/ TYPE 6 BASE
12	PROPOSED (1) RR PRE-EMPTION PUSHBUTTON 10' POLE W/ TYPE 4A BASE

MAST ARM SCHEDULE*

MA*	HEIGHT OF POLE	LENGTH OF ARM	# OF HEADS	# OPTICOM RECEIVERS	SF OF SIGNING	ARM MOUNT HEIGHT
1	21'-6"	40 FT	2	-	9.0 SF	20'-0"
2	21'-6"	40 FT	2	-	18.0 SF	16'-0"
3	21'-6"	40 FT	2	-	-	16'-0"

*SEE NOTE 17

PROPOSED OVERHEAD SIGNS



NOTES:

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
2. POLE BASES, CABINET BASE AND CONDUIT JUNCTION WELLS TO BE REMOVED IN ACCORDANCE WITH SECTION 211 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY THE ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.
3. ALL WORK PERFORMED UNDER THIS PROJECT IS INTENDED TO OCCUR WITHIN DELDOT'S EXISTING RIGHT-OF-WAY BASED ON THE ARCHIVED SIGNAL PLAN FOR CONTRACT NOS. 71-10-001 AND 82-071-07 AND THE NEW CASTLE COUNTY TAX PARCEL MAP.
4. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.
5. THE CONTRACTOR SHALL INSTALL THE PROPOSED ELECTRICAL SERVICE PEDESTAL IN ACCORDANCE WITH STANDARD NO. T-17 (2013), AND THEN THE CITY OF WILMINGTON PUBLIC WORKS SHALL BE RESPONSIBLE FOR REMOVING THE ENCLOSED METER SOCKET FOR CUSTOMARY LEASED (TARIFF) SERVICE.
6. DELDOT TRAFFIC SHALL MODIFY THE HIB ASSEMBLIES FROM PASSIVE TO ACTIVE WARNING DEVICES BY UTILIZING A DELAY TIMER CIRCUIT.
7. ALL CONDUITS SHALL BE SCHEDULE 80 PVC WHEN INSTALLED BY TRENCHING AND SCHEDULE 80 HDPE WHEN INSTALLED BY BORING, UNLESS OTHERWISE NOTED.
8. DELDOT TRAFFIC SHALL REMOVE THE EXISTING SIGNAL HEADS, HEAD CABLES, AND SPAN WIRES AND INSTALL THE PROPOSED MAST ARMS, SIGNAL HEADS, AND OVERHEAD SIGNS, AS SHOWN.
9. PROPOSED SIGNAL HEADS 6, 7, 13, AND 14 SHALL BE MOUNTED HORIZONTALLY SO THE BOTTOM OF THE SIGNAL HOUSING, INCLUDING BRACKETS, IS EXACTLY 15 FEET ABOVE PAVEMENT GRADE FOR VISIBILITY UNDER THE RAILROAD BRIDGE. THE CONTRACTOR SHALL ADJUST THE MAST ARM MOUNTING HEIGHT AND/OR UTILIZE DOWNROD EXTENSIONS TO MEET THE 15 FOOT CLEARANCE.
10. THE CONTRACTOR SHALL CONTACT DELDOT ITMS CONSTRUCTION FOR REMOVAL AND RELOCATION OF THE BLUETOOTH MONITORING DEVICE.
11. THE CONTRACTOR SHALL CONTACT DELMARVA POWER TO RELOCATE THE EXISTING LEASED LIGHT AND BRACKET ARM FROM THE SIGNAL POLE TO BE REMOVED TO THE PROPOSED UTILITY POLE, AS SHOWN.
12. THE CONTRACTOR SHALL INSTALL A 2-INCH GALVANIZED STEEL CONDUIT RISER AND WEATHERHEAD ON DELMARVA POWER POLE NO. 48773-43006 AND CONNECT TO CO-37. CONTACT CITY OF WILMINGTON (THOMAS BLACK, 302-300-0203) TO COORDINATE AERIAL SPLICE AND INSTALLATION OF NEW HOME RUN COORDINATION CABLE BY CITY FORCES.
13. THE CONTRACTOR SHALL PERFORM TEST PITS TO LOCATE THE EXISTING AMTRAK NE CORRIDOR COMMUNICATION DUCT BANK IMMEDIATELY EAST OF THE AT-GRADE RAIL CROSSING (THE AMTRAK DUCT BANK WILL NOT BE LOCATED VIA MISS UTILITY). CONDUIT RUN 20 SHALL BE BORED TO A MINIMUM DEPTH OF 8 FEET BELOW GRADE OR 2 FEET BELOW THE AMTRAK DUCT BANK, WHICHEVER IS DEEPER. THE EXITING AT-GRADE RAIL CROSSING SHALL NOT BE DISTURBED DURING CONDUIT INSTALLATION.
14. THE CONTRACTOR AND DELDOT TRAFFIC CONSTRUCTION SHALL CONTACT THE DELAWARE CAR COMPANY A MINIMUM OF TWO WEEKS PRIOR TO COMMENCEMENT OF CONSTRUCTION (THOMAS CROWLEY, VICE PRESIDENT, 302-655-6665, TCROWLEY@DELAWARECAR.NET).
15. THE CONTRACTOR SHALL UTILIZE MODIFIED TA-21 OF THE DE MUTCD TO CLOSE TRAVEL LANES APPROACHING THE INTERSECTION. A PEDESTRIAN FLAGGER SHALL BE PROVIDED AT ALL TIMES DURING ACTIVE CONSTRUCTION TO GUIDE PEDESTRIANS THROUGH THE WORK ZONE. LANE CLOSURES ARE PERMITTED FROM 9 AM TO 3 PM, MONDAY THROUGH FRIDAY, ONLY. SEE MOT CHECKLIST FOR ADDITIONAL INFORMATION.
16. THE CONTRACTOR SHALL INSTALL A DAVIT ARM CCTV CAMERA ON POLE *2.
17. THE PROPOSED MAST ARMS SHALL BE INSTALLED TO PROVIDE A 15-FOOT MINIMUM HORIZONTAL CLEARANCE FROM THE CENTERLINE OF THE AT- GRADE RAILROAD CROSSING.
18. THE PROPOSED PUSHBUTTON SHALL BE LOCATED 20 FEET FROM THE ACTIVE RAILROAD TRACK CENTERLINE AND NO MORE THAN 4 FEET FROM THE FOURTH STREET FENCE LINE.

RECOMMENDED

Thomas Black, via 10/18/2021 Field Meeting

CITY OF WILMINGTON, DEPT. OF PUBLIC WORKS — DATE

RECOMMENDED

Thomas Crowley, via email dated 9/20/2021

DELAWARE CAR COMPANY — DATE

PREPARED BY

Whitman, Requardt and Associates, LLP
Engineers • Architects • Environmental Planners Est. 1915

10/13/2021

THIS SEAL APPLIES TO ALL SHEETS BEARING THE "WRA" SECTION DESIGNATION. — DATE

KYLE O. CLEVENGER, LICENSE No. 18723, DELAWARE PROFESSIONAL ENGINEER — SEAL

CONCURRENCE FOR INSTALLATION

10/18/2021

CHIEF OF TRAFFIC ENGINEERING — DATE

ADDENDA / REVISIONS

SCALE 0 30 60 90 FEET

2016 HEP
SITE N

CONTRACT	T201800402
COUNTY	NEW CASTLE
PERMIT NO.	W771 & NCAM235
DESIGNED BY:	D. GUNYUZLU
CHECKED BY:	K. CLEVENGER

SIGNAL PLAN
E. 4TH STREET (SR 9 /US 13)
N. CHURCH STREET (US 13)

SECTION	WRA
SHEET NO.	1

N:\31957-025\CADD\SC01_4th St @ Church St.dgn
10/12/2021 11:57:44 PM

ADDITIONAL GENERAL SIGNAL NOTES

3. POLE BASES, CABINET BASE AND CONDUIT JUNCTION WELLS TO BE REMOVED IN ACCORDANCE WITH SECTION 211 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.

4. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED, AND COMPRESSION FITTING ARE NOT ACCEPTABLE.

5. POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHOULD BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (SLOPE NOT EXCEEDING 1.5%) LANDING AREA OF THE PEDESTRIAN CONNECTION OR SIDEWALK IN ACCORDANCE WITH ADA BEST PRACTICES. THE PEDESTRIAN PUSHBUTTON SHALL BE INSTALLED AT A MINIMUM HEIGHT OF 15 INCHES AND A MAXIMUM HEIGHT OF 48 INCHES ABOVE THE LEVEL LANDING AREA/SIDEWALK, BUT SHOULD BE INSTALLED AT A HEIGHT OF 42 INCHES TO 48 INCHES. THE PEDESTRIAN PUSHBUTTON SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE DOES NOT EXCEED 10 INCHES FROM THE LEVEL LANDING AREA TO THE FACE OF THE PUSH BUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING, INCLUDING BRACKETS, NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE THE GROUND.

6. THE COMPANY WHICH OWNS THE RED LIGHT CAMERA EQUIPMENT WILL BE RESPONSIBLE TO REINSTALL RED LIGHT RUNNING CAMERA ON THE SOUTHBOUND ELKTON ROAD APPROACH.

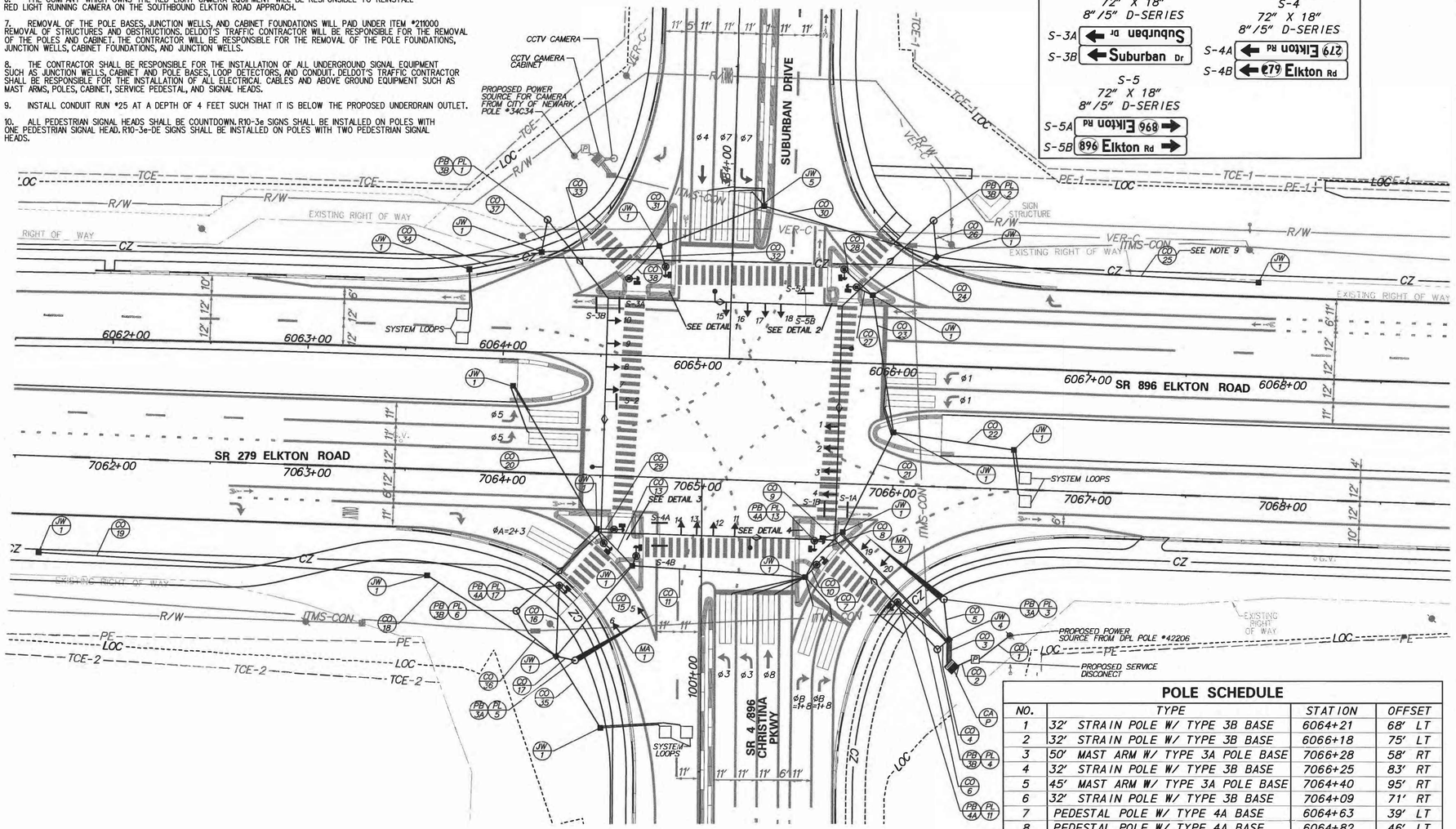
7. REMOVAL OF THE POLE BASES, JUNCTION WELLS, AND CABINET FOUNDATIONS WILL PAID UNDER ITEM *211000 REMOVAL OF STRUCTURES AND OBSTRUCTIONS. DELDOT'S TRAFFIC CONTRACTOR WILL BE RESPONSIBLE FOR THE REMOVAL OF THE POLES AND CABINET. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE REMOVAL OF THE POLE FOUNDATIONS, JUNCTION WELLS, CABINET FOUNDATIONS, AND JUNCTION WELLS.

8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF ALL UNDERGROUND SIGNAL EQUIPMENT SUCH AS JUNCTION WELLS, CABINET AND POLE BASES, LOOP DETECTORS, AND CONDUIT. DELDOT'S TRAFFIC CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF ALL ELECTRICAL CABLES AND ABOVE GROUND EQUIPMENT SUCH AS MAST ARMS, POLES, CABINET, SERVICE PEDESTAL, AND SIGNAL HEADS.

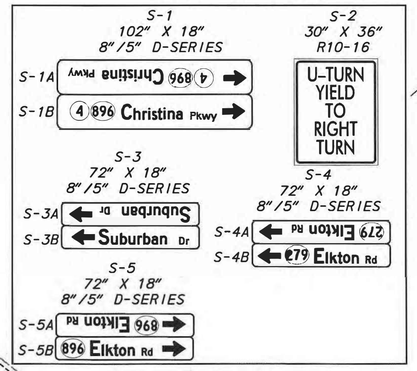
9. INSTALL CONDUIT RUN *25 AT A DEPTH OF 4 FEET SUCH THAT IT IS BELOW THE PROPOSED UNDERDRAIN OUTLET.

10. ALL PEDESTRIAN SIGNAL HEADS SHALL BE COUNTDOWN. R10-3e SIGNS SHALL BE INSTALLED ON POLES WITH ONE PEDESTRIAN SIGNAL HEAD. R10-3e-DE SIGNS SHALL BE INSTALLED ON POLES WITH TWO PEDESTRIAN SIGNAL HEADS.

ULTIMATE



OVERHEAD SIGN DETAILS



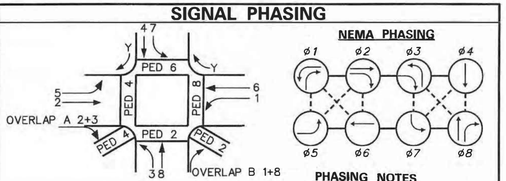
MAST ARM SCHEDULE

NO.	LENGTH	NO. OF SIGNAL HEADS	S.F. OF SIGNAGE
1	45' MAST ARM	2 - 3 SECTION	0 SF
2	50' MAST ARM	2 - 3 SECTION	0 SF

POLE SCHEDULE

NO.	TYPE	STATION	OFFSET
1	32' STRAIN POLE W/ TYPE 3B BASE	6064+21	68' LT
2	32' STRAIN POLE W/ TYPE 3B BASE	6066+18	75' LT
3	50' MAST ARM W/ TYPE 3A POLE BASE	7066+28	58' RT
4	32' STRAIN POLE W/ TYPE 3B BASE	7066+25	83' RT
5	45' MAST ARM W/ TYPE 3A POLE BASE	7064+40	95' RT
6	32' STRAIN POLE W/ TYPE 3B BASE	7064+09	71' RT
7	PEDESTAL POLE W/ TYPE 4A BASE	6064+63	39' LT
8	PEDESTAL POLE W/ TYPE 4A BASE	6064+82	46' LT
9	PEDESTAL POLE W/ TYPE 4A BASE	6065+73	48' LT
10	PEDESTAL POLE W/ TYPE 4A BASE	6065+80	39' LT
11	PEDESTAL POLE W/ TYPE 4A BASE	7066+04	60' RT
12	PEDESTAL POLE W/ TYPE 4A BASE	7065+62	42' RT
13	PEDESTAL POLE W/ TYPE 4A BASE	7065+61	30' RT
14	PEDESTAL POLE W/ TYPE 4A BASE	7064+70	41' RT
15	PEDESTAL POLE W/ TYPE 4A BASE	7064+58	27' RT
16	PEDESTAL POLE W/ TYPE 4A BASE	7064+53	35' RT
17	PEDESTAL POLE W/ TYPE 4A BASE	7064+31	57' RT

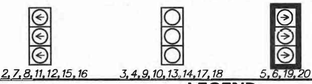
SIGNAL PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

AB	ABANDON	OH	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH *	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO *	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO *	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (* OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (* OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	JW	■
LOOP DETECTOR, TYPE 1		□
LOOP DETECTOR, TYPE 2		▭
LUMINAIRE		—◆
MAST ARM		➤
MICROWAVE DETECTION	—◀	—◀
OPTICOM RECEIVER	—●	—●
OVERHEAD SIGNING		—|
PEDESTRIAN POLE/BASE	○	◉
PEDESTRIAN PUSHBUTTON	—D	—➤
PEDESTRIAN SIGNAL HEAD		—■
RIGHT-OF-WAY		—R/W—
SERVICE PEDESTAL		—P
SIGNAL CABINET		■
SIGNAL HEAD	—▷	—➤
SIGNAL POLE/BASE	◑	⊙
CCTV CAMERA		—■
SPAN WIRE	—XX—	—◇—
UTILITY POLE	⊘	◣
VIDEO DETECTION		◀

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.

PREPARED BY
JOHNSON, MIRMIRAN & THOMPSON

Mir Abe Waked — 12/17/2018 (DATE)

MIR A. WAKED LICENSE No. 14810 DELAWARE PROFESSIONAL ENGINEER (SEAL)

THIS SEAL APPLIES TO ALL SHEETS BEARING THE "JMT" SECTION DESIGNATION.

APPROVED FOR INSTALLATION

CHIEF TRAFFIC ENGINEER — 12/19/18 (DATE)

ADDENDA / REVISIONS

SCALE 0 30 60 90 FEET

ELKTON ROAD, MD LINE TO CASHO MILL ROAD

CONTRACT	T201504401	PERMIT NO.	N153
COUNTY	NEW CASTLE	DESIGNED BY:	JDS (JMT)
		CHECKED BY:	MAW (JMT)

SIGNAL PLAN SR 279/896 (ELKTON ROAD) @ SR 4/896 (CHRISTINA PKWY)

SECTION: JMT
SHEET NO.: 426

PLOTTED BY: JDSMITH DATE: 12/17/2018
FILE LOCATION: Q:\NDE\140659_007_ELKTON_RD_CASHO_MILL\CADD\SG _ROUTE 4_PRINT FILES\1.DGN [SHEET: SG39]

SPAN WIRE SCHEDULE

SPAN	LENGTH	SPAN MOUNT HEIGHT	5% DROP	BULL RING HEIGHT	5% SAG	SPAN LOW POINT	BOTTOM OF LOWEST HEAD
NORTHEAST	64 FT	29.2 FT	3.2 FT	26.0 FT	-	-	-
SOUTHEAST	77 FT	29.9 FT	3.9 FT	26.0 FT	-	-	-
NORTHWEST	51 FT	28.6 FT	2.6 FT	26.0 FT	-	-	-
SOUTHWEST	59 FT	29.0 FT	3.0 FT	26.0 FT	-	-	-
NORTH	120 FT	-	-	26.0 FT	6.0 FT	20.0 FT	16.0 FT
SOUTH	120 FT	-	-	26.0 FT	6.0 FT	20.0 FT	16.0 FT
EAST	120 FT	-	-	26.0 FT	6.0 FT	20.0 FT	16.0 FT
WEST	120 FT	-	-	26.0 FT	6.0 FT	20.0 FT	16.0 FT

NOTE: FIELD ADJUSTMENTS AS REQUIRED

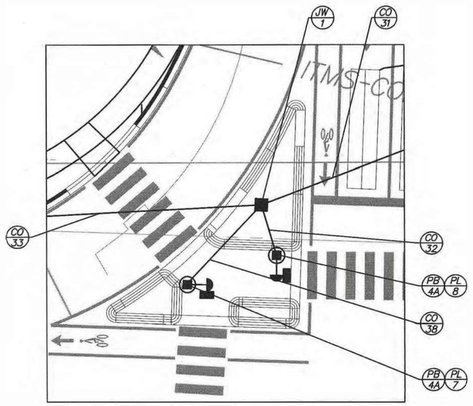
CONDUIT RUN SCHEDULE

CR#	# OF CONDUITS	B/T/O	SIZE	LENGTH	AMOUNT AND TYPE OF CABLE / WIRE
1	1 (GALV. STEEL)	T	2"	20'	(1)2/#8 U.F. W/GROUND
2	1 (GALV. STEEL)	T	2"	15'	(1)2/#8 U.F. W/GROUND
3	4	T	4"	15'	(19)2/#14, (4)4/#18, (2)16/#14, (2)9/#14, (12)5/#14, (4)1/#6 GRD
4	1	T	3"	10'	(2)16/#14, (4)4/#18, (1)1/#6 GRD
5	1	T	3"	25'	(1)9/#14, (1)1/#6 GRD
6	1	T	3"	35'	(1)5/#14, (1)1/#6 GRD
7	2	O	4"	80'	(19)2/#14, (1)9/#14, (11)5/#14, (1)1/#6 GRD
8	1	O	4"	35'	(10)2/#14, (5)5/#14, (1)9/#14, (1)1/#6 GRD
9	1	T	3"	10'	(2)5/#14, (1)1/#6 GRD
10	1	T	3"	5'	(1)5/#14, (1)1/#6 GRD
11	1 (SCHD 80 HDPE)	B	4"	90'	(5)2/#14, (1)9/#14, (4)5/#14, (1)1/#6 GRD
12	1	O	3"	10'	(1)5/#14, (1)1/#6 GRD
13	1	O	4"	30'	(3)2/#14, (2)5/#14, (1)1/#6 GRD
14	1	O	3"	10'	(1)5/#14, (1)1/#6 GRD
15	1 (SCHD 80 HDPE)	B	4"	65'	(2)2/#14, (1)9/#14, (1)5/#14, (1)1/#6 GRD
16	1	T	3"	40'	(1)5/#14, (1)1/#6 GRD
17	1	T	3"	10'	(1)9/#14, (1)1/#6 GRD
18	1	T	4"	80'	EMPTY
19	1	T	4"	200'	EMPTY
20	1 (SCHD 80 HDPE)	B	4"	85'	(2)2/#14, (1)1/#6 GRD
21	1 (SCHD 80 HDPE)	B	4"	60'	(9)2/#14, (4)5/#14, (1)1/#6 GRD
22	1	T	4"	65'	(2)2/#14, (1)1/#6 GRD
23	1 (SCHD 80 HDPE)	B	4"	75'	(5)2/#14, (4)5/#14, (1)1/#6 GRD
24	1	O	4"	40'	(5)2/#14, (2)5/#14, (1)1/#6 GRD
25	1	T	4"	170'	EMPTY
26	1	T	3"	20'	EMPTY
27	1	T	3"	10'	(1)5/#14, (1)1/#6 GRD
28	1	T	3"	20'	(1)5/#14, (1)1/#6 GRD
29	1	O	3"	10'	(1)5/#14, (1)1/#6 GRD
30	1 (SCHD 80 HDPE)	B	4"	95'	(5)2/#14, (2)5/#14, (1)1/#6 GRD
31	1 (SCHD 80 HDPE)	B	4"	60'	(2)2/#14, (2)5/#14, (1)1/#6 GRD
32	1	O	3"	15'	(1)5/#14, (1)1/#6 GRD
33	1	O	4"	65'	(2)2/#14, (1)1/#6 GRD
34	1	T	4"	40'	(2)2/#14, (1)1/#6 GRD
35	1	T	4"	45'	(2)2/#14, (1)1/#6 GRD
36	1	T	3"	35'	EMPTY
37	1	T	3"	20'	EMPTY
38	1	O	3"	25'	(1)5/#14, (1)1/#6 GRD

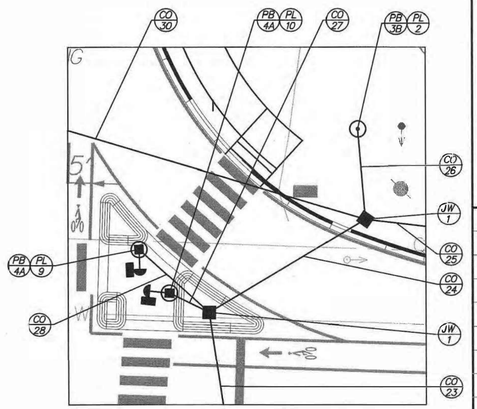
NOTE: ALL CONDUITS SHALL BE SCHEUDLE 80 PVC UNLESS OTHERWISE NOTED
B=BORE, T=TRENCH, O=OPEN CUT

ULTIMATE

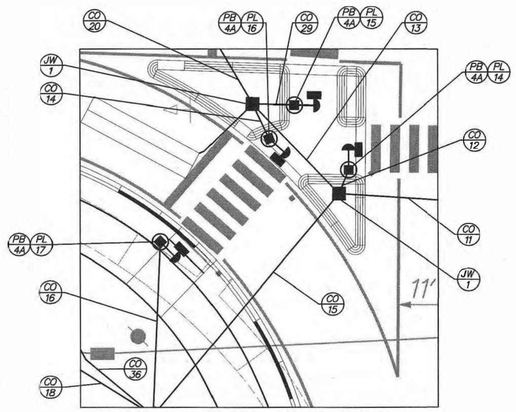




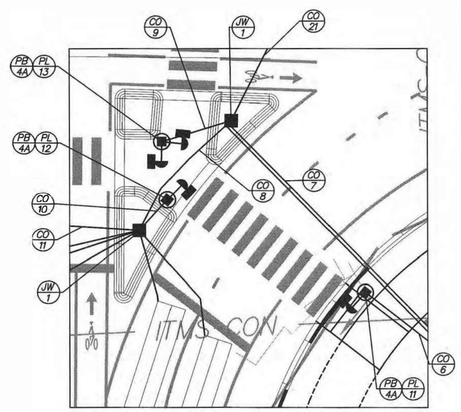
DETAIL 1 – NORTHWEST CORNER
SCALE: 1" = 15'



DETAIL 2 – NORTHEAST CORNER
SCALE: 1" = 15'

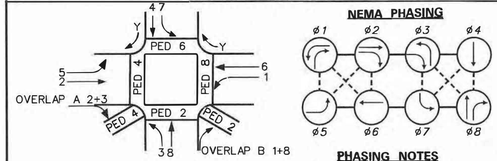


DETAIL 3 – SOUTHWEST CORNER
SCALE: 1" = 15'



DETAIL 4 – SOUTHEAST CORNER
SCALE: 1" = 15'

SIGNAL PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



1,2,7,8,11,12,15,16 — 3,4,9,10,13,14,17,18 — 5,6,19,20

LEGEND

AB	ABANDON	OH (*)	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH (*)	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO (*)	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO (*)	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (* OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (* OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		□
LOOP DETECTOR, TYPE 2		▭
LUMINAIRE		—◆
MAST ARM		➤
MICROWAVE DETECTION	—◀	—◀
OPTICOM RECEIVER	—●	—●
OVERHEAD SIGNING		—|
PEDESTRIAN POLE/BASE	○	◉
PEDESTRIAN PUSHBUTTON	—D	—➤
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		—R/W—
SERVICE PEDESTAL		P
SIGNAL CABINET		
SIGNAL HEAD	—▷	—➤
SIGNAL POLE/BASE	⊗	⊙
CCTV CAMERA		—■
SPAN WIRE	—XX—	—◇—
UTILITY POLE	⊘	◥
VIDEO DETECTION		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.

PREPARED BY
JOHNSON, MIRMIRAN & THOMPSON

Mir Ata Waked — 12/17/2018
DATE

THIS SEAL APPLIES TO ALL SHEETS BEARING THE "JMT" SECTION DESIGNATION.

MIR A. WAHED — LICENSE — No. 14810 — DELAWARE — PROFESSIONAL ENGINEER
SEAL

APPROVED FOR INSTALLATION

CHIEF TRAFFIC ENGINEER — 12/19/18 DATE

ADDENDA / REVISIONS			

NOT TO SCALE

ELKTON ROAD,
MD LINE TO
CASHO MILL ROAD

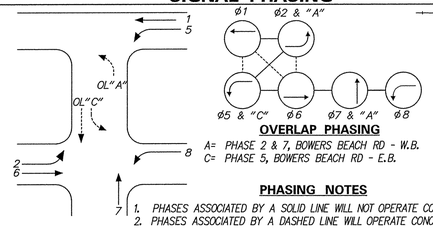
CONTRACT	T201504401	PERMIT NO.	N153
COUNTY	NEW CASTLE	DESIGNED BY:	JDS (JMT)
		CHECKED BY:	MAW (JMT)

SIGNAL PLAN
SR 279/896 (ELKTON ROAD)
@ SR 4/896 (CHRISTINA PKWY)

SECTION: JMT
SHEET NO.: 427

PLOTTED BY: JDSMITH DATE: 12/17/2018
FILE LOCATION: Q:\NDE\140659_007_ELKTON_RD_CASHO_MILL\CADD\SG_ROUTE 4_PRINT FILES\DGN [SHEET: SG40]

SIGNAL PHASING



OVERLAP PHASING

A= PHASE 2 & 7, BOWERS BEACH RD - W.B.
C= PHASE 5, BOWERS BEACH RD - E.B.

PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

(AB)	ABANDON	(OH/•)	EXISTING OVERHEAD RUN IDENTIFIER (• OF OVERHEAD RUN)
(CA/X)	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	(OH/•)	PROPOSED OVERHEAD RUN IDENTIFIER (• OF OVERHEAD RUN)
(CA/X)	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	(PB/X)	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
(CO/•)	EXISTING CONDUIT RUN IDENTIFIER (• OF CONDUIT RUN)	(PB/X)	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
(CO/•)	PROPOSED CONDUIT RUN IDENTIFIER (• OF CONDUIT RUN)	(PL/X)	EXISTING POLE IDENTIFIER (• OF POLE)
(JW/X)	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	(PL/X)	PROPOSED POLE IDENTIFIER (• OF POLE)
(JW/X)	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	(RM/C)	REMOVE BY CONTRACTOR
(MA/X)	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	(RM/O)	REMOVE BY OTHERS
(MA/X)	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	(RM/TC)	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W. □	■
LOOP DETECTOR, TYPE 1	⬚	□
LOOP DETECTOR, TYPE 2	▭	▬
LUMINAIRE	——○	——●
MAST ARM	▷	▶
MICROWAVE DETECTION	—◂	—◂
OPTICOM RECEIVER	—○	—●
OVERHEAD SIGNING	—⊣	—⊣
PEDESTRIAN POLE/BASE	◎	◉
PEDESTRIAN PUSHBUTTON	—▷	—▶
PEDESTRIAN SIGNAL HEAD	—▭	—▪
RIGHT-OF-WAY	———	———
SERVICE PEDESTAL	P	P
SIGNAL CABINET	▭	▬
SIGNAL HEAD	—▷	—▶
SIGNAL POLE/BASE	⊗	⊙
SPAN INSULATOR	◇	◆
SPAN WIRE	—XX—	———
UTILITY POLE	⊘	●
CAMERA (CCTV)	—▪	—▪

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-DOVER, DELAWARE.
2. POLE BASES, CABINET BASE AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.
3. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (50:1 FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES, THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAT 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL.
4. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
5. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
6. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.

MAST ARM SCHEDULE

MA#	LENGTH OF ARM	# OF SIGNAL HEADS	# OF OPTICOM RECEIVERS	SF OF SIGNING	ARM MOUNT HEIGHT
x1	80'	4	2	16	20'-0"
x2	70'	2	1	16	20'-0"
x3	70'	2	-	4	20'-0"
x4	70'	4	1	-	20'-0"
x5	70'	4	1	-	20'-0"
x6	70'	2	1	-	20'-0"
x7	70'	-	1	-	20'-0"

x- DENOTES EXISTING

POLE SCHEDULE

POLE #	POLE TYPE	HEIGHT	MATERIAL
x1	MAST ARM	21'-6"	STEEL
x4	CAMERA	75'	STEEL
x6	MAST ARM	21'-6"	STEEL
x7	MAST ARM	21'-6"	STEEL
x8	RWIS	30'	ALUMINUM
x10	MAST ARM	21'-6"	STEEL
x13	MAST ARM	21'-6"	STEEL
x14	MAST ARM	21'-6"	STEEL
x15	MAST ARM	21'-6"	STEEL
x18	REPEATER	30'	ALUMINUM

x- DENOTES EXISTING

ADDITIONAL LEGEND

- PROPOSED PAVEMENT
- PROPOSED WORK AREA
- PROPOSED WORK AREA REMOVAL
- PROPOSED PUCK SENSOR
- EXISTING PUCK SENSOR

NOTE: CONDUIT SCHEDULE FURTHER IN PLAN SET

PHASE V, STAGE 4

PHASE V, STAGE 4 SIGNAL NOTES

1. SLIDE SIGNAL HEADS #13,#14,#15 AND #16 TO NEW POSITIONS SHOWN.
2. PEDESTRIAN SIGNAL POLES, HEADS AND PUSH BUTTONS SHALL NOT BE INSTALLED DURING THIS STAGE. CONTRACTOR SHALL PLUG EXPOSED CONDUIT.
3. EXISTING 4"x4"x6" DECKING JUNCTION WELL.
4. EXISTING 9"x9"x6" HAND HOLE IN PARAPET WALL.

RECOMMENDED _____ DATE: _____

RECOMMENDED _____ DATE: 12/5/14

RECOMMENDED _____ DATE: 12/2/14

APPROVED TRAFFIC ENGINEER _____ DATE: 12/5/14

APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER _____ DATE: 12/9/14

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

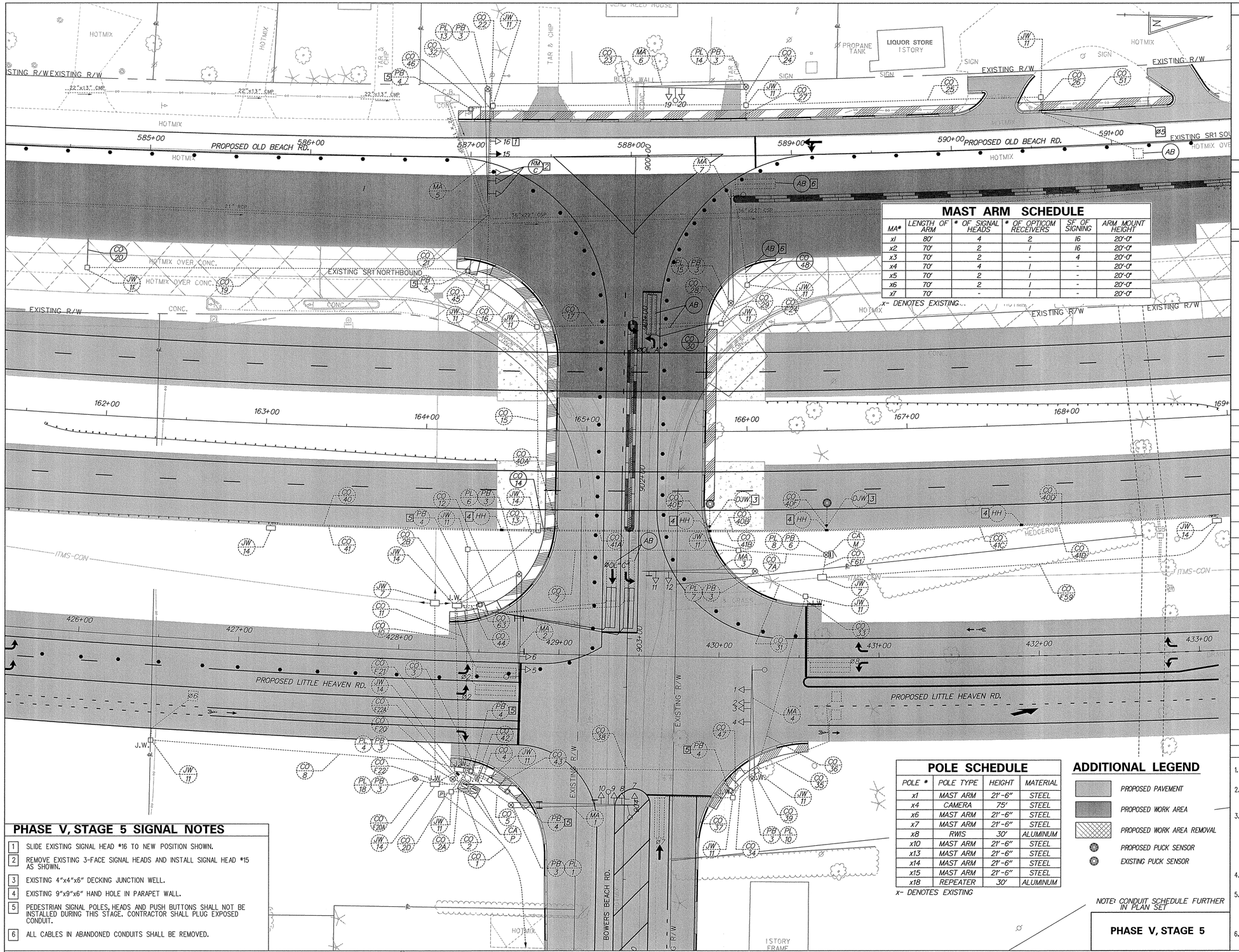
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SR1, LITTLE HEAVEN GRADE SEPARATED INTERSECTION

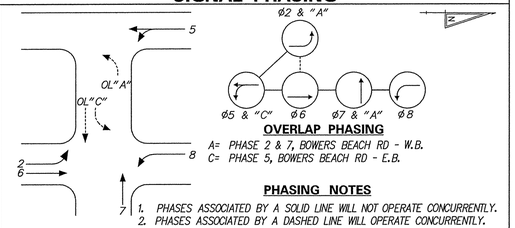
CONTRACT	PERMIT NO.	K145	SIGNAL PLAN
T200412202	DESIGNED BY:	MSK	SR1 @ BOWERS BEACH RD
COUNTY	CHECKED BY:	BAM	
KENT			

SHEET NO. 600 — TOTAL SHTS. 641

12/2/2014
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SIGNAL PHASING



OVERLAP PHASING

A= PHASE 2 & 7, BOWERS BEACH RD - W.B.
C= PHASE 5, BOWERS BEACH RD - E.B.

PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



MAST ARM SCHEDULE

MA#	LENGTH OF ARM	# OF SIGNAL HEADS	# OF OPTICOM RECEIVERS	SF OF SIGNING	ARM MOUNT HEIGHT
x1	80'	4	2	16	20'-0"
x2	70'	2	1	16	20'-0"
x3	70'	2	-	4	20'-0"
x4	70'	4	1	-	20'-0"
x5	70'	2	1	-	20'-0"
x6	70'	2	1	-	20'-0"
x7	70'	-	1	-	20'-0"

x- DENOTES EXISTING

POLE SCHEDULE

POLE #	POLE TYPE	HEIGHT	MATERIAL
x1	MAST ARM	21'-6"	STEEL
x4	CAMERA	75'	STEEL
x6	MAST ARM	21'-6"	STEEL
x7	MAST ARM	21'-6"	STEEL
x8	RWIS	30'	ALUMINUM
x10	MAST ARM	21'-6"	STEEL
x13	MAST ARM	21'-6"	STEEL
x14	MAST ARM	21'-6"	STEEL
x15	MAST ARM	21'-6"	STEEL
x18	REPEATER	30'	ALUMINUM

x- DENOTES EXISTING

LEGEND

AB	ABANDON	OH*	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH*	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO *	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO *	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (* OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (* OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA X	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA X	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W. □	■
LOOP DETECTOR, TYPE 1	□	□
LOOP DETECTOR, TYPE 2	▭	▭
LUMINAIRE	—○	—●
MAST ARM	▷	▶
MICROWAVE DETECTION	—◖	—◖
OPTICOM RECEIVER	—○	—●
OVERHEAD SIGNING	—⊣	—⊣
PEDESTRIAN POLE/BASE	◎	◉
PEDESTRIAN PUSHBUTTON	—▯	—▮
PEDESTRIAN SIGNAL HEAD	—▭	—▬
RIGHT-OF-WAY	———	———
SERVICE PEDESTAL	P	P
SIGNAL CABINET	▭	▬
SIGNAL HEAD	—▷	—▶
SIGNAL POLE/BASE	⊗	⊙
SPAN INSULATOR	◇	◆
SPAN WIRE	—XX—	——
UTILITY POLE	⊘	◔
CAMERA (CCTV)	—▮	—▮

ADDITIONAL LEGEND

- PROPOSED PAVEMENT
- PROPOSED WORK AREA
- PROPOSED WORK AREA REMOVAL
- PROPOSED PUCK SENSOR
- EXISTING PUCK SENSOR

NOTE: CONDUIT SCHEDULE FURTHER IN PLAN SET

PHASE V, STAGE 5

PHASE V, STAGE 5 SIGNAL NOTES

1. SLIDE EXISTING SIGNAL HEAD #16 TO NEW POSITION SHOWN.
2. REMOVE EXISTING 3-FACE SIGNAL HEADS AND INSTALL SIGNAL HEAD #15 AS SHOWN.
3. EXISTING 4"x4"x6" DECKING JUNCTION WELL.
4. EXISTING 9"x9"x6" HAND HOLE IN PARAPET WALL.
5. PEDESTRIAN SIGNAL POLES, HEADS AND PUSH BUTTONS SHALL NOT BE INSTALLED DURING THIS STAGE. CONTRACTOR SHALL PLUG EXPOSED CONDUIT.
6. ALL CABLES IN ABANDONED CONDUITS SHALL BE REMOVED.

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-DOVER, DELAWARE.
2. POLE BASES, CABINET BASE AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.
3. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (SQ=1 FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES, THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAT 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL.
4. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
5. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
6. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.

RECOMMENDED _____ DATE: _____

RECOMMENDED _____ DATE: 12/5/14

RECOMMENDED _____ DATE: 12/2/14

APPROVED TRAFFIC ENGINEER _____ DATE: 12/5/14

APPROVED FOR INSTALLATION
CHIEF TRAFFIC ENGINEER _____ DATE: 12/9/14

DELAWARE DEPARTMENT OF TRANSPORTATION

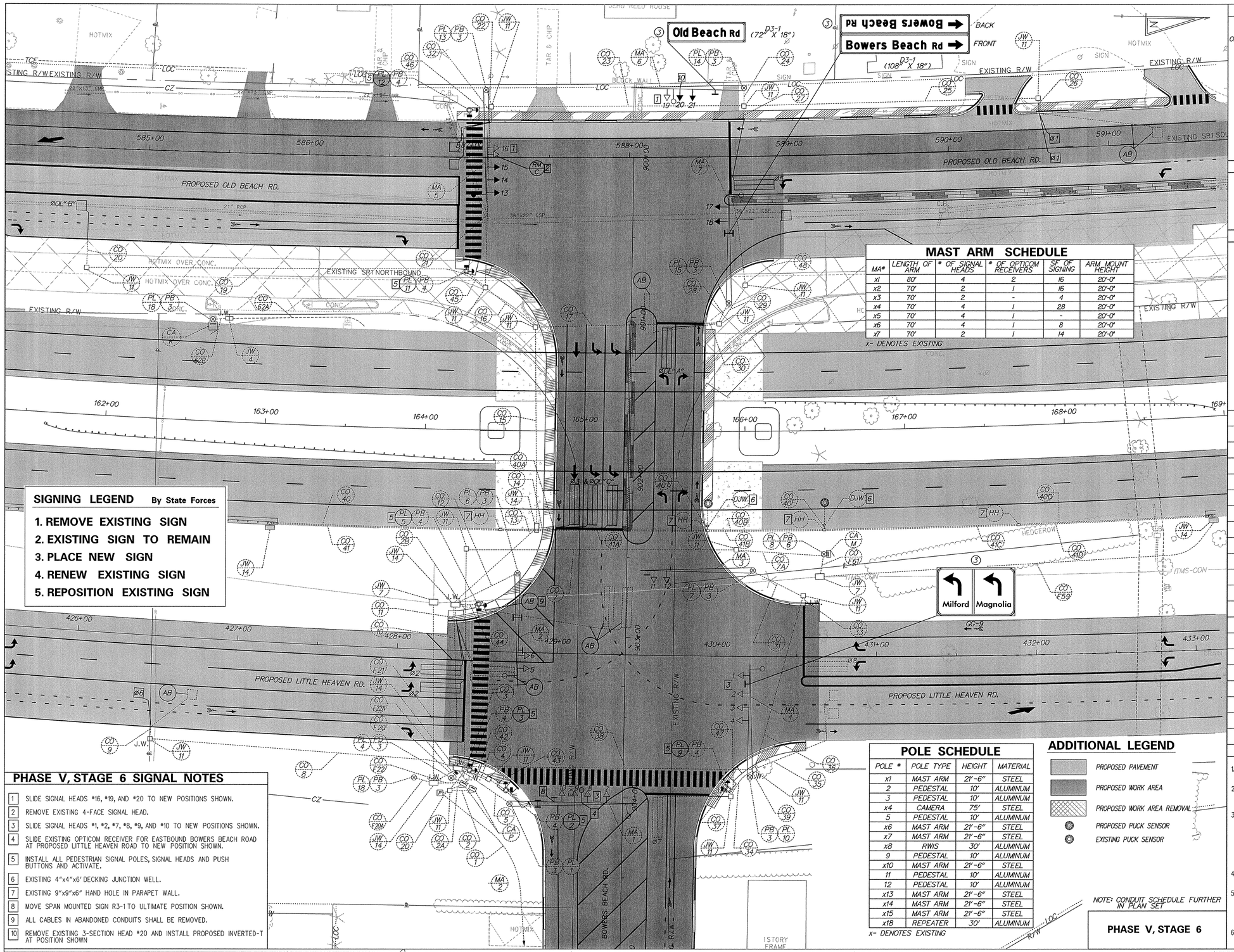
ADDENDUM / REVISIONS

SCALE 0 30 60 90 FEET

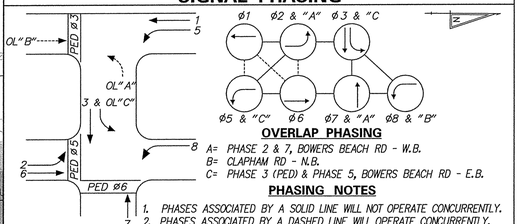
SR1, LITTLE HEAVEN GRADE SEPARATED INTERSECTION

CONTRACT	PERMIT NO.	K145	SIGNAL PLAN	SHEET NO.
T200412202	DESIGNED BY: MSK		SR1 @ BOWERS BEACH RD	601
COUNTY	CHECKED BY: BAM			TOTAL SHTS.
KENT				641

12/2/2014
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SIGNAL PHASING



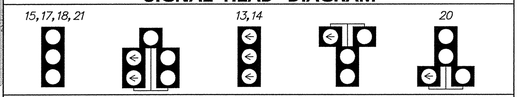
OVERLAP PHASING

A= PHASE 2 & 7, BOWERS BEACH RD - W.B.
B= CLAPHAM RD - N.B.
C= PHASE 3 (PED) & PHASE 5, BOWERS BEACH RD - E.B.

PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

AB	ABANDON	OH/*	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA/X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH/*	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA/X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB/X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO/*	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PB/X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO/*	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PL/X	EXISTING POLE IDENTIFIER (* OF POLE)
JW/X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL/X	PROPOSED POLE IDENTIFIER (* OF POLE)
JW/X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM/C	REMOVE BY CONTRACTOR
MA/X	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM/O	REMOVE BY OTHERS
MA/X	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM/TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1	□	□
LOOP DETECTOR, TYPE 2	▭	▭
LUMINAIRE	—○	—●
MAST ARM	▷	▶
MICROWAVE DETECTION	◀	◀
OPTICOM RECEIVER	—○	—●
OVERHEAD SIGNING	⊣	⊣
PEDESTRIAN POLE/BASE	○	◉
PEDESTRIAN PUSHBUTTON	—▷	—▶
PEDESTRIAN SIGNAL HEAD	⊐	⊐
RIGHT-OF-WAY	———	———
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD	—▷	—▶
SIGNAL POLE/BASE	⊗	⊙
SPAN INSULATOR	◇	◆
SPAN WIRE	—XX—	———
UTILITY POLE	⊘	●
CAMERA (CCTV)	—▮	—▮

MAST ARM SCHEDULE

MA*	LENGTH OF ARM	* OF SIGNAL HEADS	* OF OPTICOM RECEIVERS	SF OF SIGNING	ARM MOUNT HEIGHT
x1	80'	4	2	16	20'-0"
x2	70'	2	1	16	20'-0"
x3	70'	2	-	4	20'-0"
x4	70'	4	1	28	20'-0"
x5	70'	4	1	-	20'-0"
x6	70'	4	1	8	20'-0"
x7	70'	2	1	14	20'-0"

x- DENOTES EXISTING

SIGNING LEGEND By State Forces

1. REMOVE EXISTING SIGN
2. EXISTING SIGN TO REMAIN
3. PLACE NEW SIGN
4. RENEW EXISTING SIGN
5. REPOSITION EXISTING SIGN

PHASE V, STAGE 6 SIGNAL NOTES

1. SLIDE SIGNAL HEADS *16, *19, AND *20 TO NEW POSITIONS SHOWN.
2. REMOVE EXISTING 4-FACE SIGNAL HEAD.
3. SLIDE SIGNAL HEADS *1, *2, *7, *8, *9, AND *10 TO NEW POSITIONS SHOWN.
4. SLIDE EXISTING OPTICOM RECEIVER FOR EASTBOUND BOWERS BEACH ROAD AT PROPOSED LITTLE HEAVEN ROAD TO NEW POSITION SHOWN.
5. INSTALL ALL PEDESTRIAN SIGNAL POLES, SIGNAL HEADS AND PUSH BUTTONS AND ACTIVATE.
6. EXISTING 4"x4"x6' DECKING JUNCTION WELL.
7. EXISTING 9"x9"x6" HAND HOLE IN PARAPET WALL.
8. MOVE SPAN MOUNTED SIGN R3-1 TO ULTIMATE POSITION SHOWN.
9. ALL CABLES IN ABANDONED CONDUITS SHALL BE REMOVED.
10. REMOVE EXISTING 3-SECTION HEAD *20 AND INSTALL PROPOSED INVERTED-T AT POSITION SHOWN

POLE SCHEDULE

POLE #	POLE TYPE	HEIGHT	MATERIAL
x1	MAST ARM	21'-6"	STEEL
2	PEDESTAL	10'	ALUMINUM
3	PEDESTAL	10'	ALUMINUM
x4	CAMERA	75'	STEEL
5	PEDESTAL	10'	ALUMINUM
x6	MAST ARM	21'-6"	STEEL
x7	MAST ARM	21'-6"	STEEL
x8	RWIS	30'	ALUMINUM
9	PEDESTAL	10'	ALUMINUM
x10	MAST ARM	21'-6"	STEEL
11	PEDESTAL	10'	ALUMINUM
12	PEDESTAL	10'	ALUMINUM
x13	MAST ARM	21'-6"	STEEL
x14	MAST ARM	21'-6"	STEEL
x15	MAST ARM	21'-6"	STEEL
x18	REPEATER	30'	ALUMINUM

x- DENOTES EXISTING

ADDITIONAL LEGEND

- PROPOSED PAVEMENT
- PROPOSED WORK AREA
- PROPOSED WORK AREA REMOVAL
- PROPOSED PUCK SENSOR
- EXISTING PUCK SENSOR

NOTE: CONDUIT SCHEDULE FURTHER IN PLAN SET

PHASE V, STAGE 6

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-DOVER, DELAWARE.
2. POLE BASES, CABINET BASE AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.
3. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (50:1 FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES, THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAT 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL.
4. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
5. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
6. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.

RECOMMENDED _____ DATE: _____

RECOMMENDED _____ DATE: 12/5/14

RECOMMENDED _____ DATE: 12/2/14

APPROVED TRAFFIC ENGINEER _____ DATE: 12/5/14

APPROVED FOR INSTALLATION
CHIEF TRAFFIC ENGINEER _____ DATE: 12/9/14

DELAWARE
DEPARTMENT OF TRANSPORTATION

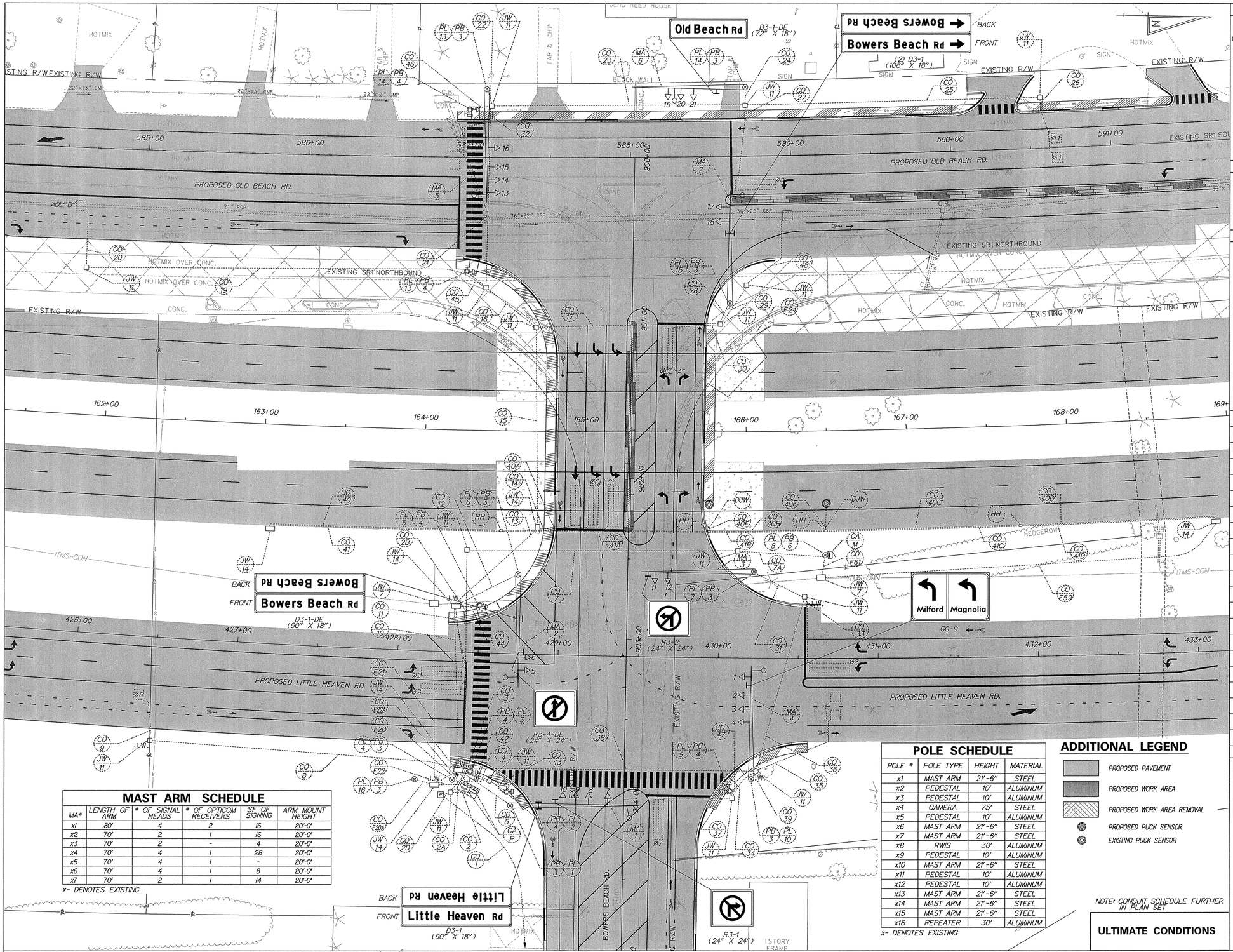
ADDENDUM / REVISIONS

SCALE
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SR1, LITTLE HEAVEN GRADE SEPARATED INTERSECTION

CONTRACT	PERMIT NO.	K145	SIGNAL PLAN	SHEET NO.
T200412202	DESIGNED BY: MSK		SR1 @ BOWERS BEACH RD	602
COUNTY	CHECKED BY: BAM			TOTAL SHTS.
KENT				641

12/2/2014
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MAST ARM SCHEDULE

MA#	LENGTH OF ARM	# OF SIGNAL HEADS	# OF OPTICOM RECEIVERS	SF OF SIGNING	ARM MOUNT HEIGHT
x1	80'	4	2	16	20'-0"
x2	70'	2	1	16	20'-0"
x3	70'	2	-	4	20'-0"
x4	70'	4	1	28	20'-0"
x5	70'	4	1	-	20'-0"
x6	70'	4	1	8	20'-0"
x7	70'	2	1	14	20'-0"

x- DENOTES EXISTING

POLE SCHEDULE

POLE #	POLE TYPE	HEIGHT	MATERIAL
x1	MAST ARM	21'-6"	STEEL
x2	PEDESTAL	10'	ALUMINUM
x3	PEDESTAL	10'	ALUMINUM
x4	CAMERA	75'	STEEL
x5	PEDESTAL	10'	ALUMINUM
x6	MAST ARM	21'-6"	STEEL
x7	MAST ARM	21'-6"	STEEL
x8	RWIS	30'	ALUMINUM
x9	PEDESTAL	10'	ALUMINUM
x10	MAST ARM	21'-6"	STEEL
x11	PEDESTAL	10'	ALUMINUM
x12	PEDESTAL	10'	ALUMINUM
x13	MAST ARM	21'-6"	STEEL
x14	MAST ARM	21'-6"	STEEL
x15	MAST ARM	21'-6"	STEEL
x18	REPEATER	30'	ALUMINUM

x- DENOTES EXISTING

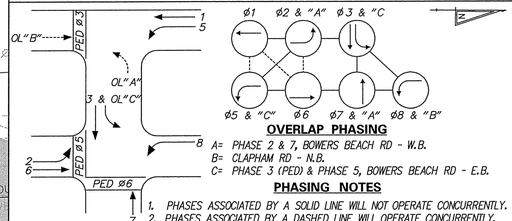
ADDITIONAL LEGEND

- PROPOSED PAVEMENT
- PROPOSED WORK AREA
- PROPOSED WORK AREA REMOVAL
- PROPOSED PUCK SENSOR
- EXISTING PUCK SENSOR

NOTE: CONDUIT SCHEDULE FURTHER IN PLAN SET

ULTIMATE CONDITIONS

SIGNAL PHASING



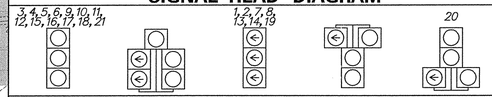
OVERLAP PHASING

A= PHASE 2 & 7, BOWERS BEACH RD - W.B.
B= CLAPHAM RD - N.B.
C= PHASE 3 (PED) & PHASE 5, BOWERS BEACH RD - E.B.

PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

AB	ABANDON	OH#	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH#	PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #'	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (# OF POLE)
JW X'	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (# OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA X'	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA X	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W. □	■
LOOP DETECTOR, TYPE 1	⬚	□
LOOP DETECTOR, TYPE 2	▭	▭
LUMINAIRE	—○	—●
MAST ARM	▷	▶
MICROWAVE DETECTION	—◂	—◂
OPTICOM RECEIVER	—○	—●
OVERHEAD SIGNING	—⊣	—⊣
PEDESTRIAN POLE/BASE	◎	◉
PEDESTRIAN PUSHBUTTON	—▯	—▮
PEDESTRIAN SIGNAL HEAD	—▭	—▬
RIGHT-OF-WAY	———	———
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD	—▷	—▶
SIGNAL POLE/BASE	—⊗	—⊙
SPAN INSULATOR	—◇	—◆
SPAN WIRE	—XX—	———
UTILITY POLE	—Ø	—Ø
CAMERA (CCTV)	—▪	—▪

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-DOVER, DELAWARE.
2. POLE BASES, CABINET BASE AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.
3. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (50:1 FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES, THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAT 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL.
4. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
5. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
6. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.

RECOMMENDED _____ DATE: _____

RECOMMENDED Jack SAINTIL DATE: 12/5/14

RECOMMENDED [illegible] DATE: 12/2/14

APPROVED TRAFFIC ENGINEER [illegible] DATE: 12/5/14

APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER [illegible] DATE: 12/9/14

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SCALE 0 30 60 90 FEET

SR1, LITTLE HEAVEN GRADE SEPARATED INTERSECTION

CONTRACT	T200412202	PERMIT NO.	K145
COUNTY	KENT	DESIGNED BY:	MSK
		CHECKED BY:	BAM

SIGNAL PLAN

SR1 @ BOWERS BEACH RD

SHEET NO.	603
TOTAL SHTS.	641

12/2/2014
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PHASE III, STAGE 4 CONDUIT RUN SCHEDULE

CO*	* OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/WIRE
1	1	2"	GALV	190'/30'	T/P	(1) 2/*8 UFW/GROUND
2	1	2"	GALV	15'	T	(1) 2/*8 UFW/GROUND
2A	1	2"	GALV	10'	T	*(SEE UTILITY & ITMS PLANS)
2B	1	2"	GALV	115'	T	*(SEE UTILITY & ITMS PLANS)
2D	1	3"	GALV	5'	T	(1)2/*8 UFW/GROUND *(SEE UTILITY & ITMS PLANS)
3	3	4"	PVC	15'	T	(10) 2/*14 (1)*6 BSC
4	1	4"	PVC	20'	T	EMPTY
5	1	3"	PVC	40'	T	EMPTY
7	1	2"	GALV	125'	B	*(SEE UTILITY & ITMS PLANS)
8	1	4"	PVC	190'	T	(2) 2/*14 (20' COILED IN JW), (1)*6 BSC
9	1	1.5"	GALV	10'	T	EMPTY
10	1	4"	PVC	105'	T	(4) 2/*14 (20' OF (1) 2/*14COILED IN JW), (1)*6 BSC
12	1	3"	PVC	45'	T	EMPTY
31	1	3"	PVC	35'	T	EMPTY
34	1	4"	PVC	25'	T	(1) 2/*14 (20' COILED IN JW), (1)*6 BSC
35	1	1.5"	GALV	50'	T	EMPTY
36	1	4"	PVC	115'	T	(1) 2/*14 (20' COILED IN JW), (1)*6 BSC
37	1	1.5"	GALV	15'	T	EMPTY
38	1	4"	HDPE	185'	B	(4)2/*14 (20' EACH OF (2)2/*14 COILED IN JW), (1)*6 BSC
39	1	3"	PVC	10'	T	EMPTY
42	1	2.5"	PVC	15'	T	EMPTY
43	1	2.5"	PVC	15'	T	EMPTY
44	1	2.5"	PVC	15'	T	EMPTY
47	1	2.5"	PVC	5'	T	EMPTY
49	1	4"	HDPE	215'	B	EMPTY
x50	1	1.5"	-	10'	-	EXISTING (4)4/*18
x51	1	1.5"	-	10'	-	EXISTING (4)4/*18
x52	1	2.5"	-	235'	-	EXISTING (2) 4/*18
x53	1	1.5"	-	20'	-	EXISTING (2) 4/*18
x54	1	2.5"	-	65'	-	EXISTING (2) 4/*18
x55	1	2.5"	-	290'	-	EXISTING (3) 4/*18
x56	1	2.5"	-	15'	-	EXISTING [(3) 4/*18 (2) 16/*14]
x57	1	2.5"	-	50'	-	EXISTING (6) 4/*18 REMOVE (1) 4/*18 NEW (2) 2/*14
x58	1	1.5"	-	15'	-	EXISTING (2) 4/*18
x59	2	2.5"	-	85'	-	EXISTING [(2)2/*8 UFW/GRND (2) 6/*22] REMOVE [(1)2/*8 (1)6/*22]
x60	2	2.5"	-	70'	-	EXISTING [(2)2/*8 UFW/GRND (2) 6/*22] REMOVE [(1)2/*8 (1)6/*22]
x61	2	2.5"	-	180'	-	EXISTING [(2)2/*8 UFW/GRND (2) 6/*22] REMOVE [(1)2/*8 (1)6/*22]
x62	1	2.5"	-	15'	-	EXISTING [(1)2/*8 UFW/GRND (1) 6/*22]
x62A	1	2.5"	-	90'	-	EXISTING [(1)2/*8 UFW/GRND (1) 6/*22] REMOVE [(1)2/*8 (1)6/*22]
x62B	1	2.5"	-	15'	-	EXISTING [(1)2/*8 UFW/GRND (1) 6/*22] REMOVE [(1)2/*8 (1)6/*22]
x64	1	2.5"	-	75'	-	EXISTING (1)2/*8 UFW/GROUND
x65	1	2.5"	-	75'	-	EXISTING (3) 4/*18 REMOVE (1) 4/*18 NEW (2) 2/*14
x66	1	2.5"	-	125'	-	EXISTING (2)4/*18 REMOVE (1) 4/*18 NEW (2) 2/*14
x67	1	2.5"	-	370'	-	EXISTING (2)4/*18 REMOVE (1)4/*18 NEW (2) 2/*14
x68	1	1.5"	-	15'	-	EXISTING (4)4/*18 REMOVE (4)4/*18 NEW (4) 1/*14
x69	1	1.5"	-	15'	-	EXISTING (4) 4/*18
F20	1	xx4"	-	20'	-	*(SEE UTILITY AND ITMS PLANS)
F20A	1	3"	-	15'	-	*(SEE UTILITY AND ITMS PLANS)
F21	1	xx4"	-	115'	-	*(SEE UTILITY AND ITMS PLANS)
F22	1	4"	-	20'	-	*(SEE UTILITY AND ITMS PLANS)
F22A	1	3"	-	20'	-	*(SEE UTILITY AND ITMS PLANS)

LEGEND

x DENOTES EXISTING

xx ALL 4" ITMS CONDUIT TO BE MULTI-DUCT WITH FOUR 1" INNER DUCTS EXCEPT WHERE SHOWN. THE 1" INNER DUCTS SHALL BE FURNISHED AND INSTALLED BY THE FIBER CONTRACTOR.

* SEE UTILITY AND ITMS PLANS FOR SCHEDULE FOR THE INSTALLATION OF FIBER OPTIC CABLES AND/OR POWER CABLES TO ITMS DEVICES.

B-BORE P- ATTACH TO POLE
T-TRENCH SM- SINGLE MODE FIBER
O-OPEN CUT BSC- BARE STRANDED COPPER

PHASE III, STAGE 5 CONDUIT RUN SCHEDULE

CO*	* OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/WIRE
x1	1	2"	GALV	190'/30'	-	EXISTING (1) 2/*8 UFW/GROUND
x2	1	2"	GALV	15'	-	EXISTING (1) 2/*8 UFW/GROUND
x2A	1	2"	GALV	10'	-	*(SEE UTILITY & ITMS PLANS)
x2B	1	2"	GALV	115'	-	*(SEE UTILITY & ITMS PLANS)
x2C	1	2"	GALV	25'	-	*(SEE UTILITY & ITMS PLANS)
x2D	1	3"	GALV	5'	-	EXISTING (1)2/*8 UFW/GROUND *(SEE UTILITY & ITMS PLANS)
x3	3	4"	PVC	15'	-	EXISTING [(10) 2/*14 (1) *6 BSC] NEW [(6) 4/*18 (4) 2/*14 (3) 9/*14 (2) 16/*14]
x4	1	4"	PVC	20'	-	EMPTY
x5	1	3"	PVC	40'	-	NEW (2)4/*18 (1)9/*14 (1)*6 BSC
x7	1	2"	GALV	125'	-	*(SEE UTILITY & ITMS PLANS)
x8	1	4"	PVC	190'	-	EXISTING (2) 2/*14 (1)*6 BSC
x9	1	1.5"	GALV	10'	-	(4) 1/*14
x10	1	4"	PVC	105'	-	EX.[(4) 2/*14 (20' OF (1)2/*14 COILED IN JW), (1)*6 BSC] NEW (1)4/*18
11	1	1.5"	GALV	15'	T	(2) 1/*14
x12	1	3"	PVC	45'	-	NEW (1)4/*18 (1)*6 BSC
22	1	3"	PVC	15'	T	EMPTY
23	1	4"	HDPE	160'	B	EMPTY
24	1	3"	PVC	15'	T	EMPTY
25	1	4"	HDPE	185'	B	EMPTY
27	1	1.5"	GALV	10'	T	EMPTY
x31	1	3"	PVC	35'	-	NEW (1)9/*14 (1)*6 BSC
x34	1	4"	PVC	25'	-	EXISTING (1) 2/*14 (1)*6 BSC
x35	1	1.5"	GALV	50'	-	EMPTY
x36	1	4"	PVC	115'	-	EXISTING [(1) 2/*14 (20' COILED IN JW), (1)*6 BSC] NEW [(3)4/*18 (4)2/*14 (1)9/*14 (2)16/*14]
x37	1	1.5"	GALV	15'	-	NEW (2) 1/*14
x38	1	4"	HDPE	185'	-	EXISTING [(4) 2/*14 (20' EACH OF (2)2/*14 COILED IN JW), (1)*6 BSC] NEW [(3)4/*18 (4)2/*14 (2)9/*14 (2)16/*14]
x39	1	3"	PVC	10'	-	NEW (1)9/*14 (1)*6 BSC
x42	1	2.5"	PVC	15'	-	EMPTY
x43	1	2.5"	PVC	15'	-	EMPTY
x44	1	2.5"	PVC	15'	-	EMPTY
46	1	2.5"	PVC	10'	T	EMPTY
x47	1	2.5"	PVC	5'	-	EMPTY
x49	1	4"	HDPE	215'	-	NEW [(3) 4/*18 (4) 2/*14 (2) 16/*14]
x51	1	1.5"	-	10'	-	EXISTING (4) 4/*18 REMOVE (4)4/*18 NEW (4)1/*14
x52	1	2.5"	-	235'	-	EXISTING (2)4/*18 REMOVE (1)4/*18 NEW (2)2/*14
x53	1	1.5"	-	20'	-	EXISTING (2)4/*18 REMOVE (2)4/*18 NEW (2)1/*14
x54	1	2.5"	-	65'	-	EXISTING (2)4/*18 REMOVE (1)4/*18 NEW (2)2/*14
x55	1	2.5"	-	290'	-	EXISTING (3) 4/*18
x56	1	2.5"	-	15'	-	EXISTING [(3) 4/*18 (2) 16/*14] REMOVE [(3) 4/*18 (2) 16/*14] NEW [(3)4/*18 (2)16/*14]
x57	1	2.5"	-	50'	-	EXISTING [(5)4/*18 (2)2/*14] REMOVE [(5)4/*18 (2)2/*14] NEW [(3)4/*18 (2)16/*14]
63	1	1.5"	GALV	30'	T	(4) 1/*14
x64	1	4"	-	75'	-	EXISTING (1) 2/*8 UFW/GROUND
x65	1	2.5"	-	75'	-	EXISTING [(2)4/*18 (2)2/*14] REMOVE [(2)4/*18 (2)2/*14] NEW (3)2/*14
xF20	1	xx4"	-	20'	-	*(SEE UTILITY AND ITMS PLANS)
xF20A	1	3"	-	15'	-	*(SEE UTILITY AND ITMS PLANS)
xF21	1	xx4"	-	115'	-	*(SEE UTILITY AND ITMS PLANS)
xF22	1	4"	-	20'	-	*(SEE UTILITY AND ITMS PLANS)
xF22A	1	3"	-	20'	-	*(SEE UTILITY AND ITMS PLANS)

LEGEND

x DENOTES EXISTING

xx ALL 4" ITMS CONDUIT TO BE MULTI-DUCT WITH FOUR 1" INNER DUCTS EXCEPT WHERE SHOWN. THE 1" INNER DUCTS SHALL BE FURNISHED AND INSTALLED BY THE FIBER CONTRACTOR.

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B-BORE P- ATTACH TO POLE
T-TRENCH SM- SINGLE MODE FIBER
O-OPEN CUT BSC- BARE STRANDED COPPER

SIGNAL PHASING

SIGNAL HEAD DIAGRAM

LEGEND

AB	ABANDON	OH (*)	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA (X)	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH (*)	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA (X)	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB (X)	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO (*)	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PB (X)	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO (*)	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PL (X)	EXISTING POLE IDENTIFIER (* OF POLE)
JW (X)	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL (X)	PROPOSED POLE IDENTIFIER (* OF POLE)
JW (X)	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM (C)	REMOVE BY CONTRACTOR
MA (X)	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM (O)	REMOVE BY OTHERS
MA (X)	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM (TC)	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
SPAN INSULATOR		
SPAN WIRE	XX	
UTILITY POLE		
CAMERA (CCTV)		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-DOVER, DELAWARE.
2. POLE BASES, CABINET BASE AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.
3. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (5:1 FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAT 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL.
4. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
5. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
6. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.

RECOMMENDED _____ DATE: _____

RECOMMENDED [signature] DATE: 12/5/14

RECOMMENDED [signature] DATE: 12/2/14

APPROVED TRAFFIC ENGINEER [signature] DATE: 12/5/14

APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER [signature] DATE: 12/9/14

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SR1, LITTLE HEAVEN GRADE SEPARATED INTERSECTION

CONTRACT	PERMIT NO.	K145	SIGNAL PLAN	SHEET NO.
T200412202	DESIGNED BY:	MSK	SR1 @ BOWERS BEACH RD	604
COUNTY	CHECKED BY:	BAM		TOTAL SHTS.
KENT				641

12/2/2014
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PHASE IV, STAGE 4A CONDUIT RUN SCHEDULE

CO*	* OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/WIRE
x1	1	2"	GALV	190'/30'	-	EXISTING (1) 2/*8 UFW/GROUND
x2	1	2"	GALV	15'	-	EXISTING (1) 2/*8 UFW/GROUND
x2A	1	2"	GALV	10'	-	*(SEE UTILITY & ITMS PLANS)
x2B	1	2"	GALV	115'	-	*(SEE UTILITY & ITMS PLANS)
x2C	1	2"	GALV	25'	-	*(SEE UTILITY & ITMS PLANS)
x2D	1	3"	GALV	5'	-	EXISTING (1)2/*8 UFW/GROUND *(SEE UTILITY & ITMS PLANS)
x3	3	4"	PVC	15'	-	EXISTING [(14)2/*14 (6)4/*18 (3)9/*14 (2)16/*14 (1)*6 BSC]
x4	1	4"	PVC	20'	-	EMPTY
x5	1	3"	PVC	40'	-	EXISTING [(2)4/*18 (1)9/*14 (1)*6 BSC]
x7	1	2"	GALV	125'	-	*(SEE UTILITY & ITMS PLANS)
x8	1	4"	PVC	190'	-	EXISTING [(2) 2/*14 (1)*6 BSC]
x9	1	1.5"	GALV	10'	-	EXISTING (4) 1/*14
x10	1	4"	PVC	105'	-	EX. [(1)4/*18 (4) 2/*14 (20' EA.OF (1)2/*14 COILED IN JW), (1)*6 BSC]
x11	1	1.5"	GALV	15'	-	EXISTING (2) 1/*14
x12	1	3"	PVC	45'	-	EXISTING [(1)4/*18 (1)*6 BSC]
x22	1	3"	PVC	15'	-	EMPTY
x23	1	4"	HDPE	160'	-	EMPTY
x24	1	3"	PVC	15'	-	EMPTY
x25	1	4"	HDPE	185'	-	EMPTY
x27	1	1.5"	GALV	10'	-	EMPTY
x31	1	3"	PVC	35'	-	EXISTING [(1)9/*14 (1)*6 BSC]
x34	1	4"	PVC	25'	-	EXISTING [(1) 2/*14 (1)*6 BSC]
x35	1	1.5"	GALV	50'	-	EMPTY
x36	1	4"	PVC	115'	-	EXISTING [(3)4/*18 (5)2/*14 (20' OF (1)2/*14 COILED IN JW) (1)9/*14 (2)16/*14 (1)*6 BSC]
x37	1	1.5"	GALV	15'	-	EXISTING (2) 1/*14
x38	1	4"	HDPE	185'	-	EXISTING [(3)4/*18 (8) 2/*14 (20' EACH OF (4)2/*14 COILED IN JW) (2)9/*14 (2)16/*14 (1)*6 BSC]
x39	1	3"	PVC	10'	-	EXISTING (1)9/*14 (1)*6 BSC
x42	1	2.5"	PVC	15'	-	EMPTY
x43	1	2.5"	PVC	15'	-	EMPTY
x44	1	2.5"	PVC	15'	-	EMPTY
x46	1	2.5"	PVC	10'	-	EMPTY
x47	1	2.5"	PVC	5'	-	EMPTY
x49	1	4"	HDPE	215'	-	EXISTING [(3)4/*18 (4)2/*14 (2)16/*14]
x51	1	1.5"	-	10'	-	EXISTING (4) 1/*14 REMOVE (4)1/*14 NEW (4)1/*14
x52	1	2.5"	-	235'	-	EXISTING [(1) 4/*18 (2)2/*14]
x53	1	1.5"	-	20'	-	EXISTING (2) 1/*14
x54	1	2.5"	-	65'	-	EXISTING [(1) 4/*18 (2)2/*14]
x55	1	2.5"	-	290'	-	EXISTING (3) 4/*18
x56	1	2.5"	-	15'	-	EXISTING [(3) 4/*18 (2) 16/*14]
x57	1	2.5"	-	50'	-	EXISTING [(3)4/*18 (2)16/*14]
x63	1	1.5"	GALV	30'	-	EXISTING (4) 1/*14
x64	1	4"	-	75'	-	EXISTING (1) 2/*8 UFW/GROUND
x65	1	2.5"	-	75'	-	EXISTING (3)2/*14
xF20	1	xx4"	-	20'	-	*(SEE UTILITY AND ITMS PLANS)
xF20A	1	3"	-	15'	-	*(SEE UTILITY AND ITMS PLANS)
xF21	1	xx4"	-	115'	-	*(SEE UTILITY AND ITMS PLANS)
xF22	1	4"	-	20'	-	*(SEE UTILITY AND ITMS PLANS)
xF22A	1	3"	-	20'	-	*(SEE UTILITY AND ITMS PLANS)

LEGEND

x DENOTES EXISTING

xx ALL 4" ITMS CONDUIT TO BE MULTI-DUCT WITH FOUR 1" INNER DUCTS EXCEPT WHERE SHOWN. THE 1" INNER DUCTS SHALL BE FURNISHED AND INSTALLED BY THE FIBER CONTRACTOR.

* SEE UTILITY AND ITMS PLANS FOR SCHEDULE FOR THE INSTALLATION OF FIBER OPTIC CABLES AND/OR POWER CABLES TO ITMS DEVICES.

B-BORE P- ATTACH TO POLE
T-TRENCH SM- SINGLE MODE FIBER
O-OPEN CUT BSC- BARE STRANDED COPPER

PHASE IV, STAGE 4B CONDUIT RUN SCHEDULE

CO*	* OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/WIRE
x1	1	2"	GALV	190'/30'	-	EXISTING (1) 2/*8 UFW/GROUND
x2	1	2"	GALV	15'	-	EXISTING (1) 2/*8 UFW/GROUND
x2A	1	2"	GALV	10'	-	*(SEE UTILITY & ITMS PLANS)
x2B	1	2"	GALV	115'	-	*(SEE UTILITY & ITMS PLANS)
x2C	1	2"	GALV	25'	-	*(SEE UTILITY & ITMS PLANS)
x2D	1	3"	GALV	5'	-	EXISTING (1)2/*8 UFW/GROUND *(SEE UTILITY & ITMS PLANS)
x3	3	4"	PVC	15'	-	EXISTING [(14)2/*14 (6)4/*18 (3)9/*14 (2)16/*14 (1)*6 BSC] REMOVE [(3)4/*18 (4)2/*14 (2)16/*14] NEW [(2)4/*18 (8)2/*14 (2)9/*14]
x4	1	4"	PVC	20'	-	EMPTY
x5	1	3"	PVC	40'	-	EXISTING (2)4/*18 (1)9/*14 (1)*6 BSC
x7	1	2"	GALV	125'	-	*(SEE UTILITY & ITMS PLANS)
x8	1	4"	PVC	190'	-	EXISTING (2) 2/*14 (1)*6 BSC
x9	1	1.5"	GALV	10'	-	EXISTING (4) 1/*14
x10	1	4"	PVC	105'	-	EX. [(1)4/*18 (4)2/*14 (20' EA.OF (1)2/*14 COILED IN JW), (1)*6 BSC] NEW [(2)4/*18 (8)2/*14 (2)9/*14]
x11	1	1.5"	GALV	15'	-	EXISTING (2) 1/*14
x12	1	3"	PVC	45'	-	EXISTING (1)4/*18 (1)*6 BSC
13	1	4"	PVC	70'	T	(2)4/*18 (8)2/*14 (2)9/*14 (1)*6 BSC
15	1	4"	PVC	125'	T	(2)4/*18 (8)2/*14 (2)9/*14 (1)*6 BSC
16	1	4"	PVC	40'	T	(1)4/*18 (6)2/*14 (2)9/*14 (1)*6 BSC
17	1	4"	HDPE	115'	B	(1)4/*18 (2)2/*14 (1)*6 BSC
18	1	1.5"	GALV	40'	T	(2)1/*14
19	1	4"	PVC	255'	T	(1)2/*14 (20' COILED IN JW), (1)*6 BSC
21	1	4"	HDPE	115'	B	(1)4/*18 (5)2/*14 (20' EA.OF (2)2/*14 COILED IN JW), (2)9/*14 (1)*6 BSC
x22	1	3"	PVC	15'	-	NEW (1)9/*14 (1)*6 BSC
x23	1	4"	HDPE	160'	-	NEW (1)4/*18 (3)2/*14 (20' OF (1)2/*14 COILED IN JW), (1)9/*14 (1)*6 BSC
x24	1	3"	PVC	15'	-	NEW (1)4/*18 (1)9/*14 (1)*6 BSC
x25	1	4"	HDPE	185'	-	NEW (2)2/*14 (1)*6 BSC
26	1	1.5"	GALV	10'	T	(4)1/*14
x27	1	1.5"	GALV	10'	-	EMPTY
28	1	3"	PVC	10'	T	(1)4/*18 (1)*6 BSC
29	1	4"	PVC	30'	T	(1)2/*14 (1)*6 BSC
x31	1	3"	PVC	35'	-	EXISTING (1)9/*14 (1)*6 BSC
x34	1	4"	PVC	25'	-	EXISTING (1) 2/*14 (1)*6 BSC
x35	1	1.5"	GALV	50'	-	EMPTY
x36	1	4"	PVC	115'	-	EXISTING [(3)4/*18 (5)2/*14 (20' OF (1)2/*14 COILED IN JW) (1)9/*14 (2)16/*14 (1)*6 BSC] REMOVE [(3)4/*18 (4)2/*14 (2)16/*14]
x37	1	1.5"	GALV	15'	-	EXISTING (2) 1/*14
x38	1	4"	HDPE	185'	-	EXISTING [(3)4/*18 (8) 2/*14 (20' EACH OF (4)2/*14 COILED IN JW) (2)9/*14 (2)16/*14 (1)*6 BSC] REMOVE [(3)4/*18 (4)2/*14 (2)16/*14]
x39	1	3"	PVC	10'	-	EXISTING (1)9/*14 (1)*6 BSC
40	1	2.5"	-	145'	-	*(SEE UTILITY AND ITMS PLANS)
40A	1	2.5"	-	130'	-	*(SEE UTILITY AND ITMS PLANS)
40B	1	2.5"	-	75'	-	*(SEE UTILITY AND ITMS PLANS)
40C	1	2.5"	-	125'	-	*(SEE UTILITY AND ITMS PLANS)
40D	1	2.5"	-	130'	-	*(SEE UTILITY AND ITMS PLANS)
41	1	2.5"	-	145'	-	*(SEE UTILITY AND ITMS PLANS)
41A	1	2.5"	-	130'	-	*(SEE UTILITY AND ITMS PLANS)
41B	1	2.5"	-	75'	-	*(SEE UTILITY AND ITMS PLANS)
41C	1	2.5"	-	125'	-	*(SEE UTILITY AND ITMS PLANS)
41D	1	2.5"	-	130'	-	*(SEE UTILITY AND ITMS PLANS)
x42	1	2.5"	PVC	15'	-	EMPTY
x43	1	2.5"	PVC	15'	-	EMPTY
x44	1	2.5"	PVC	15'	-	EMPTY
45	1	2.5"	PVC	15'	T	EMPTY
x46	1	2.5"	PVC	10'	-	EMPTY
x47	1	2.5"	PVC	5'	-	EMPTY
53	1	1.5"	GALV	55'	T	(2)1/*14
58	1	1.5"	GALV	40'	T	(2)1/*14
x63	1	1.5"	GALV	30'	-	EXISTING (4) 1/*14
xF20	1	xx4"	-	20'	-	*(SEE UTILITY AND ITMS PLANS)
xF20A	1	3"	-	15'	-	*(SEE UTILITY AND ITMS PLANS)
xF21	1	xx4"	-	115'	-	*(SEE UTILITY AND ITMS PLANS)
xF22	1	4"	-	20'	-	*(SEE UTILITY AND ITMS PLANS)
xF22A	1	3"	-	20'	-	*(SEE UTILITY AND ITMS PLANS)

LEGEND

x DENOTES EXISTING

xx ALL 4" ITMS CONDUIT TO BE MULTI-DUCT WITH FOUR 1" INNER DUCTS EXCEPT WHERE SHOWN. THE 1" INNER DUCTS SHALL BE FURNISHED AND INSTALLED BY THE FIBER CONTRACTOR.

* SEE UTILITY AND ITMS PLANS FOR SCHEDULE FOR THE INSTALLATION OF FIBER OPTIC CABLES AND/OR POWER CABLES TO ITMS DEVICES.

B-BORE P- ATTACH TO POLE
T-TRENCH SM- SINGLE MODE FIBER
O-OPEN CUT BSC- BARE STRANDED COPPER

SIGNAL PHASING

SIGNAL HEAD DIAGRAM

LEGEND

AB	ABANDON	OH#	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH#	PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (# OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (# OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA X	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA X	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
SPAN INSULATOR		
SPAN WIRE	XX	
UTILITY POLE		
CAMERA (CCTV)		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-DOVER, DELAWARE.
2. POLE BASES, CABINET BASE AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.
3. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (5.0% FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES, THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAT 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL.
4. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
5. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
6. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.

RECOMMENDED _____ DATE: _____

RECOMMENDED Jason SAINDON DATE: 12/5/14

RECOMMENDED [signature] DATE: 12/2/14

APPROVED TRAFFIC ENGINEER [signature] DATE: 12/8/14

APPROVED FOR INSTALLATION
CHIEF TRAFFIC ENGINEER [signature] DATE: 12/9/14

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS	

SR1, LITTLE HEAVEN
GRADE SEPARATED
INTERSECTION

CONTRACT	PERMIT NO.	K145	SHEET NO.
T200412202	DESIGNED BY: MSK	SIGNAL PLAN	605
COUNTY	CHECKED BY: BAM	SR1 @ BOWERS BEACH RD	TOTAL SHTS.
KENT			641

12/2/2014
G:\PROJECTS\03517.00 (DELDOT AGMT 1223 DOTS Open End\03517.16 SR1, LITTLE HEAVEN FINAL DESIGN\DGN Files\signal_bowers11.dgn
SZZEQUTNA

PHASE IV, STAGE 6 CONDUIT RUN SCHEDULE

CO*	* OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/WIRE
x1	1	2"	GALV	190'/30'	-	EXISTING (1) 2/*8 UFW/GROUND
x2	1	2"	GALV	15'	-	EXISTING (1) 2/*8 UFW/GROUND
x2A	1	2"	GALV	10'	-	*(SEE UTILITY & ITMS PLANS)
x2B	1	2"	GALV	115'	-	*(SEE UTILITY & ITMS PLANS)
2B[E]	1	2"	GALV	40'	T	*(SEE UTILITY & ITMS PLANS)
x2C	1	2"	GALV	25'	-	*(SEE UTILITY & ITMS PLANS)
x2D	1	3"	GALV	5'	-	EXISTING (1)2/*8 UFW/GROUND *(SEE UTILITY & ITMS PLANS)
x3	3	4"	PVC	15'	-	EXISTING [(1B) 2/*14 (5)4/*18 (5)9/*14 (1)*6 BSC] REMOVE (1)2/*14 NEW [(1)4/*18 (1)9/*14]
x4	1	4"	PVC	20'	-	EMPTY
x5	1	3"	PVC	40'	-	EXISTING (2)4/*18 (1)9/*14 (1)*6 BSC
x7	1	2"	GALV	125'	-	*(SEE UTILITY & ITMS PLANS)
7E	1	2"	GALV	45'	T	*(SEE UTILITY & ITMS PLANS)
7A	1	3"	GALV	55'	T	*(SEE UTILITY & ITMS PLANS)
x8	1	4"	PVC	190'	-	EXISTING [(2) 2/*14 (1)*6 BSC] REMOVE (1)2/*14
x9	1	1.5"	GALV	10'	-	EXISTING (4) 1/*14
x10	1	4"	PVC	105'	-	EX. [(3)4/*18 (12)2/*14 (20' OF (1)2/*14 COILED JW), (2)9/*14 (1)*6 BSC] NEW (1)9/*14
x11	1	1.5"	GALV	15'	-	EXISTING (2)1/*14 REMOVE (2)1/*14 NEW (4)1/*14
x12	1	3"	PVC	45'	-	EXISTING [(1)4/*18 (1)*6 BSC] NEW (1)9/*14
x13	1	4"	PVC	70'	-	EXISTING (2)4/*18 (8)2/*14 (2)9/*14 (1)*6 BSC
x15	1	4"	PVC	125'	-	EXISTING (2)4/*18 (8)2/*14 (2)9/*14 (1)*6 BSC
x16	1	4"	PVC	40'	-	EXISTING (1)4/*18 (6)2/*14 (2)9/*14 (1)*6 BSC
x17	1	4"	HDPE	115'	-	EXISTING (1)4/*18 (2)2/*14 (1)*6 BSC
x18	1	1.5"	GALV	40'	-	EXISTING (2)1/*14
x19	1	4"	PVC	255'	-	EXISTING (1)2/*14 (20' COILED IN JW), (1)*6 BSC
x21	1	4"	HDPE	115'	-	EX.(1)4/*18 (5)2/*14 (20' EA.OF (2)2/*14 COILED IN JW), (2)9/*14 (1)*6 BSC
x22	1	3"	PVC	15'	-	EXISTING (1)9/*14 (1)*6 BSC
x23	1	4"	HDPE	160'	-	EX.(1)4/*18 (3)2/*14 (20' OF (1)2/*14 COILED IN JW), (1)9/*14 (1)*6 BSC
x24	1	3"	PVC	15'	-	EXISTING (1)4/*18 (1)9/*14 (1)*6 BSC
x25	1	4"	HDPE	185'	-	EXISTING (2)2/*14 (1)*6 BSC
x26	1	1.5"	GALV	10'	-	EXISTING (4)1/*14
x27	1	1.5"	GALV	10'	-	EMPTY
x28	1	3"	PVC	10'	-	EXISTING (1)4/*18 (1)*6 BSC
x29	1	4"	PVC	30'	-	EXISTING (1)2/*14 (1)*6 BSC
x31	1	3"	PVC	35'	-	EXISTING (1)9/*14 (1)*6 BSC
33	1	1.5"	GALV	10'	T	(2)1/*14
x34	1	4"	PVC	25'	-	EXISTING (1) 2/*14 (1)*6 BSC
x35	1	1.5"	GALV	50'	-	NEW (4)1/*14
x36	1	4"	PVC	115'	-	EXISTING (1)2/*14 (1)9/*14 (1)*6 BSC
x37	1	1.5"	GALV	15'	-	EXISTING (2) 1/*14
x38	1	4"	HDPE	185'	-	EXISTING [(4) 2/*14 (2)9/*14 (1)*6 BSC] NEW (1)4/*18
x39	1	3"	PVC	10'	-	EXISTING [(1)9/*14 (1)*6 BSC] NEW (1)4/*18
x40	1	2.5"	-	145'	-	*(SEE UTILITY AND ITMS PLANS)
x40A	1	2.5"	-	130'	-	*(SEE UTILITY AND ITMS PLANS)
x40B	1	2.5"	-	75'	-	*(SEE UTILITY AND ITMS PLANS)
x40C	1	2.5"	-	125'	-	*(SEE UTILITY AND ITMS PLANS)
x40D	1	2.5"	-	130'	-	*(SEE UTILITY AND ITMS PLANS)
x41	1	2.5"	-	145'	-	*(SEE UTILITY AND ITMS PLANS)
x41A	1	2.5"	-	130'	-	*(SEE UTILITY AND ITMS PLANS)
x41B	1	2.5"	-	75'	-	*(SEE UTILITY AND ITMS PLANS)
x41C	1	2.5"	-	125'	-	*(SEE UTILITY AND ITMS PLANS)
x41D	1	2.5"	-	130'	-	*(SEE UTILITY AND ITMS PLANS)
x42	1	2.5"	PVC	15'	-	EMPTY
x43	1	2.5"	PVC	15'	-	EMPTY
x44	1	2.5"	PVC	15'	-	EMPTY
x45	1	2.5"	PVC	15'	-	EMPTY
x46	1	2.5"	PVC	10'	-	EMPTY
x47	1	2.5"	PVC	5'	-	EMPTY
x53	1	1.5"	GALV	55'	-	EXISTING (2)1/*14
x58	1	1.5"	GALV	40'	-	EXISTING (2)1/*14
x63	1	1.5"	GALV	30'	-	EXISTING (4)1/*14
xF20	1	xx4"	-	20'	-	*(SEE UTILITY AND ITMS PLANS)
xF20A	1	3"	-	15'	-	*(SEE UTILITY AND ITMS PLANS)
xF21	1	xx4"	-	115'	-	*(SEE UTILITY AND ITMS PLANS)
xF22	1	4"	-	20'	-	*(SEE UTILITY AND ITMS PLANS)
xF22A	1	3"	-	20'	-	*(SEE UTILITY AND ITMS PLANS)
F59	1	4"	-	260'	-	*(SEE UTILITY AND ITMS PLANS)
F61	1	3"	-	15'	-	*(SEE UTILITY AND ITMS PLANS)

LEGEND

x DENOTES EXISTING

xx ALL 4" ITMS CONDUIT TO BE MULTI-DUCT WITH FOUR 1" INNER DUCTS EXCEPT WHERE SHOWN. THE 1" INNER DUCTS SHALL BE FURNISHED AND INSTALLED BY THE FIBER CONTRACTOR.

* SEE UTILITY AND ITMS PLANS FOR SCHEDULE FOR THE INSTALLATION OF FIBER OPTIC CABLES AND/OR POWER CABLES TO ITMS DEVICES.

B-BORE P- ATTACH TO POLE
T-TRENCH SM- SINGLE MODE FIBER
O-OPEN CUT BSC- BARE STRANDED COPPER

PHASE V, STAGE 4 CONDUIT RUN SCHEDULE

CO*	* OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/WIRE
x1	1	2"	GALV	190'/30'	-	EXISTING (1) 2/*8 UFW/GROUND
x2	1	2"	GALV	15'	-	EXISTING (1) 2/*8 UFW/GROUND
x2A	1	2"	GALV	10'	-	*(SEE UTILITY & ITMS PLANS)
x2B	1	2"	GALV	155'	-	*(SEE UTILITY & ITMS PLANS)
x2C	1	2"	GALV	25'	-	*(SEE UTILITY & ITMS PLANS)
x2D	1	3"	GALV	5'	-	EXISTING (1)2/*8 UFW/GROUND *(SEE UTILITY & ITMS PLANS)
x3	3	4"	PVC	15'	-	EXISTING (1)4/*18 (7') 2/*14 (5)4/*18 (6)9/*14 (1)*6 BSC
x4	1	4"	PVC	20'	-	EMPTY
x5	1	3"	PVC	40'	-	EXISTING (2)4/*18 (1)9/*14 (1)*6 BSC
x7	1	2"	GALV	170'	-	*(SEE UTILITY & ITMS PLANS)
x7A	1	3"	GALV	55'	-	*(SEE UTILITY & ITMS PLANS)
x8	1	4"	PVC	190'	-	EXISTING (1) 2/*14 (1)*6 BSC
x9	1	1.5"	GALV	10'	-	EXISTING (4) 1/*14
x10	1	4"	PVC	105'	-	EX.[(3)4/*18 (12)2/*14 (20' OF (1)2/*14 COILED IN JW), (3)9/*14 (1)*6 BSC]
x11	1	1.5"	GALV	15'	-	EXISTING (4)1/*14
x12	1	3"	PVC	45'	-	EXISTING (1)4/*18 (1)9/*14 (1)*6 BSC
x13	1	4"	PVC	70'	-	EXISTING (2)4/*18 (8)2/*14 (2)9/*14 (1)*6 BSC
x15	1	4"	PVC	125'	-	EXISTING (2)4/*18 (8)2/*14 (2)9/*14 (1)*6 BSC
x16	1	4"	PVC	40'	-	EXISTING (1)4/*18 (6)2/*14 (2)9/*14 (1)*6 BSC
x17	1	4"	HDPE	115'	-	EXISTING (1)4/*18 (2)2/*14 (1)*6 BSC
x18	1	1.5"	GALV	40'	-	EXISTING (2)1/*14
x19	1	4"	PVC	255'	-	EXISTING (1)2/*14 (20' COILED IN JW), (1)*6 BSC
x21	1	4"	HDPE	115'	-	EX.(1)4/*18 (5)2/*14 (20' EA.OF (2)2/*14 COILED IN JW), (2)9/*14 (1)*6 BSC
x22	1	3"	PVC	15'	-	EXISTING (1)9/*14 (1)*6 BSC
x23	1	4"	HDPE	160'	-	EX.(1)4/*18 (3)2/*14 (20' OF (1)2/*14 COILED IN JW), (1)9/*14 (1)*6 BSC
x24	1	3"	PVC	15'	-	EXISTING (1)4/*18 (1)9/*14 (1)*6 BSC
x25	1	4"	HDPE	185'	-	EXISTING (2)2/*14 (1)*6 BSC
x26	1	1.5"	GALV	10'	-	EXISTING (4)1/*14
x27	1	1.5"	GALV	10'	-	EMPTY
x28	1	3"	PVC	10'	-	EXISTING (1)4/*18 (1)*6 BSC
x29	1	4"	PVC	30'	-	EXISTING (1)2/*14 (1)*6 BSC
x31	1	3"	PVC	35'	-	EXISTING (1)9/*14 (1)*6 BSC
32	1	1.5"	GALV	5'	T	EMPTY
x33	1	1.5"	GALV	10'	-	EXISTING (2)1/*14
x34	1	4"	PVC	25'	-	EXISTING (1) 2/*14 (1)*6 BSC
x35	1	1.5"	GALV	50'	-	EXISTING (4)1/*14
x36	1	4"	PVC	115'	-	EXISTING (1)2/*14 (1)9/*14 (1)*6 BSC
x37	1	1.5"	GALV	15'	-	EXISTING (2) 1/*14
x38	1	4"	HDPE	185'	-	EXISTING (1)4/*18 (4) 2/*14 (2)9/*14 (1)*6 BSC
x39	1	3"	PVC	10'	-	EXISTING (1)4/*18 (1)9/*14 (1)*6 BSC
x40	1	2.5"	-	145'	-	*(SEE UTILITY AND ITMS PLANS)
x40A	1	2.5"	-	130'	-	*(SEE UTILITY AND ITMS PLANS)
x40B	1	2.5"	-	75'	-	*(SEE UTILITY AND ITMS PLANS)
x40C	1	2.5"	-	125'	-	*(SEE UTILITY AND ITMS PLANS)
x40D	1	2.5"	-	130'	-	*(SEE UTILITY AND ITMS PLANS)
x41	1	2.5"	-	145'	-	*(SEE UTILITY AND ITMS PLANS)
x41A	1	2.5"	-	130'	-	*(SEE UTILITY AND ITMS PLANS)
x41B	1	2.5"	-	75'	-	*(SEE UTILITY AND ITMS PLANS)
x41C	1	2.5"	-	125'	-	*(SEE UTILITY AND ITMS PLANS)
x41D	1	2.5"	-	130'	-	*(SEE UTILITY AND ITMS PLANS)
x42	1	2.5"	PVC	15'	-	EMPTY
x43	1	2.5"	PVC	15'	-	EMPTY
x44	1	2.5"	PVC	15'	-	EMPTY
x45	1	2.5"	PVC	15'	-	EMPTY
x46	1	2.5"	PVC	10'	-	EMPTY
x47	1	2.5"	PVC	5'	-	EMPTY
x53	1	1.5"	GALV	55'	-	EXISTING (2)1/*14 REMOVE (2)1/*14 NEW (2)1/*14
x58	1	1.5"	GALV	40'	-	EXISTING (2)1/*14 REMOVE (2)1/*14 NEW (2)1/*14
x63	1	1.5"	GALV	30'	-	EXISTING (4)1/*14
xF20	1	xx4"	-	20'	-	*(SEE UTILITY AND ITMS PLANS)
xF20A	1	3"	-	15'	-	*(SEE UTILITY AND ITMS PLANS)
xF21	1	xx4"	-	115'	-	*(SEE UTILITY AND ITMS PLANS)
xF22	1	4"	-	20'	-	*(SEE UTILITY AND ITMS PLANS)
xF22A	1	3"	-	20'	-	*(SEE UTILITY AND ITMS PLANS)
xF59	1	4"	-	260'	-	*(SEE UTILITY AND ITMS PLANS)
xF61	1	3"	-	15'	-	*(SEE UTILITY AND ITMS PLANS)

LEGEND

x DENOTES EXISTING

xx ALL 4" ITMS CONDUIT TO BE MULTI-DUCT WITH FOUR 1" INNER DUCTS EXCEPT WHERE SHOWN. THE 1" INNER DUCTS SHALL BE FURNISHED AND INSTALLED BY THE FIBER CONTRACTOR.

* SEE UTILITY AND ITMS PLANS FOR SCHEDULE FOR THE INSTALLATION OF FIBER OPTIC CABLES AND/OR POWER CABLES TO ITMS DEVICES.

B-BORE P- ATTACH TO POLE
T-TRENCH SM- SINGLE MODE FIBER
O-OPEN CUT BSC- BARE STRANDED COPPER

SIGNAL PHASING

SIGNAL HEAD DIAGRAM

LEGEND

AB	ABANDON	OH •	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH •	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO •	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO •	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (* OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (* OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA X	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA X	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W. □	■
LOOP DETECTOR, TYPE 1	⬚	□
LOOP DETECTOR, TYPE 2	▭	▭
LUMINAIRE	—○—	—●—
MAST ARM	⊱	➤
MICROWAVE DETECTION	—◂	—◂
OPTICOM RECEIVER	—○	—●
OVERHEAD SIGNING	—|	—|
PEDESTRIAN POLE/BASE	◎	◉
PEDESTRIAN PUSHBUTTON	—D	—➤
PEDESTRIAN SIGNAL HEAD	⊐	⊐
RIGHT-OF-WAY	— - - —	— - - —
SERVICE PEDESTAL	P	P
SIGNAL CABINET	▱	▰
SIGNAL HEAD	—▷	—➤
SIGNAL POLE/BASE	⊗	⊙
SPAN INSULATOR	◇	◆
SPAN WIRE	— XX —	———
UTILITY POLE	⊘	●
CAMERA (CCTV)	—■	—■

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-DOVER, DELAWARE.
2. POLE BASES, CABINET BASE AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.
3. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (5%1 FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAT 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL.
4. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
5. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
6. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.

RECOMMENDED _____ DATE: _____

RECOMMENDED [signature] DATE: 12/5/14

RECOMMENDED [signature] DATE: 12/2/14

APPROVED TRAFFIC ENGINEER [signature] DATE: 12/5/14

APPROVED FOR INSTALLATION
CHIEF TRAFFIC ENGINEER [signature] DATE: 12/9/14

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SR1, LITTLE HEAVEN
GRADE SEPARATED
INTERSECTION

CONTRACT T200412202	PERMIT NO.	K145	SIGNAL PLAN
COUNTY KENT	DESIGNED BY:	MSK	SR1 @ BOWERS BEACH RD
	CHECKED BY:	BAM	

SHEET NO. 606
TOTAL SHTS. 641

12/2/2014
G:\PROJECTS\03517.00 DELDOT AGMT 1223 DOTS Open End\03517.16 SR1, LITTLE HEAVEN FINAL DESIGN\DGN Files\signal_bowers12.dgn
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PHASE V, STAGE 5 CONDUIT RUN SCHEDULE

CO*	# OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/WIRE
x1	1	2"	GALV	190'/30'	-	EXISTING (1) 2/#8 UFW/GROUND
x2	1	2"	GALV	15'	-	EXISTING (1) 2/#8 UFW/GROUND
x2A	1	2"	GALV	10'	-	*(SEE UTILITY & ITMS PLANS)
x2B	1	2"	GALV	155'	-	*(SEE UTILITY & ITMS PLANS)
x2C	1	2"	GALV	25'	-	*(SEE UTILITY & ITMS PLANS)
x2D	1	3"	GALV	5'	-	EXISTING (1)2/#8 UFW/GROUND *(SEE UTILITY & ITMS PLANS)
x3	3	4"	PVC	15'	-	EXISTING (1)4/#18 (17) 2/#14 (5)4/#18 (6)9/#14 (1)#6 BSC
x4	1	4"	PVC	20'	-	EMPTY
x5	1	3"	PVC	40'	-	EXISTING (2)4/#18 (1)9/#14 (1)#6 BSC
x7	1	2"	GALV	170'	-	*(SEE UTILITY & ITMS PLANS)
x7A	1	3"	GALV	55'	-	*(SEE UTILITY & ITMS PLANS)
x8	1	4"	PVC	190'	-	EXISTING (1) 2/#14 (1)#6 BSC
x9	1	1.5"	GALV	10'	-	EXISTING (4) 1/#14
x10	1	4"	PVC	105'	-	EX.(3)4/#18 (12)2/#14 (20' OF (1)2/#14 COILED IN JW), (3)9/#14 (1)#6 BSC
x11	1	1.5"	GALV	15'	-	EXISTING (4)1/#14
x12	1	3"	PVC	45'	-	EXISTING (1)4/#18 (1)9/#14 (1)#6 BSC
x13	1	4"	PVC	70'	-	EXISTING (2)4/#18 (8)2/#14 (2)9/#14 (1)#6 BSC
14	1	1.5"	GALV	5'	T	EMPTY
x15	1	4"	PVC	125'	-	EXISTING (2)4/#18 (8)2/#14 (2)9/#14 (1)#6 BSC
x16	1	4"	PVC	40'	-	EXISTING (1)4/#18 (6)2/#14 (2)9/#14 (1)#6 BSC
x17	1	4"	HDPE	115'	-	EXISTING (1)4/#18 (2)2/#14 (1)#6 BSC
x18	1	1.5"	GALV	40'	-	EXISTING (2)1/#14
x19	1	4"	PVC	255'	-	EXISTING (1)2/#14 (20' COILED IN JW), (1)#6 BSC
20	1	1.5"	GALV	20'	T	EMPTY
x21	1	4"	HDPE	115'	-	EX.(1)4/#18 (5)2/#14 (20' EA.OF (2)2/#14 COILED IN JW), (2)9/#14 (1)#6 BSC
x22	1	3"	PVC	15'	-	EXISTING (1)9/#14 (1)#6 BSC
x23	1	4"	HDPE	160'	-	EX.(1)4/#18 (3)2/#14 (20' OF (1)2/#14 COILED IN JW), (1)9/#14 (1)#6 BSC
x24	1	3"	PVC	15'	-	EXISTING (1)4/#18 (1)9/#14 (1)#6 BSC
x25	1	4"	HDPE	185'	-	EXISTING (2)2/#14 (1)#6 BSC
x26	1	1.5"	GALV	10'	-	EXISTING (4)1/#14
x27	1	1.5"	GALV	10'	-	EMPTY
x28	1	3"	PVC	10'	-	EXISTING (1)4/#18 (1)#6 BSC
x29	1	4"	PVC	30'	-	EXISTING (1)2/#14 (1)#6 BSC
30	1	1.5"	GALV	10'	T	(2)1/#14
x31	1	3"	PVC	35'	-	EXISTING (1)9/#14 (1)#6 BSC
x32	1	1.5"	GALV	5'	-	EMPTY
x33	1	1.5"	GALV	10'	-	EXISTING (2)1/#14
x34	1	4"	PVC	25'	-	EXISTING (1) 2/#14 (1)#6 BSC
x35	1	1.5"	GALV	50'	-	EXISTING (4)1/#14
x36	1	4"	PVC	115'	-	EXISTING (1)2/#14 (1)9/#14 (1)#6 BSC
x37	1	1.5"	GALV	15'	-	EXISTING (2) 1/#14
x38	1	4"	HDPE	185'	-	EXISTING (1)4/#18 (4) 2/#14 (2)9/#14 (1)#6 BSC
x39	1	3"	PVC	10'	-	EXISTING (1)4/#18 (1)9/#14 (1)#6 BSC
x40	1	2.5"	-	145'	-	*(SEE UTILITY AND ITMS PLANS)
x40A	1	2.5"	-	130'	-	*(SEE UTILITY AND ITMS PLANS)
x40B	1	2.5"	-	75'	-	*(SEE UTILITY AND ITMS PLANS)
x40C	1	2.5"	-	125'	-	*(SEE UTILITY AND ITMS PLANS)
x40D	1	2.5"	-	130'	-	*(SEE UTILITY AND ITMS PLANS)
x41	1	2.5"	-	145'	-	*(SEE UTILITY AND ITMS PLANS)
x41A	1	2.5"	-	130'	-	*(SEE UTILITY AND ITMS PLANS)
x41B	1	2.5"	-	75'	-	*(SEE UTILITY AND ITMS PLANS)
x41C	1	2.5"	-	125'	-	*(SEE UTILITY AND ITMS PLANS)
x41D	1	2.5"	-	130'	-	*(SEE UTILITY AND ITMS PLANS)
x42	1	2.5"	PVC	15'	-	EMPTY
x43	1	2.5"	PVC	15'	-	EMPTY
x44	1	2.5"	PVC	15'	-	EMPTY
x45	1	2.5"	PVC	15'	-	EMPTY
x46	1	2.5"	PVC	10'	-	EMPTY
x47	1	2.5"	PVC	5'	-	EMPTY
48	1	1.5"	GALV	30'	T	EMPTY
x63	1	1.5"	GALV	30'	-	EXISTING (4)1/#14
xF20	1	xx4"	-	20'	-	*(SEE UTILITY AND ITMS PLANS)
xF20A	1	3"	-	15'	-	*(SEE UTILITY AND ITMS PLANS)
xF21	1	xx4"	-	115'	-	*(SEE UTILITY AND ITMS PLANS)
xF22	1	4"	-	20'	-	*(SEE UTILITY AND ITMS PLANS)
xF22A	1	3"	-	20'	-	*(SEE UTILITY AND ITMS PLANS)
xF59	1	4"	-	260'	-	*(SEE UTILITY AND ITMS PLANS)
xF61	1	3"	-	15'	-	*(SEE UTILITY AND ITMS PLANS)

LEGEND
x DENOTES EXISTING

xx ALL 4" ITMS CONDUIT TO BE MULTI-DUCT WITH FOUR 1" INNER DUCTS EXCEPT WHERE SHOWN. THE 1" INNER DUCTS SHALL BE FURNISHED AND INSTALLED BY THE FIBER CONTRACTOR.

* SEE UTILITY AND ITMS PLANS FOR SCHEDULE FOR THE INSTALLATION OF FIBER OPTIC CABLES AND/OR POWER CABLES TO ITMS DEVICES.

B-BORE P- ATTACH TO POLE
T-TRENCH SM- SINGLE MODE FIBER
O-OPEN CUT BSC- BARE STRANDED COPPER

PHASE V, STAGE 6 CONDUIT RUN SCHEDULE

CO*	# OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/WIRE
x1	1	2"	GALV	190'/30'	-	EXISTING (1) 2/#8 UFW/GROUND
x2	1	2"	GALV	15'	-	EXISTING (1) 2/#8 UFW/GROUND
x2A	1	2"	GALV	10'	-	*(SEE UTILITY & ITMS PLANS)
x2B	1	2"	GALV	155'	-	*(SEE UTILITY & ITMS PLANS)
x2C	1	2"	GALV	25'	-	*(SEE UTILITY & ITMS PLANS)
x2D	1	3"	GALV	5'	-	EXISTING (1)2/#8 UFW/GROUND *(SEE UTILITY & ITMS PLANS)
x3	3	4"	PVC	15'	-	EXISTING (1)5\4/#18 (17) 2/#14 (6)9/#14 (1)#6 BSC] REMOVE (2)2/#14 NEW [(1)4/#18 (3)2/#14 (6)5/#14 (1)9/#14
x4	1	4"	PVC	20'	-	NEW (2)5/#14 (1)#6 BSC
x5	1	3"	PVC	40'	-	EXISTING (2)4/#18 (1)9/#14 (1)#6 BSC
x7	1	2"	GALV	170'	-	*(SEE UTILITY & ITMS PLANS)
x7A	1	3"	GALV	55'	-	*(SEE UTILITY & ITMS PLANS)
x8	1	4"	PVC	190'	-	EXISTING (1) 2/#14 (1)#6 BSC
x9	1	1.5"	GALV	10'	-	EXISTING (4) 1/#14
x10	1	4"	PVC	105'	-	EXISTING [(3)4/#18 (12)2/#14 (3)9/#14 (1)#6 BSC] REMOVE (2)2/#14 NEW [(3)2/#14 (3)5/#14 (1)9/#14]
x11	1	1.5"	GALV	15'	-	EXISTING (4)1/#14
x12	1	3"	PVC	45'	-	EXISTING (1)4/#18 (1)9/#14 (1)#6 BSC
x13	1	4"	PVC	70'	-	EX.[(2)4/#18 (8)2/#14 (2)9/#14 (1)#6 BSC] NEW[(3)2/#14 (2)5/#14 (1)9/#14]
x14	1	1.5"	GALV	5'	-	NEW (6)1/#14
x15	1	4"	PVC	125'	-	EX.[(2)4/#18 (8)2/#14 (2)9/#14 (1)#6 BSC] NEW[(1)4/#18 (2)5/#14 (1)9/#14]
x16	1	4"	PVC	40'	-	EXISTING [(1)4/#18 (6)2/#14 (2)9/#14 (1)#6 BSC] NEW [(1)4/#18 (2)5/#14]
x17	1	4"	HDPE	115'	-	EXISTING [(1)4/#18 (2)2/#14 (1)#6 BSC] NEW (1)9/#14
x18	1	1.5"	GALV	40'	-	EXISTING (2)1/#14
x19	1	4"	PVC	255'	-	EXISTING (1)2/#14 (1)#6 BSC
x20	1	1.5"	GALV	20'	-	NEW (2)1/#14
x21	1	4"	HDPE	115'	-	EXISTING [(1)4/#18 (5)2/#14 (2)9/#14 (1)#6 BSC] NEW [(1)4/#18 (1)5/#14]
x22	1	3"	PVC	15'	-	EXISTING [(1)9/#14 (1)#6 BSC] NEW (1)4/#18
x23	1	4"	HDPE	160'	-	EXISTING (1)4/#18 (3)2/#14 (1)9/#14 (1)#6 BSC
x24	1	3"	PVC	15'	-	EXISTING (1)4/#18 (1)9/#14 (1)#6 BSC
x25	1	4"	HDPE	185'	-	EXISTING (2)2/#14 (1)#6 BSC
x26	1	1.5"	GALV	10'	-	EXISTING (4)1/#14
x27	1	1.5"	GALV	10'	-	NEW (2)1/#14
x28	1	3"	PVC	10'	-	EXISTING [(1)4/#18 (1)#6 BSC] NEW (1)9/#14
x29	1	4"	PVC	30'	-	EXISTING (1)2/#14 (1)#6 BSC
x30	1	1.5"	GALV	10'	-	EXISTING (2)1/#14 REMOVE (2)1/#14 NEW (2)1/#14
x31	1	3"	PVC	35'	-	EXISTING (1)9/#14 (1)#6 BSC
x32	1	1.5"	GALV	5'	-	NEW (4)1/#14
x33	1	1.5"	GALV	10'	-	EXISTING (2)1/#14
x34	1	4"	PVC	25'	-	EXISTING [(1) 2/#14 (1)#6 BSC] NEW (1)5/#14
x35	1	1.5"	GALV	50'	-	EXISTING (4)1/#14
x36	1	4"	PVC	115'	-	EXISTING (1)2/#14 (1)9/#14 (1)#6 BSC
x37	1	1.5"	GALV	15'	-	EXISTING (2)1/#14
x38	1	4"	HDPE	185'	-	EXISTING [(1)4/#18 (4) 2/#14 (2)9/#14 (1)#6 BSC] NEW (1)5/#14
x39	1	3"	PVC	10'	-	EXISTING (1)4/#18 (1)9/#14 (1)#6 BSC
x40	1	2.5"	-	145'	-	*(SEE UTILITY AND ITMS PLANS)
x40A	1	2.5"	-	130'	-	*(SEE UTILITY AND ITMS PLANS)
x40B	1	2.5"	-	75'	-	*(SEE UTILITY AND ITMS PLANS)
x40C	1	2.5"	-	125'	-	*(SEE UTILITY AND ITMS PLANS)
x40D	1	2.5"	-	130'	-	*(SEE UTILITY AND ITMS PLANS)
x41	1	2.5"	-	145'	-	*(SEE UTILITY AND ITMS PLANS)
x41A	1	2.5"	-	130'	-	*(SEE UTILITY AND ITMS PLANS)
x41B	1	2.5"	-	75'	-	*(SEE UTILITY AND ITMS PLANS)
x41C	1	2.5"	-	125'	-	*(SEE UTILITY AND ITMS PLANS)
x41D	1	2.5"	-	130'	-	*(SEE UTILITY AND ITMS PLANS)
x42	1	2.5"	PVC	15'	-	NEW (1)5/#14 (1)#6 BSC
x43	1	2.5"	PVC	15'	-	NEW (1)5/#14 (1)#6 BSC
x44	1	2.5"	PVC	15'	-	NEW (1)5/#14 (1)#6 BSC
x45	1	2.5"	PVC	15'	-	NEW (1)5/#14 (1)#6 BSC
x46	1	2.5"	PVC	10'	-	NEW (1)5/#14 (1)#6 BSC
x47	1	2.5"	PVC	5'	-	NEW (1)5/#14 (1)#6 BSC
x48	1	1.5"	GALV	30'	-	NEW (2)1/#14
x63	1	1.5"	GALV	30'	-	EXISTING (4)1/#14
xF20	1	xx4"	-	20'	-	*(SEE UTILITY AND ITMS PLANS)
xF20A	1	3"	-	15'	-	*(SEE UTILITY AND ITMS PLANS)
xF21	1	xx4"	-	115'	-	*(SEE UTILITY AND ITMS PLANS)
xF22	1	4"	-	20'	-	*(SEE UTILITY AND ITMS PLANS)
xF22A	1	3"	-	20'	-	*(SEE UTILITY AND ITMS PLANS)
xF59	1	4"	-	260'	-	*(SEE UTILITY AND ITMS PLANS)
xF61	1	3"	-	15'	-	*(SEE UTILITY AND ITMS PLANS)

LEGEND
x DENOTES EXISTING

xx ALL 4" ITMS CONDUIT TO BE MULTI-DUCT WITH FOUR 1" INNER DUCTS EXCEPT WHERE SHOWN. THE 1" INNER DUCTS SHALL BE FURNISHED AND INSTALLED BY THE FIBER CONTRACTOR.

* SEE UTILITY AND ITMS PLANS FOR SCHEDULE FOR THE INSTALLATION OF FIBER OPTIC CABLES AND/OR POWER CABLES TO ITMS DEVICES.

B-BORE P- ATTACH TO POLE
T-TRENCH SM- SINGLE MODE FIBER
O-OPEN CUT BSC- BARE STRANDED COPPER

SIGNAL PHASING

SIGNAL HEAD DIAGRAM

LEGEND

AB	ABANDON	OH/*	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA/X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH/*	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA/X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB/X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO/*	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PB/X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO/*	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PL/X	EXISTING POLE IDENTIFIER (* OF POLE)
JW/X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL/X	PROPOSED POLE IDENTIFIER (* OF POLE)
JW/X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM/C	REMOVE BY CONTRACTOR
MA/X	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM/O	REMOVE BY OTHERS
MA/X	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM/TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W. □	■
LOOP DETECTOR, TYPE 1	⬚	□
LOOP DETECTOR, TYPE 2	▭	▭
LUMINAIRE	—○	—●
MAST ARM	▷	▶
MICROWAVE DETECTION	◁	◀
OPTICOM RECEIVER	—○	—●
OVERHEAD SIGNING	⊣	⊣
PEDESTRIAN POLE/BASE	◎	◉
PEDESTRIAN PUSHBUTTON	—▷	—▶
PEDESTRIAN SIGNAL HEAD	⊐	⊐
RIGHT-OF-WAY	— - - - —	— - - - —
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD	—▷	—▶
SIGNAL POLE/BASE	⊗	⊙
SPAN INSULATOR	◇	◆
SPAN WIRE	—— XX ——	————
UTILITY POLE	⊘	●
CAMERA (CCTV)	—▮	—▮

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-DOVER, DELAWARE.
2. POLE BASES, CABINET BASE AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.
3. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (SLOPE FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES, THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAT 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL.
4. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
5. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
6. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.

RECOMMENDED _____ DATE:_____

RECOMMENDED Max SAINTIL DATE: 12/5/14

RECOMMENDED [illegible] DATE: 12/2/14

APPROVED TRAFFIC ENGINEER [illegible] DATE: 12/5/14

APPROVED FOR INSTALLATION
CHIEF TRAFFIC ENGINEER [illegible] DATE: 12/9/14

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SR1, LITTLE HEAVEN GRADE SEPARATED INTERSECTION

CONTRACT	PERMIT NO.	K145	SIGNAL PLAN
T200412202	DESIGNED BY:	MSK	SHEET NO. 607
COUNTY	CHECKED BY:	BAM	TOTAL SHTS. 641
KENT			SR1 @ BOWERS BEACH RD

12/2/2014
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ULTIMATE CONDUIT RUN SCHEDULE

CO#	# OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/WIRE
x1	1	2"	GALV	190'/30'	-	EXISTING (1) 2/#8 UFW/GROUND
x2	1	2"	GALV	15'	-	EXISTING (1) 2/#8 UFW/GROUND
x2A	1	2"	GALV	10'	-	*(SEE UTILITY & ITMS PLANS)
x2B	1	2"	GALV	155'	-	*(SEE UTILITY & ITMS PLANS)
x2C	1	2"	GALV	25'	-	*(SEE UTILITY & ITMS PLANS)
x2D	1	3"	GALV	5'	-	EXISTING (1)2/#8 UFW/GROUND *(SEE UTILITY & ITMS PLANS)
x3	3	4"	PVC	15'	-	EXISTING (6)4/#18 (18) 2/#14 (6)5/#14 (7)9/#14 (1)#6 BSC
x4	1	4"	PVC	20'	-	EXISTING (2)5/#14 (1)#6 BSC
x5	1	3"	PVC	40'	-	EXISTING (2)4/#18 (1)9/#14 (1)#6 BSC
x7	1	2"	GALV	170'	-	*(SEE UTILITY & ITMS PLANS)
x7A	1	3"	GALV	55'	-	*(SEE UTILITY & ITMS PLANS)
x8	1	4"	PVC	190'	-	EXISTING (1) 2/#14 (1)#6 BSC
x9	1	1.5"	GALV	10'	-	EXISTING (4) 1/#14
x10	1	4"	PVC	105'	-	EXISTING (3)4/#18 (13)2/#14 (3)5/#14 (4)9/#14 (1)#6 BSC
x11	1	1.5"	GALV	15'	-	EXISTING (4)1/#14
x12	1	3"	PVC	45'	-	EXISTING (1)4/#18 (1)9/#14 (1)#6 BSC
x13	1	4"	PVC	70'	-	EXISTING (2)4/#18 (11)2/#14 (2)5/#14 (3)9/#14 (1)#6 BSC
x14	1	1.5"	GALV	5'	-	EXISTING (6)1/#14
x15	1	4"	PVC	125'	-	EXISTING (3)4/#18 (8)2/#14 (2)5/#14 (3)9/#14 (1)#6 BSC
x16	1	4"	PVC	40'	-	EXISTING (2)4/#18 (6)2/#14 (2)5/#14 (2)9/#14 (1)#6 BSC
x17	1	4"	HDPE	115'	-	EXISTING (1)4/#18 (2)2/#14 (1)9/#14 (1)#6 BSC
x18	1	1.5"	GALV	40'	-	EXISTING (2)1/#14
x19	1	4"	PVC	255'	-	EXISTING (1)2/#14 (1)#6 BSC
x20	1	1.5"	GALV	20'	-	EXISTING (2)1/#14
x21	1	4"	HDPE	115'	-	EXISTING (2)4/#18 (5)2/#14 (1)5/#14 (2)9/#14 (1)#6 BSC
x22	1	3"	PVC	15'	-	EXISTING (1)4/#18 (1)9/#14 (1)#6 BSC
x23	1	4"	HDPE	160'	-	EXISTING (1)4/#18 (3)2/#14 (1)9/#14 (1)#6 BSC
x24	1	3"	PVC	15'	-	EXISTING (1)4/#18 (1)9/#14 (1)#6 BSC
x25	1	4"	HDPE	185'	-	EXISTING (2)2/#14 (1)#6 BSC
x26	1	1.5"	GALV	10'	-	EXISTING (4)1/#14
x27	1	1.5"	GALV	10'	-	EXISTING (2)1/#14
x28	1	3"	PVC	10'	-	EXISTING (1)4/#18 (1)9/#14 (1)#6 BSC
x29	1	4"	PVC	30'	-	EXISTING (1)2/#14 (1)#6 BSC
x30	1	1.5"	GALV	10'	-	EXISTING (2)1/#14
x31	1	3"	PVC	35'	-	EXISTING (1)9/#14 (1)#6 BSC
x32	1	1.5"	GALV	5'	-	EXISTING (4)1/#14
x33	1	1.5"	GALV	10'	-	EXISTING (2)1/#14
x34	1	4"	PVC	25'	-	EXISTING (1) 2/#14 (1)5/#14 (1)#6 BSC
x35	1	1.5"	GALV	50'	-	EXISTING (4)1/#14
x36	1	4"	PVC	115'	-	EXISTING (1)2/#14 (1)9/#14 (1)#6 BSC
x37	1	1.5"	GALV	15'	-	EXISTING (2) 1/#14
x38	1	4"	HDPE	185'	-	EXISTING (1)4/#18 (4) 2/#14 (1)5/#14 (2)9/#14 (1)#6 BSC
x39	1	3"	PVC	10'	-	EXISTING (1)4/#18 (1)9/#14 (1)#6 BSC
x40	1	2.5"	-	145'	-	*(SEE UTILITY AND ITMS PLANS)
x40A	1	2.5"	-	130'	-	*(SEE UTILITY AND ITMS PLANS)
x40B	1	2.5"	-	75'	-	*(SEE UTILITY AND ITMS PLANS)
x40C	1	2.5"	-	125'	-	*(SEE UTILITY AND ITMS PLANS)
x40D	1	2.5"	-	130'	-	*(SEE UTILITY AND ITMS PLANS)
x41	1	2.5"	-	145'	-	*(SEE UTILITY AND ITMS PLANS)
x41A	1	2.5"	-	130'	-	*(SEE UTILITY AND ITMS PLANS)
x41B	1	2.5"	-	75'	-	*(SEE UTILITY AND ITMS PLANS)
x41C	1	2.5"	-	125'	-	*(SEE UTILITY AND ITMS PLANS)
x41D	1	2.5"	-	130'	-	*(SEE UTILITY AND ITMS PLANS)
x42	1	2.5"	PVC	15'	-	EXISTING (1)5/#14 (1)#6 BSC
x43	1	2.5"	PVC	15'	-	EXISTING (1)5/#14 (1)#6 BSC
x44	1	2.5"	PVC	15'	-	EXISTING (1)5/#14 (1)#6 BSC
x45	1	2.5"	PVC	15'	-	EXISTING (1)5/#14 (1)#6 BSC
x46	1	2.5"	PVC	10'	-	EXISTING (1)5/#14 (1)#6 BSC
x47	1	2.5"	PVC	5'	-	EXISTING (1)5/#14 (1)#6 BSC
x48	1	1.5"	GALV	30'	-	EXISTING (2)1/#14
x63	1	1.5"	GALV	30'	-	EXISTING (4) 1/#14
xF20	1	xx4"	-	20'	-	*(SEE UTILITY AND ITMS PLANS)
xF20A	1	3"	-	15'	-	*(SEE UTILITY AND ITMS PLANS)
xF21	1	xx4"	-	115'	-	*(SEE UTILITY AND ITMS PLANS)
xF22	1	4"	-	20'	-	*(SEE UTILITY AND ITMS PLANS)
xF22A	1	3"	-	20'	-	*(SEE UTILITY AND ITMS PLANS)
xF59	1	4"	-	260'	-	*(SEE UTILITY AND ITMS PLANS)
xF61	1	3"	-	15'	-	*(SEE UTILITY AND ITMS PLANS)

LEGEND

x DENOTES EXISTING

xx ALL 4" ITMS CONDUIT TO BE MULTI-DUCT WITH FOUR 1" INNER DUCTS EXCEPT WHERE SHOWN. THE 1" INNER DUCTS SHALL BE FURNISHED AND INSTALLED BY THE FIBER CONTRACTOR.

* SEE UTILITY AND ITMS PLANS FOR SCHEDULE FOR THE INSTALLATION OF FIBER OPTIC CABLES AND/OR POWER CABLES TO ITMS DEVICES.

B-BORE P- ATTACH TO POLE
T-TRENCH SM- SINGLE MODE FIBER
O-OPEN CUT BSC- BARE STRANDED COPPER

SIGNAL PHASING

SIGNAL HEAD DIAGRAM

LEGEND

AB	ABANDON	OH-X	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA-X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH-#	PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA-X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB-X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO-#	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PB-X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO-#	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PL-X	EXISTING POLE IDENTIFIER (# OF POLE)
JW-X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL-X	PROPOSED POLE IDENTIFIER (# OF POLE)
JW-X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM-C	REMOVE BY CONTRACTOR
MA-X	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM-O	REMOVE BY OTHERS
MA-X	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM-TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
SPAN INSULATOR		
SPAN WIRE	XX	
UTILITY POLE		
CAMERA (CCTV)		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-DOVER, DELAWARE.
2. POLE BASES, CABINET BASE AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.
3. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (50:1 FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES, THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAT 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL.
4. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
5. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
6. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.

RECOMMENDED _____ DATE: _____

RECOMMENDED Max SAINTIL DATE: 12/5/14

RECOMMENDED B. Schuette DATE: 12/2/14

APPROVED TRAFFIC ENGINEER Marc C. Coté DATE: 12/5/14

APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER Neil Lowe DATE: 12/9/14

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SR1, LITTLE HEAVEN GRADE SEPARATED INTERSECTION

CONTRACT	PERMIT NO.	K145	SIGNAL PLAN	SHEET NO.
T200412202	DESIGNED BY:	MSK	SR1 @ BOWERS BEACH RD	608
COUNTY				TOTAL SHTS.
KENT	CHECKED BY:	BAM		641

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POLE SCHEDULE

POLE #	POLE TYPE	HEIGHT	MATERIAL
4	MAST ARM	21'-6"	STEEL
7	MAST ARM	21'-6"	STEEL

ADDITIONAL LEGEND

- PROPOSED PAVEMENT
- PROPOSED WORK AREA
- PROPOSED WORK AREA REMOVAL

CONDUIT RUN SCHEDULE

CO#	# OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/WIRE
5	1	4"	HDPE	115'	B	EMPTY
8	1	1.5"	GALV	10'	T	EMPTY
9	1	3"	PVC	20'	T	EMPTY
10	1	4"	PVC	60'	T	EMPTY
11	1	1.5"	GALV	10'	T	EMPTY
12	1	4"	HDPE	90'	B	EMPTY
13	1	3"	PVC	15'	T	EMPTY
14	1	4"	PVC	40'	T	EMPTY
15	1	4"	PVC	205'	T	EMPTY
21	1	2.5"	PVC	15'	T	EMPTY
22	1	2.5"	PVC	10'	T	EMPTY
23	1	2.5"	PVC	15'	T	EMPTY

LEGEND

x DENOTES EXISTING

xx ALL 4" ITMS CONDUIT TO BE MULTI-DUCT WITH FOUR 1" INNER DUCTS EXCEPT WHERE SHOWN. THE 1" INNER DUCTS SHALL BE FURNISHED AND INSTALLED BY THE FIBER CONTRACTOR.

* SEE UTILITY AND ITMS PLANS FOR SCHEDULE FOR THE INSTALLATION OF FIBER OPTIC CABLES AND/OR POWER CABLES TO ITMS DEVICES.

B-BORE P- ATTACH TO POLE
T-TRENCH SM- SINGLE MODE FIBER
O-OPEN CUT BSC- BARE STRANDED COPPER

PHASE I, STAGE 9 SIGNAL NOTES

1. PEDESTRIAN SIGNAL POLES, HEADS AND PUSH BUTTONS SHALL NOT BE INSTALLED DURING THIS STAGE. CONTRACTOR SHALL PLUG PROPOSED CONDUIT.
2. PLUG ALL EXPOSED ENDS OF PROPOSED CONDUITS.

PHASE I, STAGE 9

SIGNAL PHASING

SIGNAL HEAD DIAGRAM

LEGEND

AB	ABANDON	OH-X	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUNS)
CA-X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH-#	PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUNS)
CA-X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB-X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO-*	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUNS)	PB-X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO-#	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUNS)	PL-X	EXISTING POLE IDENTIFIER (# OF POLE)
JW-X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL-X	PROPOSED POLE IDENTIFIER (# OF POLE)
JW-X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM-C	REMOVE BY CONTRACTOR
MA-X	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM-O	REMOVE BY OTHERS
MA-X	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM-TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W. □	■
LOOP DETECTOR, TYPE 1	⬚	□
LOOP DETECTOR, TYPE 2	▭	▭
LUMINAIRE	—○	—●
MAST ARM	⊢	⊢
MICROWAVE DETECTION	—◖	—◖
OPTICOM RECEIVER	—○	—●
OVERHEAD SIGNING	⊣	⊣
PEDESTRIAN POLE/BASE	⊕	◉
PEDESTRIAN PUSHBUTTON	—D	—●
PEDESTRIAN SIGNAL HEAD	⊐	⊐
RIGHT-OF-WAY	———	———
SERVICE PEDESTAL	P	P
SIGNAL CABINET	▱	▰
SIGNAL HEAD	—▷	—▶
SIGNAL POLE/BASE	⊗	⊙
SPAN INSULATOR	◇	◆
SPAN WIRE	—— XX ——	——
UTILITY POLE	⊘	◔
CAMERA (CCTV)	—▪	—▪

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-DOVER, DELAWARE.
2. POLE BASES, CABINET BASE AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.
3. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (5.0:1 FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES, THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAT 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL.
4. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
5. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
6. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.

RECOMMENDED _____ DATE: _____

RECOMMENDED _____ DATE: 12/5/14

RECOMMENDED _____ DATE: 12/2/14

APPROVED TRAFFIC ENGINEER _____ DATE: 12/6/14

APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER _____ DATE: 12/9/14

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SCALE 0 30 60 90 FEET

SR1, LITTLE HEAVEN GRADE SEPARATED INTERSECTION

CONTRACT	T200412202	PERMIT NO.	K303
COUNTY	KENT	DESIGNED BY:	MSK
		CHECKED BY:	BAM

SIGNAL PLAN

CLAPHAM ROAD @ BUFFALO RD

SHEET NO. 609

TOTAL SHTS. 641

12/2/2014
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CONDUIT RUN SCHEDULE

CO#	# OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/WIRE
IB	1	2"	GALV	275'	T	*(SEE UTILITY AND ITMS PLANS)
IE	1	2"	GALV	20'	T	EMPTY
2	2	4"	PVC	15'	T	EMPTY
3	1	3"	PVC	10'	T	EMPTY
4	1	4"	PVC	20'	T	EMPTY

POLE SCHEDULE

POLE #	POLE TYPE	HEIGHT	MATERIAL
1	MAST ARM	21'-6"	STEEL
x4	MAST ARM	21'-6"	STEEL
x7	MAST ARM	21'-6"	STEEL
8	MAST ARM	21'-6"	STEEL

x- DENOTES EXISTING

ADDITIONAL LEGEND

- PROPOSED PAVEMENT
- PROPOSED WORK AREA
- PROPOSED WORK AREA REMOVAL

SIGNAL PHASING

SIGNAL HEAD DIAGRAM

LEGEND

AB	ABANDON	OH-#	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA-X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH-#	PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA-X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB-X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO-#	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PB-X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO-#	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PL-X	EXISTING POLE IDENTIFIER (# OF POLE)
JW-X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL-X	PROPOSED POLE IDENTIFIER (# OF POLE)
JW-X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM-C	REMOVE BY CONTRACTOR
MA-X	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM-O	REMOVE BY OTHERS
MA-X	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM-TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1	□	□
LOOP DETECTOR, TYPE 2	▭	▭
LUMINAIRE	—○—	—●—
MAST ARM	▷	▶
MICROWAVE DETECTION	—◀	—◀
OPTICOM RECEIVER	—○	—●
OVERHEAD SIGNING	—|	—|
PEDESTRIAN POLE/BASE	◎	◉
PEDESTRIAN PUSHBUTTON	—○	—●
PEDESTRIAN SIGNAL HEAD	—▱	—▰
RIGHT-OF-WAY	———	———
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD	—▷	—▶
SIGNAL POLE/BASE	—⊗	—⊙
SPAN INSULATOR	—◇	—◆
SPAN WIRE	—XX—	———
UTILITY POLE	—⊘	—◔
CAMERA (CCTV)	—▪	—▪

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-DOVER, DELAWARE.
2. POLE BASES, CABINET BASE AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.
3. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (SO1 FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES, THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAT 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL.
4. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
5. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
6. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.

CONDUIT RUN SCHEDULE CONT.

CO#	# OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/WIRE
x5	1	4"	HDPE	115'	-	EMPTY
x8	1	1.5"	GALV	10'	-	EMPTY
x9	1	3"	PVC	20'	-	EMPTY
x10	1	4"	PVC	60'	-	EMPTY
x11	1	1.5"	GALV	10'	-	EMPTY
x12	1	4"	HDPE	90'	-	EMPTY
x13	1	3"	PVC	15'	-	EMPTY
x14	1	4"	PVC	40'	-	EMPTY
x15	1	4"	PVC	205'	-	EMPTY
17	1	1.5"	GALV	10'	T	EMPTY
18	1	3"	PVC	10'	T	EMPTY
19	1	4"	PVC	130'	T	EMPTY
20	1	2.5"	PVC	10'	T	EMPTY
x21	1	2.5"	PVC	15'	-	EMPTY
x22	1	2.5"	PVC	10'	-	EMPTY
x23	1	2.5"	PVC	15'	-	EMPTY
24	1	4"	PVC	30'	T	EMPTY
F35	1	xx4"	-	220'	-	*(SEE UTILITY AND ITMS PLANS)
F39	1	xx4"	-	5'	-	*(SEE UTILITY AND ITMS PLANS)

LEGEND

x DENOTES EXISTING

xx ALL 4" ITMS CONDUIT TO BE MULTI-DUCT WITH FOUR 1" INNER DUCTS EXCEPT WHERE SHOWN. THE 1" INNER DUCTS SHALL BE FURNISHED AND INSTALLED BY THE FIBER CONTRACTOR.

* SEE UTILITY AND ITMS PLANS FOR SCHEDULE FOR THE INSTALLATION OF FIBER OPTIC CABLES AND/OR POWER CABLES TO ITMS DEVICES.

B-BORE P- ATTACH TO POLE
T-TRENCH SM- SINGLE MODE FIBER
O-OPEN CUT BSC- BARE STRANDED COPPER

PHASE I, STAGE 10 SIGNAL NOTES

1. PEDESTRIAN SIGNAL POLES, HEADS AND PUSH BUTTONS SHALL NOT BE INSTALLED DURING THIS STAGE. CONTRACTOR SHALL PLUG PROPOSED CONDUIT.
2. PLUG ALL EXPOSED ENDS OF PROPOSED CONDUITS.
3. COMMUNICATION WITH DELDOT TMC SHALL BE VIA CDMA UNTIL ITMS FIBER COMMUNICATION IS ESTABLISHED.

PHASE I, STAGE 10

RECOMMENDED _____ DATE: _____

RECOMMENDED Mark SAINDON DATE: 12/5/14

RECOMMENDED _____ DATE: 12/2/14

APPROVED TRAFFIC ENGINEER _____ DATE: 12/5/14

APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER _____ DATE: 12/9/14

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SCALE 0 30 60 90 FEET

SR1, LITTLE HEAVEN GRADE SEPARATED INTERSECTION

CONTRACT	PERMIT NO.	K303	SIGNAL PLAN	SHEET NO.
T200412202	DESIGNED BY:	MSK	CLAPHAM ROAD @ BUFFALO RD	610
COUNTY KENT	CHECKED BY:	BAM		TOTAL SHTS. 641

12/2/2014
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CONDUIT RUN SCHEDULE

CO*	* OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/WIRE
1	1	2"	GALV	15'	T	(1)#2/*8 U.F.W./GROUND
1A	1	2"	GALV	235'	T	(1)#2/*8 U.F.W./GROUND
x1B	1	2"	GALV	275'	-	*(SEE UTILITY & ITMS PLANS)
x1E	1	2"	GALV	20'	-	NEW (1)#2/*8 U.F.W./GROUND
x2	2	4"	PVC	15'	-	NEW (8)#2/*14 (3)#4/*18 (3)#9/*14 (1)*6 BSC
x3	1	3"	PVC	10'	-	NEW (1)#4/*18 (1)#9/*14 (1)*6 BSC
x4	1	4"	PVC	20'	-	NEW (4)#2/*14 (1)#4/*18 (2)#9/*14 (1)*6 BSC

MAST ARM SCHEDULE

MA*	LENGTH OF ARM	* OF SIGNAL HEADS	* OF OPTICOM RECEIVERS	SF OF SIGNING	ARM MOUNT HEIGHT
1	60'	2	1	-	20'-0"
2	60'	4	-	-	20'-0"
3	60'	3	1	-	20'-0"
4	60'	-	1	-	20'-0"

POLE SCHEDULE

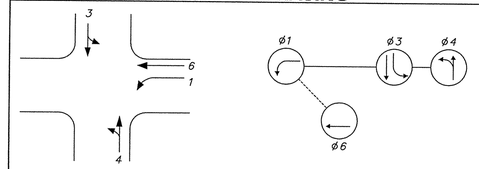
POLE #	POLE TYPE	HEIGHT	MATERIAL
x1	MAST ARM	21'-6"	STEEL
x4	MAST ARM	21'-6"	STEEL
x7	MAST ARM	21'-6"	STEEL
x8	MAST ARM	21'-6"	STEEL

x- DENOTES EXISTING

ADDITIONAL LEGEND

- PROPOSED PAVEMENT
- PROPOSED WORK AREA
- PROPOSED WORK AREA REMOVAL

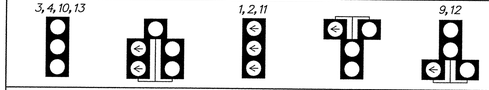
SIGNAL PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

AB	ABANDON	OH-*	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA-X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH-*	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA-X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB-X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO-*	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PB-X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO-*	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PL-X	EXISTING POLE IDENTIFIER (* OF POLE)
JW-X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL-X	PROPOSED POLE IDENTIFIER (* OF POLE)
JW-X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM-C	REMOVE BY CONTRACTOR
MA-X	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM-O	REMOVE BY OTHERS
MA-X	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM-TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		□
LOOP DETECTOR, TYPE 2		▭
LUMINAIRE	—◇—	—●—
MAST ARM	—▷	—▶
MICROWAVE DETECTION	—◀	—◀
OPTICOM RECEIVER	—○	—●
OVERHEAD SIGNING	—⊣	—⊣
PEDESTRIAN POLE/BASE	◎	◉
PEDESTRIAN PUSHBUTTON	—▷	—▶
PEDESTRIAN SIGNAL HEAD	—▭	—▬
RIGHT-OF-WAY	———	———
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD	—▷	—▶
SIGNAL POLE/BASE	⊗	⊙
SPAN INSULATOR	◇	◆
SPAN WIRE	—XX—	———
UTILITY POLE	⊘	●
CAMERA (CCTV)	—▮	—▮

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-DOVER, DELAWARE.
2. POLE BASES, CABINET BASE AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.
3. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (5:01 FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAT 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL.
4. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
5. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
6. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.

PHASE I, STAGE 13 SIGNAL NOTES

1. PEDESTRIAN SIGNAL POLES, HEADS AND PUSH BUTTONS SHALL NOT BE INSTALLED DURING THIS STAGE. CONTRACTOR SHALL PLUG PROPOSED CONDUIT.
2. EXISTING INTERSECTION OF CLAPHAM ROAD AT SR1 SHALL BE CLOSED DURING THIS STAGE. SOUTHBOUND CLAPHAM ROAD LANE SOUTH OF ITS INTERSECTION WITH BUFFALO ROAD IS OPEN TO LOCAL TRAFFIC ONLY. THERE IS NO ACCESS TO SR1 SOUTH OF THIS INTERSECTION FOR THROUGH TRAFFIC. SOUTHBOUND TRAFFIC TO SR1 AT THIS INTERSECTION MUST USE THE NEW PROPOSED RAMP
3. PLUG ALL EXPOSED ENDS OF PROPOSED CONDUITS.
4. SIGNAL HEAD #11 SHALL BE NON-OPERATIONAL AND COVERED DURING PHASE I, STAGE 13.
5. COMMUNICATION WITH DELDOT TMC SHALL BE VIA CDMA UNTIL ITMS FIBER COMMUNICATION IS ESTABLISHED

CONDUIT RUN SCHEDULE CONT.

CO*	* OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/WIRE
x5	1	4"	HDPE	115'	-	EXISTING (4)#2/*14 (1)#4/*18 (2)#9/*14] NEW ([3)#2/*14 (1)#4/*18 (3)#5/*14 (1)*6 BSC]
6	1	4"	PVC	190'	T	EMPTY
7	1	1.5"	GALV	15'	T	EMPTY
x8	1	1.5"	GALV	10'	-	EMPTY
x9	1	3"	PVC	20'	-	NEW (1)#9/*14 (1)*6 BSC
x10	1	4"	PVC	60'	-	NEW (4)#2/*14 (1)#4/*18 (1)#9/*14 (1)*6 BSC
x11	1	1.5"	GALV	10'	-	NEW (2)#/*14
x12	1	4"	HDPE	90'	-	NEW (3)#2/*14 (1)#4/*18 (1)#9/*14 (1)*6 BSC
x13	1	3"	PVC	15'	-	NEW (1)#4/*18 (1)#9/*14 (1)*6 BSC
x14	1	4"	PVC	40'	-	NEW (3)#2/*14 (1)*6 BSC
x15	1	4"	PVC	205'	-	NEW (1)#2/*14 (1)*6 BSC
16	1	1.5"	GALV	10'	T	NEW (2)#/*14
x17	1	1.5"	GALV	10'	-	NEW (4)#/*14
x18	1	3"	PVC	10'	-	NEW (1)#4/*18
x19	1	4'	PVC	130'	-	NEW (4)#2/*14 (1)#4/*18 (1)*6 BSC
x20	1	2.5"	PVC	10'	-	EMPTY
x21	1	2.5"	PVC	15'	-	EMPTY
x22	1	2.5"	PVC	10'	-	EMPTY
x23	1	2.5"	PVC	15'	-	EMPTY
x24	1	4"	PVC	30'	-	NEW (4)#/*14
xF35	1	xx4"	-	220'	-	*(SEE UTILITY AND ITMS PLANS)
xF39	1	4"	-	5'	-	*(SEE UTILITY AND ITMS PLANS)

LEGEND

x DENOTES EXISTING

xx ALL 4" ITMS CONDUIT TO BE MULTI-DUCT WITH FOUR 1" INNER DUCTS EXCEPT WHERE SHOWN. THE 1" INNER DUCTS SHALL BE FURNISHED AND INSTALLED BY THE FIBER CONTRACTOR.

* SEE UTILITY AND ITMS PLANS FOR SCHEDULE FOR THE INSTALLATION OF FIBER OPTIC CABLES AND/OR POWER CABLES TO ITMS DEVICES.

B-BORE P- ATTACH TO POLE
T-TRENCH SM- SINGLE MODE FIBER
O-OPEN CUT BSC- BARE STRANDED COPPER

PHASE I, STAGE 13

RECOMMENDED _____ DATE: _____

RECOMMENDED Mark Saintil DATE: 12/5/14

RECOMMENDED [signature] DATE: 12/2/14

APPROVED TRAFFIC ENGINEER Marvin C. Howard DATE: 12/5/14

APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER [signature] DATE: 12/9/14

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SCALE 0 30 60 90 FEET

SR1, LITTLE HEAVEN GRADE SEPARATED INTERSECTION

CONTRACT	PERMIT NO.	K303
T200412202	DESIGNED BY:	MSK
COUNTY	CHECKED BY:	BAM
KENT		

SIGNAL PLAN

CLAPHAM ROAD @ BUFFALO RD

SHEET NO.
611
TOTAL SHTS.
641

12/2/2014
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CONDUIT RUN SCHEDULE

CO*	* OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/WIRE
x1	1	2"	GALV	15'	-	EXISTING (1)2/*8 U.F.W./GROUND
x1A	1	2"	GALV	235'	-	EXISTING (1)2/*8 U.F.W./GROUND
x1B	1	2"	GALV	275'	-	*(SEE UTILITY & ITMS PLANS)
x1E	1	2"	GALV	20'	-	EXISTING (1)2/*8 U.F.W./GROUND
x2	2	4"	PVC	15'	-	EXISTING [(8)2/*14 (3)4/*18 (3)9/*14 (1)*6 BSC] NEW [(5)2/*14 (1)4/*18 (4)5/*14 (1)9/*14]
x3	1	3"	PVC	10'	-	EXISTING (1)4/*18 (1)9/*14 (1)*6 BSC
x4	1	4"	PVC	20'	-	EXISTING [(41)2/*14 (1)4/*18 (2)9/*14 (1)*6 BSC] NEW [(5)2/*14 (1)4/*18 (4)5/*14]

MAST ARM SCHEDULE

MA*	LENGTH OF ARM	* OF SIGNAL HEADS	* OF OPTICOM RECEIVERS	SF OF SIGNING	ARM MOUNT HEIGHT
1	60'	2	1	12	20'-0"
2	60'	4	1	9	20'-0"
3	60'	3	1	10	20'-0"
4	60'	4	1	18	20'-0"

SIGNING LEGEND By State Forces

1. REMOVE EXISTING SIGN
2. EXISTING SIGN TO REMAIN
3. PLACE NEW SIGN
4. RENEW EXISTING SIGN
5. REPOSITION EXISTING SIDE

POLE SCHEDULE

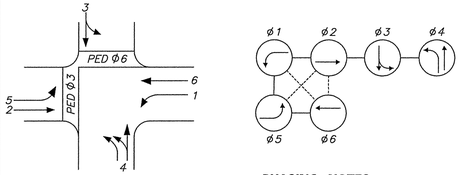
POLE #	POLE TYPE	HEIGHT	MATERIAL
x1	MAST ARM	21'-6"	STEEL
2	PEDESTAL	10'	ALUMINUM
3	PEDESTAL	10'	ALUMINUM
x4	MAST ARM	21'-6"	STEEL
5	PEDESTAL	10'	ALUMINUM
6	PEDESTAL	10'	ALUMINUM
x7	MAST ARM	21'-6"	STEEL
x8	MAST ARM	21'-6"	STEEL

x- DENOTES EXISTING

ADDITIONAL LEGEND

- PROPOSED PAVEMENT
- PROPOSED WORK AREA
- PROPOSED WORK AREA REMOVAL

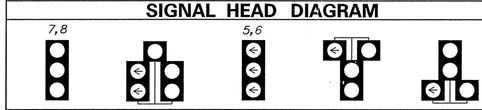
SIGNAL PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

AB	ABANDON	OH (*)	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH (*)	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO (*)	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO (*)	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (* OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (* OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA X	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA X	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
SPAN INSULATOR		
SPAN WIRE	XX	
UTILITY POLE		
CAMERA (CCTV)		

PHASE I, STAGE 15 SIGNAL NOTES

1. SLIDE SIGNAL HEADS *3 & *4 TO NEW POSITIONS SHOWN.
2. SIGNAL HEAD *11 SHALL BE UNCOVERED AND MADE OPERATIONAL DURING PHASE I, STAGE 15.
3. INSTALL ALL PEDESTRIAN SIGNAL POLES, HEADS AND PUSH BUTTONS AND ACTIVATE PEDESTRIAN SIGNALS.

CONDUIT RUN SCHEDULE CONT.

CO*	* OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/WIRE
x5	1	4"	HDPE	115'	-	EXISTING [(41)2/*14 (1)4/*18 (2)9/*14] NEW [(3)2/*14 (1)4/*18 (3)5/*14 (1)*6 BSC]
x6	1	4"	PVC	190'	-	NEW (2)2/*14 (1)*6 BSC
x7	1	1.5"	GALV	15'	-	NEW (4)1/*14
x8	1	1.5"	GALV	10'	-	NEW (6)1/*14
x9	1	3"	PVC	20'	-	EXISTING (1)9/*14 NEW [(1)4/*18 (1)*6 BSC]
x10	1	4"	PVC	60'	-	EXISTING [(41)2/*14 (1)4/*18 (1)9/*14 (1)*6 BSC] NEW (2)5/*14
x11	1	1.5"	GALV	10'	-	EXISTING (2)1/*14
x12	1	4"	HDPE	90'	-	EXISTING [(3)2/*14 (1)4/*18 (1)9/*14 (1)*6 BSC] NEW (1)5/*14
x13	1	3"	PVC	15'	-	EXISTING (1)4/*18 (1)9/*14 (1)*6 BSC
x14	1	4"	PVC	40'	-	EXISTING (3)2/*14 (1)*6 BSC
x15	1	4"	PVC	205'	-	EXISTING (1)2/*14 (1)*6 BSC
x16	1	1.5"	GALV	10'	-	EXISTING (2)2/*14 (1)*6 BSC
x17	1	1.5"	GALV	10'	-	EXISTING (4)1/*14
x18	1	3"	PVC	10'	-	EXISTING [(1)4/*18 (1)*6 BSC] NEW (1)9/*14
x19	1	4"	PVC	130'	-	EXISTING [(41)2/*14 (1)4/*18 (1)*6 BSC] NEW (1)9/*14
x20	1	2.5"	PVC	10'	-	NEW (1)5/*14 (1)*6 BSC
x21	1	2.5"	PVC	15'	-	NEW (1)5/*14 (1)*6 BSC
x22	1	2.5"	PVC	10'	-	NEW (1)5/*14 (1)*6 BSC
x23	1	2.5"	PVC	15'	-	NEW (1)5/*14 (1)*6 BSC
x24	1	4"	PVC	30'	-	EXISTING (4)1/*14
xF35	1	xx4"	-	220'	-	*(SEE UTILITY AND ITMS PLANS)
xF39	1	4"	-	5'	-	*(SEE UTILITY AND ITMS PLANS)

LEGEND

x DENOTES EXISTING

xx ALL 4" ITMS CONDUIT TO BE MULTI-DUCT WITH FOUR 1" INNER DUCTS EXCEPT WHERE SHOWN. THE 1" INNER DUCTS SHALL BE FURNISHED AND INSTALLED BY THE FIBER CONTRACTOR.

* SEE UTILITY AND ITMS PLANS FOR SCHEDULE FOR THE INSTALLATION OF FIBER OPTIC CABLES AND/OR POWER CABLES TO ITMS DEVICES.

B-BORE P- ATTACH TO POLE
T-TRENCH SM- SINGLE MODE FIBER
O-OPEN CUT BSC- BARE STRANDED COPPER

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-DOVER, DELAWARE.
2. POLE BASES, CABINET BASE AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.
3. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (50:1 FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAT 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL.
4. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
5. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
6. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.

PHASE I, STAGE 15

RECOMMENDED _____ DATE: _____

RECOMMENDED _____ DATE: 12/5/14

RECOMMENDED _____ DATE: 12/2/14

APPROVED TRAFFIC ENGINEER _____ DATE: 12/5/14

APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER _____ DATE: 12/9/14

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SCALE 0 30 60 90 FEET

SR1, LITTLE HEAVEN GRADE SEPARATED INTERSECTION

CONTRACT	PERMIT NO.	K303	SIGNAL PLAN	SHEET NO.
T200412202	DESIGNED BY: MSK		CLAPHAM ROAD @ BUFFALO RD	612
COUNTY KENT	CHECKED BY: BAM			TOTAL SHTS. 641

12/2/2014
10:30:00 AM
SHEIRON
C:\DOTS\DOTS\03517.00 (DELDOT AGMT 1223 DOTS Open End)\03517.16 SR1, LITTLE HEAVEN FINAL DESIGN\DGN Files\signal_buffalo04.dgn

CONDUIT RUN SCHEDULE

CO*	* OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/WIRE
x1	1	2"	GALV	15'	-	EXISTING (11)2/*8 U.F.W./GROUND
x1A	1	2"	GALV	235'	-	EXISTING (11)2/*8 U.F.W./GROUND
x1B	1	2"	GALV	275'	-	*(SEE UTILITY AND ITMS PLANS)
x1E	1	2"	GALV	20'	-	EXISTING (11)2/*8 U.F.W./GROUND
x2	2	4"	PVC	15'	-	EXISTING (13)2/*14 (4)4/*18 (4)9/*14 (1)*6 BSC
x3	1	3"	PVC	10'	-	EXISTING (1)4/*18 (1)9/*14 (1)*6 BSC
x4	1	4"	PVC	20'	-	EXISTING (9)2/*14 (2)4/*18 (4)5/*14 (2)9/*14 (1)*6 BSC

MAST ARM SCHEDULE

MA*	LENGTH OF ARM	* OF SIGNAL HEADS	* OF OPTICOM RECEIVERS	SF OF SIGNING	ARM MOUNT HEIGHT
x1	60'	2	1	12	20'-0"
x2	60'	4	1	9	20'-0"
x3	60'	3	1	10	20'-0"
x4	60'	4	1	18	20'-0"

x- DENOTES EXISTING

POLE SCHEDULE

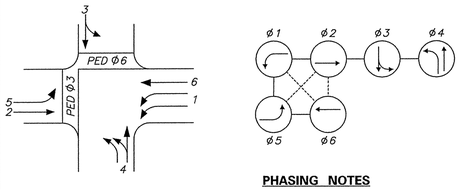
POLE #	POLE TYPE	HEIGHT	MATERIAL
x1	MAST ARM	21'-6"	STEEL
x2	PEDESTAL	10'	ALUMINUM
x3	PEDESTAL	10'	ALUMINUM
x4	MAST ARM	21'-6"	STEEL
x5	PEDESTAL	10'	ALUMINUM
x6	PEDESTAL	10'	ALUMINUM
x7	MAST ARM	21'-6"	STEEL
x8	MAST ARM	21'-6"	STEEL

x- DENOTES EXISTING

ADDITIONAL LEGEND

- PROPOSED PAVEMENT
- PROPOSED WORK AREA
- PROPOSED WORK AREA REMOVAL

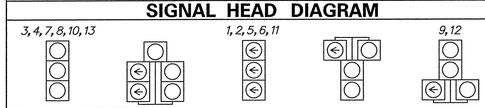
SIGNAL PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

AB	ABANDON	OH	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (* OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (* OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA X	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA X	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
SPAN INSULATOR		
SPAN WIRE	XX	
UTILITY POLE		
CAMERA (CCTV)		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-DOVER, DELAWARE.
2. POLE BASES, CABINET BASE AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.
3. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (5%) FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAT 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL.
4. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
5. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
6. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.

CONDUIT RUN SCHEDULE CONT.

CO*	* OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/WIRE
x5	1	4"	HDPE	115'	-	EXISTING (7)2/*14 (1)4/*18 (3)5/*14 (2)9/*14 (1)*6 BSC
x6	1	4"	PVC	190'	-	EXISTING (2)2/*14 (1)*6 BSC
x7	1	1.5"	GALV	15'	-	EXISTING (4)1/*14
x8	1	1.5"	GALV	10'	-	EXISTING (6)1/*14
x9	1	3"	PVC	20'	-	EXISTING (1)4/*18 (1)9/*14 (1)*6 BSC
x10	1	4"	PVC	60'	-	EXISTING (4)2/*14 (1)4/*18 (2)5/*14 (1)9/*14 (1)*6 BSC
x11	1	1.5"	GALV	10'	-	EXISTING (2)1/*14
x12	1	4"	HDPE	90'	-	EXISTING (3)2/*14 (1)4/*18 (1)5/*14 (1)9/*14 (1)*6 BSC
x13	1	3"	PVC	15'	-	EXISTING (1)4/*18 (1)9/*14 (1)*6 BSC
x14	1	4"	PVC	40'	-	EXISTING (3)2/*14 (1)*6 BSC
x15	1	4"	PVC	205'	-	EXISTING (1)2/*14 (1)*6 BSC
x16	1	1.5"	GALV	10'	-	EXISTING (2)2/*14 (1)*6 BSC
x17	1	1.5"	GALV	10'	-	EXISTING (4)1/*14
x18	1	3"	PVC	10'	-	EXISTING (1)4/*18 (1)9/*14 (1)*6 BSC
x19	1	4'	PVC	130'	-	EXISTING (4)2/*14 (1)4/*18 (1)9/*14 (1)*6 BSC
x20	1	2.5"	PVC	10'	-	EXISTING (1)5/*14 (1)*6 BSC
x21	1	2.5"	PVC	15'	-	EXISTING (1)5/*14 (1)*6 BSC
x22	1	2.5"	PVC	10'	-	EXISTING (1)5/*14 (1)*6 BSC
x23	1	2.5"	PVC	15'	-	EXISTING (1)5/*14 (1)*6 BSC
x24	1	4"	PVC	30'	-	EXISTING (4)1/*14
xF35	1	xx4"	-	220'	-	*(SEE UTILITY AND ITMS PLANS)
xF39	1	4"	-	5'	-	*(SEE UTILITY AND ITMS PLANS)

LEGEND

x DENOTES EXISTING

xx ALL 4" ITMS CONDUIT TO BE MULTI-DUCT WITH FOUR 1" INNER DUCTS EXCEPT WHERE SHOWN. THE 1" INNER DUCTS SHALL BE FURNISHED AND INSTALLED BY THE FIBER CONTRACTOR.

* SEE UTILITY AND ITMS PLANS FOR SCHEDULE FOR THE INSTALLATION OF FIBER OPTIC CABLES AND/OR POWER CABLES TO ITMS DEVICES.

B-BORE P- ATTACH TO POLE
T-TRENCH SM- SINGLE MODE FIBER
O-OPEN CUT BSC- BARE STRANDED COPPER

ULTIMATE CONDITIONS

RECOMMENDED _____ DATE: _____

RECOMMENDED Max SAINTIL DATE: 12/5/14

RECOMMENDED [signature] DATE: 12/5/14

APPROVED TRAFFIC ENGINEER [signature] DATE: 12/5/14

APPROVED FOR INSTALLATION
CHIEF TRAFFIC ENGINEER [signature] DATE: 12/9/14

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS	

SCALE
0 30 60 90
FEET

SR1, LITTLE HEAVEN GRADE SEPARATED INTERSECTION

CONTRACT	PERMIT NO.	K303
T200412202	DESIGNED BY:	MSK
COUNTY	CHECKED BY:	BAM
KENT		

SIGNAL PLAN

CLAPHAM ROAD @ BUFFALO RD

SHEET NO. 613
TOTAL SHTS. 641

12/2/2014
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3:09:22 PM

CONDUIT RUN SCHEDULE

CO*	* OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
6	1	1"	5'	T	EMPTY
7	1	4"	160'	-	EMPTY
8	1	1"	5'	-	EMPTY
9	1	3"	25'	-	EMPTY
10	1	4"	100'	T	EMPTY
11	1	1"	10'	T	EMPTY
12	1	3"	5'	-	EMPTY
13	1	1"	20'	T	EMPTY
*24	1	2"	100'	-	EXISTING (1)#2/8 U.F. W/GROUND
*25	1	2.5"	20'	-	EXISTING (14)#18/4 (2)#16/14
*26	2	2.5"	10'	-	EXISTING (4)#18/4
*27	1	2.5"	40'	-	EXISTING (2)#18/4
*28	1	2.5"	65'	-	EXISTING (2)#18/4
*29	1	1.5"	10'	-	EXISTING (2)#18/4
*30	1	1.5"	10'	-	EXISTING (2)#18/4
*31	1	1.5"	20'	-	EXISTING (2)#18/4
*32	1	2.5"	100'	-	EXISTING (2)#18/4
*33	1	1.5"	3'	-	EXISTING (2)#18/4
F1	1	4"	255'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
F2	1	4"	165'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)

LEGEND
* DENOTES EXISTING

B- BORE
T- TRENCH
O- OPEN CUT

SPAN WIRE SCHEDULE

SPAN	LENGTH	SPAN MOUNT HEIGHT	3.5% SAG	SPAN LOW POINT	BOTTOM OF LOWEST HEAD
DIAGONAL	180 FT	27.00 FT	6.30 FT	20.70 FT	16.20 FT

NOTE: FIELD ADJUSTMENTS AS REQUIRED

POLE SCHEDULE

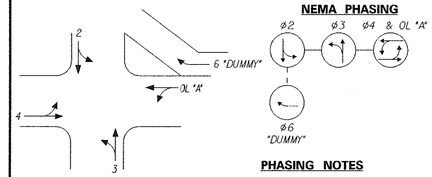
POLE *	POLE TYPE	HEIGHT	MATERIAL
1	STRAIN	32'	STEEL
5	STRAIN	32'	STEEL

PHASE 6, STAGE 4 SIGNAL NOTES

1. EXISTING SIGNAL INSTALLATIONS SHALL REMAIN INTACT AND IN OPERATION IN THIS PHASE/STAGE, EXCEPT WHERE SHOWN.
2. INSTALL PROPOSED SPAN WIRE BETWEEN PROPOSED NORTHEAST POLE AND EXISTING SOUTHWEST POLE. RELOCATE EXISTING I-SECTION SIGNAL HEADS *7,*8 AND OPTICOM FOR EB-SR 26 ONTO PROPOSED SPAN WIRE AS SHOWN AND ACTIVATE, THEN REMOVE THE EXISTING WIRE ON THE WEST LEG OF SR26.
3. POLE TO BE REMOVED BY TRAFFIC CONTRACTOR AND POLE BASE TO BE REMOVED BY PROJECT CONTRACTOR.
4. PLUG OPEN END OF CONDUIT.

SIGNAL PHASING

NEMA PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

- PROPOSED SIGNAL CABINET
- EXISTING SIGNAL CABINET
- PROPOSED SIGNAL POLE BASE
- EXISTING SIGNAL POLE BASE
- PROPOSED PEDESTRIAN POLE BASE
- EXISTING PEDESTRIAN POLE BASE
- PROPOSED WOOD POLE
- EXISTING WOOD POLE
- PROPOSED JUNCTION WELL
- EXISTING JUNCTION WELL
- PROPOSED SIGNAL HEAD
- EXISTING SIGNAL HEAD
- PROPOSED PEDESTRIAN SIGNAL HEAD
- EXISTING PEDESTRIAN SIGNAL HEAD
- PROPOSED PEDESTRIAN PUSHBUTTON
- EXISTING PEDESTRIAN PUSHBUTTON
- PROPOSED VIDEO DETECTION
- EXISTING VIDEO DETECTION
- PROPOSED MICROWAVE DETECTION
- EXISTING MICROWAVE DETECTION
- OVERHEAD SIGNING
- PROPOSED OPTICOM RECEIVER
- EXISTING OPTICOM RECEIVER
- PROPOSED MAST ARM
- EXISTING MAST ARM
- PROPOSED LUMINAIRE
- EXISTING LUMINAIRE
- PROPOSED LOOP DETECTOR (TYPE I OR 2)
- EXISTING LOOP DETECTOR (TYPE I OR 2)
- REMOVE BY CONTRACTOR
- REMOVE BY OTHERS
- ABANDON
- PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
- EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
- PROPOSED POLE IDENTIFIER (* OF POLE)
- EXISTING POLE IDENTIFIER (* OF POLE)
- PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
- EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
- PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
- EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
- PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
- EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
- PROPOSED MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
- EXISTING MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
- PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
- EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
- PROPOSED SPAN WIRE
- XX — EXISTING SPAN WIRE
- RIGHT-OF-WAY OR PROPERTY LINE
- PROPOSED SPAN INSULATOR
- EXISTING SPAN INSULATOR
- SERVICE PEDESTAL
- PROPOSED CCTV
- EXISTING CCTV
- PROPOSED PLASTIC DRUMS
- EXISTING PLASTIC DRUMS

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-DOVER, DELAWARE.
2. POLE BASES, CABINET BASE, AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED EXCEPT WHERE SHOWN.
3. ALL GALVANIZED RIGID CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
4. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY FOR THE UTILITY MARKOUTS PRIOR TO THE BEGINNING OF CONSTRUCTION. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
5. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.
6. ALL 4", 3", 2.5", AND 2" CONDUITS SHALL BE SCHEDULE 80 PVC WITH THE EXCEPTION OF 4" BORED CONDUIT WHICH SHALL BE SDR-13.5 HDPE. ALL 1" CONDUITS LESS THAN OR EQUAL TO 6'-0" SHALL BE LIQUID TIGHT FLEXIBLE NON-METALLIC AND ALL 1" CONDUITS GREATER THAN 6'-0" SHALL BE RIGID GALVANIZED.

SECTION 1

PHASE 6, STAGE 4

RECOMMENDED _____ DATE: 05/15/13

RECOMMENDED _____ DATE: 7/12/13

RECOMMENDED _____ DATE: _____

APPROVED TRAFFIC ENGINEER _____ DATE: 7/12/13

APPROVED FOR INSTALLATION
CHIEF TRAFFIC ENGINEER _____ DATE: 7/12/13

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SCALE
0 30 60 90
FEET

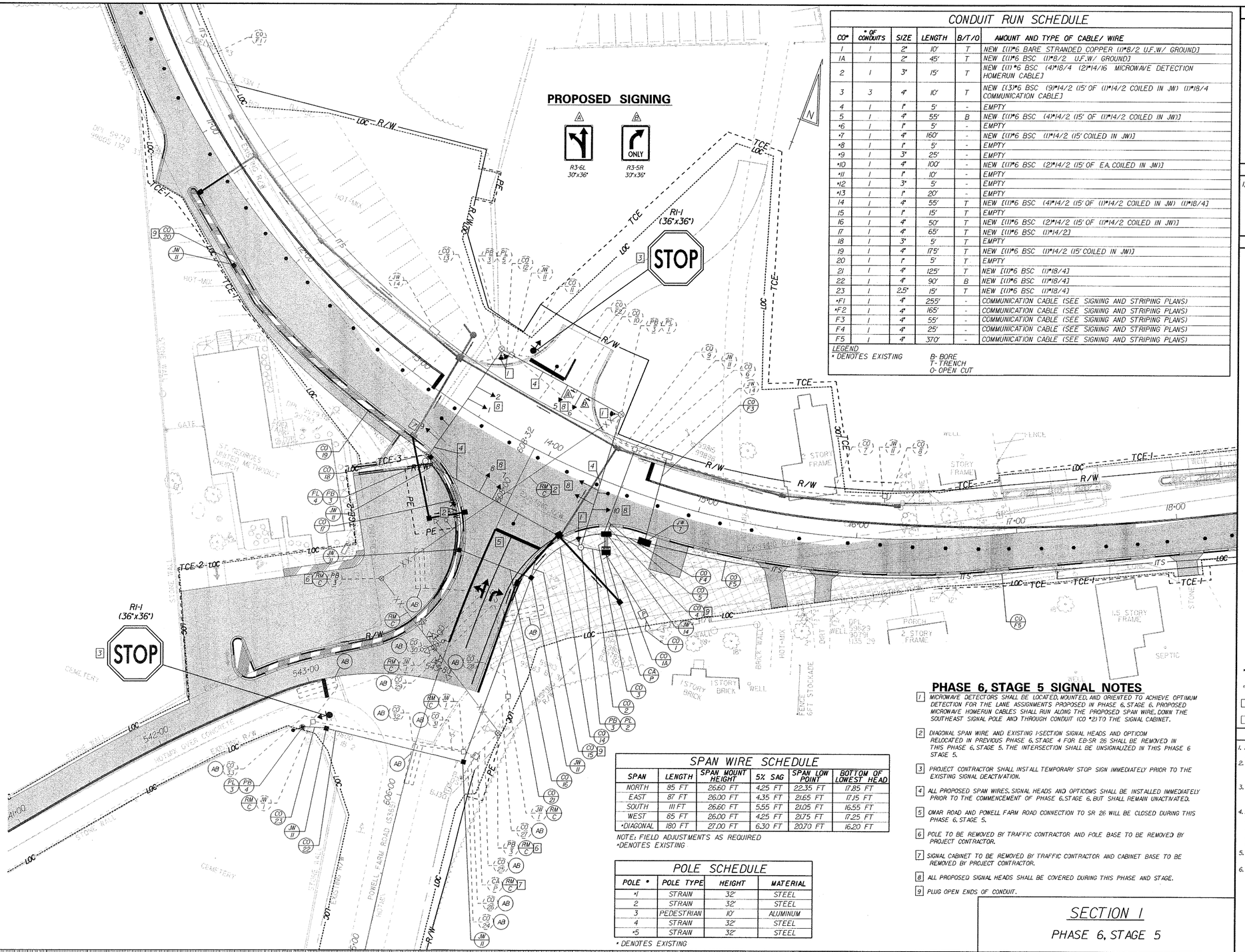
SR 26, ATLANTIC AVENUE FROM CLARKSVILLE TO ASSAWOMAN CANAL

CONTRACT	T200411210
COUNTY	SUSSEX
PERMIT NO.	S196
DESIGNED BY:	MSK
CHECKED BY:	BAM

SIGNAL PLAN
SR 26 @ POWELL FARM ROAD

SHEET NO.	513
TOTAL SHTS.	589

7/10/2013
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5446432



CONDUIT RUN SCHEDULE

CO*	* OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
1	1	2"	10'	T	NEW [(1)#6 BARE STRANDED COPPER (1)#8/2 U.F.W/ GROUND]
1A	1	2"	45'	T	NEW [(1)#6 BSC (1)#8/2 U.F.W/ GROUND]
2	1	3"	15'	T	NEW [(1) #6 BSC (4)#18/4 (2)#14/16 MICROWAVE DETECTION HOMERUN CABLE]
3	3	4"	10'	T	NEW [(3)#6 BSC (9)#14/2 (15' OF (1)#14/2 COILED IN JW) (1)#18/4 COMMUNICATION CABLE]
4	1	1"	5'	-	EMPTY
5	1	4"	55'	B	NEW [(1)#6 BSC (4)#14/2 (15' OF (1)#14/2 COILED IN JW)]
*6	1	1"	5'	-	EMPTY
*7	1	4"	160'	-	NEW [(1)#6 BSC (1)#14/2 (15' COILED IN JW)]
*8	1	1"	5'	-	EMPTY
*9	1	3"	25'	-	EMPTY
*10	1	4"	100'	-	NEW [(1)#6 BSC (2)#14/2 (15' OF EA. COILED IN JW)]
*11	1	1"	10'	-	EMPTY
*12	1	3"	5'	-	EMPTY
*13	1	1"	20'	-	EMPTY
14	1	4"	55'	T	NEW [(1)#6 BSC (4)#14/2 (15' OF (1)#14/2 COILED IN JW) (1)#18/4]
15	1	1"	15'	T	EMPTY
16	1	4"	50'	T	NEW [(1)#6 BSC (2)#14/2 (15' OF (1)#14/2 COILED IN JW)]
17	1	4"	65'	T	NEW [(1)#6 BSC (1)#14/2]
18	1	3"	5'	T	EMPTY
19	1	4"	175'	T	NEW [(1)#6 BSC (1)#14/2 (15' COILED IN JW)]
20	1	1"	5'	T	EMPTY
21	1	4"	125'	T	NEW [(1)#6 BSC (1)#18/4]
22	1	4"	90'	B	NEW [(1)#6 BSC (1)#18/4]
23	1	2.5"	15'	T	NEW [(1)#6 BSC (1)#18/4]
*F1	1	4"	255'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F2	1	4"	165'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
F3	1	4"	55'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
F4	1	4"	25'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
F5	1	4"	370'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)

LEGEND
* DENOTES EXISTING
B- BORE
T- TRENCH
O- OPEN CUT

SPAN WIRE SCHEDULE

SPAN	LENGTH	SPAN MOUNT HEIGHT	5% SAG	SPAN LOW POINT	BOTTOM OF LOWEST HEAD
NORTH	85 FT	26.60 FT	4.25 FT	22.35 FT	17.85 FT
EAST	87 FT	26.00 FT	4.35 FT	21.65 FT	17.15 FT
SOUTH	111 FT	26.60 FT	5.55 FT	21.05 FT	16.55 FT
WEST	85 FT	26.00 FT	4.25 FT	21.75 FT	17.25 FT
*DIAGONAL	180 FT	27.00 FT	6.30 FT	20.70 FT	16.20 FT

NOTE: FIELD ADJUSTMENTS AS REQUIRED
*DENOTES EXISTING

POLE SCHEDULE

POLE *	POLE TYPE	HEIGHT	MATERIAL
*1	STRAIN	32'	STEEL
2	STRAIN	32'	STEEL
3	PEDESTRIAN	10'	ALUMINUM
4	STRAIN	32'	STEEL
*5	STRAIN	32'	STEEL

* DENOTES EXISTING

PHASE 6, STAGE 5 SIGNAL NOTES

1. MICROWAVE DETECTORS SHALL BE LOCATED, MOUNTED, AND ORIENTED TO ACHIEVE OPTIMUM DETECTION FOR THE LANE ASSIGNMENTS PROPOSED IN PHASE 6, STAGE 6. PROPOSED MICROWAVE HOMERUN CABLES SHALL RUN ALONG THE PROPOSED SPAN WIRE, DOWN THE SOUTHEAST SIGNAL POLE AND THROUGH CONDUIT (CO *2) TO THE SIGNAL CABINET.
2. DIAGONAL SPAN WIRE AND EXISTING I-SECTION SIGNAL HEADS AND OPTICOM RELOCATED IN PREVIOUS PHASE 6, STAGE 4 FOR EB-SR 26 SHALL BE REMOVED IN THIS PHASE 6, STAGE 5. THE INTERSECTION SHALL BE UNSIGNALIZED IN THIS PHASE 6 STAGE 5.
3. PROJECT CONTRACTOR SHALL INSTALL TEMPORARY STOP SIGN IMMEDIATELY PRIOR TO THE EXISTING SIGNAL DEACTIVATION.
4. ALL PROPOSED SPAN WIRES, SIGNAL HEADS AND OPTICOMS SHALL BE INSTALLED IMMEDIATELY PRIOR TO THE COMMENCEMENT OF PHASE 6, STAGE 6, BUT SHALL REMAIN UNACTIVATED.
5. OMAR ROAD AND POWELL FARM ROAD CONNECTION TO SR 26 WILL BE CLOSED DURING THIS PHASE 6, STAGE 5.
6. POLE TO BE REMOVED BY TRAFFIC CONTRACTOR AND FOLE BASE TO BE REMOVED BY PROJECT CONTRACTOR.
7. SIGNAL CABINET TO BE REMOVED BY TRAFFIC CONTRACTOR AND CABINET BASE TO BE REMOVED BY PROJECT CONTRACTOR.
8. ALL PROPOSED SIGNAL HEADS SHALL BE COVERED DURING THIS PHASE AND STAGE.
9. PLUG OPEN ENDS OF CONDUIT.

SECTION 1
PHASE 6, STAGE 5

SIGNAL PHASING

NEMA PHASING

PHASING NOTES
1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

	PROPOSED SIGNAL CABINET	(RM/C)	REMOVE BY CONTRACTOR
	EXISTING SIGNAL CABINET	(RM/O)	REMOVE BY OTHERS
	PROPOSED SIGNAL POLE BASE	(AB)	ABANDON
	EXISTING SIGNAL POLE BASE	(PB/X)	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	PROPOSED PEDESTRIAN POLE BASE	(PB/X)	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	EXISTING PEDESTRIAN POLE BASE	(PL/X)	PROPOSED POLE IDENTIFIER (* OF POLE)
	PROPOSED WOOD POLE	(PL/X)	EXISTING POLE IDENTIFIER (* OF POLE)
	EXISTING WOOD POLE	(JW/X)	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	PROPOSED JUNCTION WELL	(JW/X)	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	EXISTING JUNCTION WELL	(CO/*)	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
	PROPOSED SIGNAL HEAD	(CO/*)	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
	EXISTING SIGNAL HEAD	(OH/*)	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
	PROPOSED PEDESTRIAN SIGNAL HEAD	(OH/*)	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
	EXISTING PEDESTRIAN SIGNAL HEAD	(MA/XX)	PROPOSED MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	PROPOSED PEDESTRIAN PUSHBUTTON	(MA/XX)	EXISTING MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	EXISTING PEDESTRIAN PUSHBUTTON	(CA/X)	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
	PROPOSED VIDEO DETECTION	(CA/X)	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
	EXISTING VIDEO DETECTION		PROPOSED SPAN WIRE
	PROPOSED MICROWAVE DETECTION	XX	EXISTING SPAN WIRE
	EXISTING MICROWAVE DETECTION		RIGHT-OF-WAY OR PROPERTY LINE
	OVERHEAD SIGNING		PROPOSED SPAN INSULATOR
	PROPOSED OPTICOM RECEIVER		EXISTING SPAN INSULATOR
	EXISTING OPTICOM RECEIVER	P	SERVICE PEDESTAL
	PROPOSED MAST ARM		PROPOSED CCTV
	EXISTING MAST ARM		EXISTING CCTV
	PROPOSED LUMINAIRE		PROPOSED PLASTIC DRUMS
	EXISTING LUMINAIRE		EXISTING PLASTIC DRUMS
	PROPOSED LOOP DETECTOR (TYPE 1 OR 2)		
	EXISTING LOOP DETECTOR (TYPE 1 OR 2)		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-DOVER, DELAWARE.
2. POLE BASES, CABINET BASE, AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED EXCEPT WHERE SHOWN.
3. ALL GALVANIZED RIGID CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
4. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY FOR THE UTILITY MARKOUTS PRIOR TO THE BEGINNING OF CONSTRUCTION. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
5. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.
6. ALL 1", 3", 2.5", AND 2" CONDUITS SHALL BE SCHEDULE 80 PVC WITH THE EXCEPTION OF 4" BORED CONDUIT WHICH SHALL BE SDR-13.5 HDPE. ALL 1" CONDUITS LESS THAN OR EQUAL TO 6'-0" SHALL BE LIQUID TIGHT FLEXIBLE NON-METALLIC AND ALL 1" CONDUITS GREATER THAN 6'-0" SHALL BE RIGID GALVANIZED.

RECOMMENDED [signature]	DATE: 05/15/13	RECOMMENDED Chitra Dave	DATE: 7/12/13
RECOMMENDED	DATE:	APPROVED TRAFFIC ENGINEER [signature]	DATE: 7/12/13
APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER [signature]	DATE: 7/12/13		

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SCALE
0 30 60 90
FEET

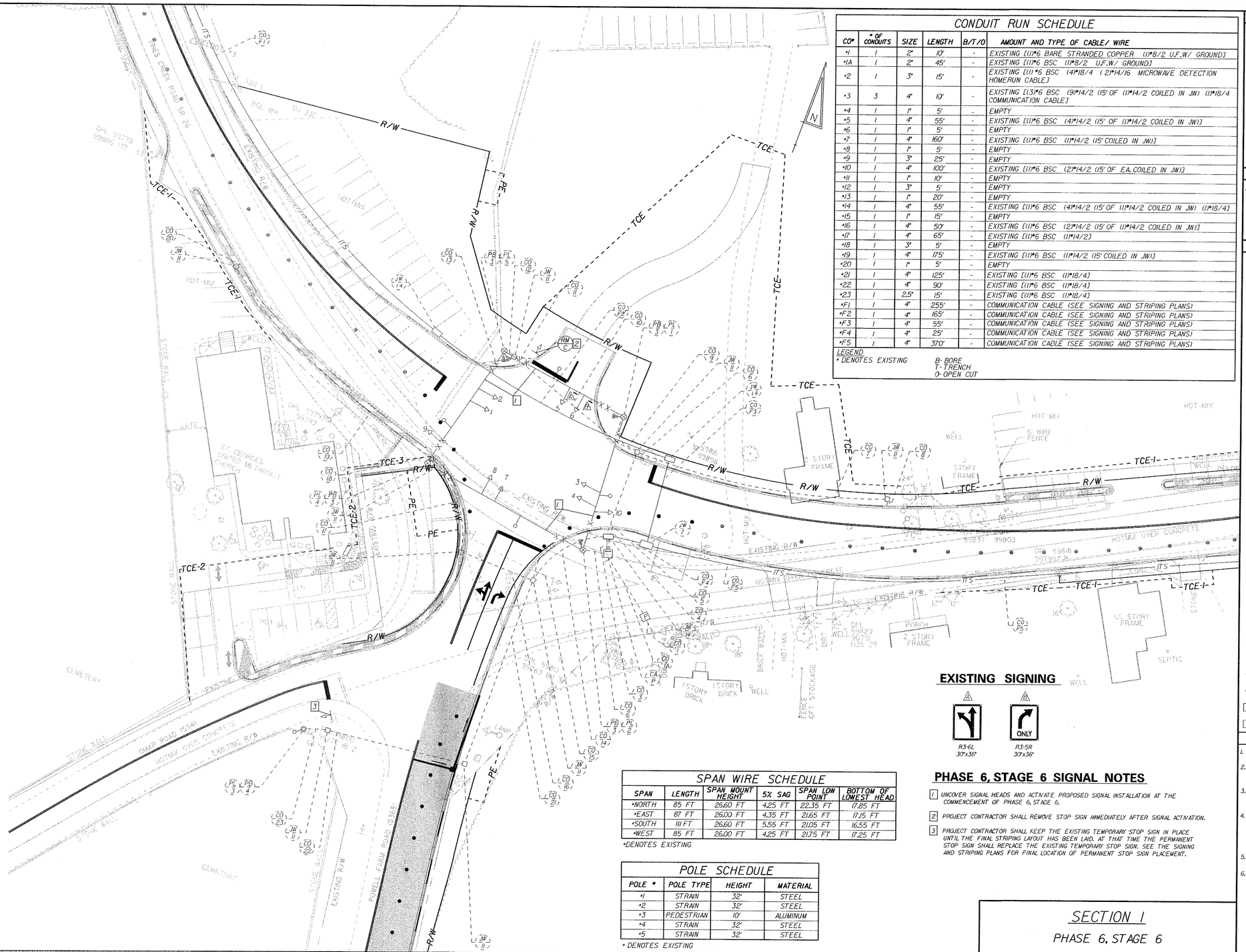
SR 26, ATLANTIC AVENUE FROM CLARKSVILLE TO ASSAWOMAN CANAL

CONTRACT	T200411210	PERMIT NO.	S196
COUNTY	SUSSEX	DESIGNED BY:	MSK
		CHECKED BY:	BAM

SIGNAL PLAN SR 26 @ POWELL FARM ROAD

SHEET NO.	514
TOTAL SHTS.	589

7/10/2013
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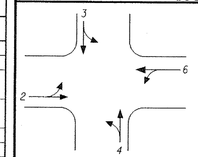
CONDUIT RUN SCHEDULE

CO*	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
*1	1	2"	10'	-	EXISTING [(1)#6 BARE STRANDED COPPER (1)#8/2 U.F.W/ GROUND]
*1A	1	2"	45'	-	EXISTING [(1)#6 BSC (1)#8/2 U.F.W/ GROUND]
*2	1	3"	15'	-	EXISTING [(1) #6 BSC (4)#18/4 (2)#14/16 MICROWAVE DETECTION HOMERUN CABLE]
*3	3	4"	10'	-	EXISTING [(3)#6 BSC (9)#14/2 (15' OF (1)#14/2 COILED IN JW) (1)#18/4 COMMUNICATION CABLE]
*4	1	1"	5'	-	EMPTY
*5	1	4"	55'	-	EXISTING [(1)#6 BSC (4)#14/2 (15' OF (1)#14/2 COILED IN JW)]
*6	1	1"	5'	-	EMPTY
*7	1	4"	160'	-	EXISTING [(1)#6 BSC (1)#14/2 (15' COILED IN JW)]
*8	1	1"	5'	-	EMPTY
*9	1	3"	25'	-	EMPTY
*10	1	4"	100'	-	EXISTING [(1)#6 BSC (2)#14/2 (15' OF EA.COILED IN JW)]
*11	1	1"	10'	-	EMPTY
*12	1	3"	5'	-	EMPTY
*13	1	1"	20'	-	EMPTY
*14	1	4"	55'	-	EXISTING [(1)#6 BSC (4)#14/2 (15' OF (1)#14/2 COILED IN JW) (1)#18/4]
*15	1	1"	15'	-	EMPTY
*16	1	4"	50'	-	EXISTING [(1)#6 BSC (2)#14/2 (15' OF (1)#14/2 COILED IN JW)]
*17	1	4"	65'	-	EXISTING [(1)#6 BSC (1)#14/2]
*18	1	3"	5'	-	EMPTY
*19	1	4"	175'	-	EXISTING [(1)#6 BSC (1)#14/2 (15' COILED IN JW)]
*20	1	1"	5'	-	EMPTY
*21	1	4"	125'	-	EXISTING [(1)#6 BSC (1)#18/4]
*22	1	4"	90'	-	EXISTING [(1)#6 BSC (1)#18/4]
*23	1	2.5"	15'	-	EXISTING [(1)#6 BSC (1)#18/4]
*F1	1	4"	255'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F2	1	4"	165'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F3	1	4"	55'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F4	1	4"	25'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F5	1	4"	370'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)

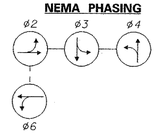
LEGEND
* DENOTES EXISTING

B- BORE
T- TRENCH
O- OPEN CUT

SIGNAL PHASING



NEMA PHASING

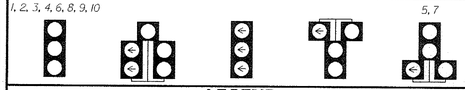


PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM

1, 2, 3, 4, 6, 8, 9, 10 — 5, 7



LEGEND

- PROPOSED SIGNAL CABINET
- EXISTING SIGNAL CABINET
- PROPOSED SIGNAL POLE BASE
- EXISTING SIGNAL POLE BASE
- PROPOSED PEDESTRIAN POLE BASE
- EXISTING PEDESTRIAN POLE BASE
- PROPOSED WOOD POLE
- EXISTING WOOD POLE
- PROPOSED JUNCTION WELL
- EXISTING JUNCTION WELL
- PROPOSED SIGNAL HEAD
- EXISTING SIGNAL HEAD
- PROPOSED PEDESTRIAN SIGNAL HEAD
- EXISTING PEDESTRIAN SIGNAL HEAD
- PROPOSED PEDESTRIAN PUSHBUTTON
- EXISTING PEDESTRIAN PUSHBUTTON
- PROPOSED VIDEO DETECTION
- EXISTING VIDEO DETECTION
- PROPOSED MICROWAVE DETECTION
- EXISTING MICROWAVE DETECTION
- OVERHEAD SIGNING
- PROPOSED OPTICOM RECEIVER
- EXISTING OPTICOM RECEIVER
- PROPOSED MAST ARM
- EXISTING MAST ARM
- PROPOSED LUMINAIRE
- EXISTING LUMINAIRE
- PROPOSED LOOP DETECTOR (TYPE 1 OR 2)
- EXISTING LOOP DETECTOR (TYPE 1 OR 2)
- REMOVE BY CONTRACTOR
- REMOVE BY OTHERS
- ABANDON
- PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
- EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
- PROPOSED POLE IDENTIFIER (# OF POLE)
- EXISTING POLE IDENTIFIER (# OF POLE)
- PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
- EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
- PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)
- EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)
- PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
- EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
- PROPOSED MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
- EXISTING MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
- PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
- EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
- PROPOSED SPAN WIRE
- EXISTING SPAN WIRE
- RIGHT-OF-WAY OR PROPERTY LINE
- PROPOSED SPAN INSULATOR
- EXISTING SPAN INSULATOR
- SERVICE PEDESTAL
- PROPOSED CCTV
- EXISTING CCTV
- PROPOSED PLASTIC DRUMS
- EXISTING PLASTIC DRUMS

EXISTING SIGNING

R3-6L 30"x36"
R3-5R 30"x36"

SPAN WIRE SCHEDULE

SPAN	LENGTH	SPAN MOUNT HEIGHT	5% SAG	SPAN LOW POINT	BOTTOM OF LOWEST HEAD
*NORTH	85 FT	26.50 FT	4.25 FT	22.35 FT	17.85 FT
*EAST	87 FT	26.00 FT	4.35 FT	21.65 FT	17.15 FT
*SOUTH	111 FT	26.60 FT	5.55 FT	21.05 FT	16.55 FT
*WEST	85 FT	26.00 FT	4.25 FT	21.75 FT	17.25 FT

*DENOTES EXISTING

POLE SCHEDULE

POLE *	POLE TYPE	HEIGHT	MATERIAL
*1	STRAIN	32'	STEEL
*2	STRAIN	32'	STEEL
*3	PEDESTRIAN	10'	ALUMINUM
*4	STRAIN	32'	STEEL
*5	STRAIN	32'	STEEL

* DENOTES EXISTING

PHASE 6, STAGE 6 SIGNAL NOTES

1. UNCOVER SIGNAL HEADS AND ACTIVATE PROPOSED SIGNAL INSTALLATION AT THE COMMENCEMENT OF PHASE 6, STAGE 6.
2. PROJECT CONTRACTOR SHALL REMOVE STOP SIGN IMMEDIATELY AFTER SIGNAL ACTIVATION.
3. PROJECT CONTRACTOR SHALL KEEP THE EXISTING TEMPORARY STOP SIGN IN PLACE UNTIL THE FINAL STRIPING LAYOUT HAS BEEN LAID. AT THAT TIME THE PERMANENT STOP SIGN SHALL REPLACE THE EXISTING TEMPORARY STOP SIGN. SEE THE SIGNING AND STRIPING PLANS FOR FINAL LOCATION OF PERMANENT STOP SIGN PLACEMENT.

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-DOVER, DELAWARE
2. POLE BASES, CABINET BASE, AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED EXCEPT WHERE SHOWN.
3. ALL GALVANIZED RIGID CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
4. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY FOR THE UTILITY MARKOUTS PRIOR TO THE BEGINNING OF CONSTRUCTION. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
5. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.
6. ALL 4", 3", 2.5", AND 2" CONDUITS SHALL BE SCHEDULE 80 PVC WITH THE EXCEPTION OF 4" BORED CONDUIT WHICH SHALL BE SDR-13.5 HDPE. ALL 1" CONDUITS LESS THAN OR EQUAL TO 6'-0" SHALL BE LIQUID TIGHT FLEXIBLE NON-METALLIC AND ALL 1" CONDUITS GREATER THAN 6'-0" SHALL BE RIGID GALVANIZED.

SECTION 1
PHASE 6, STAGE 6

RECOMMENDED _____ DATE: 05/15/13

RECOMMENDED _____ DATE: 7/12/13

RECOMMENDED _____ DATE: _____

APPROVED TRAFFIC ENGINEER _____ DATE: 7/12/13

APPROVED FOR INSTALLATION
CHIEF TRAFFIC ENGINEER _____ DATE: 7/12/13

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SCALE
0 30 60 90
FEET

SR 26, ATLANTIC AVENUE FROM CLARKSVILLE TO ASSAWOMAN CANAL

CONTRACT	PERMIT NO.	S196
T200411210	DESIGNED BY:	MSK
COUNTY	CHECKED BY:	BAM
SUSSEX		

SIGNAL PLAN SR 26 @ POWELL FARM ROAD

SHEET NO.
515
TOTAL SHTS.
589

7/10/2013
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15:45:43

CONDUIT RUN SCHEDULE

CO#	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
*1	1	2"	10'	-	EXISTING [(1)#6 BARE STRANDED COPPER (1)#8/2 U.F.W/ GROUND]
*1A	1	2"	45'	-	EXISTING [(1)#6 BSC (1)#8/2 U.F.W/ GROUND]
*2	1	4"	15'	-	EXISTING [(1)#6 BSC (4)#18/4 (2)#14/16 (4)MW DETECTION HR CABLE]. REMOVE (4)MICROWAVE DETECTION HOMERUN CABLE
*3	3	4"	10'	-	EXISTING (3)#6 BSC (9)#14/2 (1)#18/4 COMMUNICATION CABLE]
*4	1	1"	5'	-	NEW (2)#14/1
*5	1	4"	55'	-	EXISTING [(1)#6 BSC (4)#14/2]
*6	1	1"	5'	-	NEW (2)#14/1
*7	1	4"	160'	-	EXISTING [(1)#6 BSC (1)#14/2]
*8	1	1"	5'	-	NEW (2)#14/1
*9	1	3"	25'	-	EMPTY
*10	1	4"	100'	-	EXISTING [(1)#6 BSC (2)#14/2]
*11	1	1"	10'	-	NEW (2)#14/1
*12	1	3"	5'	-	EMPTY
*13	1	1"	20'	-	NEW (2)#14/1
*14	1	4"	55'	-	EXISTING [(1)#6 BSC (4)#14/2 (1)#18/4]
*15	1	1"	15'	-	NEW (2)#14/1
*16	1	4"	50'	-	EXISTING [(1)#6 BSC (2)#14/2]
*17	1	4"	65'	-	EXISTING [(1)#6 BSC (1)#14/2]
*18	1	3"	5'	-	EMPTY
*19	1	4"	175'	-	EXISTING [(1)#6 BSC (1)#14/2]
*20	1	1"	5'	-	NEW (2)#14/1
*21	1	4"	125'	-	EXISTING [(1)#6 BSC (1)#18/4]
*22	1	4"	90'	-	EXISTING [(1)#6 BSC (1)#18/4]
*23	1	2.5"	15'	-	EXISTING [(1)#6 BSC (1)#18/4]
*F1	1	4"	255'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F2	1	4"	165'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F3	1	4"	55'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F4	1	4"	25'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F5	1	4"	370'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)

LEGEND
* DENOTES EXISTING

B- BORE
T- TRENCH
O- OPEN CUT

SPAN WIRE SCHEDULE

SPAN	LENGTH	SPAN MOUNT HEIGHT	5% SAG	SPAN LOW POINT	BOTTOM OF LOWEST HEAD
*NORTH	85 FT	26.60 FT	4.25 FT	22.35 FT	17.85 FT
*EAST	87 FT	26.00 FT	4.35 FT	21.65 FT	17.15 FT
*SOUTH	111 FT	26.60 FT	5.55 FT	21.05 FT	16.55 FT
*WEST	85 FT	26.00 FT	4.25 FT	21.75 FT	17.25 FT

*DENOTES EXISTING

POLE SCHEDULE

POLE *	POLE TYPE	HEIGHT	MATERIAL
*1	STRAIN	32'	STEEL
*2	STRAIN	32'	STEEL
*3	PEDESTRIAN	10'	ALUMINUM
*4	STRAIN	32'	STEEL
*5	STRAIN	32'	STEEL

* DENOTES EXISTING

EXISTING SIGNING

A — R3-6L 30"x36"

B — R3-5R 30"x36"

PROPOSED SIGNING

A — ← Powell Farm Rd — D3-1 138"x24"

A — Powell Farm Rd → — D3-1 138"x24"

A — Atlantic Ave — D3-1 90"x24"

PHASE 7, STAGE 1 SIGNAL NOTES

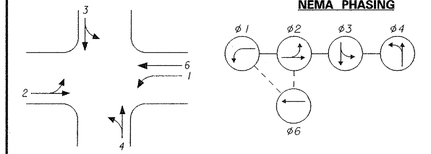
1. INSTALL PROPOSED LOOP DETECTORS.
2. REMOVE EXISTING MICROWAVE DETECTION SIGNAL INSTALLATION. ACTIVATION OF THE PROPOSED LOOP DETECTOR SIGNAL INSTALLATION AND DEACTIVATION OF THE EXISTING MICROWAVE DETECTORS SHALL BE COORDINATED TO ALLOW FOR A SMOOTH SIGNAL TRANSITION.
3. REMOVE EXISTING 3-SECTION SIGNAL HEAD *1 AND REPLACE WITH PROPOSED 5-SECTION SIGNAL HEAD *1 AS SHOWN.

SECTION 4

PHASE 7, STAGE 1

SIGNAL PHASING

NEMA PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

	PROPOSED SIGNAL CABINET	(RM/C)	REMOVE BY CONTRACTOR
	EXISTING SIGNAL CABINET	(RM/O)	REMOVE BY OTHERS
	PROPOSED SIGNAL POLE BASE	(AB)	ABANDON
	EXISTING SIGNAL POLE BASE	(PB/X)	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	PROPOSED PEDESTRIAN POLE BASE	(PB/X)	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	EXISTING PEDESTRIAN POLE BASE	(PL/X)	PROPOSED POLE IDENTIFIER (* OF POLE)
	PROPOSED WOOD POLE	(PL/X)	EXISTING POLE IDENTIFIER (* OF POLE)
	EXISTING WOOD POLE	(JW/X)	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	PROPOSED JUNCTION WELL	(JW/X)	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	EXISTING JUNCTION WELL	(CO/*)	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
	PROPOSED SIGNAL HEAD	(CO/*)	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
	EXISTING SIGNAL HEAD	(OH/*)	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
	PROPOSED PEDESTRIAN SIGNAL HEAD	(OH/*)	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
	EXISTING PEDESTRIAN SIGNAL HEAD	(MA/XX)	PROPOSED MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	PROPOSED PEDESTRIAN PUSHBUTTON	(MA/XX)	EXISTING MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	EXISTING PEDESTRIAN PUSHBUTTON	(CA/X)	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
	PROPOSED VIDEO DETECTION	(CA/X)	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
	EXISTING VIDEO DETECTION		PROPOSED SPAN WIRE
	PROPOSED MICROWAVE DETECTION	XX	EXISTING SPAN WIRE
	EXISTING MICROWAVE DETECTION		RIGHT-OF-WAY OR PROPERTY LINE
	OVERHEAD SIGNING		PROPOSED SPAN INSULATOR
	PROPOSED OPTICOM RECEIVER		EXISTING SPAN INSULATOR
	EXISTING OPTICOM RECEIVER	P	SERVICE PEDESTAL
	PROPOSED MAST ARM		PROPOSED CCTV
	EXISTING MAST ARM		EXISTING CCTV
	PROPOSED LUMINAIRE		PROPOSED PLASTIC DRUMS
	EXISTING LUMINAIRE		EXISTING PLASTIC DRUMS
	PROPOSED LOOP DETECTOR (TYPE 1 OR 2)		
	EXISTING LOOP DETECTOR (TYPE 1 OR 2)		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-DOVER, DELAWARE.
2. POLE BASES, CABINET BASE, AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED EXCEPT WHERE SHOWN.
3. ALL GALVANIZED RIGID CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
4. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY FOR THE UTILITY MARKOUTS PRIOR TO THE BEGINNING OF CONSTRUCTION. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
5. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.
6. ALL 4", 3", 2.5", AND 2" CONDUITS SHALL BE SCHEDULE 80 PVC WITH THE EXCEPTION OF 4" BORED CONDUIT WHICH SHALL BE SDR-13.5 HDPE. ALL 1" CONDUITS LESS THAN OR EQUAL TO 6'-0" SHALL BE LIQUID TIGHT FLEXIBLE NON-METALLIC AND ALL 1" CONDUITS GREATER THAN 6'-0" SHALL BE RIGID GALVANIZED.

RECOMMENDED B. Adolf	DATE: 05/15/13	RECOMMENDED Chtne Dave	DATE: 7/12/13
RECOMMENDED _____	DATE: _____	APPROVED TRAFFIC ENGINEER M. Finney	DATE: 7/12/13
APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER M. Lagos	DATE: 7/12/13		

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

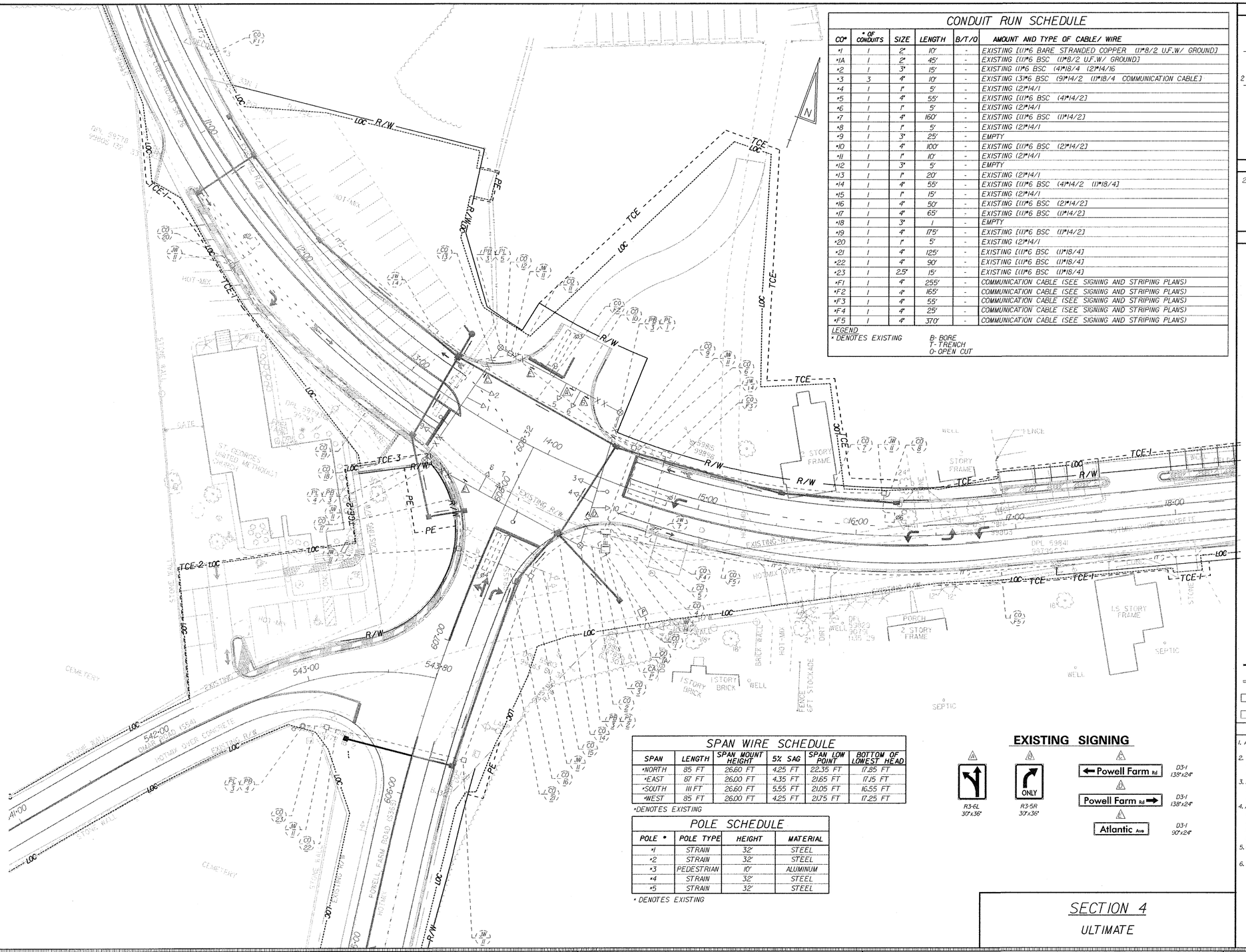
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SR 26, ATLANTIC AVENUE FROM CLARKSVILLE TO ASSAWOMAN CANAL

CONTRACT T200411210	PERMIT NO.	S196	SHEET NO. 516
COUNTY SUSSEX	DESIGNED BY:	MSK	TOTAL SHTS. 589
	CHECKED BY:	BAM	

SIGNAL PLAN SR 26 @ POWELL FARM ROAD

7/10/2013
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15:46:29



CONDUIT RUN SCHEDULE

CO#	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
*1	1	2"	10'	-	EXISTING [(1)#6 BARE STRANDED COPPER (1)#8/2 U.F.W/ GROUND]
*1A	1	2"	45'	-	EXISTING [(1)#6 BSC (1)#8/2 U.F.W/ GROUND]
*2	1	3"	15'	-	EXISTING (1)#6 BSC (4)#18/4 (2)#14/16
*3	3	4"	10'	-	EXISTING (3)#6 BSC (9)#14/2 (1)#18/4 COMMUNICATION CABLE]
*4	1	1"	5'	-	EXISTING (2)#14/1
*5	1	4"	55'	-	EXISTING [(1)#6 BSC (4)#14/2]
*6	1	1"	5'	-	EXISTING (2)#14/1
*7	1	4"	160'	-	EXISTING [(1)#6 BSC (1)#14/2]
*8	1	1"	5'	-	EXISTING (2)#14/1
*9	1	3"	25'	-	EMPTY
*10	1	4"	100'	-	EXISTING [(1)#6 BSC (2)#14/2]
*11	1	1"	10'	-	EXISTING (2)#14/1
*12	1	3"	5'	-	EMPTY
*13	1	1"	20'	-	EXISTING (2)#14/1
*14	1	4"	55'	-	EXISTING [(1)#6 BSC (4)#14/2 (1)#18/4]
*15	1	1"	15'	-	EXISTING (2)#14/1
*16	1	4"	50'	-	EXISTING [(1)#6 BSC (2)#14/2]
*17	1	4"	65'	-	EXISTING [(1)#6 BSC (1)#14/2]
*18	1	3"	1	-	EMPTY
*19	1	4"	175'	-	EXISTING [(1)#6 BSC (1)#14/2]
*20	1	1"	5'	-	EXISTING (2)#14/1
*21	1	4"	125'	-	EXISTING [(1)#6 BSC (1)#18/4]
*22	1	4"	90'	-	EXISTING [(1)#6 BSC (1)#18/4]
*23	1	2.5"	15'	-	EXISTING [(1)#6 BSC (1)#18/4]
*F1	1	4"	255'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F2	1	4"	165'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F3	1	4"	55'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F4	1	4"	25'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F5	1	4"	370'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)

LEGEND
* DENOTES EXISTING

B- BORE
T- TRENCH
O- OPEN CUT

SPAN WIRE SCHEDULE

SPAN	LENGTH	SPAN MOUNT HEIGHT	5% SAG	SPAN LOW POINT	BOTTOM OF LOWEST HEAD
*NORTH	85 FT	26.60 FT	4.25 FT	22.35 FT	17.85 FT
*EAST	87 FT	26.00 FT	4.35 FT	21.65 FT	17.15 FT
*SOUTH	111 FT	26.60 FT	5.55 FT	21.05 FT	16.55 FT
*WEST	85 FT	26.00 FT	4.25 FT	21.75 FT	17.25 FT

*DENOTES EXISTING

POLE SCHEDULE

POLE *	POLE TYPE	HEIGHT	MATERIAL
*1	STRAIN	32'	STEEL
*2	STRAIN	32'	STEEL
*3	PEDESTRIAN	10'	ALUMINUM
*4	STRAIN	32'	STEEL
*5	STRAIN	32'	STEEL

* DENOTES EXISTING

EXISTING SIGNING

R3-6L 30"x36"

R3-5R 30"x36"

D3-1 139"x24"

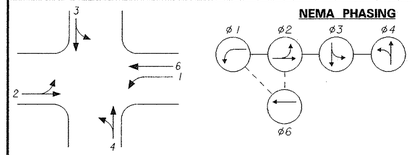
D3-1 138"x24"

D3-1 90"x24"

SECTION 4

ULTIMATE

SIGNAL PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

	PROPOSED SIGNAL CABINET	RM/C	REMOVE BY CONTRACTOR
	EXISTING SIGNAL CABINET	RM/O	REMOVE BY OTHERS
	PROPOSED SIGNAL POLE BASE	AB	ABANDON
	EXISTING SIGNAL POLE BASE	FB/X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	PROPOSED PEDESTRIAN POLE BASE	PB/X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	EXISTING PEDESTRIAN POLE BASE	PL/X	PROPOSED POLE IDENTIFIER (* OF POLE)
	PROPOSED WOOD POLE	PL/X	EXISTING POLE IDENTIFIER (* OF POLE)
	EXISTING WOOD POLE	JW/X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	PROPOSED JUNCTION WELL	JW/X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	EXISTING JUNCTION WELL	CO/*	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
	PROPOSED SIGNAL HEAD	CO/*	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
	EXISTING SIGNAL HEAD	OH/*	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
	PROPOSED PEDESTRIAN SIGNAL HEAD	OH/*	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
	EXISTING PEDESTRIAN SIGNAL HEAD	MA/XX	PROPOSED MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	PROPOSED PEDESTRIAN PUSHBUTTON	MA/XX	EXISTING MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	EXISTING PEDESTRIAN PUSHBUTTON	CA/X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
	PROPOSED VIDEO DETECTION	CA/X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
	EXISTING VIDEO DETECTION		PROPOSED SPAN WIRE
	PROPOSED MICROWAVE DETECTION	XX	EXISTING SPAN WIRE
	EXISTING MICROWAVE DETECTION		RIGHT-OF-WAY OR PROPERTY LINE
	OVERHEAD SIGNING		PROPOSED SPAN INSULATOR
	PROPOSED OPTICOM RECEIVER		EXISTING SPAN INSULATOR
	EXISTING OPTICOM RECEIVER	P	SERVICE PEDESTAL
	PROPOSED MAST ARM		PROPOSED CCTV
	EXISTING MAST ARM		EXISTING CCTV
	PROPOSED LUMINAIRE		PROPOSED PLASTIC DRUMS
	EXISTING LUMINAIRE		EXISTING PLASTIC DRUMS
	PROPOSED LOOP DETECTOR (TYPE 1 OR 2)		
	EXISTING LOOP DETECTOR (TYPE 1 OR 2)		

GENERAL SIGNAL NOTES

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5. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.
6. ALL 4", 3", 2.5", AND 2" CONDUITS SHALL BE SCHEDULE 80 PVC WITH THE EXCEPTION OF 4" BORED CONDUIT WHICH SHALL BE SDR-13.5 HDPE. ALL 1" CONDUITS LESS THAN OR EQUAL TO 6'-0" SHALL BE LIQUID TIGHT FLEXIBLE NON-METALLIC AND ALL 1" CONDUITS GREATER THAN 6'-0" SHALL BE RIGID GALVANIZED.

RECOMMENDED B. A. M. DATE: 05/15/13

RECOMMENDED Chris Dane DATE: 7/12/13

RECOMMENDED _____ DATE: _____

APPROVED TRAFFIC ENGINEER Narae C. Mtt DATE: 7/12/13

APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER _____ DATE: 7/12/13

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SCALE 0 30 60 90 FEET

SR 26, ATLANTIC AVENUE FROM CLARKSVILLE TO ASSAWOMAN CANAL

CONTRACT	T200411210	PERMIT NO.	S196
COUNTY	SUSSEX	DESIGNED BY:	MSK
		CHECKED BY:	BAM

SIGNAL PLAN SR 26 @ POWELL FARM ROAD (ULTIMATE)

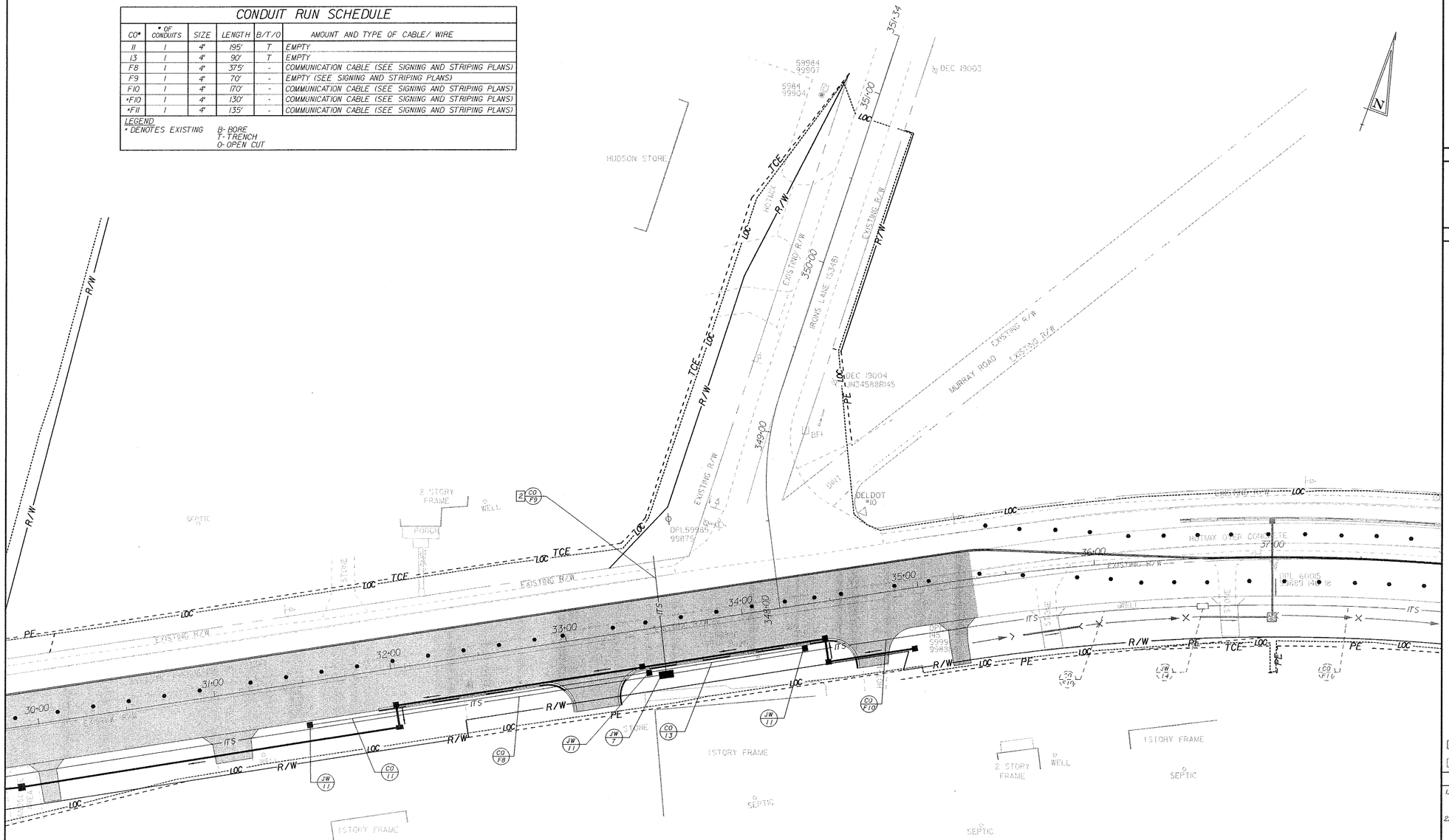
SHEET NO.	517
TOTAL SHTS.	589

7/10/2013
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CONDUIT RUN SCHEDULE

CO*	* OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
I1	1	4"	195'	T	EMPTY
I3	1	4"	90'	T	EMPTY
F8	1	4"	375'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
F9	1	4"	70'	-	EMPTY (SEE SIGNING AND STRIPING PLANS)
F10	1	4"	170'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F10	1	4"	130'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F11	1	4"	135'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)

LEGEND
* DENOTES EXISTING B- BORE, T- TRENCH, O- OPEN CUT



SIGNAL PHASING

SIGNAL HEAD DIAGRAM



LEGEND

	PROPOSED SIGNAL CABINET	RM/C	REMOVE BY CONTRACTOR
	EXISTING SIGNAL CABINET	RM/O	REMOVE BY OTHERS
	PROPOSED SIGNAL POLE BASE	AB	ABANDON
	EXISTING SIGNAL POLE BASE	PB/X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	PROPOSED PEDESTRIAN POLE BASE	(PB/X)	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	EXISTING PEDESTRIAN POLE BASE	PL/X	PROPOSED POLE IDENTIFIER (* OF POLE)
	PROPOSED WOOD POLE	(PL/X)	EXISTING POLE IDENTIFIER (* OF POLE)
	EXISTING WOOD POLE	JW/X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	PROPOSED JUNCTION WELL	(JW/X)	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	EXISTING JUNCTION WELL	CO/*	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
	PROPOSED SIGNAL HEAD	(CO/*)	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
	EXISTING SIGNAL HEAD	OH/*	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
	PROPOSED PEDESTRIAN SIGNAL HEAD	(OH/*)	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
	EXISTING PEDESTRIAN SIGNAL HEAD	MA/XX	PROPOSED MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	PROPOSED PEDESTRIAN PUSHBUTTON	(MA/XX)	EXISTING MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
D	EXISTING PEDESTRIAN PUSHBUTTON	CA/X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
	PROPOSED VIDEO DETECTION	(CA/X)	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
	EXISTING VIDEO DETECTION		PROPOSED SPAN WIRE
	PROPOSED MICROWAVE DETECTION	XX	EXISTING SPAN WIRE
	EXISTING MICROWAVE DETECTION		RIGHT-OF-WAY OR PROPERTY LINE
	OVERHEAD SIGNING		PROPOSED SPAN INSULATOR
	PROPOSED OPTICOM RECEIVER		EXISTING SPAN INSULATOR
	EXISTING OPTICOM RECEIVER	P	SERVICE PEDESTAL
	PROPOSED MAST ARM		PROPOSED CCTV
	EXISTING MAST ARM		EXISTING CCTV
	PROPOSED LUMINAIRE		PROPOSED PLASTIC DRUMS
	EXISTING LUMINAIRE		EXISTING PLASTIC DRUMS
	PROPOSED LOOP DETECTOR (TYPE 1 OR 2)		
	EXISTING LOOP DETECTOR (TYPE 1 OR 2)		

GENERAL SIGNAL NOTES

1. ALL GALVANIZED RIGID CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
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3. ALL 4", 3", 2.5", AND 2" CONDUITS SHALL BE SCHEDULE 80 PVC WITH THE EXCEPTION OF 4" BORED CONDUIT WHICH SHALL BE SDR-13.5 HDPE. ALL 1" CONDUITS LESS THAN OR EQUAL TO 6'-0" SHALL BE LIQUID TIGHT FLEXIBLE NON-METALLIC AND ALL 1" CONDUITS GREATER THAN 6'-0" SHALL BE RIGID GALVANIZED.

UNDERGROUND ONLY

PHASE 5, STAGE 2 SIGNAL NOTES

1. SIGNAL INSTALLATION AT THIS INTERSECTION IS UNDERGROUND ONLY. ONLY CONDUITS AND JUNCTION WELLS WILL BE INSTALLED.
2. PLUG OPEN END OF CONDUIT.

SECTION 4
PHASE 5, STAGE 2

RECOMMENDED _____ DATE: 05/15/13
RECOMMENDED _____ DATE: 7/12/13
RECOMMENDED _____ DATE: _____
APPROVED TRAFFIC ENGINEER _____ DATE: 7/12/13
APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER _____ DATE: 7/12/13

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SCALE 0 30 60 90 FEET

SR 26, ATLANTIC AVENUE FROM CLARKSVILLE TO ASSAWOMAN CANAL

CONTRACT	T200411210
COUNTY	SUSSEX
PERMIT NO.	S327
DESIGNED BY:	MSK
CHECKED BY:	BAM

SIGNAL PLAN SR 26 @ IRONS LANE

SHEET NO.	518
TOTAL SHTS.	589

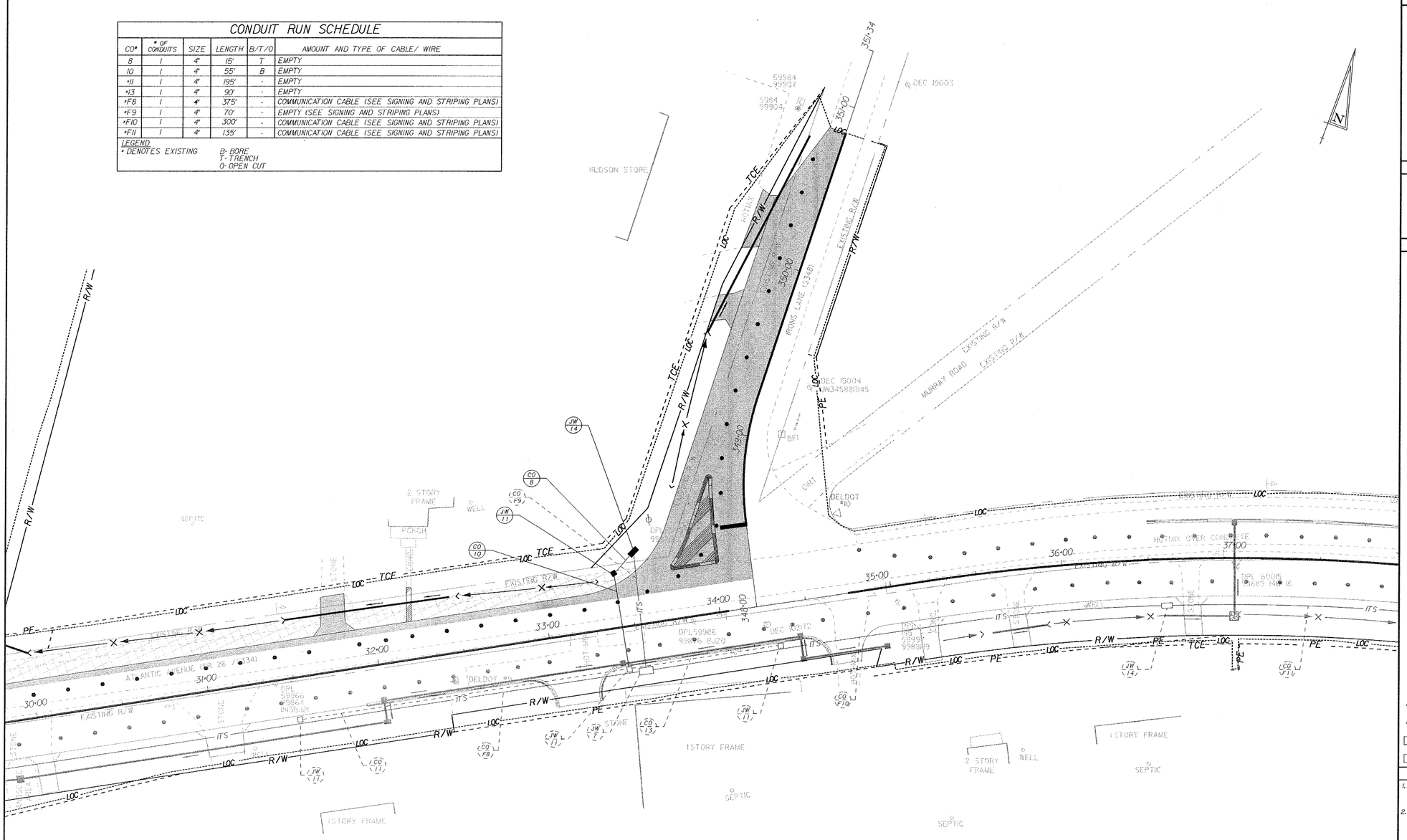
7/10/2013
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CONDUIT RUN SCHEDULE

CO#	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
8	1	4"	15'	T	EMPTY
10	1	4"	55'	B	EMPTY
*11	1	4"	195'	-	EMPTY
*13	1	4"	90'	-	EMPTY
*F8	1	4"	375'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F9	1	4"	70'	-	EMPTY (SEE SIGNING AND STRIPING PLANS)
*F10	1	4"	300'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F11	1	4"	135'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)

LEGEND
* DENOTES EXISTING

B- BORE
T- TRENCH
O- OPEN CUT

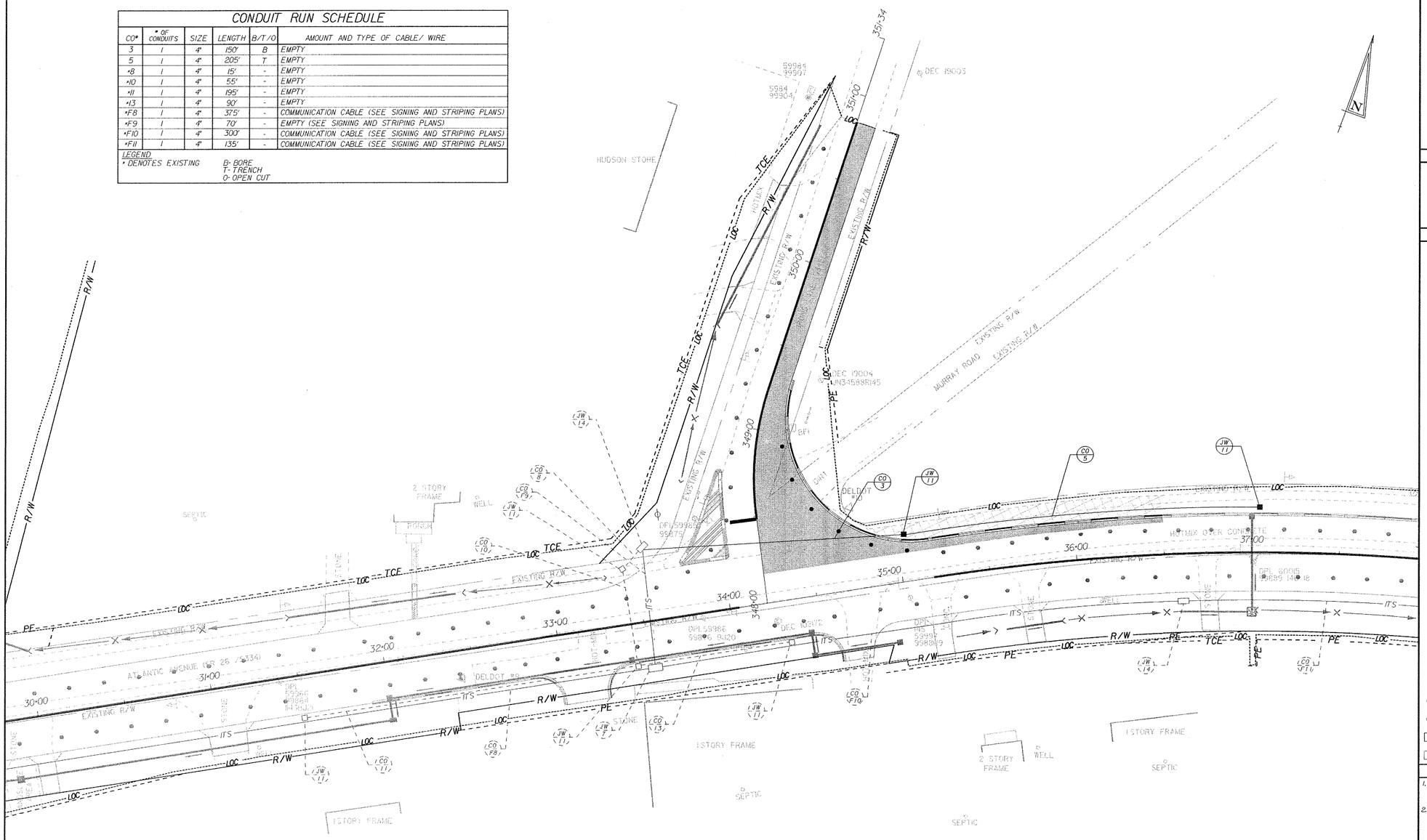


CONDUIT RUN SCHEDULE

CO#	* OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
3	1	4"	150'	B	EMPTY
5	1	4"	205'	T	EMPTY
*8	1	4"	15'	-	EMPTY
*10	1	4"	55'	-	EMPTY
*11	1	4"	195'	-	EMPTY
*13	1	4"	90'	-	EMPTY
*F8	1	4"	375'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F9	1	4"	70'	-	EMPTY (SEE SIGNING AND STRIPING PLANS)
*F10	1	4"	300'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F11	1	4"	135'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)

LEGEND
* DENOTES EXISTING

B- BORE
T- TRENCH
O- OPEN CUT

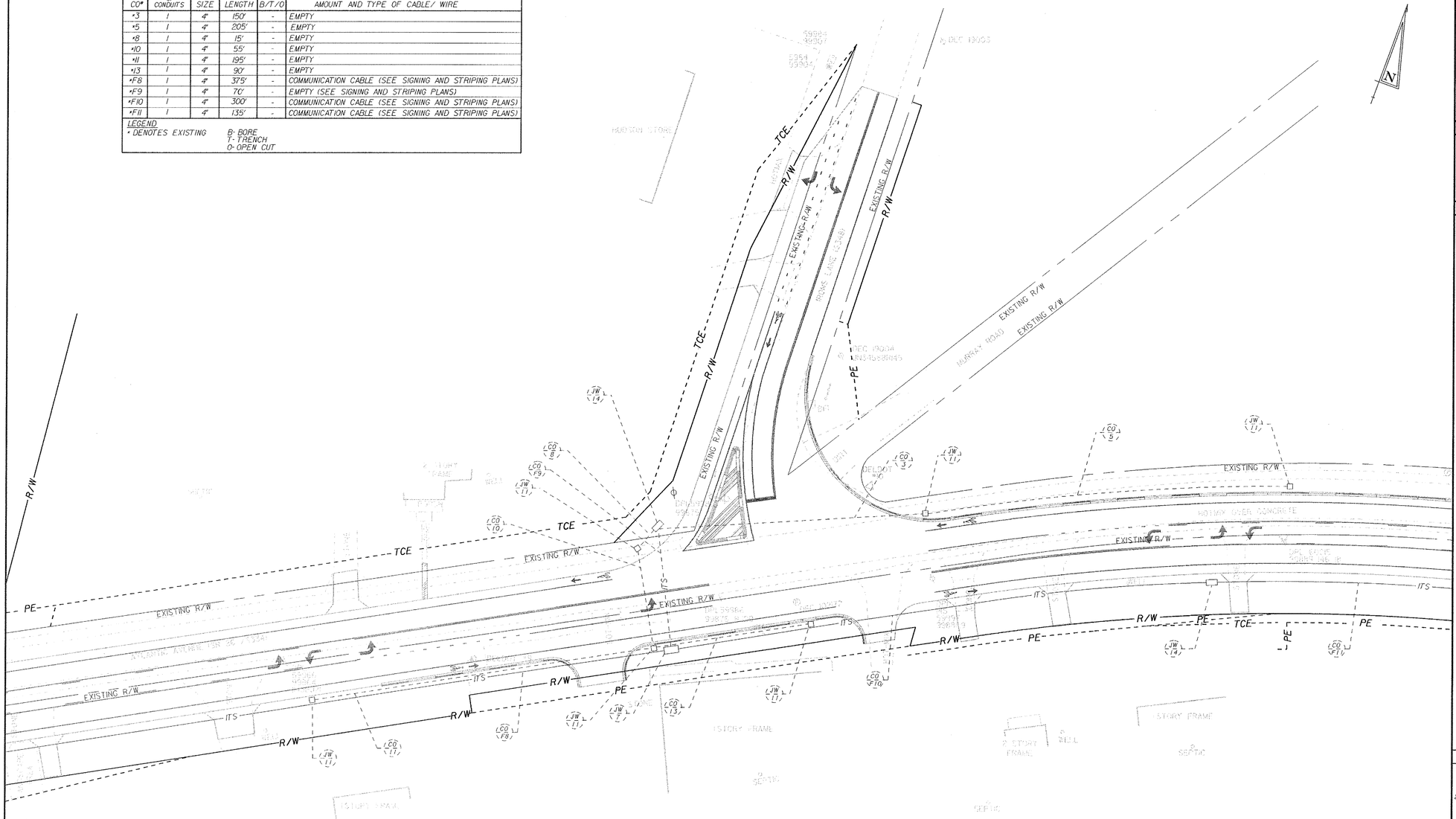


CONDUIT RUN SCHEDULE

CO#	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
*3	1	4"	150'	-	EMPTY
*5	1	4"	205'	-	EMPTY
*8	1	4"	15'	-	EMPTY
*10	1	4"	55'	-	EMPTY
*11	1	4"	195'	-	EMPTY
*13	1	4"	90'	-	EMPTY
*F8	1	4"	375'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F9	1	4"	70'	-	EMPTY (SEE SIGNING AND STRIPING PLANS)
*F10	1	4"	300'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F11	1	4"	135'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)

LEGEND
* DENOTES EXISTING

B- BORE
T- TRENCH
O- OPEN CUT



UNDERGROUND ONLY

PHASE 5, STAGE 2 SIGNAL NOTES

1. SIGNAL INSTALLATION AT THIS INTERSECTION IS UNDERGROUND ONLY. ONLY CONDUITS AND JUNCTION WELLS WILL BE INSTALLED.

SECTION 4
ULTIMATE

SIGNAL PHASING

SIGNAL HEAD DIAGRAM



LEGEND

	PROPOSED SIGNAL CABINET	(RM/C)	REMOVE BY CONTRACTOR
	EXISTING SIGNAL CABINET	(RM/O)	REMOVE BY OTHERS
	PROPOSED SIGNAL POLE BASE	(AB)	ABANDON
	EXISTING SIGNAL POLE BASE	(PB/X)	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	PROPOSED PEDESTRIAN POLE BASE	(PB/X)	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	EXISTING PEDESTRIAN POLE BASE	(PL/X)	PROPOSED POLE IDENTIFIER (# OF POLE)
	PROPOSED WOOD POLE	(PL/X)	EXISTING POLE IDENTIFIER (# OF POLE)
	EXISTING WOOD POLE	(JW/X)	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	PROPOSED JUNCTION WELL	(JW/X)	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	EXISTING JUNCTION WELL	(CO/#)	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)
	PROPOSED SIGNAL HEAD	(CO/#)	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)
	EXISTING SIGNAL HEAD	(OH/#)	PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
	PROPOSED PEDESTRIAN SIGNAL HEAD	(OH/#)	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
	EXISTING PEDESTRIAN SIGNAL HEAD	(MA/XX)	PROPOSED MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	PROPOSED PEDESTRIAN PUSHBUTTON	(MA/XX)	EXISTING MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	EXISTING PEDESTRIAN PUSHBUTTON	(CA/X)	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
	PROPOSED VIDEO DETECTION	(CA/X)	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
	EXISTING VIDEO DETECTION		PROPOSED SPAN WIRE
	PROPOSED MICROWAVE DETECTION	XX	EXISTING SPAN WIRE
	EXISTING MICROWAVE DETECTION		RIGHT-OF-WAY OR PROPERTY LINE
	OVERHEAD SIGNING		PROPOSED SPAN INSULATOR
	PROPOSED OPTICOM RECEIVER		EXISTING SPAN INSULATOR
	EXISTING OPTICOM RECEIVER	P	SERVICE PEDESTAL
	PROPOSED MAST ARM		PROPOSED CCTV
	EXISTING MAST ARM		EXISTING CCTV
	PROPOSED LUMINAIRE		PROPOSED PLASTIC DRUMS
	EXISTING LUMINAIRE		EXISTING PLASTIC DRUMS
	PROPOSED LOOP DETECTOR (TYPE 1 OR 2)		
	EXISTING LOOP DETECTOR (TYPE 1 OR 2)		

GENERAL SIGNAL NOTES

1. ALL GALVANIZED RIGID CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY FOR THE UTILITY MARKOUTS PRIOR TO THE BEGINNING OF CONSTRUCTION. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
3. ALL 4", 3", 2.5", AND 2" CONDUITS SHALL BE SCHEDULE 80 PVC WITH THE EXCEPTION OF 4" BORED CONDUIT WHICH SHALL BE SDR-13.5 HDPE. ALL 1" CONDUITS LESS THAN OR EQUAL TO 6'-0" SHALL BE LIQUID TIGHT FLEXIBLE NON-METALLIC AND ALL 1" CONDUITS GREATER THAN 6'-0" SHALL BE RIGID GALVANIZED.

RECOMMENDED _____ DATE: 05/15/13

RECOMMENDED Chelna Daw DATE: 7/12/2013

RECOMMENDED _____ DATE: _____

APPROVED TRAFFIC ENGINEER _____ DATE: 7/12/13

APPROVED FOR INSTALLATION
CHIEF TRAFFIC ENGINEER _____ DATE: 7/12/13

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SCALE
0 30 60 90
FEET

SR 26, ATLANTIC AVENUE FROM CLARKSVILLE TO ASSAWOMAN CANAL

CONTRACT	T200411210
COUNTY	SUSSEX
PERMIT NO.	S327
DESIGNED BY:	MSK
CHECKED BY:	BAM

SIGNAL PLAN
SR 26 @ IRONS LANE
(ULTIMATE)

SHEET NO.	521
TOTAL SHTS.	589

7/10/2013
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SPAN WIRE SCHEDULE

SPAN	LENGTH	SPAN MOUNT HEIGHT	5% SAG	SPAN LOW POINT	BOTTOM OF LOWEST HEAD
NORTH	108 FT	26.60 FT	5.40 FT	21.20 FT	16.70 FT
EAST	85 FT	26.00 FT	4.25 FT	21.75 FT	17.25 FT
SOUTH	122 FT	27.10 FT	6.10 FT	21.00 FT	16.50 FT
WEST	88 FT	26.00 FT	4.40 FT	21.60 FT	17.10 FT

NOTE: FIELD ADJUSTMENTS AS REQUIRED

POLE SCHEDULE

POLE #	POLE TYPE	HEIGHT	MATERIAL
1	STRAIN	32'	STEEL
2	CAMERA	75'	STEEL
3	STRAIN	32'	STEEL
4	STRAIN	32'	STEEL
5	STRAIN	32'	STEEL

PHASE 3, STAGE 2 SIGNAL NOTES

1. EXISTING SIGNAL SYSTEM SHALL NOT BE REMOVED OR ABANDONED BUT SHALL BE LEFT OPERATIONAL UNTIL PROPOSED MICROWAVE DETECTION SIGNAL INSTALLATION IS COMPLETED AND ACTIVATED IN THIS PHASE AND STAGE.
2. MICROWAVE DETECTORS SHALL BE LOCATED, MOUNTED, AND ORIENTED TO ACHIEVE OPTIMUM DETECTION. PROPOSED MICROWAVE HOMERUN CABLES SHALL RUN ALONG THE PROPOSED SPAN WIRE, DOWN THE SOUTHEAST SIGNAL POLE AND THROUGH CONDUIT (CO #2) TO THE SIGNAL CABINET.
3. PLUG OPEN ENDS OF CONDUIT.
4. POLE TO BE REMOVED BY TRAFFIC CONTRACTOR AND POLE BASE TO BE REMOVED BY PROJECT CONTRACTOR.
5. SIGNAL CABINET TO BE REMOVED BY TRAFFIC CONTRACTOR AND CABINET BASE TO BE REMOVED BY PROJECT CONTRACTOR.
6. REMOVE EXISTING JUNCTION WELL TYPE I AND REPLACE WITH PROPOSED JUNCTION WELL TYPE II. CARE SHALL BE TAKEN DURING REMOVAL AND INSTALLATION PROCESS NOT TO DAMAGE EXISTING CONDUITS AND CABLES.
7. TRAFFIC CONTRACTOR SHALL LIAISE WITH DelDOT TO CONDUCT SITE VISIT TO BEST ESTABLISH THE DEAD ZONE/PRIVACY MASKS FOR THE PROPOSED CCTV CAMERA TO GUARANTEE PRIVACY FOR AREAS THAT SHOULD NOT BE COVERED BY THE CAMERA.

CONDUIT RUN SCHEDULE

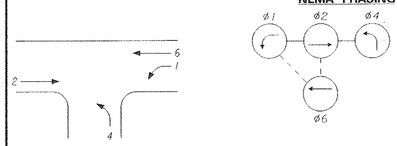
CO#	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
1	1	2"	10'	T	NEW [(1)#6 BARE STRANDED COPPER (1)#8/2 U.F.W./ GROUND]
1A	2	2"	15'	T	NEW [(2)#6 BSC (2)#8/2 U.F.W./ GROUND]
1B	2	2"	70'	B	NEW [(2)#6 BSC (2)#8/2 U.F.W./ GROUND]
1C	1	2"	15'	T	NEW [(1)#6 BSC (1)#8/2 U.F.W./ GROUND]
1D	1	2"	35'	T	NEW [(1)#6 BSC (1)#8/2 U.F.W./ GROUND]
1E	1	2"	10'	T	NEW [(1)#6 BSC (1)#8/2 U.F.W./ GROUND]
2	1	3"	5'	T	NEW [(1)#6 BSC (3)#18/4 (2)#14/16 (3)MICROWAVE DETECTION HOMERUN CABLES]
3	3	4"	5'	T	NEW COMMUNICATION CABLE
4	1	1"	5'	T	EMPTY
5	1	4"	65'	B	EMPTY
6	1	4"	205'	T	EMPTY
7	1	1"	10'	T	EMPTY
8	1	3"	15'	T	EMPTY
9	1	4"	130'	T	EMPTY
10	1	4"	25'	T	EMPTY
11	1	3"	10'	T	EMPTY
12	1	1"	10'	T	EMPTY
16	1	3"	25'	T	EMPTY
17	1	4"	40'	T	EMPTY
18	1	4"	235'	T	EMPTY
19	1	1"	5'	T	EMPTY
*20	1	2"	15'	-	EXISTING (1)#8/2 U.F.W/GROUND
*21	3	2.5"	5'	-	EXISTING [(7)#18/4 (3)#14/9]
*22	1	2.5"	12'	-	EXISTING [(1)#18/4 (1)#14/9]
*23	1	1.5"	6'	-	EXISTING (2)#18/4
*24	1	2.5"	78'	-	EXISTING (1)#18/4
*25	1	2.5"	225'	-	EXISTING (1)#18/4
*26	1	1.5"	8'	-	EXISTING (2)#18/4
*27	1	2.5"	72'	-	EXISTING [(3)#18/4 (2)#14/9]
*28	1	1.5"	5'	-	EXISTING (2)#18/4
*29	1	2.5"	40'	-	EXISTING [(2)#18/4 (2)#14/9]
*30	1	2.5"	200'	-	EXISTING (1)#18/4
*31	1	1.5"	5'	-	EXISTING (2)#18/4
F16	1	4"	385'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
F17	1	4"	175'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
F18	1	4"	10'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
F19	1	4"	10'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
F19A	1	3"	5'	-	CAMERA CABLE (SEE SIGNING AND STRIPING PLANS)
F20	1	4"	260'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)

LEGEND
* DENOTES EXISTING
B- BORE
T- TRENCH
O- OPEN CUT

PROPOSED DELDOT TRAFFIC CAMERA 7

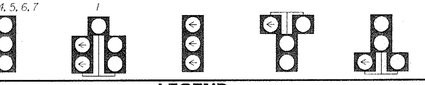
SIGNAL PHASING

NEMA PHASING



PHASING NOTES
1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

	PROPOSED SIGNAL CABINET	RM C	REMOVE BY CONTRACTOR
	EXISTING SIGNAL CABINET	RM O	REMOVE BY OTHERS
	PROPOSED SIGNAL POLE BASE	AB	ABANDON
	EXISTING SIGNAL POLE BASE	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	PROPOSED PEDESTRIAN POLE BASE	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	EXISTING PEDESTRIAN POLE BASE	PL X	PROPOSED POLE IDENTIFIER (# OF POLE)
	PROPOSED WOOD POLE	PL X	EXISTING POLE IDENTIFIER (# OF POLE)
	EXISTING WOOD POLE	JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	PROPOSED JUNCTION WELL	JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	EXISTING JUNCTION WELL	CO #	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)
	PROPOSED SIGNAL HEAD	CO #	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)
	EXISTING SIGNAL HEAD	OH #	PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
	PROPOSED PEDESTRIAN SIGNAL HEAD	OH #	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
	EXISTING PEDESTRIAN SIGNAL HEAD	MA XX	PROPOSED MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	PROPOSED PEDESTRIAN PUSHBUTTON	MA XX	EXISTING MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	EXISTING PEDESTRIAN PUSHBUTTON	CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
	PROPOSED VIDEO DETECTION	CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
	EXISTING VIDEO DETECTION		PROPOSED SPAN WIRE
	PROPOSED MICROWAVE DETECTION		EXISTING SPAN WIRE
	EXISTING MICROWAVE DETECTION		RIGHT-OF-WAY OR PROPERTY LINE
	OVERHEAD SIGNING		PROPOSED SPAN INSULATOR
	PROPOSED OPTICOM RECEIVER		EXISTING SPAN INSULATOR
	EXISTING OPTICOM RECEIVER	P	SERVICE PEDESTAL
	PROPOSED MAST ARM		PROPOSED CCTV
	EXISTING MAST ARM		EXISTING CCTV
	PROPOSED LUMINAIRE		PROPOSED PLASTIC DRUMS
	EXISTING LUMINAIRE		EXISTING PLASTIC DRUMS
	PROPOSED LOOP DETECTOR (TYPE 1OR 2)		
	EXISTING LOOP DETECTOR (TYPE 1OR 2)		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-DOVER, DELAWARE
2. POLE BASES, CABINET BASE, AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 209 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED EXCEPT WHERE SHOWN.
3. ALL GALVANIZED RIGID CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
4. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY FOR THE UTILITY MARKOUTS PRIOR TO THE BEGINNING OF CONSTRUCTION. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
5. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.
6. ALL 4", 3", 2.5", AND 2" CONDUITS SHALL BE SCHEDULE 80 PVC WITH THE EXCEPTION OF 4" BORED CONDUIT WHICH SHALL BE SDR-13.5 HDPE. ALL 1" CONDUITS LESS THAN OR EQUAL TO 6'-0" SHALL BE LIQUID TIGHT FLEXIBLE NON-METALLIC AND ALL 1" CONDUITS GREATER THAN 6'-0" SHALL BE RIGID GALVANIZED.

SECTION 4
PHASE 3, STAGE 2

RECOMMENDED _____ DATE: 05/15/13
RECOMMENDED _____ DATE: 2/12/13
RECOMMENDED _____ DATE:
APPROVED TRAFFIC ENGINEER _____ DATE: 7/12/13
APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER _____ DATE: 7/12/13

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SCALE 0 30 60 90 FEET

SR 26, ATLANTIC AVENUE FROM CLARKSVILLE TO ASSAWOMAN CANAL

CONTRACT	T200411210
COUNTY	SUSSEX

PERMIT NO.	S169
DESIGNED BY:	MSK
CHECKED BY:	BAM

SIGNAL PLAN
SR 26 @ ROXANA ROAD

SHEET NO.	522
TOTAL SHTS	589

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SPAN WIRE SCHEDULE

SPAN	LENGTH	SPAN MOUNT HEIGHT	5% SAG	SPAN LOW POINT	BOTTOM OF LOWEST HEAD
*NORTH	108 FT	26.60 FT	5.40 FT	21.20 FT	16.70 FT
*EAST	85 FT	26.00 FT	4.25 FT	21.75 FT	17.25 FT
*SOUTH	122 FT	27.10 FT	6.10 FT	21.00 FT	16.50 FT
*WEST	88 FT	26.00 FT	4.40 FT	21.60 FT	17.10 FT

* DENOTES EXISTING

POLE SCHEDULE

POLE *	POLE TYPE	HEIGHT	MATERIAL
*1	STRAIN	32'	STEEL
*2	CAMERA	75'	STEEL
*3	STRAIN	32'	STEEL
*4	STRAIN	32'	STEEL
*5	STRAIN	32'	STEEL

PHASE 3, STAGE 3 SIGNAL NOTES

1. EXISTING MICROWAVE DETECTORS SHALL BE ADJUSTED/REALIGNED AS NECESSARY TO ENSURE OPTIMUM DETECTION FOR LANE ASSIGNMENTS IN THIS STAGE.
2. AT THE COMMENCEMENT OF THIS STAGE, WHILE THE INTERSECTION IS UNDER FLAGGER OPERATION DURING CONSTRUCTION WORK HOURS, THE EXISTING CONCRETE ISLAND SHOULD BE REMOVED AND THE REMOVAL AREA PATCHED UP TO MATCH THE TEMPORARY WORK AREA GRADE ON ROXANA ROAD BEFORE THE INTERSECTION CONTROL IS SWITCHED TO SIGNAL CONTROL FOR NON-WORK HOURS.
3. PLUG OPEN ENDS OF CONDUIT.

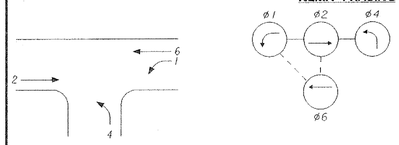
CONDUIT RUN SCHEDULE

CO*	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
*1	1	2"	10'	-	EXISTING [(1)#6 BARE STRANDED COPPER (1)#8/2 U.F.W./ GROUND]
*1A	2	2"	15'	-	EXISTING [(2)#6 BSC (2)#8/2 U.F.W./ GROUND]
*1B	2	2"	70'	-	EXISTING [(2)#6 BSC (2)#8/2 U.F.W./ GROUND]
*1C	1	2"	15'	-	EXISTING [(1)#6 BSC (1)#8/2 U.F.W./ GROUND]
*1D	1	2"	35'	-	EXISTING [(1)#6 BSC (1)#8/2 U.F.W./ GROUND]
*1E	1	2"	10'	-	EXISTING [(1)#6 BSC (1)#8/2 U.F.W./ GROUND]
*2	1	3"	5'	-	EXISTING [(1)#6 BSC (3)#18/4 (2)#14/16 (3)MICROWAVE DETECTION HOMERUN CABLES]
*3	3	4"	5'	-	EXISTING COMM. CABLE NEW [(3)#6 BSC (8)#14/2 (15' OF (2)#14/2 COILED IN JW)]
*4	1	1"	5'	-	EMPTY
*5	1	4"	65'	-	NEW [(1)#6 BSC (2)#14/2]
*6	1	4"	205'	-	NEW [(1)#6 BSC (1)#14/2 (15' COILED IN JW)]
*7	1	1"	10'	-	EMPTY
*8	1	3"	15'	-	EMPTY
*9	1	4"	130'	-	NEW [(1)#6 BSC (1)#14/2 (15' COILED IN JW)]
*10	1	4"	25'	-	EMPTY
*11	1	3"	10'	-	EMPTY
*12	1	1"	10'	-	EMPTY
13	1	4"	20'	T	NEW [(1)#6 BSC (4)#14/2 (15' OF (3)#14/2 COILED IN JW)]
14	1	1"	10'	T	EMPTY
15	1	4"	85'	B	NEW [(1)#6 BSC (1)#14/2]
*16	1	3"	25'	-	EMPTY
*17	1	4"	40'	-	NEW [(1)#6 BSC (1)#14/2]
*18	1	4"	235'	-	NEW [(1)#6 BSC (1)#14/2 (15' COILED IN JW)]
*19	1	1"	5'	-	EMPTY
*F16	1	4"	385'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F17	1	4"	175'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F18	1	4"	10'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F19	1	4"	10'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F19A	1	3"	5'	-	CAMERA CABLE (SEE SIGNING AND STRIPING PLANS)
*F20	1	4"	260'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)

LEGEND
* DENOTES EXISTING
B- BORE
T- TRENCH
O- OPEN CUT

SIGNAL PHASING

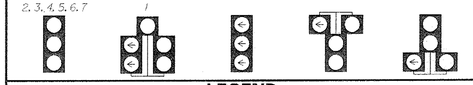
NEMA PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

	PROPOSED SIGNAL CABINET	RM/C	REMOVE BY CONTRACTOR
	EXISTING SIGNAL CABINET	RM/O	REMOVE BY OTHERS
	PROPOSED SIGNAL POLE BASE	AB	ABANDON
	EXISTING SIGNAL POLE BASE	PB/X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	PROPOSED PEDESTRIAN POLE BASE	(PB/X)	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	EXISTING PEDESTRIAN POLE BASE	PL/X	PROPOSED POLE IDENTIFIER (* OF POLE)
	PROPOSED WOOD POLE	(PL/X)	EXISTING POLE IDENTIFIER (* OF POLE)
	EXISTING WOOD POLE	JW/X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	PROPOSED JUNCTION WELL	(JW/X)	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	EXISTING JUNCTION WELL	CO/*	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
	PROPOSED SIGNAL HEAD	(CO/*)	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
	EXISTING SIGNAL HEAD	OH/*	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
	PROPOSED PEDESTRIAN SIGNAL HEAD	(OH/*)	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
	EXISTING PEDESTRIAN SIGNAL HEAD	MA/XX	PROPOSED MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	PROPOSED PEDESTRIAN PUSHBUTTON	(MA/XX)	EXISTING MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	EXISTING PEDESTRIAN PUSHBUTTON	CA/X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
	PROPOSED VIDEO DETECTION	(CA/X)	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
	EXISTING VIDEO DETECTION		PROPOSED SPAN WIRE
	PROPOSED MICROWAVE DETECTION	XX	EXISTING SPAN WIRE
	EXISTING MICROWAVE DETECTION		RIGHT-OF-WAY OR PROPERTY LINE
	OVERHEAD SIGNING		PROPOSED SPAN INSULATOR
	PROPOSED OPTICOM RECEIVER		EXISTING SPAN INSULATOR
	EXISTING OPTICOM RECEIVER	P	SERVICE PEDESTAL
	PROPOSED MAST ARM		PROPOSED CCTV
	EXISTING MAST ARM		EXISTING CCTV
	PROPOSED LUMINAIRE		PROPOSED PLASTIC DRUMS
	EXISTING LUMINAIRE		EXISTING PLASTIC DRUMS
	PROPOSED LOOP DETECTOR (TYPE 1 OR 2)		
	EXISTING LOOP DETECTOR (TYPE 1 OR 2)		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-DOVER, DELAWARE
2. POLE BASES, CABINET BASE, AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED EXCEPT WHERE SHOWN.
3. ALL GALVANIZED RIGID CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
4. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY FOR THE UTILITY MARKOUTS PRIOR TO THE BEGINNING OF CONSTRUCTION. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
5. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.
6. ALL 4", 3", 2.5", AND 2" CONDUITS SHALL BE SCHEDULE 80 PVC WITH THE EXCEPTION OF 4" BORED CONDUIT WHICH SHALL BE SDR-13.5 HDPE. ALL 1" CONDUITS LESS THAN OR EQUAL TO 6'-0" SHALL BE LIQUID TIGHT FLEXIBLE NON-METALLIC AND ALL 1" CONDUITS GREATER THAN 6'-0" SHALL BE RIGID GALVANIZED.

SECTION 4
PHASE 3, STAGE 3

RECOMMENDED _____ DATE: 05/15/13
RECOMMENDED _____ DATE: 7/12/13
RECOMMENDED _____ DATE: _____
APPROVED TRAFFIC ENGINEER _____ DATE: 7/12/13
APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER _____ DATE: 7/12/13

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SCALE 0 30 60 90 FEET

SR 26, ATLANTIC AVENUE FROM CLARKSVILLE TO ASSAWOMAN CANAL

CONTRACT	PERMIT NO.	S169
T200411210	DESIGNED BY:	MSK
COUNTY	CHECKED BY:	BAM
SUSSEX		

SIGNAL PLAN
SR 26 @ ROXANA ROAD

SHEET NO. 523
TOTAL SHTS. 589

7/11/2013 3:45:43 PM
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SPAN WIRE SCHEDULE

SPAN	LENGTH	SPAN MOUNT HEIGHT	5% SAG	SPAN LOW POINT	BOTTOM OF LOWEST HEAD
*NORTH	108 FT	26.60 FT	5.40 FT	21.20 FT	16.70 FT
*EAST	85 FT	26.00 FT	4.25 FT	21.75 FT	17.25 FT
*SOUTH	122 FT	27.10 FT	6.10 FT	21.00 FT	16.50 FT
*WEST	88 FT	26.00 FT	4.40 FT	21.60 FT	17.10 FT

* DENOTES EXISTING

POLE SCHEDULE

POLE *	POLE TYPE	HEIGHT	MATERIAL
*1	STRAIN	32'	STEEL
*2	CAMERA	75'	STEEL
*3	STRAIN	32'	STEEL
*4	STRAIN	32'	STEEL
*5	STRAIN	32'	STEEL

PHASE 7, STAGE 1 SIGNAL NOTES

1. SLIDE EXISTING SIGNAL HEAD TO ULTIMATE POSITION SHOWN.
2. ACTIVATE PROPOSED ULTIMATE SIGNAL INSTALLATION AND DEACTIVATE MICROWAVE DETECTION SIGNAL INSTALLATION. ACTIVATION AND DEACTIVATION SHOULD BE COORDINATED TO ALLOW FOR A SMOOTH SIGNAL TRANSITION.
3. REMOVE MICROWAVE DETECTORS AND ASSOCIATED CABLES.

PROPOSED SIGNING

A — Roxana Rd → — D3-1 102"x24"

A — ← Roxana Rd — D3-1 102"x24"

A — Atlantic Ave — D3-1 90"x24"

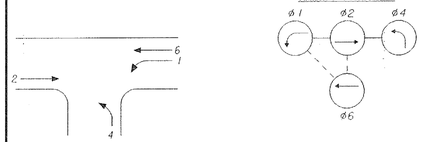
CONDUIT RUN SCHEDULE

CO*	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
*1	1	2"	10'	-	EXISTING ((1)#6 BARE STRANDED COPPER ((1)#8/2 U.F.W./ GROUND)
*1A	2	2"	15'	-	EXISTING ((2)#6 BSC (2)#8/2 U.F.W./ GROUND)
*1B	2	2"	70'	-	EXISTING ((2)#6 BSC (2)#8/2 U.F.W./ GROUND)
*1C	1	2"	15'	-	EXISTING ((1)#6 BSC (1)#8/2 U.F.W./ GROUND)
*1D	1	2"	35'	-	EXISTING ((1)#6 BSC (1)#8/2 U.F.W./ GROUND)
*1E	1	2"	10'	-	EXISTING ((1)#6 BSC (1)#8/2 U.F.W./ GROUND)
*2	1	3"	5'	-	EXISTING ((1)#6 BSC (3)#18/4 (2)#14/16 (3)MICROWAVE DETECTION HOMERUN CABLES) REMOVE (3)MICROWAVE DETECTION HOMERUN CABLES
*3	3	4"	5'	-	EXISTING ((3)#6 BSC (8)#14/2 COMMUNICATION CABLE)
*4	1	1"	5'	-	NEW (4)#14/1
*5	1	4"	65'	-	EXISTING ((1)#6 BSC (2)#14/2)
*6	1	4"	205'	-	EXISTING ((1)#6 BSC (1)#14/2)
*7	1	1"	10'	-	NEW (2)#14/1
*8	1	3"	15'	-	EMPTY
*9	1	4"	130'	-	EXISTING ((1)#6 BSC (1)#14/2)
*10	1	4"	25'	-	EMPTY
*11	1	3"	10'	-	EMPTY
*12	1	1"	10'	-	NEW (2)#14/1
*13	1	4"	20'	-	EXISTING ((1)#6 BSC (4)#14/2)
*14	1	1"	10'	-	NEW (4)#14/1
*15	1	4"	85'	-	EXISTING ((1)#6 BSC (1)#14/2)
*16	1	3"	25'	-	EMPTY
*17	1	4"	40'	-	EXISTING ((1)#6 BSC (1)#14/2)
*18	1	4"	235'	-	EXISTING ((1)#6 BSC (1)#14/2)
*19	1	1"	5'	-	NEW (2)#14/1
*F16	1	4"	385'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F17	1	4"	175'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F18	1	4"	10'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F19	1	4"	10'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F19A	1	3"	5'	-	CAMERA CABLE (SEE SIGNING AND STRIPING PLANS)
*F20	1	4"	260'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)

LEGEND
* DENOTES EXISTING
B- BORE
T- TRENCH
O- OPEN CUT

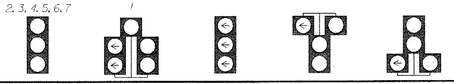
SIGNAL PHASING

NEMA PHASING



PHASING NOTES
1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

PROPOSED SIGNAL CABINET		(RM/C)	REMOVE BY CONTRACTOR
EXISTING SIGNAL CABINET		(RM/O)	REMOVE BY OTHERS
PROPOSED SIGNAL POLE BASE		(AB)	ABANDON
EXISTING SIGNAL POLE BASE		(PB/X)	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
PROPOSED PEDESTRIAN POLE BASE		(PB/X)	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
EXISTING PEDESTRIAN POLE BASE		(PL/X)	PROPOSED POLE IDENTIFIER (* OF POLE)
PROPOSED WOOD POLE		(PL/X)	EXISTING POLE IDENTIFIER (* OF POLE)
EXISTING WOOD POLE		(JW/X)	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
PROPOSED JUNCTION WELL		(JW/X)	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
EXISTING JUNCTION WELL		(CO/*)	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
PROPOSED SIGNAL HEAD		(CO/*)	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
EXISTING SIGNAL HEAD		(OH/*)	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
PROPOSED PEDESTRIAN SIGNAL HEAD		(OH/*)	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
EXISTING PEDESTRIAN SIGNAL HEAD		(MA/XX)	PROPOSED MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
PROPOSED PEDESTRIAN PUSHBUTTON		(MA/XX)	EXISTING MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
EXISTING PEDESTRIAN PUSHBUTTON		(CA/X)	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
PROPOSED VIDEO DETECTION		(CA/X)	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
EXISTING VIDEO DETECTION			PROPOSED SPAN WIRE
PROPOSED MICROWAVE DETECTION		XX	EXISTING SPAN WIRE
EXISTING MICROWAVE DETECTION			RIGHT-OF-WAY OR PROPERTY LINE
OVERHEAD SIGNING			PROPOSED SPAN INSULATOR
PROPOSED OPTICOM RECEIVER			EXISTING SPAN INSULATOR
EXISTING OPTICOM RECEIVER		P	SERVICE PEDESTAL
PROPOSED MAST ARM			PROPOSED CCTV
EXISTING MAST ARM			EXISTING CCTV
PROPOSED LUMINAIRE			PROPOSED PLASTIC DRUMS
EXISTING LUMINAIRE			EXISTING PLASTIC DRUMS
PROPOSED LOOP DETECTOR (TYPE 1 OR 2)			
EXISTING LOOP DETECTOR (TYPE 1 OR 2)			

GENERAL SIGNAL NOTES

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5. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.
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SECTION 4

PHASE 7, STAGE 1

RECOMMENDED [signature]	DATE: 05/15/13	RECOMMENDED Chetna Desai	DATE: 7/12/13
RECOMMENDED	DATE:	APPROVED TRAFFIC ENGINEER [signature]	DATE: 7/12/13
APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER [signature]	DATE: 7/12/13		

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SCALE 0 30 60 90 FEET

SR 26, ATLANTIC AVENUE FROM CLARKSVILLE TO ASSAWOMAN CANAL

CONTRACT	PERMIT NO.	S169
T200411210	DESIGNED BY:	MSK
COUNTY	CHECKED BY:	BAM
SUSSEX		

SIGNAL PLAN

SR 26 @ ROXANA ROAD

SHEET NO.	
524	
TOTAL SHTS.	
589	

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SPAN WIRE SCHEDULE

SPAN	LENGTH	SPAN MOUNT HEIGHT	5% SAG	SPAN LOW POINT	BOTTOM OF LOWEST HEAD
*NORTH	108 FT	26.60 FT	5.40 FT	21.20 FT	16.70 FT
*EAST	85 FT	26.00 FT	4.25 FT	21.75 FT	17.25 FT
*SOUTH	122 FT	27.10 FT	6.10 FT	21.00 FT	16.50 FT
*WEST	88 FT	26.00 FT	4.40 FT	21.60 FT	17.10 FT

* DENOTES EXISTING

POLE SCHEDULE

POLE *	POLE TYPE	HEIGHT	MATERIAL
*1	STRAIN	32'	STEEL
*2	CAMERA	75'	STEEL
*3	STRAIN	32'	STEEL
*4	STRAIN	32'	STEEL
*5	STRAIN	32'	STEEL

EXISTING SIGNING

A — Roxana Rd — D3-1 102"x24"

B — Roxana Rd — D3-1 102"x24"

A — Atlantic Ave — D3-1 90"x24"

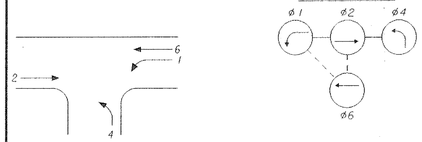
CONDUIT RUN SCHEDULE

CO*	* OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
*1	1	2"	10'	-	EXISTING [(1)#6 BARE STRANDED COPPER (1)#8/2 U.F.W./ GROUND]
*1A	2	2"	15'	-	EXISTING [(2)#6 BSC (2)#8/2 U.F.W./ GROUND]
*1B	2	2"	70'	-	EXISTING [(2)#6 BSC (2)#8/2 U.F.W./ GROUND]
*1C	1	2"	15'	-	EXISTING [(1)#6 BSC (1)#8/2 U.F.W./ GROUND]
*1D	1	2"	35'	-	EXISTING [(1)#6 BSC (1)#8/2 U.F.W./ GROUND]
*1E	1	2"	10'	-	EXISTING [(1)#6 BSC (1)#8/2 U.F.W./ GROUND]
*2	1	3"	5'	-	EXISTING [(1)#6 BSC (3)#18/4 (2)#14/16]
*3	3	4"	5'	-	EXISTING [(3)#6 BSC (8)#14/2 COMMUNICATION CABLE]
*4	1	1"	5'	-	EXISTING (4)#14/1
*5	1	4"	65'	-	EXISTING [(1)#6 BSC (2)#14/2]
*6	1	4"	205'	-	EXISTING [(1)#6 BSC (1)#14/2]
*7	1	1"	10'	-	EXISTING (2)#14/1
*8	1	3"	15'	-	EMPTY
*9	1	4"	130'	-	EXISTING [(1)#6 BSC (1)#14/2]
*10	1	4"	25'	-	EMPTY
*11	1	3"	10'	-	EMPTY
*12	1	1"	10'	-	EXISTING (2)#14/1
*13	1	4"	20'	-	EXISTING [(1)#6 BSC (4)#14/2]
*14	1	1"	10'	-	EXISTING (4)#14/1
*15	1	4"	85'	-	EXISTING [(1)#6 BSC (1)#14/2]
*16	1	3"	25'	-	EMPTY
*17	1	4"	40'	-	EXISTING [(1)#6 BSC (1)#14/2]
*18	1	4"	235'	-	EXISTING [(1)#6 BSC (1)#14/2]
*19	1	1"	5'	-	EXISTING (2)#14/1
*F16	1	4"	385'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F17	1	4"	175'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F18	1	4"	10'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F19	1	4"	10'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F19A	1	3"	5'	-	CAMERA CABLE (SEE SIGNING AND STRIPING PLANS)
*F20	1	4"	260'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)

LEGEND
* DENOTES EXISTING
B- BORE
T- TRENCH
O- OPEN CUT

SIGNAL PHASING

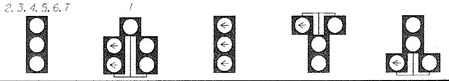
NEMA PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

- PROPOSED SIGNAL CABINET
- EXISTING SIGNAL CABINET
- PROPOSED SIGNAL POLE BASE
- EXISTING SIGNAL POLE BASE
- PROPOSED PEDESTRIAN POLE BASE
- EXISTING PEDESTRIAN POLE BASE
- PROPOSED WOOD POLE
- EXISTING WOOD POLE
- PROPOSED JUNCTION WELL
- EXISTING JUNCTION WELL
- PROPOSED SIGNAL HEAD
- EXISTING SIGNAL HEAD
- PROPOSED PEDESTRIAN SIGNAL HEAD
- EXISTING PEDESTRIAN SIGNAL HEAD
- PROPOSED PEDESTRIAN PUSHBUTTON
- EXISTING PEDESTRIAN PUSHBUTTON
- PROPOSED VIDEO DETECTION
- EXISTING VIDEO DETECTION
- PROPOSED MICROWAVE DETECTION
- EXISTING MICROWAVE DETECTION
- OVERHEAD SIGNING
- PROPOSED OPTICOM RECEIVER
- EXISTING OPTICOM RECEIVER
- PROPOSED MAST ARM
- EXISTING MAST ARM
- PROPOSED LUMINAIRE
- EXISTING LUMINAIRE
- PROPOSED LOOP DETECTOR (TYPE 1 OR 2)
- EXISTING LOOP DETECTOR (TYPE 1 OR 2)
- (RM/C) REMOVE BY CONTRACTOR
- (RM/O) REMOVE BY OTHERS
- (AB) ABANDON
- (PB/X) PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
- (PB/X) EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
- (PL/X) PROPOSED POLE IDENTIFIER (* OF POLE)
- (PL/X) EXISTING POLE IDENTIFIER (* OF POLE)
- (JW/X) PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
- (JW/X) EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
- (CO/*) PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
- (CO/*) EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
- (OH/*) PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
- (OH/*) EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
- (MA/XX) PROPOSED MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
- (MA/XX) EXISTING MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
- (CA/X) PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
- (CA/X) EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
- PROPOSED SPAN WIRE
- XX EXISTING SPAN WIRE
- RIGHT-OF-WAY OR PROPERTY LINE
- PROPOSED SPAN INSULATOR
- EXISTING SPAN INSULATOR
- P SERVICE PEDESTAL
- PROPOSED CCTV
- EXISTING CCTV
- PROPOSED PLASTIC DRUMS
- EXISTING PLASTIC DRUMS

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC DOVER, DELAWARE
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6. ALL 4", 3", 2.5", AND 2" CONDUITS SHALL BE SCHEDULE 80 PVC WITH THE EXCEPTION OF 4" BORED CONDUIT WHICH SHALL BE SDR-13.5 HDPE. ALL 1" CONDUITS LESS THAN OR EQUAL TO 6'-0" SHALL BE LIQUID TIGHT FLEXIBLE NON-METALLIC AND ALL 1" CONDUITS GREATER THAN 6'-0" SHALL BE RIGID GALVANIZED.

SECTION 4
ULTIMATE

RECOMMENDED _____ DATE: 05/15/13

RECOMMENDED Christina Dame DATE: 7/12/13

RECOMMENDED _____ DATE: _____

APPROVED TRAFFIC ENGINEER _____ DATE: 7/12/13

APPROVED FOR INSTALLATION
CHIEF TRAFFIC ENGINEER _____ DATE: 7/12/13

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SCALE
0 30 60 90
FEET

SR 26, ATLANTIC AVENUE FROM CLARKSVILLE TO ASSAWOMAN CANAL

CONTRACT	PERMIT NO.	S169
T200411210	DESIGNED BY:	MSK
COUNTY	CHECKED BY:	BAM
SUSSEX		

SIGNAL PLAN

SR 26 @ ROXANA ROAD

(ULTIMATE)

SHEET NO.	TOTAL SHTS.
525	589

7/11/2013
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CONDUIT RUN SCHEDULE

CO*	* OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
*1	1	2"	-	-	EXISTING (1)#8/2 U.F.W./ GROUND
*3	*2	2.5"	5'	-	EXISTING (12)#18/4 (3)#14/9 (2)#14/16
15	1	1"	5'	T	EMPTY
15A	1	2.5"	5'	T	EMPTY
17	1	4"	45'	T	EMPTY
18	1	3"	20'	T	EMPTY
19	1	1"	5'	T	EMPTY
*27	1	2.5"	5'	-	EXISTING (14)#18/4 (2)#14/16
*28	1	2.5"	45'	-	EXISTING (14)#18/4 (2)#14/9
*29	1	2.5"	25'	-	EXISTING (1)#14/9
*30	1	2.5"	135'	-	EXISTING (1)#18/4
*31	1	1.5"	3'	-	EXISTING (2)#18/4
*32	1	2.5"	65'	-	EXISTING (12)#18/4 (1)#14/9
*33	1	2.5"	10'	-	EXISTING (1)#14/9
*34	1	1.5"	10'	-	EXISTING (2)#18/4
*35	1	2.5"	70'	-	EXISTING (14)#18/4 (1)#14/9
*36	1	1.5"	3'	-	EXISTING (4)#18/4
*37	1	2.5"	10'	-	EXISTING (1)#14/9
*38	1	2.5"	35'	-	EXISTING (3)#18/4
*39	1	1.5"	3'	-	EXISTING (4)#18/4
*40	1	2.5"	90'	-	EXISTING (2)#18/4
*41	1	2.5"	45'	-	EXISTING (1)#18/4
*42	1	2.5"	175'	-	EXISTING (1)#18/4
*43	1	1.5"	3'	-	EXISTING (2)#15/4
F34	1	4"	155'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
F35	1	4"	80'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
F37	1	4"	215'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
F38	1	4"	135'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)

LEGEND
* DENOTES EXISTING

B- BORE
T- TRENCH
O- OPEN CUT

PHASE 3, STAGE 3 SIGNAL NOTES

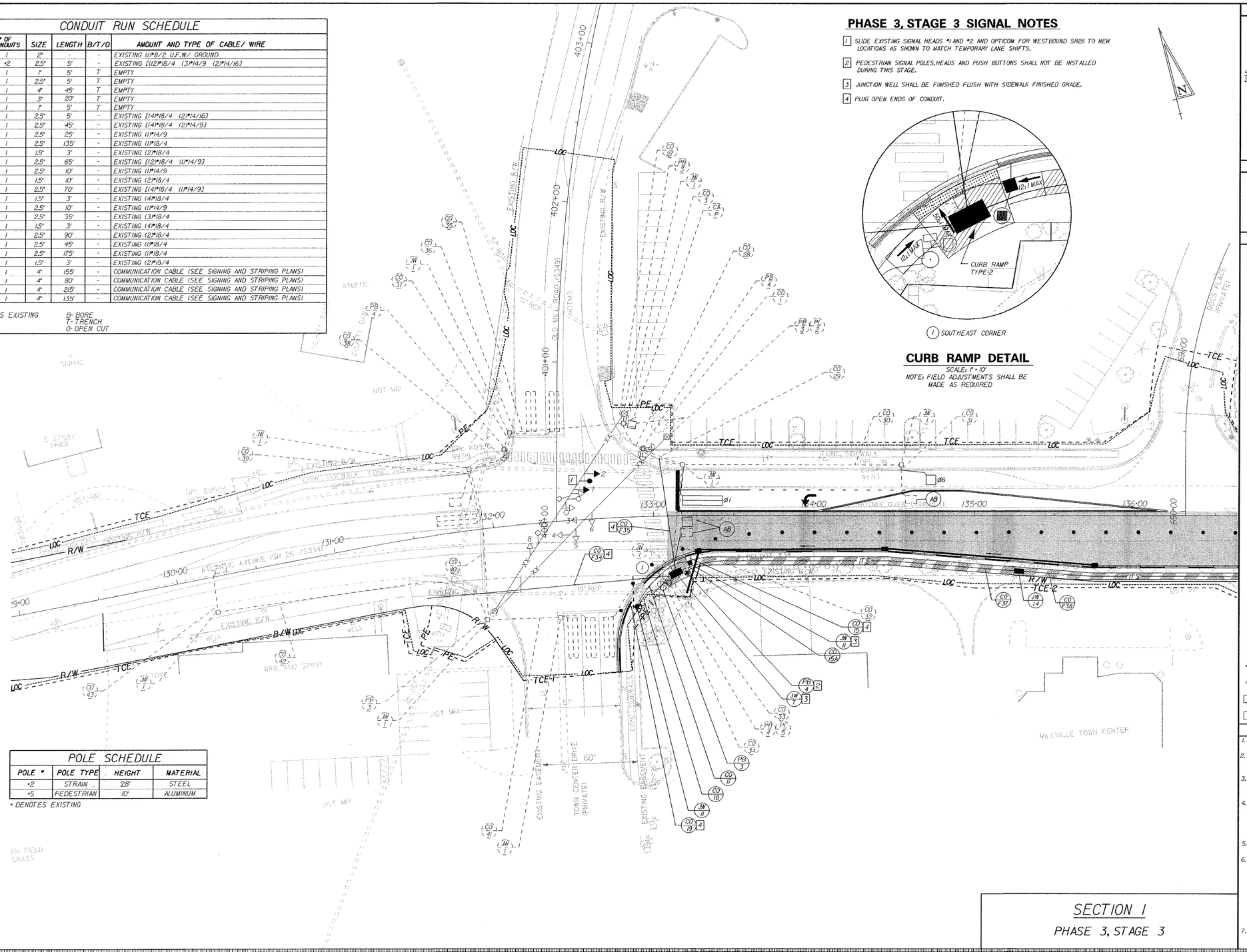
1. SLIDE EXISTING SIGNAL HEADS *1 AND *2 AND OPTICOM FOR WESTBOUND SR26 TO NEW LOCATIONS AS SHOWN TO MATCH TEMPORARY LANE SHIFTS.
2. PEDESTRIAN SIGNAL POLES, HEADS AND PUSH BUTTONS SHALL NOT BE INSTALLED DURING THIS STAGE.
3. JUNCTION WELL SHALL BE FINISHED FLUSH WITH SIDEWALK FINISHED GRADE.
4. PLUG OPEN ENDS OF CONDUIT.

1 SOUTHEAST CORNER

CURB RAMP DETAIL

SCALE: 1" = 10'

NOTE: FIELD ADJUSTMENTS SHALL BE MADE AS REQUIRED



POLE SCHEDULE

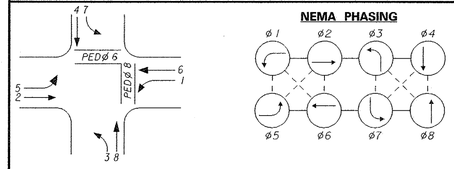
POLE *	POLE TYPE	HEIGHT	MATERIAL
*2	STRAIN	28'	STEEL
*5	PEDESTRIAN	10'	ALUMINUM

* DENOTES EXISTING

SECTION 1

PHASE 3, STAGE 3

SIGNAL PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

	PROPOSED SIGNAL CABINET	(RM C)	REMOVE BY CONTRACTOR
	EXISTING SIGNAL CABINET	(RM O)	REMOVE BY OTHERS
	PROPOSED SIGNAL POLE BASE	(AB)	ABANDON
	EXISTING SIGNAL POLE BASE	(PB X)	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	PROPOSED PEDESTRIAN POLE BASE	(PB X)	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	EXISTING PEDESTRIAN POLE BASE	(PL X)	PROPOSED POLE IDENTIFIER (* OF POLE)
	PROPOSED WOOD POLE	(PL X)	EXISTING POLE IDENTIFIER (* OF POLE)
	EXISTING WOOD POLE	(JW X)	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	PROPOSED JUNCTION WELL	(JW X)	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	EXISTING JUNCTION WELL	(CO *)	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
	PROPOSED SIGNAL HEAD	(CO *)	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
	EXISTING SIGNAL HEAD	(OH *)	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
	PROPOSED PEDESTRIAN SIGNAL HEAD	(OH *)	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
	EXISTING PEDESTRIAN SIGNAL HEAD	(MA XX)	PROPOSED MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	PROPOSED PEDESTRIAN PUSHBUTTON	(MA XX)	EXISTING MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	EXISTING PEDESTRIAN PUSHBUTTON	(CA X)	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
	PROPOSED VIDEO DETECTION	(CA X)	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
	EXISTING VIDEO DETECTION		PROPOSED SPAN WIRE
	PROPOSED MICROWAVE DETECTION	XX	EXISTING SPAN WIRE
	EXISTING MICROWAVE DETECTION		RIGHT-OF-WAY OR PROPERTY LINE
	OVERHEAD SIGNING		PROPOSED SPAN INSULATOR
	PROPOSED OPTICOM RECEIVER		EXISTING SPAN INSULATOR
	EXISTING OPTICOM RECEIVER	P	SERVICE PEDESTAL
	PROPOSED MAST ARM		PROPOSED CCTV
	EXISTING MAST ARM		EXISTING CCTV
	PROPOSED LUMINAIRE		PROPOSED PLASTIC DRUMS
	EXISTING LUMINAIRE		EXISTING PLASTIC DRUMS
	PROPOSED LOOP DETECTOR (TYPE 1 OR 2)		
	EXISTING LOOP DETECTOR (TYPE 1 OR 2)		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC- DOVER, DELAWARE
2. POLE BASES, CABINET BASE, AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 101 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED EXCEPT WHERE SHOWN.
3. ALL GALVANIZED RIGID CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
4. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY FOR THE UTILITY MARKOUTS PRIOR TO THE BEGINNING OF CONSTRUCTION. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
5. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.
6. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (5% OR FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHALL BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL. ALL PEDESTRIAN SIGNAL HEADS SHALL BE COUNTDOWN TYPE.
7. ALL 4", 3", 2.5", AND 2" CONDUITS SHALL BE SCHEDULE 80 PVC WITH THE EXCEPTION OF 4" BORED CONDUIT WHICH SHALL BE SDR-13.5 HDPE. ALL 1" CONDUITS LESS THAN OR EQUAL TO 6'-0" SHALL BE LIQUID TIGHT FLEXIBLE NON-METALLIC AND ALL 1" CONDUITS GREATER THAN 6'-0" SHALL BE RIGID GALVANIZED.

RECOMMENDED _____ DATE: 05/15/13

RECOMMENDED Chitra Dave DATE: 7/12/13

RECOMMENDED _____ DATE: _____

APPROVED TRAFFIC ENGINEER _____ DATE: 7/12/13

APPROVED FOR INSTALLATION
CHIEF TRAFFIC ENGINEER _____ DATE: 7/12/13

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SCALE
0 30 60 90
FEET

SR 26, ATLANTIC AVENUE FROM CLARKSVILLE TO ASSAWOMAN CANAL

CONTRACT	PERMIT NO.	S263
T200411210	DESIGNED BY:	MSK
COUNTY	CHECKED BY:	BAM
SUSSEX		

SIGNAL PLAN
SR 26 @ OLD MILL ROAD

SHEET NO. 526
TOTAL SHTS. 589

7/10/2013
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CONDUIT RUN SCHEDULE

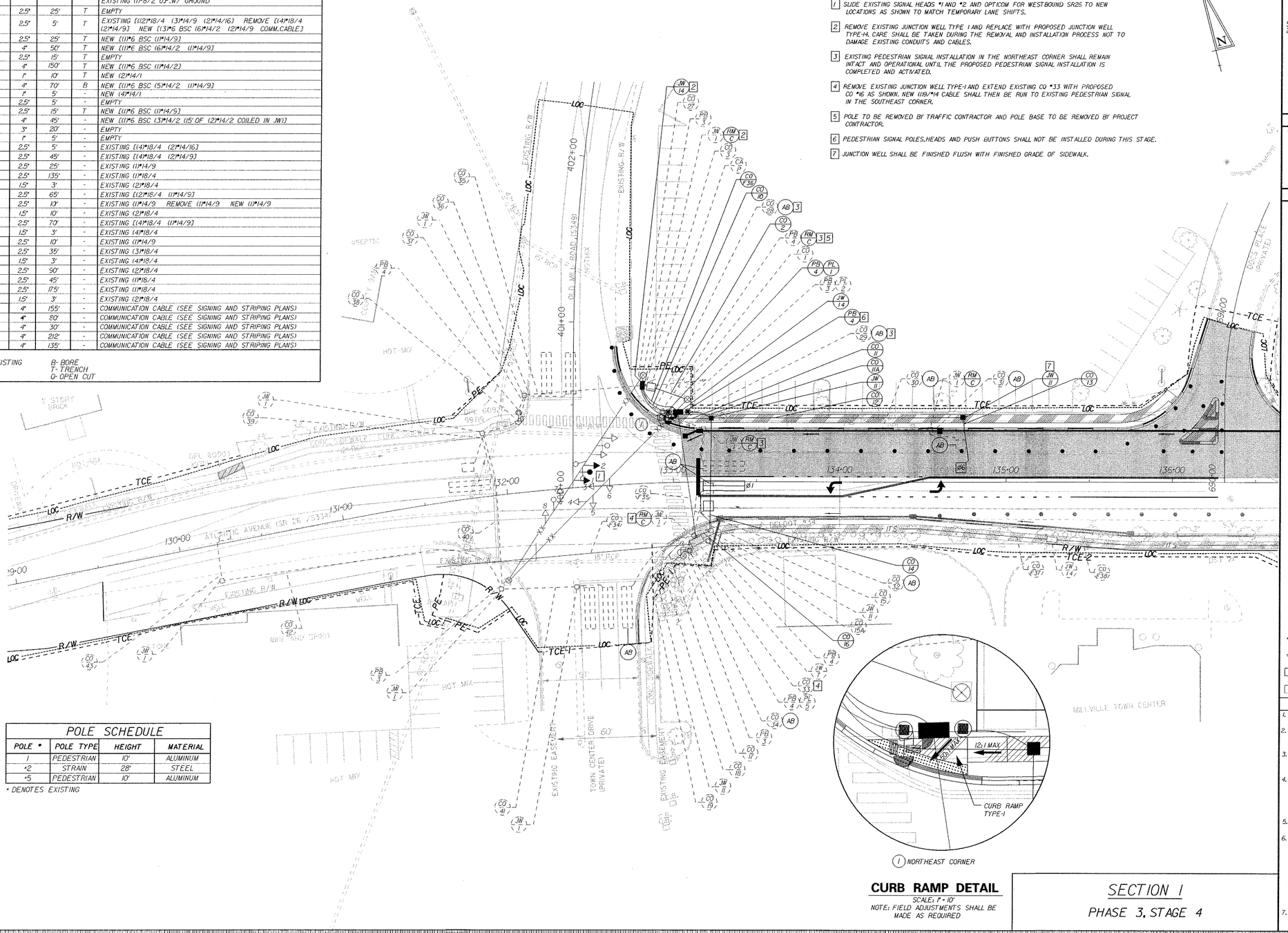
CO*	* OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
*1	1	2"	-	-	NEW (1)#6 BARE STRANDED COPPER EXISTING (1)#8/2 UF.W/ GROUND
2	1	2.5"	25'	T	EMPTY
3	*2 1	2.5"	5'	T	EXISTING [(12)#18/4 (3)#14/9 (2)#14/16] REMOVE [(4)#18/4 (2)#14/9] NEW [(3)#6 BSC (6)#14/2 (2)#14/9 COMM.CABLE]
10	1	2.5"	25'	T	NEW (1)#6 BSC (1)#14/9
11	1	4"	50'	T	NEW ((1)#6 BSC (6)#14/2 (1)#14/9]
11A	1	2.5"	15'	T	EMPTY
12	1	4"	150'	T	NEW ((1)#6 BSC (1)#14/2]
13	1	1"	10'	T	NEW (2)#14/1
14	1	4"	70'	B	NEW ((1)#6 BSC (5)#14/2 (1)#14/9]
*15	1	1"	5'	-	NEW (4)#14/1
*15A	1	2.5"	5'	-	EMPTY
16	1	2.5"	15'	T	NEW [(1)#6 BSC (1)#14/9]
*17	1	4"	45'	-	NEW [(1)#6 BSC (3)#14/2 (15' OF (2)#14/2 COILED IN JW1]
*18	1	3"	20'	-	EMPTY
*19	1	1"	5'	-	EMPTY
*27	1	2.5"	5'	-	EXISTING [(4)#18/4 (2)#14/16]
*28	1	2.5"	45'	-	EXISTING [(4)#18/4 (2)#14/9]
*29	1	2.5"	25'	-	EXISTING (1)#14/9
*30	1	2.5"	135'	-	EXISTING (1)#18/4
*31	1	1.5"	3'	-	EXISTING (2)#18/4
*32	1	2.5"	65'	-	EXISTING [(2)#18/4 (1)#14/9]
*33	1	2.5"	10'	-	EXISTING (1)#14/9 REMOVE (1)#14/9 NEW (1)#14/9
*34	1	1.5"	10'	-	EXISTING (2)#18/4
*35	1	2.5"	70'	-	EXISTING [(4)#18/4 (1)#14/9]
*36	1	1.5"	3'	-	EXISTING (4)#18/4
*37	1	2.5"	10'	-	EXISTING (1)#14/9
*38	1	2.5"	35'	-	EXISTING (3)#18/4
*39	1	1.5"	3'	-	EXISTING (4)#18/4
*40	1	2.5"	90'	-	EXISTING (2)#18/4
*41	1	2.5"	45'	-	EXISTING (1)#16/4
*42	1	2.5"	175'	-	EXISTING (1)#18/4
*43	1	1.5"	3'	-	EXISTING (2)#18/4
*F34	1	4"	155'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F35	1	4"	80'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
F36	1	4"	30'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F37	1	4"	212'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F38	1	4"	135'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)

LEGEND
* DENOTES EXISTING

B- BORE
T- TRENCH
O- OPEN CUT

PHASE 3, STAGE 4 SIGNAL NOTES

1. SLIDE EXISTING SIGNAL HEADS *1 AND *2 AND OPTICOM FOR WESTBOUND SR26 TO NEW LOCATIONS AS SHOWN TO MATCH TEMPORARY LANE SHIFTS.
2. REMOVE EXISTING JUNCTION WELL TYPE I AND REPLACE WITH PROPOSED JUNCTION WELL TYPE-14. CARE SHALL BE TAKEN DURING THE REMOVAL AND INSTALLATION PROCESS NOT TO DAMAGE EXISTING CONDUIT'S AND CABLES.
3. EXISTING PEDESTRIAN SIGNAL INSTALLATION IN THE NORTHEAST CORNER SHALL REMAIN INTACT AND OPERATIONAL UNTIL THE PROPOSED PEDESTRIAN SIGNAL INSTALLATION IS COMPLETED AND ACTIVATED.
4. REMOVE EXISTING JUNCTION WELL TYPE-I AND EXTEND EXISTING CO *33 WITH PROPOSED CO *16 AS SHOWN. NEW (1)9/*14 CABLE SHALL THEN BE RUN TO EXISTING PEDESTRIAN SIGNAL IN THE SOUTHEAST CORNER.
5. POLE TO BE REMOVED BY TRAFFIC CONTRACTOR AND POLE BASE TO BE REMOVED BY PROJECT CONTRACTOR.
6. PEDESTRIAN SIGNAL POLES,HEADS AND PUSH BUTTONS SHALL NOT BE INSTALLED DURING THIS STAGE.
7. JUNCTION WELL SHALL BE FINISHED FLUSH WITH FINISHED GRADE OF SIDEWALK.



POLE SCHEDULE

POLE *	POLE TYPE	HEIGHT	MATERIAL
1	PEDESTRIAN	10'	ALUMINUM
*2	STRAIN	28'	STEEL
*5	PEDESTRIAN	10'	ALUMINUM

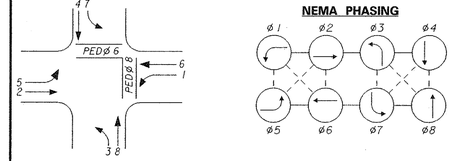
* DENOTES EXISTING

CURB RAMP DETAIL

SCALE: 1" = 10'
NOTE: FIELD ADJUSTMENTS SHALL BE MADE AS REQUIRED

SECTION I
PHASE 3, STAGE 4

SIGNAL PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

- PROPOSED SIGNAL CABINET
- EXISTING SIGNAL CABINET
- PROPOSED SIGNAL POLE BASE
- EXISTING SIGNAL POLE BASE
- PROPOSED PEDESTRIAN POLE BASE
- EXISTING PEDESTRIAN POLE BASE
- PROPOSED WOOD POLE
- EXISTING WOOD POLE
- PROPOSED JUNCTION WELL
- EXISTING JUNCTION WELL
- PROPOSED SIGNAL HEAD
- EXISTING SIGNAL HEAD
- PROPOSED PEDESTRIAN SIGNAL HEAD
- EXISTING PEDESTRIAN SIGNAL HEAD
- PROPOSED PEDESTRIAN PUSHBUTTON
- EXISTING PEDESTRIAN PUSHBUTTON
- PROPOSED VIDEO DETECTION
- EXISTING VIDEO DETECTION
- PROPOSED MICROWAVE DETECTION
- EXISTING MICROWAVE DETECTION
- OVERHEAD SIGNING
- PROPOSED OPTICOM RECEIVER
- EXISTING OPTICOM RECEIVER
- PROPOSED MAST ARM
- EXISTING MAST ARM
- PROPOSED LUMINAIRE
- EXISTING LUMINAIRE
- PROPOSED LOOP DETECTOR (TYPE 1 OR 2)
- EXISTING LOOP DETECTOR (TYPE 1 OR 2)
- REMOVE BY CONTRACTOR
- REMOVE BY OTHERS
- ABANDON
- PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
- EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
- PROPOSED POLE IDENTIFIER (# OF POLE)
- EXISTING POLE IDENTIFIER (# OF POLE)
- PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
- EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
- PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)
- EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)
- PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
- EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
- PROPOSED MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
- EXISTING MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
- PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
- EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
- PROPOSED SPAN WIRE
- XX EXISTING SPAN WIRE
- RIGHT-OF-WAY OR PROPERTY LINE
- PROPOSED SPAN INSULATOR
- EXISTING SPAN INSULATOR
- SERVICE PEDESTAL
- PROPOSED CCTV
- EXISTING CCTV
- PROPOSED PLASTIC DRUMS
- EXISTING PLASTIC DRUMS

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-COVER,DELAWARE
2. POLE BASES,CABINET BASE,AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED EXCEPT WHERE SHOWN.
3. ALL GALVANIZED RIGID CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW,BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
4. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY,AND/OR THE APPROPRIATE UTILITY ENTITY FOR THE UTILITY MARKOUTS PRIOR TO THE BEGINNING OF CONSTRUCTION. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
5. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT CUPPER CABLE.
6. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (5.0%) OR FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHALL BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL. ALL PEDESTRIAN SIGNAL HEADS SHALL BE COUNTDOWN TYPE.
7. ALL 4", 3", 2.5", AND 2" CONDUITS SHALL BE SCHEDULE 80 PVC WITH THE EXCEPTION OF 4" BORED CONDUIT WHICH SHALL BE SDR-13.5 HDPE. ALL 1" CONDUITS LESS THAN OR EQUAL TO 6'-0" SHALL BE LIQUID TIGHT FLEXIBLE NON-METALLIC AND ALL 1" CONDUITS GREATER THAN 6'-0" SHALL BE RIGID GALVANIZED.

RECOMMENDED	DATE:	RECOMMENDED	DATE:	RECOMMENDED	DATE:	APPROVED TRAFFIC ENGINEER	DATE:	APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER	DATE:
	05/15/13		7/12/13				7/12/13		7/12/13

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SCALE
0 30 60 90
FEET

SR 26, ATLANTIC AVENUE FROM CLARKSVILLE TO ASSAWOMAN CANAL

CONTRACT	T200411210
COUNTY	SUSSEX

PERMIT NO.	S263
DESIGNED BY:	MSK
CHECKED BY:	BAM

SIGNAL PLAN
SR 26 @ OLD MILL ROAD

SHEET NO.	527
TOTAL SHTS.	589

7/10/2013
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CONDUIT RUN SCHEDULE

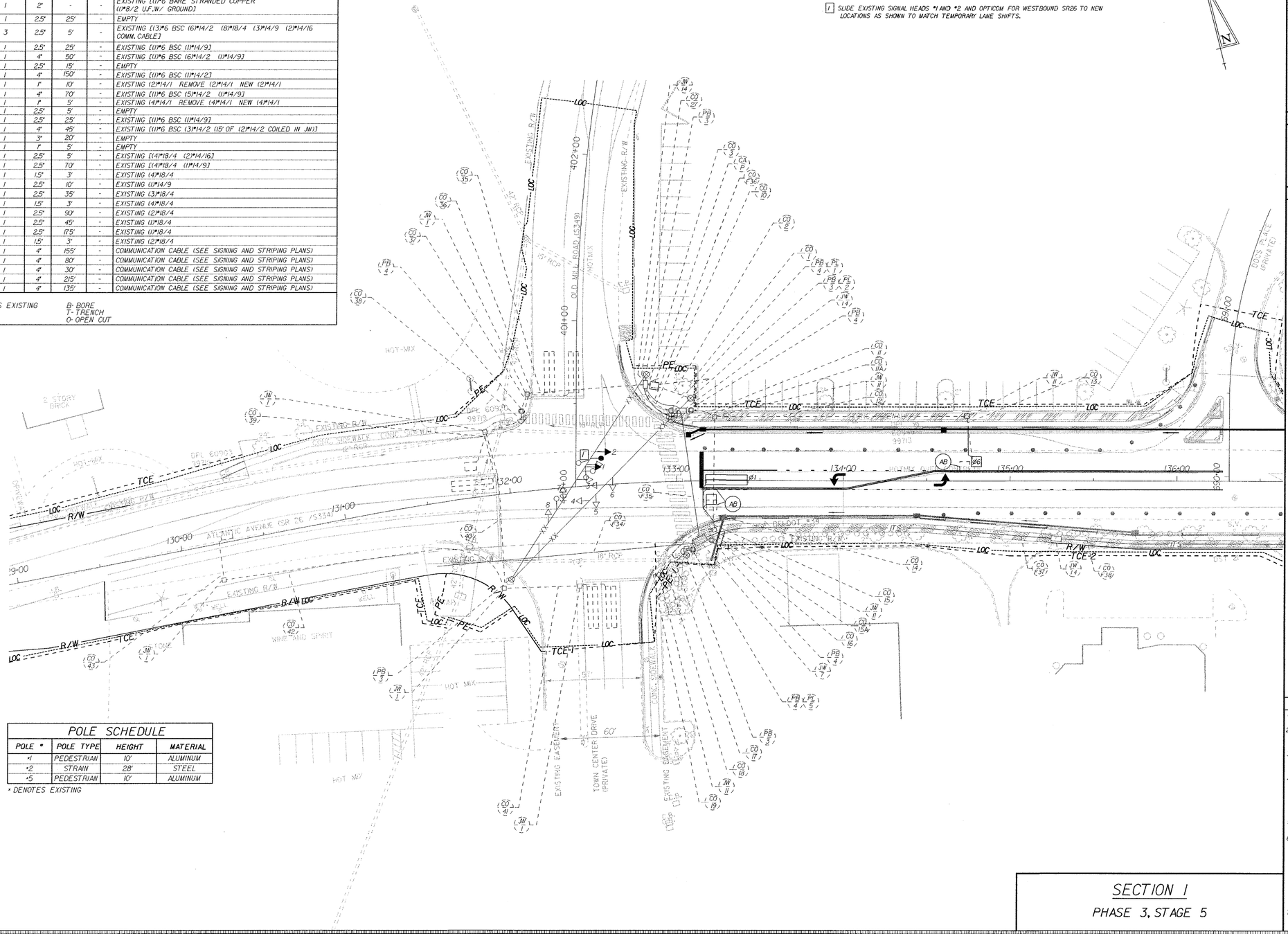
CO*	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
*1	1	2"	-	-	EXISTING [(1)#6 BARE STRANDED COPPER (1)#8/2 U.F.W/ GROUND]
*2	1	2.5"	25'	-	EMPTY
*3	3	2.5"	5'	-	EXISTING [(3)#6 BSC (6)#14/2 (8)#18/4 (3)#14/9 (2)#14/16 COMM. CABLE]
*10	1	2.5"	25'	-	EXISTING [(1)#6 BSC (1)#14/9]
*11	1	4"	50'	-	EXISTING [(1)#6 BSC (6)#14/2 (1)#14/9]
*11A	1	2.5"	15'	-	EMPTY
*12	1	4"	150'	-	EXISTING [(1)#6 BSC (1)#14/2]
*13	1	1"	10'	-	EXISTING (2)#14/1 REMOVE (2)#14/1 NEW (2)#14/1
*14	1	4"	70'	-	EXISTING [(1)#6 BSC (5)#14/2 (1)#14/9]
*15	1	1"	5'	-	EXISTING (4)#14/1 REMOVE (4)#14/1 NEW (4)#14/1
*15A	1	2.5"	5'	-	EMPTY
*16	1	2.5"	25'	-	EXISTING [(1)#6 BSC (1)#14/9]
*17	1	4"	45'	-	EXISTING [(1)#6 BSC (3)#14/2 (15' OF (2)#14/2 COILED IN JW1]
*18	1	3"	20'	-	EMPTY
*19	1	1"	5'	-	EMPTY
*27	1	2.5"	5'	-	EXISTING [(4)#18/4 (2)#14/16]
*35	1	2.5"	70'	-	EXISTING [(4)#18/4 (1)#14/9]
*36	1	1.5"	3'	-	EXISTING (4)#18/4
*37	1	2.5"	10'	-	EXISTING (1)#14/9
*38	1	2.5"	35'	-	EXISTING (3)#18/4
*39	1	1.5"	3'	-	EXISTING (4)#18/4
*40	1	2.5"	90'	-	EXISTING (2)#18/4
*41	1	2.5"	45'	-	EXISTING (1)#18/4
*42	1	2.5"	175'	-	EXISTING (1)#18/4
*43	1	1.5"	3'	-	EXISTING (2)#18/4
*F34	1	4"	155'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F35	1	4"	80'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F36	1	4"	30'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F37	1	4"	215'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F38	1	4"	135'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)

LEGEND
* DENOTES EXISTING

B- BORE
T- TRENCH
O- OPEN CUT

PHASE 3, STAGE 5 SIGNAL NOTES

1 SLIDE EXISTING SIGNAL HEADS *1 AND *2 AND OPTICOM FOR WESTBOUND SR26 TO NEW LOCATIONS AS SHOWN TO MATCH TEMPORARY LANE SHIFTS.



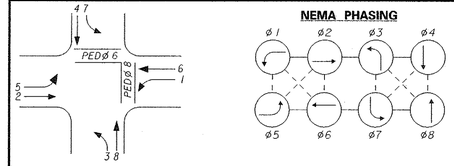
POLE SCHEDULE

POLE *	POLE TYPE	HEIGHT	MATERIAL
*1	PEDESTRIAN	10'	ALUMINUM
*2	STRAIN	28'	STEEL
*5	PEDESTRIAN	10'	ALUMINUM

* DENOTES EXISTING

SECTION 1
PHASE 3, STAGE 5

SIGNAL PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

■	PROPOSED SIGNAL CABINET	(RM/C)	REMOVE BY CONTRACTOR
▣	EXISTING SIGNAL CABINET	(RM/O)	REMOVE BY OTHERS
⊙	PROPOSED SIGNAL POLE BASE	(AB)	ABANDON
⊗	EXISTING SIGNAL POLE BASE	(PB/X)	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
◉	PROPOSED PEDESTRIAN POLE BASE	(FB/X)	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
◎	EXISTING PEDESTRIAN POLE BASE	(PL/X)	PROPOSED POLE IDENTIFIER (# OF POLE)
●	PROPOSED WOOD POLE	(PL/X)	EXISTING POLE IDENTIFIER (# OF POLE)
○	EXISTING WOOD POLE	(JW/X)	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
■	PROPOSED JUNCTION WELL	(JW/X)	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
□	EXISTING JUNCTION WELL	(CO/#)	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)
→	PROPOSED SIGNAL HEAD	(CO/#)	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)
▷	EXISTING SIGNAL HEAD	(OH/#)	PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
▬	PROPOSED PEDESTRIAN SIGNAL HEAD	(OH/#)	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
▭	EXISTING PEDESTRIAN SIGNAL HEAD	(MA/XX)	PROPOSED MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
⊸	PROPOSED PEDESTRIAN PUSHBUTTON	(MA/XX)	EXISTING MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
⊃	EXISTING PEDESTRIAN PUSHBUTTON	(CA/X)	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
◁	PROPOSED VIDEO DETECTION	(CA/X)	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
◁	EXISTING VIDEO DETECTION		PROPOSED SPAN WIRE
◀	PROPOSED MICROWAVE DETECTION	XX	EXISTING SPAN WIRE
◀	EXISTING MICROWAVE DETECTION		RIGHT-OF-WAY OR PROPERTY LINE
⊣	OVERHEAD SIGNING	◆	PROPOSED SPAN INSULATOR
●	PROPOSED OPTICOM RECEIVER	◇	EXISTING SPAN INSULATOR
○	EXISTING OPTICOM RECEIVER	P	SERVICE PEDESTAL
▶	PROPOSED MAST ARM		PROPOSED CCTV
▷	EXISTING MAST ARM		EXISTING CCTV
●—	PROPOSED LUMINAIRE	●	PROPOSED PLASTIC DRUMS
○—	EXISTING LUMINAIRE	⊠	EXISTING PLASTIC DRUMS
□	PROPOSED LOOP DETECTOR (TYPE I OR 2)		
□	EXISTING LOOP DETECTOR (TYPE I OR 2)		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-DOVER, DELAWARE
2. POLE BASES, CABINET BASE, AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED EXCEPT WHERE SHOWN.
3. ALL GALVANIZED RIGID CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
4. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY FOR THE UTILITY MARKOUTS PRIOR TO THE BEGINNING OF CONSTRUCTION. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
5. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.
6. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (5.0J OR FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHALL BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL. ALL PEDESTRIAN SIGNAL HEADS SHALL BE COUNTDOWN TYPE.
7. ALL 4", 3", 2.5", AND 2" CONDUITS SHALL BE SCHEDULE 80 PVC WITH THE EXCEPTION OF 4" BORED CONDUIT WHICH SHALL BE SDR-13.5 HDPE. ALL 1" CONDUITS LESS THAN OR EQUAL TO 6'-0" SHALL BE LIQUID TIGHT FLEXIBLE NON-METALLIC AND ALL 1" CONDUITS GREATER THAN 6'-0" SHALL BE RIGID GALVANIZED.

RECOMMENDED B. Sadler DATE: 05/15/13
RECOMMENDED Chetna Dave DATE: 7/12/13
RECOMMENDED _____ DATE: _____
APPROVED TRAFFIC ENGINEER Marvel M. Hite DATE: 7/10/13
APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER Mike Hogg DATE: 7/12/13

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SCALE 0 30 60 90 FEET

SR 26, ATLANTIC AVENUE FROM CLARKSVILLE TO ASSAWOMAN CANAL

CONTRACT	T200411210
COUNTY	SUSSEX
PERMIT NO.	S263
DESIGNED BY:	MSK
CHECKED BY:	BAM

SIGNAL PLAN
SR 26 @ OLD MILL ROAD

SHEET NO.	528
TOTAL SHTS.	589

7/10/2013
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CONDUIT RUN SCHEDULE

CO*	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
*1	1	2"	-	-	EXISTING [(1)#6 BARE STRANDED COPPER (1)#6/2 U.F.W/ GROUND]
*2	1	2.5"	25'	-	NEW [(1)#6 BSC (4)#18/4 (2)#14/16 (4)MICROWAVE DETECTION HOMERUN CABLES]
*3	3	2.5"	5'	-	EXISTING [(3)#6 BSC (6)#14/2 (8)#18/4 (3)#14/9 (2)#14/16 COMM. CABLE] REMOVE [(8)#18/4 (2)#14/16] NEW [(5) #14/2 (2)#14/9]
4	1	4"	100'	B	NEW [(1)#6 BSC (2)#14/2 (15' OF EA. COILED IN JW)]
8	1	3"	10'	T	EMPTY
9	1	1"	15'	T	EMPTY
*10	1	2.5"	25'	-	EXISTING [(1)#6 BSC (1)#14/9]
*11	1	4"	50'	-	EXISTING [(1)#6 BSC (6)#14/2 (1)#14/9] NEW [(3)#14/2 (2)#14/9]
*11A	1	2.5"	15'	-	EMPTY
*12	1	4"	150'	-	EXISTING [(1)#6 BSC (1)#14/2]
*13	1	1"	10'	-	EXISTING (2)#14/1 REMOVE (2)#14/1
*14	1	4"	70'	-	EXISTING [(1)#6 BSC (5)#14/2 (1)#14/9] NEW [(3)#14/2 (2)#14/9]
*15	1	1"	5'	-	EXISTING (4)#14/1 REMOVE (4)#14/1
*15A	1	2.5"	5'	-	EMPTY
*16	1	2.5"	25'	-	EXISTING [(1)#6 BSC (1)#14/9]
*17	1	4"	45'	-	EXISTING [(1)#6 BSC (3)#14/2 (15' OF (2)#14/2 COILED IN JW) NEW [(3)#14/2 (2)#14/9]
*18	1	3"	20'	-	EMPTY
*19	1	1"	5'	-	EMPTY
20	1	4"	100'	B	NEW [(1)#6 BSC (3)#14/2 (15' OF (2)#14/2 COILED IN JW) (2)#14/9]
21	1	4"	35'	T	NEW [(1)#6 BSC (2)#14/9]
21A	1	2.5"	5'	T	NEW (1)#6 BSC (1)#14/9]
22	1	2.5"	20'	T	NEW [(1)#6 BSC (1)#14/9]
23	1	1"	20'	T	EMPTY
24	1	3"	10'	T	EMPTY
25	1	4"	170'	T	NEW [(1)#6 BSC (1)#14/2 (15' COILED IN JW)]
26	1	1"	10'	T	EMPTY
*27	1	2.5"	5'	-	EXISTING [(4)#16/4 (2)#14/16]
*35	1	2.5"	70'	-	EXISTING [(4)#18/4 (1)#14/9]
*36	1	1.5"	3'	T	EXISTING (4)#18/4
*37	1	2.5"	10'	T	EXISTING (1)#14/9
*38	1	2.5"	35'	-	EXISTING (3)#18/4
*39	1	1.5"	3'	T	EXISTING (4)#18/4
*40	1	2.5"	90'	-	EXISTING (2)#18/4
*41	1	2.5"	45'	-	EXISTING (1)#18/4
*42	1	2.5"	175'	-	EXISTING (1)#18/4
*43	1	1.5"	3'	-	EXISTING (2)#18/4

LEGEND
* DENOTES EXISTING B- BORE T- TRENCH O- OPEN CUT

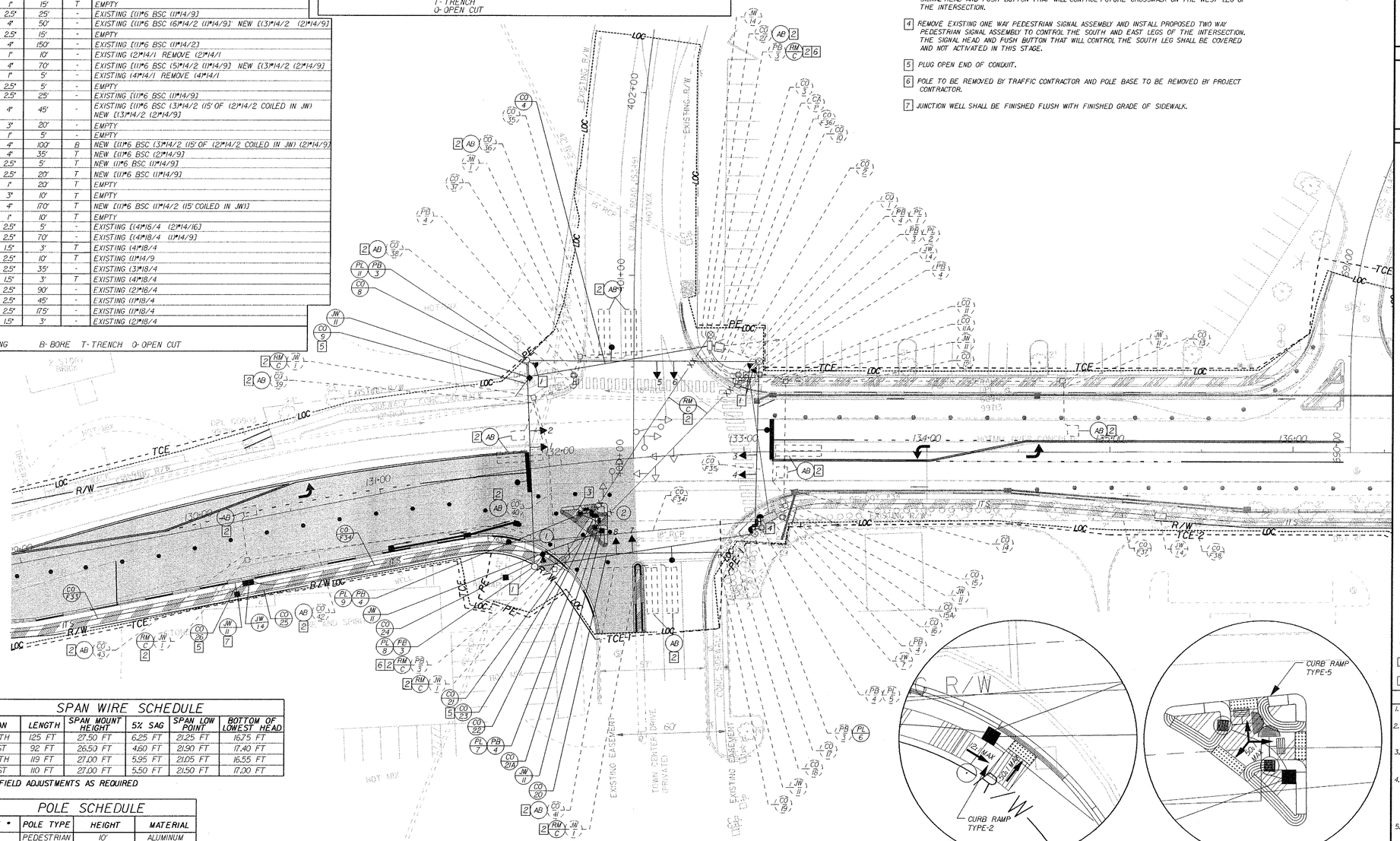
CONDUIT RUN SCHEDULE (CONT.)

CO*	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
F33	1	4"	130'	T	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
F34	1	4"	130'	T	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F34	1	4"	155'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F35	1	4"	80'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F36	1	4"	30'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F37	1	4"	215'	T	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F38	1	4"	135'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)

LEGEND
* DENOTES EXISTING B- BORE T- TRENCH O- OPEN CUT

PHASE 3, STAGE 5 SIGNAL NOTES

1. MICROWAVE DETECTORS SHALL BE LOCATED, MOUNTED, AND ORIENTED TO ACHIEVE OPTIMUM DETECTION FOR LANE ASSIGNMENTS IN THIS STAGE. PROPOSED MICROWAVE HOMERUN CABLES SHALL RUN ALONG THE PROPOSED SPAN WIRE, DOWN THE EXISTING NORTHEAST SIGNAL POLE AND THROUGH EXISTING CONDUIT (CO *2) TO THE EXISTING SIGNAL CABINET.
2. EXISTING SIGNAL INSTALLATIONS SHALL NOT BE REMOVED OR ABANDONED UNTIL THE PROPOSED MICROWAVE DETECTION SIGNAL SYSTEM IS COMPLETE AND ACTIVATED.
3. INSTALL PROPOSED CONCRETE ISLAND, PEDESTRIAN POLE BASES, POLES, SIGNAL HEADS AND PUSH BUTTONS IMMEDIATELY PRIOR TO THE END OF THIS STAGE. COVER PROPOSED PEDESTRIAN SIGNAL HEAD AND PUSH BUTTON THAT WILL CONTROL FUTURE CROSSWALK ON THE WEST LEG OF THE INTERSECTION.
4. REMOVE EXISTING ONE WAY PEDESTRIAN SIGNAL ASSEMBLY AND INSTALL PROPOSED TWO WAY PEDESTRIAN SIGNAL ASSEMBLY TO CONTROL THE SOUTH AND EAST LEGS OF THE INTERSECTION. THE SIGNAL HEAD AND PUSH BUTTON THAT WILL CONTROL THE SOUTH LEG SHALL BE COVERED AND NOT ACTIVATED IN THIS STAGE.
5. PLUG OPEN END OF CONDUIT.
6. POLE TO BE REMOVED BY TRAFFIC CONTRACTOR AND POLE BASE TO BE REMOVED BY PROJECT CONTRACTOR.
7. JUNCTION WELL SHALL BE FINISHED FLUSH WITH FINISHED GRADE OF SIDEWALK.



CONDUIT RUN SCHEDULE

CO*	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
*1	1	2"	-	-	EXISTING ((1)#6 BARE STRANDED COPPER ((1)#3/2 U.F.W/ GROUND)
*2	1	2.5"	25'	-	EXISTING ((1)#6 BSC (4)#18/4 (2)#14/16 (4)MICROWAVE DETECTION HOMERUN CABLES)
*3	3	2.5"	5'	-	EXISTING ((3)#6 BSC ((1)#14/2 (5)#14/9 COMM. CABLE) REMOVE ((1)#14/9 NEW ((3)#14/2 (2)#14/9)
*4	1	4"	100'	-	EXIST ((1)#6 BSC (2)#14/2 (15' OF EA.COILED IN JW) NEW ((3)#14/2 (2)#14/9)
5	1	4"	35'	T	NEW ((1)#6 BSC (3)#14/2 (15' OF EA.COILED IN JW)(2)#14/9)
5A	1	2.5"	5'	T	NEW ((1)#6 BSC ((1)#14/9)
6	1	1"	15'	T	EMPTY
7	1	2.5"	20'	T	NEW ((1)#6 BSC ((1)#14/9)
*8	1	3"	10'	-	EMPTY
*9	1	1"	15'	-	EMPTY
*10	1	2.5"	25'	-	EXISTING ((1)#6 BSC ((1)#14/9)
*11	1	4"	50'	-	EXISTING ((1)#6 BSC ((9)#14/2 (3)#14/9)
*11A	1	2.5"	15'	-	EMPTY
*12	1	4"	150'	-	EXISTING ((1)#6 BSC ((1)#14/2)
*13	1	1"	10'	-	EMPTY
*14	1	4"	70'	-	EXISTING ((1)#6 BSC ((8)#14/2 (3)#14/9)
*15	1	1"	5'	-	EMPTY
*15A	1	2.5"	5'	-	EMPTY
*16	1	2.5"	25'	-	EXISTING ((1)#6 BSC ((1)#14/9)
*17	1	4"	45'	-	EXISTING ((1)#6 BSC (6)#14/2 (15' OF (2)#14/2 COILED IN JW) (2)#14/9)
*18	1	3"	20'	-	EMPTY
*19	1	1"	5'	-	EMPTY
*20	1	4"	100'	-	EXISTING ((1)#6 BSC (3)#14/2 (15' OF (2)#14/2 COILED IN JW) (2)#14/9)
*21	1	4"	35'	-	EXISTING ((1)#6 BSC (2)#14/9)
*21A	1	2.5"	5'	-	EXISTING ((1)#6 BSC ((1)#14/9)
*22	1	2.5"	20'	-	EXISTING ((1)#6 BSC ((1)#14/9)
*23	1	1"	20'	-	EMPTY
*24	1	3"	10'	-	EMPTY
*25	1	4"	170'	-	EXISTING ((1)#6 BSC ((1)#14/2 (15' COILED IN JW))
*26	1	1"	10'	-	EMPTY
*35	1	2.5"	70'	-	EXISTING ((4)#18/4 ((1)#14/9)
*37	1	2.5"	10'	-	EXISTING ((1)#14/9

LEGEND
* DENOTES EXISTING B- BORE T- TRENCH O- OPEN CUT

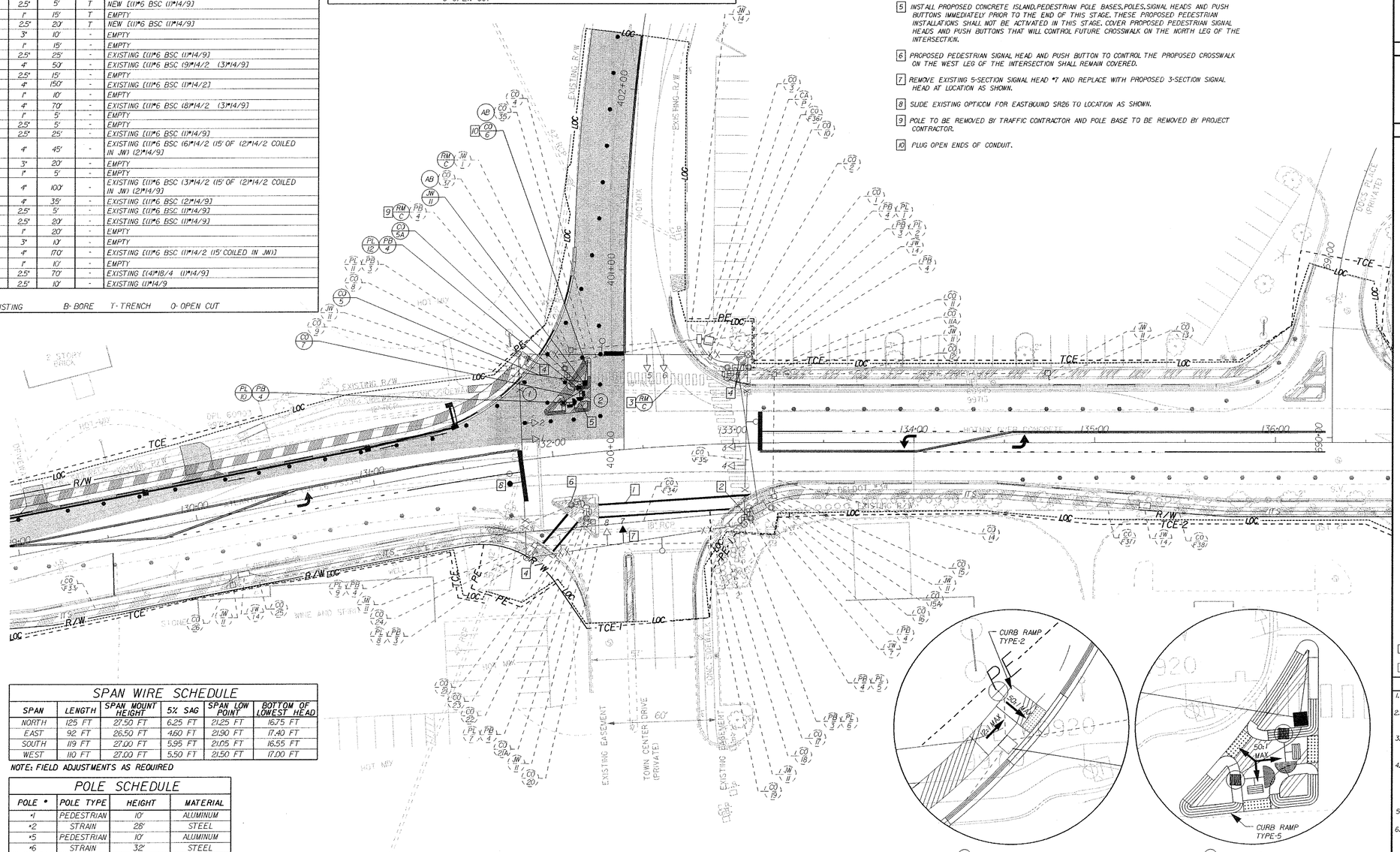
CONDUIT RUN SCHEDULE (CONT.)

CO*	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
*F33	1	4"	130'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F34	1	4"	285'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F35	1	4"	80'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F36	1	4"	30'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F37	1	4"	215'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F38	1	4"	135'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)

LEGEND
* DENOTES EXISTING B- BORE T- TRENCH O- OPEN CUT

PHASE 3, STAGE 6 SIGNAL NOTES

1. TEMPORARY CROSSWALK FOR THE SOUTH LEG OF THE INTERSECTION SHALL BE STRIPED AT THE COMMENCEMENT OF THIS STAGE.
2. THE PEDESTRIAN SIGNAL HEADS AND PUSH BUTTONS TO CONTROL THE CROSSWALK ON THE SOUTH LEG SHALL BE UNCOVERED AND ACTIVATED.
3. EXISTING CROSSWALK STRIPING ON THE NORTH LEG SHALL BE REMOVED AT THE COMMENCEMENT OF THIS STAGE.
4. EXISTING MICROWAVE DETECTORS SHALL BE ADJUSTED/ RE-ORIENTED WHERE NECESSARY TO ACHIEVE OPTIMUM DETECTION FOR LANE ASSIGNMENTS IN THIS STAGE.
5. INSTALL PROPOSED CONCRETE ISLAND,PEDESTRIAN POLE BASES,POLES,SIGNAL HEADS AND PUSH BUTTONS IMMEDIATELY PRIOR TO THE END OF THIS STAGE. THESE PROPOSED PEDESTRIAN INSTALLATIONS SHALL NOT BE ACTIVATED IN THIS STAGE. COVER PROPOSED PEDESTRIAN SIGNAL HEADS AND PUSH BUTTONS THAT WILL CONTROL FUTURE CROSSWALK ON THE NORTH LEG OF THE INTERSECTION.
6. PROPOSED PEDESTRIAN SIGNAL HEAD AND PUSH BUTTON TO CONTROL THE PROPOSED CROSSWALK ON THE WEST LEG OF THE INTERSECTION SHALL REMAIN COVERED.
7. REMOVE EXISTING 5-SECTION SIGNAL HEAD *7 AND REPLACE WITH PROPOSED 3-SECTION SIGNAL HEAD AT LOCATION AS SHOWN.
8. SLIDE EXISTING OPTICOM FOR EASTBOUND SR26 TO LOCATION AS SHOWN.
9. POLE TO BE REMOVED BY TRAFFIC CONTRACTOR AND POLE BASE TO BE REMOVED BY PROJECT CONTRACTOR.
10. PLUG OPEN ENDS OF CONDUIT.



SPAN WIRE SCHEDULE

SPAN	LENGTH	SPAN MOUNT HEIGHT	5% SAG	SPAN LOW POINT	BOTTOM OF LOWEST HEAD
NORTH	125 FT	27.50 FT	6.25 FT	21.25 FT	16.75 FT
EAST	92 FT	26.50 FT	4.60 FT	21.90 FT	17.40 FT
SOUTH	119 FT	27.00 FT	5.95 FT	21.05 FT	16.55 FT
WEST	110 FT	27.00 FT	5.50 FT	21.50 FT	17.00 FT

NOTE: FIELD ADJUSTMENTS AS REQUIRED

POLE SCHEDULE

POLE *	POLE TYPE	HEIGHT	MATERIAL
*1	PEDESTRIAN	10'	ALUMINUM
*2	STRAIN	28'	STEEL
*5	PEDESTRIAN	10'	ALUMINUM
*6	STRAIN	32'	STEEL
*7	PEDESTRIAN	10'	ALUMINUM
*8	STRAIN	32'	STEEL
*9	PEDESTRIAN	10'	ALUMINUM
10	PEDESTRIAN	10'	ALUMINUM
*11	STRAIN	32'	STEEL
12	PEDESTRIAN	10'	ALUMINUM

* DENOTES EXISTING

(1) NORTHWEST CORNER

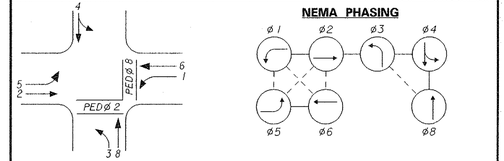
(2) NORTHWEST ISLAND

CURB RAMP DETAILS

SCALE: 1" = 10'
NOTE: FIELD ADJUSTMENTS SHALL BE MADE AS REQUIRED

SECTION 2
PHASE 3, STAGE 6

SIGNAL PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

	PROPOSED SIGNAL CABINET	(RM/C)	REMOVE BY CONTRACTOR
	EXISTING SIGNAL CABINET	(RM/O)	REMOVE BY OTHERS
	PROPOSED SIGNAL POLE BASE	(AB)	ABANDON
	EXISTING SIGNAL POLE BASE	(PB/X)	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	PROPOSED PEDESTRIAN POLE BASE	(EPB/X)	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	EXISTING PEDESTRIAN POLE BASE	(PL/X)	PROPOSED POLE IDENTIFIER (# OF POLE)
	PROPOSED WOOD POLE	(EPL/X)	EXISTING POLE IDENTIFIER (# OF POLE)
	EXISTING WOOD POLE	(JW/X)	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	PROPOSED JUNCTION WELL	(EJW/X)	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	EXISTING JUNCTION WELL	(CO/*)	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)
	PROPOSED SIGNAL HEAD	(ECO/*)	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)
	EXISTING SIGNAL HEAD	(OH/*)	PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
	PROPOSED PEDESTRIAN SIGNAL HEAD	(EOH/*)	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
	EXISTING PEDESTRIAN SIGNAL HEAD	(MA/XX)	PROPOSED MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	PROPOSED PEDESTRIAN PUSHBUTTON	(EMA/XX)	EXISTING MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	EXISTING PEDESTRIAN PUSHBUTTON	(CA/X)	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
	PROPOSED VIDEO DETECTION	(ECA/X)	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
	EXISTING VIDEO DETECTION		PROPOSED SPAN WIRE
	PROPOSED MICROWAVE DETECTION	XX	EXISTING SPAN WIRE
	EXISTING MICROWAVE DETECTION		RIGHT-OF-WAY OR PROPERTY LINE
	OVERHEAD SIGNING		PROPOSED SPAN INSULATOR
	PROPOSED OPTICOM RECEIVER		EXISTING SPAN INSULATOR
	EXISTING OPTICOM RECEIVER	P	SERVICE PEDESTAL
	PROPOSED MAST ARM		PROPOSED CCTV
	EXISTING MAST ARM		EXISTING CCTV
	PROPOSED LUMINAIRE		PROPOSED PLASTIC DRUMS
	EXISTING LUMINAIRE		EXISTING PLASTIC DRUMS
	PROPOSED LOOP DETECTOR (TYPE 1 OR 2)		
	EXISTING LOOP DETECTOR (TYPE 1 OR 2)		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC- DOVER,DELAWARE
2. POLE BASES,CABINET BASE,AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED EXCEPT WHERE SHOWN.
3. ALL GALVANIZED RIGID CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW,BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
4. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY,AND/OR THE APPROPRIATE UTILITY ENTITY FOR THE UTILITY MARKOUTS PRIOR TO THE BEGINNING OF CONSTRUCTION. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR,THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
5. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.
6. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (5.0%) OR FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHALL BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL. ALL PEDESTRIAN SIGNAL HEADS SHALL BE COUNTDOWN TYPE.
7. ALL 4", 3", 2.5", AND 2" CONDUITS SHALL BE SCHEDULE 80 PVC WITH THE EXCEPTION OF 4" BORED CONDUIT WHICH SHALL BE SDR-13.5 HDPE. ALL 1" CONDUITS LESS THAN OR EQUAL TO 6'-0" SHALL BE LIQUID TIGHT FLEXIBLE NON-METALLIC AND ALL 1" CONDUITS GREATER THAN 6'-0" SHALL BE RIGID GALVANIZED.

RECOMMENDED _____ DATE: 05/15/13
RECOMMENDED Chitra Dave DATE: 7/12/13
RECOMMENDED _____ DATE: _____
APPROVED TRAFFIC ENGINEER _____ DATE: 7/10/13
APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER _____ DATE: 7/12/13

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SCALE
0 30 60 90
FEET

SR 26, ATLANTIC AVENUE FROM CLARKSVILLE TO ASSAWOMAN CANAL

CONTRACT	PERMIT NO.	S263	
T200411210	DESIGNED BY:	MSK	
COUNTY	CHECKED BY:	BAM	
SUSSEX			

SIGNAL PLAN
SR 26 @ OLD MILL ROAD

SHEET NO. 530
TOTAL SHTS. 589

7/10/2013
I:\PROJECTS\sr26online\Survey\tp_2-3-6_signal_oldmill.dgn
USER:msk

CONDUIT RUN SCHEDULE

CO*	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
*1	1	2"	-	-	EXISTING ((1)#6 BARE STRANDED COPPER (1)#8/2 (J.F.W.) GROUND
*2	1	2.5"	25'	-	EXISTING ((1)#6 BSC (4)#18/4 (2)#14/16 (4)MICROWAVE DETECTION HOMERUN CABLES)
*3	3	2.5"	5'	-	EXISTING ((3)#6 BSC (14)#14/2 (6)#14/9 COMM. CABLE)
*4	1	4"	100'	-	EXISTING ((1)#6 BSC (5)#14/2 (15' OF (2)#14/2 COILED IN JW) (2)#14/9)
*5	1	4"	35'	-	EXISTING ((1)#6 BSC (3)#14/2 (15' OF EA. COILED IN JW) (2)#14/9)
*5A	1	2.5"	5'	-	EXISTING ((1)#6 BSC (1)#14/9)
*6	1	1"	15'	-	EMPTY
*7	1	2.5"	20'	-	EXISTING ((1)#6 BSC (1)#14/9)
*8	1	3"	10'	-	EMPTY
*9	1	1"	15'	-	EMPTY
*10	1	2.5"	25'	-	EXISTING ((1)#6 BSC (1)#14/9)
*11	1	4"	50'	-	EXISTING ((1)#6 BSC (9)#14/2 (3)#14/9)
*11A	1	2.5"	15'	-	EMPTY
*12	1	4"	150'	-	EXISTING ((1)#6 BSC (1)#14/2)
*13	1	1"	10'	-	EMPTY
*14	1	4"	70'	-	EXISTING ((1)#6 BSC (8)#14/2 (3)#14/9)
*15	1	1"	5'	-	EMPTY
*15A	1	2.5"	5'	-	EMPTY
*16	1	2.5"	25'	-	EXISTING ((1)#6 BSC (1)#14/9)
*17	1	4"	45'	-	EXISTING ((1)#6 BSC (6)#14/2 (15' OF (2)#14/2 COILED IN JW) (2)#14/9)
*18	1	3"	20'	-	EMPTY
*19	1	1"	5'	-	EMPTY
*20	1	4"	100'	-	EXISTING ((1)#6 BSC (3)#14/2 (15' OF (2)#14/2 COILED IN JW) (2)#14/9)
*21	1	4"	35'	-	EXISTING ((1)#6 BSC (2)#14/9)
*21A	1	2.5"	5'	-	EXISTING ((1)#6 BSC (1)#14/9)
*22	1	2.5"	20'	-	EXISTING ((1)#6 BSC (1)#14/9)
*23	1	1"	20'	-	EMPTY
*24	1	3"	10'	-	EMPTY
*25	1	4"	170'	-	EXISTING ((1)#6 BSC (1)#14/2 (15' COILED IN JW))
*26	1	1"	10'	-	EMPTY

LEGEND
* DENOTES EXISTING
B- BORE
T- TRENCH
O- OPEN CUT

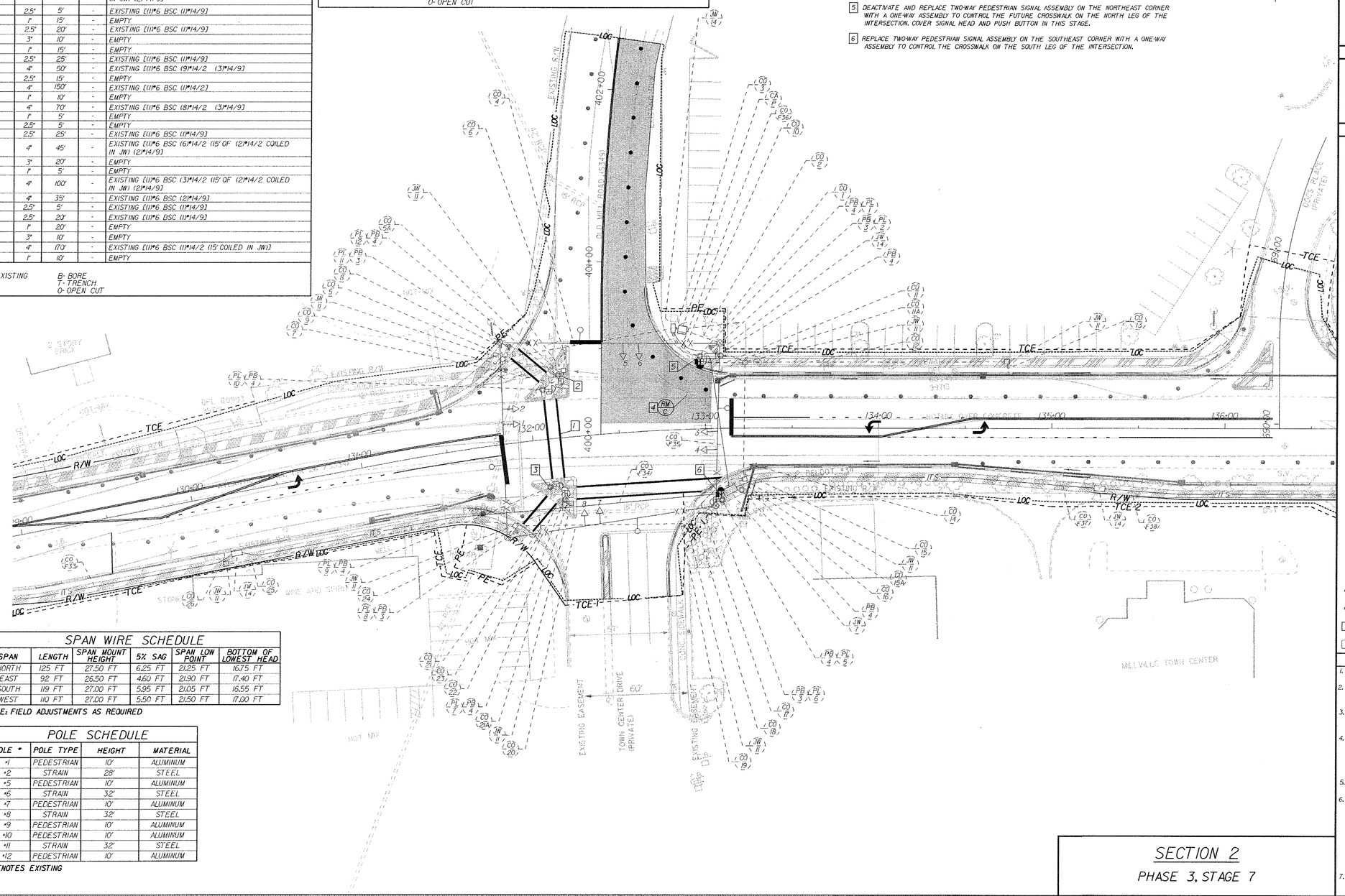
CONDUIT RUN SCHEDULE (CONT.)

CO*	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
*F33	1	4"	130'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F34	1	4"	285'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F35	1	4"	80'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F36	1	4"	30'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F37	1	4"	215'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F38	1	4"	135'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)

LEGEND
* DENOTES EXISTING
B- BORE
T- TRENCH
O- OPEN CUT

PHASE 3, STAGE 7 SIGNAL NOTES

1. TEMPORARY CROSSWALK FOR THE WEST LEG OF THE INTERSECTION SHALL BE STRIPED AT THE COMMENCEMENT OF THIS STAGE.
2. THE ISLAND PEDESTRIAN SIGNAL HEAD AND PUSH BUTTON TO CONTROL THE FUTURE CROSSWALK ON THE NORTH LEG OF THE INTERSECTION SHALL REMAIN UNACTIVATED AND COVERED IN THIS STAGE.
3. UNCOVER AND ACTIVATE THE ISLAND PEDESTRIAN SIGNAL HEAD AND PUSH BUTTON FOR CONTROL OF THE CROSSWALK ON THE WEST LEG OF THE INTERSECTION.
4. EXISTING CROSSWALK STRIPING ON THE EAST LEG SHALL BE REMOVED AT THE COMMENCEMENT OF THIS STAGE.
5. DEACTIVATE AND REPLACE TWO-WAY PEDESTRIAN SIGNAL ASSEMBLY ON THE NORTHEAST CORNER WITH A ONE-WAY ASSEMBLY TO CONTROL THE FUTURE CROSSWALK ON THE NORTH LEG OF THE INTERSECTION. COVER SIGNAL HEAD AND PUSH BUTTON IN THIS STAGE.
6. REPLACE TWO-WAY PEDESTRIAN SIGNAL ASSEMBLY ON THE SOUTHEAST CORNER WITH A ONE-WAY ASSEMBLY TO CONTROL THE CROSSWALK ON THE SOUTH LEG OF THE INTERSECTION.



CONDUIT RUN SCHEDULE

CO*	* OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
*1	1	2"	-	-	EXISTING (1)#6 BARE STRANDED COPPER (1)#8/2 (U.F.W/ GROUND
*2	1	2.5"	25'	-	EXISTING (1)#6 BSC (4)#18/4 (2)#14/16 (4)MICROWAVE DETECTION HOMERUN CABLES)
*3	3	2.5"	5'	-	EXISTING (3)#6 BSC (14)#14/2 (6)#14/9 COMM. CABLE)
*4	1	4"	100'	-	EXISTING (1)#6 BSC (5)#14/2 (15' OF (2)#14/2 COILED IN JW) (2)#14/9)
*5	1	4"	35'	-	EXISTING (1)#6 BSC (3)#14/2 (15' OF EA. COILED IN JW) (2)#14/9)
*5A	1	2.5"	5'	-	EXISTING (1)#6 BSC (1)#14/9)
*6	1	1"	15'	-	EMPTY
*7	1	2.5"	20'	-	EXISTING (1)#6 BSC (1)#14/9)
*8	1	3"	10'	-	EMPTY
*9	1	1"	15'	-	EMPTY
*10	1	2.5"	25'	-	EXISTING (1)#6 BSC (1)#14/9)
*11	1	4"	50'	-	EXISTING (1)#6 BSC (9)#14/2 (3)#14/9)
*11A	1	2.5"	15'	-	EMPTY
*12	1	4"	150'	-	EXISTING (1)#6 BSC (1)#14/2)
*13	1	1"	10'	-	EMPTY
*14	1	4"	70'	-	EXISTING (1)#6 BSC (8)#14/2 (3)#14/9)
*15	1	1"	5'	-	EMPTY
*15A	1	2.5"	5'	-	EMPTY
*16	1	2.5"	25'	-	EXISTING (1)#6 BSC (1)#14/9)
*17	1	4"	45'	-	EXISTING (1)#6 BSC (6)#14/2 (15' OF (2)#14/2 COILED IN JW) (2)#14/9)
*18	1	3"	20'	-	EMPTY
*19	1	1"	5'	-	EMPTY
*20	1	4"	100'	-	EXISTING (1)#6 BSC (3)#14/2 (15' OF (2)#14/2 COILED IN JW) (2)#14/9)
*21	1	4"	35'	-	EXISTING (1)#6 BSC (2)#14/9)
*21A	1	2.5"	5'	-	EXISTING (1)#6 BSC (1)#14/9)
*22	1	2.5"	20'	-	EXISTING (1)#6 BSC (1)#14/9)
*23	1	1"	20'	-	EMPTY
*24	1	3"	10'	-	EMPTY
*25	1	4"	170'	-	EXISTING (1)#6 BSC (1)#14/2 (15' COILED IN JW1)
*26	1	1"	10'	-	EMPTY

LEGEND
* DENOTES EXISTING
B- BORE
T- TRENCH
O- OPEN CUT

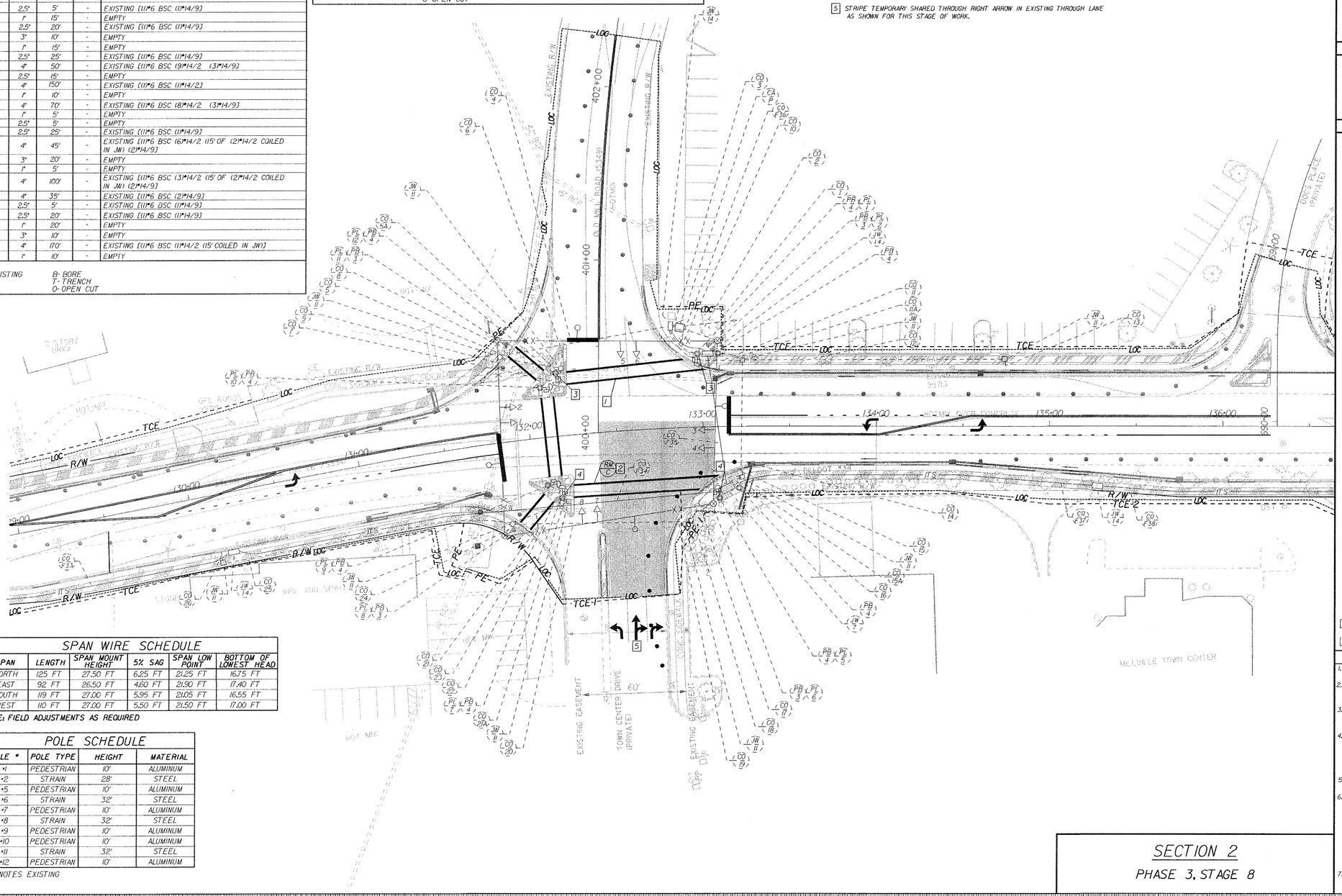
CONDUIT RUN SCHEDULE (CONT.)

CO*	* OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
*F33	1	4"	130'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F34	1	4"	285'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F35	1	4"	80'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F36	1	4"	30'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F37	1	4"	215'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F38	1	4"	135'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)

LEGEND
* DENOTES EXISTING
B- BORE
T- TRENCH
O- OPEN CUT

PHASE 3, STAGE 8 SIGNAL NOTES

1. TEMPORARY CROSSWALK FOR THE NORTH LEG OF THE INTERSECTION SHALL BE STRIPED AT THE COMMENCEMENT OF THIS STAGE.
2. EXISTING TEMPORARY CROSSWALK STRIPING ON THE SOUTH LEG SHALL BE REMOVED AT THE COMMENCEMENT OF THIS STAGE.
3. PEDESTRIAN SIGNAL HEADS AND PUSH BUTTONS TO CONTROL THE CROSSWALK ON THE NORTH LEG OF THE INTERSECTION SHALL BE UNCOVERED AND ACTIVATED.
4. DEACTIVATE AND COVER PEDESTRIAN SIGNAL HEADS AND PUSH BUTTONS THAT CONTROL THE CROSSWALK ON THE SOUTH LEG OF THE INTERSECTION.
5. STRIPE TEMPORARY SHARED THROUGH RIGHT ARROW IN EXISTING THROUGH LANE AS SHOWN FOR THIS STAGE OF WORK.



SPAN WIRE SCHEDULE

SPAN	LENGTH	SPAN MOUNT HEIGHT	5% SAG	SPAN LOW POINT	BOTTOM OF LOWEST HEAD
NORTH	125 FT	27.50 FT	6.25 FT	21.25 FT	16.75 FT
EAST	92 FT	26.50 FT	4.60 FT	21.90 FT	17.40 FT
SOUTH	119 FT	27.00 FT	5.95 FT	21.05 FT	16.55 FT
WEST	110 FT	27.00 FT	5.50 FT	21.50 FT	17.00 FT

NOTE: FIELD ADJUSTMENTS AS REQUIRED

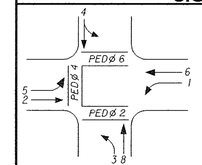
POLE SCHEDULE

POLE *	POLE TYPE	HEIGHT	MATERIAL
*1	PEDESTRIAN	10'	ALUMINUM
*2	STRAIN	28'	STEEL
*5	PEDESTRIAN	10'	ALUMINUM
*6	STRAIN	32'	STEEL
*7	PEDESTRIAN	10'	ALUMINUM
*8	STRAIN	32'	STEEL
*9	PEDESTRIAN	10'	ALUMINUM
*10	PEDESTRIAN	10'	ALUMINUM
*11	STRAIN	32'	STEEL
*12	PEDESTRIAN	10'	ALUMINUM

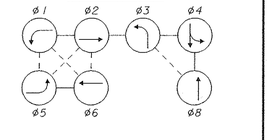
* DENOTES EXISTING

SECTION 2
PHASE 3, STAGE 8

SIGNAL PHASING



NEMA PHASING



PHASING NOTES
1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

	PROPOSED SIGNAL CABINET	RM/C	REMOVE BY CONTRACTOR
	EXISTING SIGNAL CABINET	RM/O	REMOVE BY OTHERS
	PROPOSED SIGNAL POLE BASE	AB	ABANDON
	EXISTING SIGNAL POLE BASE	PB/X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	PROPOSED PEDESTRIAN POLE BASE	(PB/X)	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	EXISTING PEDESTRIAN POLE BASE	PL/X	PROPOSED POLE IDENTIFIER (* OF POLE)
	PROPOSED WOOD POLE	(PL/X)	EXISTING POLE IDENTIFIER (* OF POLE)
	EXISTING WOOD POLE	JW/X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	PROPOSED JUNCTION WELL	(JW/X)	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	EXISTING JUNCTION WELL	CO/*	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
	PROPOSED SIGNAL HEAD	(CO/*)	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
	EXISTING SIGNAL HEAD	OH/*	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
	PROPOSED PEDESTRIAN SIGNAL HEAD	(OH/*)	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
	EXISTING PEDESTRIAN SIGNAL HEAD	MA/XX	PROPOSED MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	PROPOSED PEDESTRIAN PUSHBUTTON	(MA/XX)	EXISTING MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	EXISTING PEDESTRIAN PUSHBUTTON	CA/X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
	PROPOSED VIDEO DETECTION	(CA/X)	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
	EXISTING VIDEO DETECTION		PROPOSED SPAN WIRE
	PROPOSED MICROWAVE DETECTION	XX	EXISTING SPAN WIRE
	EXISTING MICROWAVE DETECTION		RIGHT-OF-WAY OR PROPERTY LINE
	OVERHEAD SIGNING		PROPOSED SPAN INSULATOR
	PROPOSED OPTICOM RECEIVER		EXISTING SPAN INSULATOR
	EXISTING OPTICOM RECEIVER	P	SERVICE PEDESTAL
	PROPOSED MAST ARM		PROPOSED CCTV
	EXISTING MAST ARM		EXISTING CCTV
	PROPOSED LUMINAIRE		PROPOSED PLASTIC DRUMS
	EXISTING LUMINAIRE		EXISTING PLASTIC DRUMS
	PROPOSED LOOP DETECTOR (TYPE 1 OR 2)		
	EXISTING LOOP DETECTOR (TYPE 1 OR 2)		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC- DOVER, DELAWARE.
2. POLE BASES, CABINET BASE, AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED EXCEPT WHERE SHOWN.
3. ALL GALVANIZED RIGID CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
4. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY FOR THE UTILITY MARKOUTS PRIOR TO THE BEGINNING OF CONSTRUCTION. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
5. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.
6. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (SCU OR FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHALL BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL. ALL PEDESTRIAN SIGNAL HEADS SHALL BE COUNTDOWN TYPE.
7. ALL 4", 3", 2.5", AND 2" CONDUITS SHALL BE SCHEDULE 80 PVC WITH THE EXCEPTION OF 4" BORED CONDUIT WHICH SHALL BE SDR-13.5 HDPE. ALL 1" CONDUITS LESS THAN OR EQUAL TO 6'-0" SHALL BE LIQUID TIGHT FLEXIBLE NON-METALLIC AND ALL 1" CONDUITS GREATER THAN 6'-0" SHALL BE RIGID GALVANIZED.

RECOMMENDED [signature]	DATE: 05/15/13	RECOMMENDED Christa Dane	DATE: 7/12/13
RECOMMENDED	DATE:	APPROVED TRAFFIC ENGINEER [signature]	DATE: 7/12/13
APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER [signature]	DATE: 7/12/13		

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SCALE
0 30 60 90
FEET

SR 26, ATLANTIC AVENUE FROM CLARKSVILLE TO ASSAWOMAN CANAL

CONTRACT	T200411210	PERMIT NO.	S263
COUNTY	SUSSEX	DESIGNED BY:	MSK
		CHECKED BY:	BAM

SIGNAL PLAN
SR 26 @ OLD MILL ROAD

SHEET NO.	532
TOTAL SHTS.	589

7/10/2013
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CONDUIT RUN SCHEDULE

CO*	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
*1	1	2"	-	-	EXISTING (1)#6 BARE STRANDED COPPER (1)#8/2 U.F.W/ GROUND
*2	1	2.5"	25'	-	EXISTING (1)#6 BSC (4)#18/4 (2)#14/16 (4)MICROWAVE DETECTION HOMERUN CABLES) REMOVE (4)MICROWAVE DETECTION HOMERUN CABLES
*3	3	2.5"	5'	-	EXISTING ((3)#6 BSC (14)#14/2 (6)#14/9 COMM. CABLE) NEW (2)#14/9
*4	1	4"	100'	-	EXISTING (1)#6 BSC (5)#14/2 (2)#14/9
*5	1	4"	35'	-	EXISTING (1)#6 BSC (3)#14/2 (2)#14/9
*5A	1	2.5"	5'	-	EXISTING (1)#6 BSC (1)#14/9
*6	1	1"	15'	-	NEW (6)#14/1
*7	1	2.5"	20'	-	EXISTING (1)#6 BSC (1)#14/9
*8	1	3"	10'	-	EMPTY
*9	1	1"	15'	-	NEW (4)#14/1
*10	1	2.5"	25'	-	EXISTING (1)#6 BSC (1)#14/9
*11	1	4"	50'	-	EXISTING (1)#6 BSC (9)#14/2 (3)#14/9 NEW (2)#14/9
*11A	1	2.5"	15'	-	NEW (1)#6 BSC (1)#14/9
*12	1	4"	150'	-	EXISTING (1)#6 BSC (1)#14/2
*13	1	1"	10'	-	NEW (2)#14/1
*14	1	4"	70'	-	EXISTING (1)#6 BSC (8)#14/2 (3)#14/9 NEW (1)#14/9
*15	1	1"	5'	-	NEW (4)#14/1
*15A	1	2.5"	5'	-	NEW ((1)#6 BSC (1)#14/9)
*16	1	2.5"	25'	-	EXISTING (1)#6 BSC (1)#14/9
*17	1	4"	45'	-	EXISTING (1)#6 BSC (6)#14/2 (2)#14/9
*18	1	3"	20'	-	EMPTY
*19	1	1"	5'	-	NEW (4)#14/1
*20	1	4"	100'	-	EXISTING (1)#6 BSC (3)#14/2 (2)#14/9
*21	1	4"	35'	-	EXISTING (1)#6 BSC (2)#14/9
*21A	1	2.5"	5'	-	EXISTING (1)#6 BSC (1)#14/9
*22	1	2.5"	20'	-	EXISTING (1)#6 BSC (1)#14/9
*23	1	1"	20'	-	NEW (4)#14/1
*24	1	3"	10'	-	EMPTY
*25	1	4"	170'	-	EXISTING (1)#6 BSC (1)#14/2
*26	1	1"	10'	-	NEW (2)#14/1

LEGEND
* DENOTES EXISTING
B- BORE
T- TRENCH
O- OPEN CUT

CONDUIT RUN SCHEDULE (CONT.)

CO*	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
*F33	1	4"	130'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F34	1	4"	285'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F35	1	4"	80'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F36	1	4"	30'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F37	1	4"	215'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F38	1	4"	135'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)

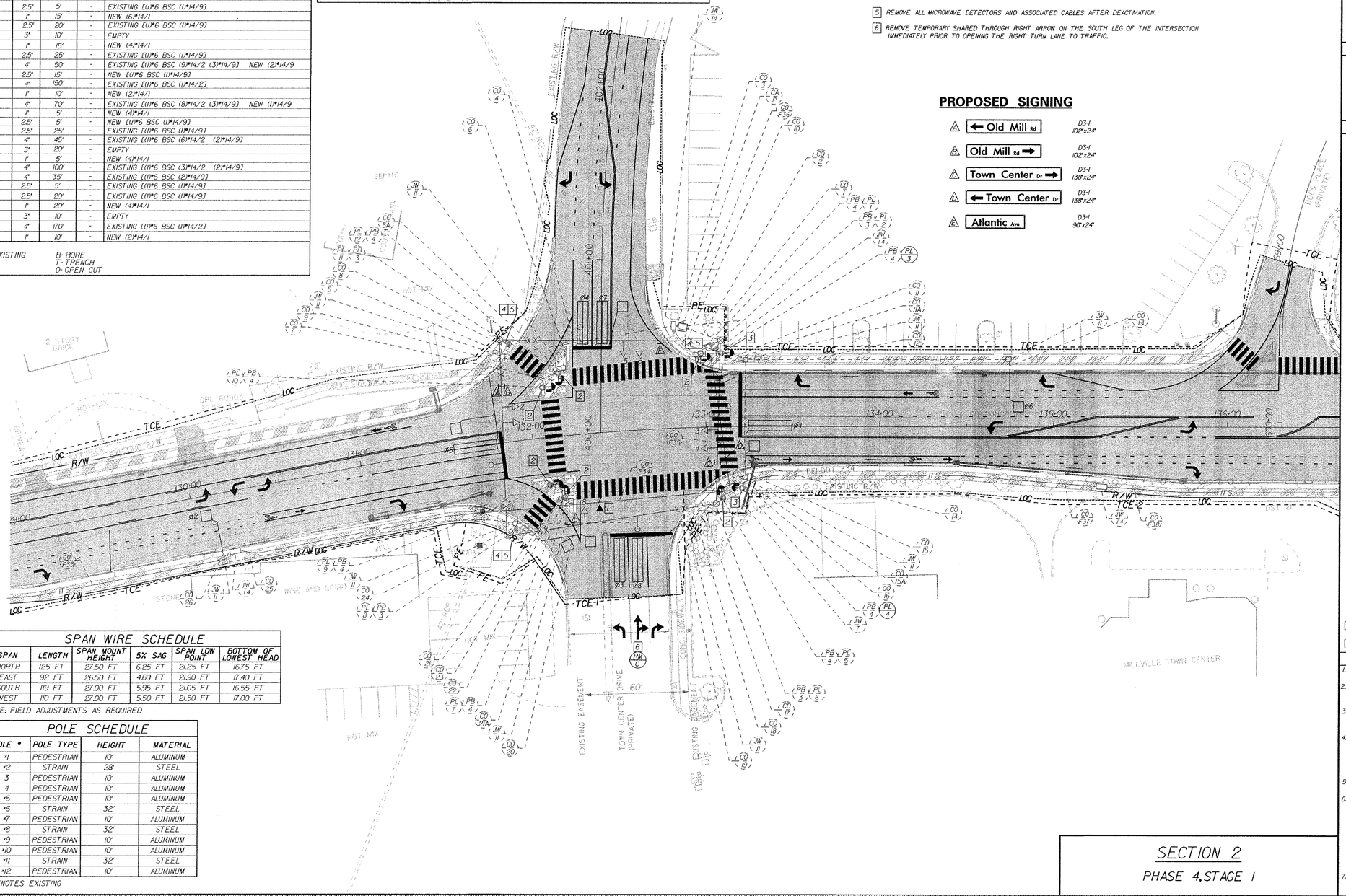
LEGEND
* DENOTES EXISTING
B- BORE
T- TRENCH
O- OPEN CUT

PHASE 4, STAGE 1 SIGNAL NOTES

1. REMOVE EXISTING 3-SECTION SIGNAL HEAD *7 AND REPLACE WITH PROPOSED 5-SECTION SIGNAL HEAD AT LOCATION AS SHOWN.
2. REPLACE ALL EXISTING PEDESTRIAN PUSH BUTTONS WITH APS STATIONS ON EXISTING PEDESTRIAN POLES AND UNCOVER AND ACTIVATE ALL EXISTING PEDESTRIAN SIGNALS.
3. INSTALL PROPOSED PEDESTRIAN POLES, SIGNAL HEADS AND APS STATIONS THAT CONTROL THE PROPOSED CROSSWALK ON THE EAST LEG OF THE INTERSECTION AND ACTIVATE PEDESTRIAN SIGNALS.
4. ACTIVATE ALL FINAL PROPOSED TRAFFIC SIGNAL INSTALLATIONS AND DEACTIVATE THE MICROWAVE DETECTION SIGNAL INSTALLATION. ACTIVATION AND DEACTIVATION OF THE SIGNAL SYSTEMS SHALL BE COORDINATED TO ALLOW FOR A SMOOTH TRANSITION.
5. REMOVE ALL MICROWAVE DETECTORS AND ASSOCIATED CABLES AFTER DEACTIVATION.
6. REMOVE TEMPORARY SHARED THROUGH RIGHT ARROW ON THE SOUTH LEG OF THE INTERSECTION IMMEDIATELY PRIOR TO OPENING THE RIGHT TURN LANE TO TRAFFIC.

PROPOSED SIGNING

A	← Old Mill Rd	D3-1 102"x24"
B	Old Mill Rd →	D3-1 102"x24"
C	Town Center Dr →	D3-1 138"x24"
D	← Town Center Dr	D3-1 138"x24"
E	Atlantic Ave	D3-1 90"x24"



SPAN WIRE SCHEDULE

SPAN	LENGTH	SPAN MOUNT HEIGHT	5% SAG	SPAN LOW POINT	BOTTOM OF LOWEST HEAD
NORTH	125 FT	27.50 FT	6.25 FT	21.25 FT	16.75 FT
EAST	92 FT	26.50 FT	4.60 FT	21.90 FT	17.40 FT
SOUTH	119 FT	27.00 FT	5.95 FT	21.05 FT	16.55 FT
WEST	110 FT	27.00 FT	5.50 FT	21.50 FT	17.00 FT

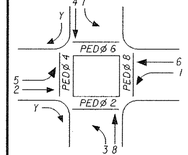
NOTE: FIELD ADJUSTMENTS AS REQUIRED

POLE SCHEDULE

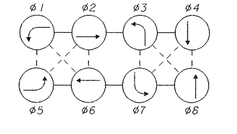
POLE *	POLE TYPE	HEIGHT	MATERIAL
*1	PEDESTRIAN	10'	ALUMINUM
*2	STRAIN	28'	STEEL
3	PEDESTRIAN	10'	ALUMINUM
4	PEDESTRIAN	10'	ALUMINUM
*5	PEDESTRIAN	10'	ALUMINUM
*6	STRAIN	32'	STEEL
*7	PEDESTRIAN	10'	ALUMINUM
*8	STRAIN	32'	STEEL
*9	PEDESTRIAN	10'	ALUMINUM
*10	PEDESTRIAN	10'	ALUMINUM
*11	STRAIN	32'	STEEL
*12	PEDESTRIAN	10'	ALUMINUM

* DENOTES EXISTING

SIGNAL PHASING



NEMA PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

	PROPOSED SIGNAL CABINET	(RM/C)	REMOVE BY CONTRACTOR
	EXISTING SIGNAL CABINET	(RM/O)	REMOVE BY OTHERS
	PROPOSED SIGNAL POLE BASE	(AB)	ABANDON
	EXISTING SIGNAL POLE BASE	(PB/X)	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	PROPOSED PEDESTRIAN POLE BASE	(PB/X)	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	EXISTING PEDESTRIAN POLE BASE	(PL/X)	PROPOSED POLE IDENTIFIER (* OF POLE)
	PROPOSED WOOD POLE	(PL/X)	EXISTING POLE IDENTIFIER (* OF POLE)
	EXISTING WOOD POLE	(JW/X)	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	PROPOSED JUNCTION WELL	(JW/X)	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	EXISTING JUNCTION WELL	(CO/•)	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
	PROPOSED SIGNAL HEAD	(CO/•)	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
	EXISTING SIGNAL HEAD	(OH/•)	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
	PROPOSED PEDESTRIAN SIGNAL HEAD	(OH/•)	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
	EXISTING PEDESTRIAN SIGNAL HEAD	(MA/XX)	PROPOSED MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	PROPOSED PEDESTRIAN PUSHBUTTON	(MA/XX)	EXISTING MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	EXISTING PEDESTRIAN PUSHBUTTON	(CA/X)	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
	PROPOSED VIDEO DETECTION	(CA/X)	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
	EXISTING VIDEO DETECTION		PROPOSED SPAN WIRE
	PROPOSED MICROWAVE DETECTION	XX	EXISTING SPAN WIRE
	EXISTING MICROWAVE DETECTION		RIGHT-OF-WAY OR PROPERTY LINE
	OVERHEAD SIGNING		PROPOSED SPAN INSULATOR
	PROPOSED OPTICOM RECEIVER		EXISTING SPAN INSULATOR
	EXISTING OPTICOM RECEIVER	P	SERVICE PEDESTAL
	PROPOSED MAST ARM		PROPOSED CCTV
	EXISTING MAST ARM		EXISTING CCTV
	PROPOSED LUMINAIRE		PROPOSED PLASTIC DRUMS
	EXISTING LUMINAIRE		EXISTING PLASTIC DRUMS
	PROPOSED LOOP DETECTOR (TYPE 1 OR 2)		
	EXISTING LOOP DETECTOR (TYPE 1 OR 2)		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-DOVER, DELAWARE
2. POLE BASES, CABINET BASE, AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED EXCEPT WHERE SHOWN.
3. ALL GALVANIZED RIGID CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
4. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY FOR THE UTILITY MARKOUTS PRIOR TO THE BEGINNING OF CONSTRUCTION. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
5. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.
6. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (50:1 OR FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHALL BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL. ALL PEDESTRIAN SIGNAL HEADS SHALL BE COUNT-DOWN TYPE.
7. ALL 4", 3", 2.5", AND 2" CONDUITS SHALL BE SCHEDULE 80 PVC WITH THE EXCEPTION OF 4" BORED CONDUIT WHICH SHALL BE SDR-13.5 HDPE. ALL 1" CONDUITS LESS THAN OR EQUAL TO 6'-0" SHALL BE LIQUID TIGHT FLEXIBLE NON-METALLIC AND ALL 1" CONDUITS GREATER THAN 6'-0" SHALL BE RIGID GALVANIZED.

SECTION 2
PHASE 4, STAGE 1

RECOMMENDED [signature]	DATE: 05/15/13	RECOMMENDED Cheltra Dane	DATE: 7/12/13
RECOMMENDED	DATE:	APPROVED TRAFFIC ENGINEER [signature]	DATE: 7/11/13
APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER [signature]	DATE: 7/12/13		

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SCALE
0 30 60 90
FEET

SR 26, ATLANTIC AVENUE FROM CLARKSVILLE TO ASSAWOMAN CANAL

CONTRACT	T200411210
COUNTY	SUSSEX
PERMIT NO.	S263
DESIGNED BY:	MSK
CHECKED BY:	BAM

SIGNAL PLAN
SR 26 @ OLD MILL ROAD

SHEET NO.	533
TOTAL SHTS.	589

7/01/2013
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CONDUIT RUN SCHEDULE

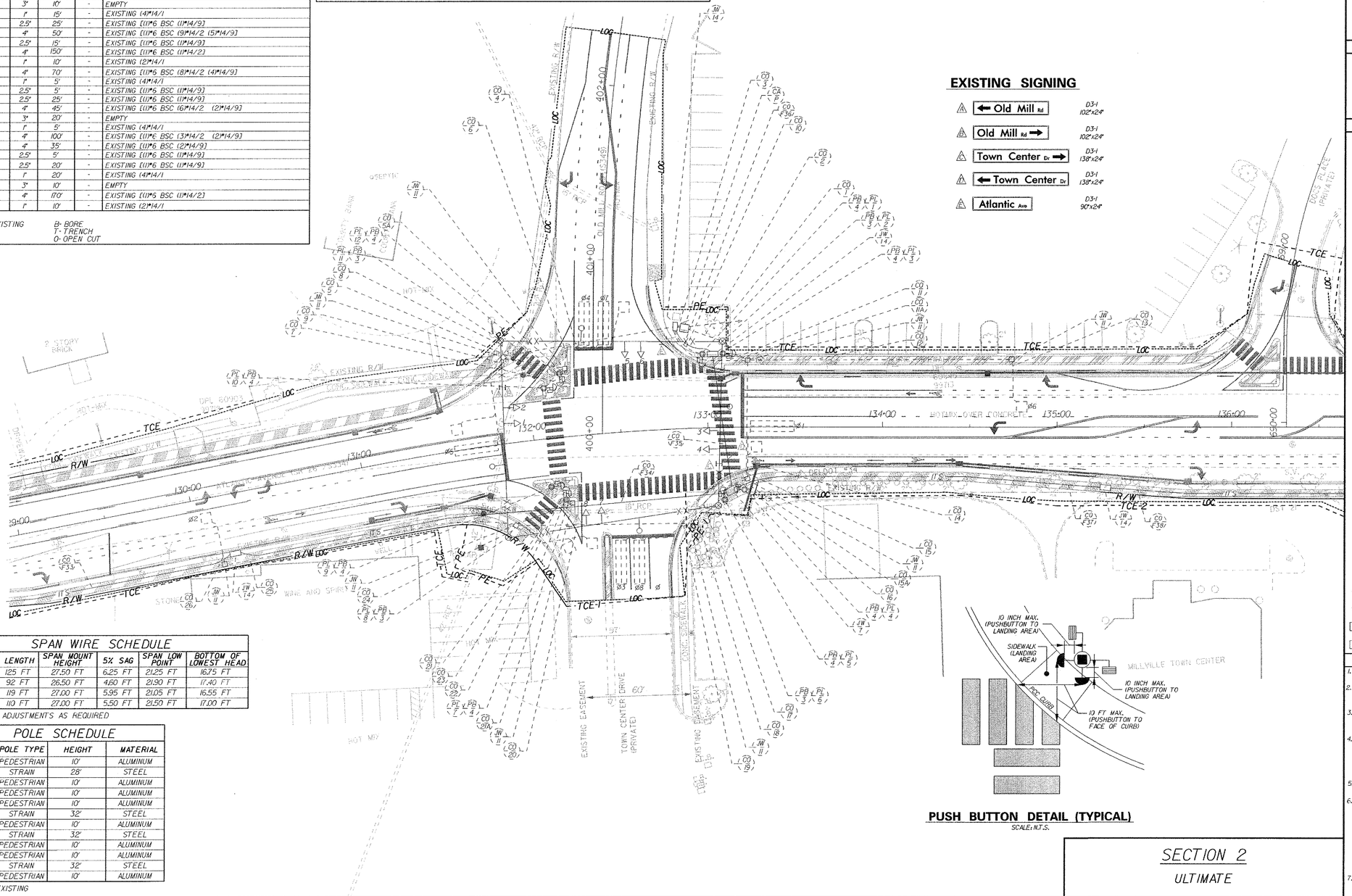
CO*	* OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
*1	1	2"	-	-	EXISTING (1)#6 BARE STRANDED COPPER (1)#8/2 U.F.W./ GROUND
*2	1	2.5"	25'	-	EXISTING (1)#6 BSC (4)#18/4 (2)#14/6]
*3	3	2.5"	5'	-	EXISTING (3)#6 BSC (14)#14/2 (8)#14/3 COMM. CABLE)
*4	1	4"	100'	-	EXISTING (1)#6 BSC (5)#14/2 (2)#14/9]
*5	1	4"	35'	-	EXISTING (1)#6 BSC (3)#14/2 (2)#14/9]
*5A	1	2.5"	5'	-	EXISTING (1)#6 BSC (1)#14/9]
*6	1	1"	15'	-	EXISTING (6)#14/1
*7	1	2.5"	20'	-	EXISTING (1)#6 BSC (1)#14/9]
*8	1	3"	10'	-	EMPTY
*9	1	1"	15'	-	EXISTING (4)#14/1
*10	1	2.5"	25'	-	EXISTING (1)#6 BSC (1)#14/9]
*11	1	4"	50'	-	EXISTING (1)#6 BSC (9)#14/2 (5)#14/9]
*11A	1	2.5"	15'	-	EXISTING (1)#6 BSC (1)#14/9]
*12	1	4"	150'	-	EXISTING (1)#6 BSC (1)#14/2]
*13	1	1"	10'	-	EXISTING (2)#14/1
*14	1	4"	70'	-	EXISTING (1)#6 BSC (8)#14/2 (4)#14/9]
*15	1	1"	5'	-	EXISTING (4)#14/1
*15A	1	2.5"	5'	-	EXISTING (1)#6 BSC (1)#14/9]
*16	1	2.5"	25'	-	EXISTING (1)#6 BSC (1)#14/9]
*17	1	4"	45'	-	EXISTING (1)#6 BSC (6)#14/2 (2)#14/9]
*18	1	3"	20'	-	EMPTY
*19	1	1"	5'	-	EXISTING (4)#14/1
*20	1	4"	100'	-	EXISTING (1)#6 BSC (3)#14/2 (2)#14/9]
*21	1	4"	35'	-	EXISTING (1)#6 BSC (2)#14/9]
*21A	1	2.5"	5'	-	EXISTING (1)#6 BSC (1)#14/9]
*22	1	2.5"	20'	-	EXISTING (1)#6 BSC (1)#14/9]
*23	1	1"	20'	-	EXISTING (4)#14/1
*24	1	3"	10'	-	EMPTY
*25	1	4"	170'	-	EXISTING (1)#6 BSC (1)#14/2]
*26	1	1"	10'	-	EXISTING (2)#14/1

LEGEND
* DENOTES EXISTING
B- BORE
T- TRENCH
O- OPEN CUT

CONDUIT RUN SCHEDULE (CONT.)

CO*	* OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
*F33	1	4"	130'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F34	1	4"	285'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F35	1	4"	80'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F36	1	4"	30'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F37	1	4"	215'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F38	1	4"	135'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)

LEGEND
* DENOTES EXISTING
B- BORE
T- TRENCH
O- OPEN CUT



PUSH BUTTON DETAIL (TYPICAL)
SCALE: N.T.S.

SPAN WIRE SCHEDULE

SPAN	LENGTH	SPAN MOUNT HEIGHT	5% SAG	SPAN LOW POINT	BOTTOM OF LOWEST HEAD
NORTH	125 FT	27.50 FT	6.25 FT	21.25 FT	16.75 FT
EAST	92 FT	26.50 FT	4.60 FT	21.90 FT	17.40 FT
SOUTH	119 FT	27.00 FT	5.95 FT	21.05 FT	16.55 FT
WEST	110 FT	27.00 FT	5.50 FT	21.50 FT	17.00 FT

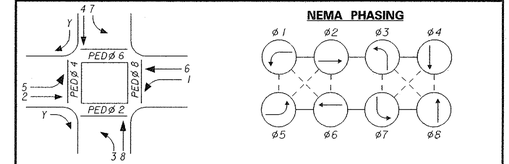
NOTE: FIELD ADJUSTMENTS AS REQUIRED

POLE SCHEDULE

POLE *	POLE TYPE	HEIGHT	MATERIAL
*1	PEDESTRIAN	10'	ALUMINUM
*2	STRAIN	28'	STEEL
*3	PEDESTRIAN	10'	ALUMINUM
*4	PEDESTRIAN	10'	ALUMINUM
*5	PEDESTRIAN	10'	ALUMINUM
*6	STRAIN	32'	STEEL
*7	PEDESTRIAN	10'	ALUMINUM
*8	STRAIN	32'	STEEL
*9	PEDESTRIAN	10'	ALUMINUM
*10	PEDESTRIAN	10'	ALUMINUM
*11	STRAIN	32'	STEEL
*12	PEDESTRIAN	10'	ALUMINUM

* DENOTES EXISTING

SIGNAL PHASING



PHASING NOTES
1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

	PROPOSED SIGNAL CABINET	(RM/C)	REMOVE BY CONTRACTOR
	EXISTING SIGNAL CABINET	(RM/O)	REMOVE BY OTHERS
	PROPOSED SIGNAL POLE BASE	(AB)	ABANDON
	EXISTING SIGNAL POLE BASE		
	PROPOSED PEDESTRIAN POLE BASE	(PB/X)	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	EXISTING PEDESTRIAN POLE BASE	(PB/X)	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	PROPOSED WOOD POLE	(PL/X)	PROPOSED POLE IDENTIFIER (* OF POLE)
	EXISTING WOOD POLE	(PL/X)	EXISTING POLE IDENTIFIER (* OF POLE)
	PROPOSED JUNCTION WELL	(JW/X)	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	EXISTING JUNCTION WELL	(JW/X)	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	PROPOSED SIGNAL HEAD	(CO/•)	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
	EXISTING SIGNAL HEAD	(CO/•)	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
	PROPOSED PEDESTRIAN SIGNAL HEAD	(OH/•)	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
	EXISTING PEDESTRIAN SIGNAL HEAD	(OH/•)	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
	PROPOSED PEDESTRIAN PUSHBUTTON	(MA/XX)	PROPOSED MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	EXISTING PEDESTRIAN PUSHBUTTON	(MA/XX)	EXISTING MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	PROPOSED VIDEO DETECTION	(CA/X)	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
	EXISTING VIDEO DETECTION	(CA/X)	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
	PROPOSED MICROWAVE DETECTION		PROPOSED SPAN WIRE
	EXISTING MICROWAVE DETECTION	XX	EXISTING SPAN WIRE
	OVERHEAD SIGNING		RIGHT-OF-WAY OR PROPERTY LINE
	PROPOSED OPTICOM RECEIVER		PROPOSED SPAN INSULATOR
	EXISTING OPTICOM RECEIVER		EXISTING SPAN INSULATOR
	PROPOSED MAST ARM	P	SERVICE PEDESTAL
	EXISTING MAST ARM		PROPOSED CCTV
	PROPOSED LUMINAIRE		EXISTING CCTV
	EXISTING LUMINAIRE		PROPOSED PLASTIC DRUMS
	PROPOSED LOOP DETECTOR (TYPE 1 OR 2)		EXISTING PLASTIC DRUMS
	EXISTING LOOP DETECTOR (TYPE 1 OR 2)		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC- DOVER, DELAWARE
2. POLE BASES, CABINET BASE, AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED EXCEPT WHERE SHOWN.
3. ALL GALVANIZED RIGID CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
4. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY FOR THE UTILITY MARKOUTS PRIOR TO THE BEGINNING OF CONSTRUCTION. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
5. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.
6. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (5%) OR FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHALL BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL. ALL PEDESTRIAN SIGNAL HEADS SHALL BE COUNTDOWN TYPE.
7. ALL 4", 3", 2.5", AND 2" CONDUITS SHALL BE SCHEDULE 80 PVC WITH THE EXCEPTION OF 4" BORED CONDUIT WHICH SHALL BE SDR-13.5 HDPE. ALL 1" CONDUITS LESS THAN OR EQUAL TO 6'-0" SHALL BE LIQUID TIGHT FLEXIBLE NON-METALLIC AND ALL 1" CONDUITS GREATER THAN 6'-0" SHALL BE RIGID GALVANIZED.

SECTION 2
ULTIMATE

RECOMMENDED [signature] DATE: 05/15/13
RECOMMENDED Chitra Dave DATE: 7/12/13
RECOMMENDED _____ DATE: _____
APPROVED TRAFFIC ENGINEER [signature] DATE: 7/12/13
APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER [signature] DATE: 7/12/13

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SCALE 0 30 60 90 FEET

SR 26, ATLANTIC AVENUE FROM CLARKSVILLE TO ASSAWOMAN CANAL

CONTRACT	T200411210	PERMIT NO.	S263
COUNTY	SUSSEX	DESIGNED BY:	MSK
		CHECKED BY:	BAM

SIGNAL PLAN SR 26 @ OLD MILL ROAD (ULTIMATE)

SHEET NO. 534
TOTAL SHTS. 589

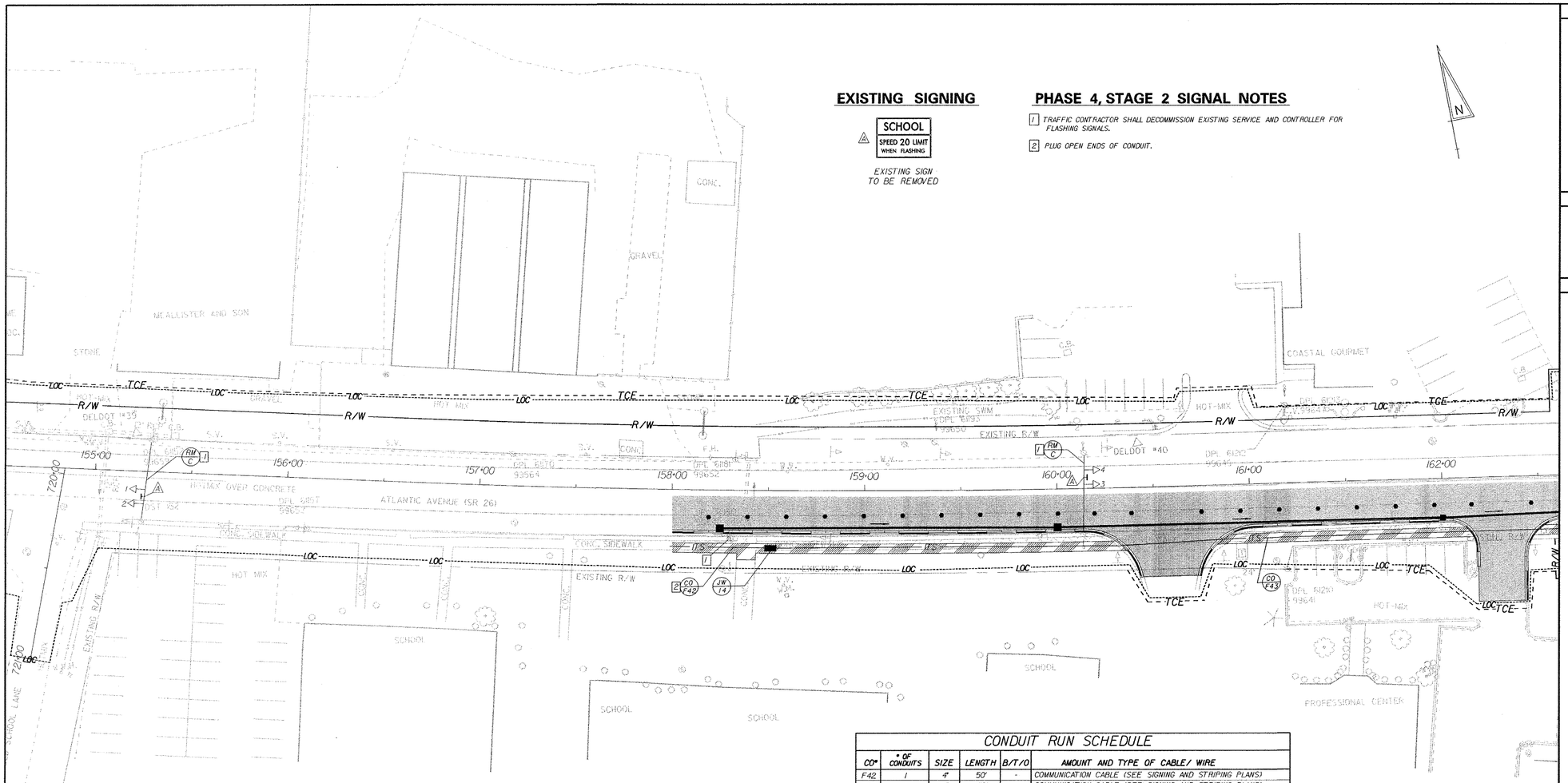
7/09/2013
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EXISTING SIGNING

EXISTING SIGN TO BE REMOVED

PHASE 4, STAGE 2 SIGNAL NOTES

1. TRAFFIC CONTRACTOR SHALL DECOMMISSION EXISTING SERVICE AND CONTROLLER FOR FLASHING SIGNALS.
2. PLUG OPEN ENDS OF CONDUIT.



CONDUIT RUN SCHEDULE

CO*	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
F42	1	4"	50'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
F43	1	4"	410'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)

LEGEND
* DENOTES EXISTING

B- BORE
T- TRENCH
O- OPEN CUT

SIGNAL PHASING

SIGNAL HEAD DIAGRAM

1, 2, 3, 4

EXISTING SIGNAL HEADS TO BE REMOVED

LEGEND

- PROPOSED SIGNAL CABINET
- EXISTING SIGNAL CABINET
- PROPOSED SIGNAL POLE BASE
- EXISTING SIGNAL POLE BASE
- PROPOSED PEDESTRIAN POLE BASE
- EXISTING PEDESTRIAN POLE BASE
- PROPOSED WOOD POLE
- EXISTING WOOD POLE
- PROPOSED JUNCTION WELL
- EXISTING JUNCTION WELL
- PROPOSED SIGNAL HEAD
- EXISTING SIGNAL HEAD
- PROPOSED PEDESTRIAN SIGNAL HEAD
- EXISTING PEDESTRIAN SIGNAL HEAD
- PROPOSED PEDESTRIAN PUSHBUTTON
- EXISTING PEDESTRIAN PUSHBUTTON
- PROPOSED VIDEO DETECTION
- EXISTING VIDEO DETECTION
- PROPOSED MICROWAVE DETECTION
- EXISTING MICROWAVE DETECTION
- OVERHEAD SIGNING
- PROPOSED OPTICOM RECEIVER
- EXISTING OPTICOM RECEIVER
- PROPOSED MAST ARM
- EXISTING MAST ARM
- PROPOSED LUMINAIRE
- EXISTING LUMINAIRE
- PROPOSED LOOP DETECTOR (TYPE 1 OR 2)
- EXISTING LOOP DETECTOR (TYPE 1 OR 2)
- (RM C) REMOVE BY CONTRACTOR
- (RM O) REMOVE BY OTHERS
- (AB) ABANDON
- (PB X) PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
- (PB X) EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
- (PL X) PROPOSED POLE IDENTIFIER (# OF POLE)
- (PL X) EXISTING POLE IDENTIFIER (# OF POLE)
- (JW X) PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
- (JW X) EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
- (CO #) PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)
- (CO #) EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)
- (OH #) PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
- (OH #) EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
- (MA XX) PROPOSED MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
- (MA XX) EXISTING MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
- (CA X) PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
- (CA X) EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
- PROPOSED SPAN WIRE
- XX EXISTING SPAN WIRE
- RIGHT-OF-WAY OR PROPERTY LINE
- PROPOSED SPAN INSULATOR
- EXISTING SPAN INSULATOR
- (P) SERVICE PEDESTAL
- PROPOSED CCTV
- EXISTING CCTV
- PROPOSED PLASTIC DRUMS
- EXISTING PLASTIC DRUMS

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-
1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC- DOVER, DELAWARE
2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY FOR THE UTILITY MARKOUTS PRIOR TO THE BEGINNING OF CONSTRUCTION. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
3. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.

SECTION 2

PHASE 2, STAGE 2

RECOMMENDED [signature] DATE: 05/15/13	RECOMMENDED Chetna Dave DATE: 7/12/13	RECOMMENDED _____ DATE:	APPROVED TRAFFIC ENGINEER [signature] DATE: 7/12/13

APPROVED FOR INSTALLATION
CHIEF TRAFFIC ENGINEER [signature] DATE: 7/12/13

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SCALE 0 30 60 90 FEET

SR 26, ATLANTIC AVENUE FROM CLARKSVILLE TO ASSAWOMAN CANAL

CONTRACT	T200411210	PERMIT NO.	S152
COUNTY	SUSSEX	DESIGNED BY:	MSK
		CHECKED BY:	BAM

SIGNAL PLAN SR 26 @ LORD BALTIMORE SCHOOL

SHEET NO.	535
TOTAL SHTS.	589

7/09/2013
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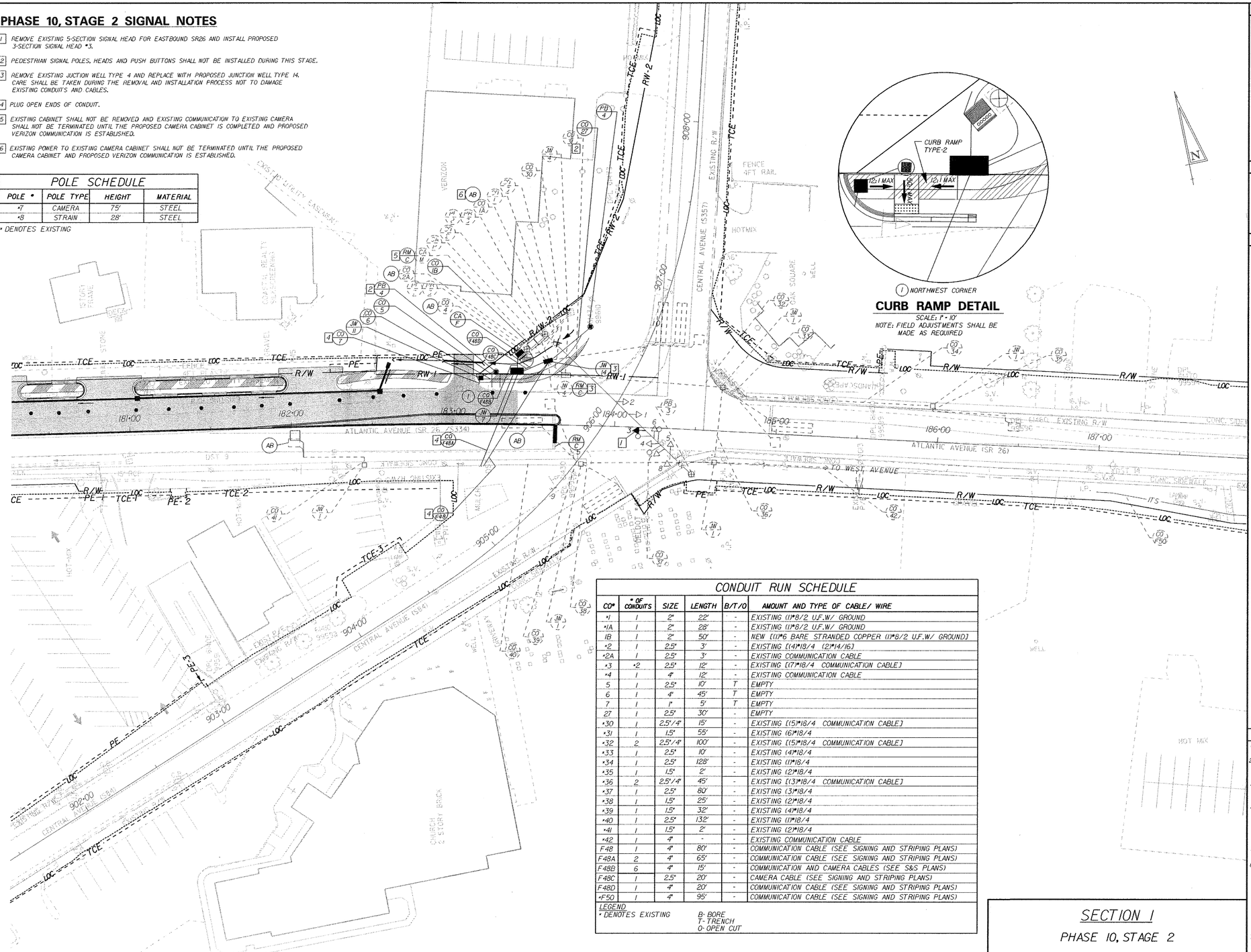
PHASE 10, STAGE 2 SIGNAL NOTES

1. REMOVE EXISTING 5-SECTION SIGNAL HEAD FOR EASTBOUND SR26 AND INSTALL PROPOSED 3-SECTION SIGNAL HEAD *3.
2. PEDESTRIAN SIGNAL POLES, HEADS AND PUSH BUTTONS SHALL NOT BE INSTALLED DURING THIS STAGE.
3. REMOVE EXISTING JUCTION WELL TYPE 4 AND REPLACE WITH PROPOSED JUNCTION WELL TYPE 14. CARE SHALL BE TAKEN DURING THE REMOVAL AND INSTALLATION PROCESS NOT TO DAMAGE EXISTING CONDUITS AND CABLES.
4. PLUG OPEN ENDS OF CONDUIT.
5. EXISTING CABINET SHALL NOT BE REMOVED AND EXISTING COMMUNICATION TO EXISTING CAMERA SHALL NOT BE TERMINATED UNTIL THE PROPOSED CAMERA CABINET IS COMPLETED AND PROPOSED VERIZON COMMUNICATION IS ESTABLISHED.
6. EXISTING POWER TO EXISTING CAMERA CABINET SHALL NOT BE TERMINATED UNTIL THE PROPOSED CAMERA CABINET AND PROPOSED VERIZON COMMUNICATION IS ESTABLISHED.

POLE SCHEDULE

POLE *	POLE TYPE	HEIGHT	MATERIAL
*7	CAMERA	75'	STEEL
*8	STRAIN	28'	STEEL

* DENOTES EXISTING



1 NORTHWEST CORNER

CURB RAMP DETAIL

SCALE: 1" = 10'

NOTE: FIELD ADJUSTMENTS SHALL BE MADE AS REQUIRED

CONDUIT RUN SCHEDULE

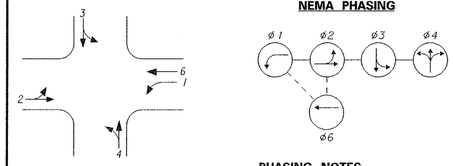
CO#	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
*1	1	2"	22'	-	EXISTING (1)#8/2 U.F.W/ GROUND
*1A	1	2"	28'	-	EXISTING (1)#8/2 U.F.W/ GROUND
1B	1	2"	50'	-	NEW ((1)#6 BARE STRANDED COPPER (1)#8/2 U.F.W/ GROUND)
*2	1	2.5"	3'	-	EXISTING ((4)#18/4 (2)#14/16)
*2A	1	2.5"	3'	-	EXISTING COMMUNICATION CABLE
*3	*2	2.5"	12'	-	EXISTING ((7)#18/4 COMMUNICATION CABLE)
*4	1	4"	12'	-	EXISTING COMMUNICATION CABLE
5	1	2.5"	10'	T	EMPTY
6	1	4"	45'	T	EMPTY
7	1	1"	5'	T	EMPTY
27	1	2.5"	30'	-	EMPTY
*30	1	2.5"/4"	15'	-	EXISTING ((5)#18/4 COMMUNICATION CABLE)
*31	1	1.5"	55'	-	EXISTING (6)#18/4
*32	2	2.5"/4"	100'	-	EXISTING ((5)#18/4 COMMUNICATION CABLE)
*33	1	2.5"	10'	-	EXISTING (4)#18/4
*34	1	2.5"	128'	-	EXISTING (1)#18/4
*35	1	1.5"	2'	-	EXISTING (2)#18/4
*36	2	2.5"/4"	45'	-	EXISTING ((3)#18/4 COMMUNICATION CABLE)
*37	1	2.5"	80'	-	EXISTING (3)#18/4
*38	1	1.5"	25'	-	EXISTING (2)#18/4
*39	1	1.5"	32'	-	EXISTING (4)#18/4
*40	1	2.5"	132'	-	EXISTING (1)#18/4
*41	1	1.5"	2'	-	EXISTING (2)#18/4
*42	1	4"	-	-	EXISTING COMMUNICATION CABLE
F48	1	4"	80'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
F48A	2	4"	65'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
F48B	6	4"	15'	-	COMMUNICATION AND CAMERA CABLES (SEE S&S PLANS)
F48C	1	2.5"	20'	-	CAMERA CABLE (SEE SIGNING AND STRIPING PLANS)
F48D	1	4"	20'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F50	1	4"	95'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)

LEGEND
* DENOTES EXISTING
B- BORE
T- TRENCH
O- OPEN CUT

SECTION 1
PHASE 10, STAGE 2

SIGNAL PHASING

NEMA PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

	PROPOSED SIGNAL CABINET	RM/C	REMOVE BY CONTRACTOR
	EXISTING SIGNAL CABINET	RM/O	REMOVE BY OTHERS
	PROPOSED SIGNAL POLE BASE	AB	ABANDON
	EXISTING SIGNAL POLE BASE	PB/X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	PROPOSED PEDESTRIAN POLE BASE	(PB/X)	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	EXISTING PEDESTRIAN POLE BASE	PL/X	PROPOSED POLE IDENTIFIER (* OF POLE)
	PROPOSED WOOD POLE	(PL/X)	EXISTING POLE IDENTIFIER (* OF POLE)
	EXISTING WOOD POLE	JW/X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	PROPOSED JUNCTION WELL	(JW/X)	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	EXISTING JUNCTION WELL	CO/*	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
	PROPOSED SIGNAL HEAD	(CO/*)	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
	EXISTING SIGNAL HEAD	OH/*	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
	PROPOSED PEDESTRIAN SIGNAL HEAD	(OH/*)	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
	EXISTING PEDESTRIAN SIGNAL HEAD	MA/XX	PROPOSED MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	PROPOSED PEDESTRIAN PUSHBUTTON	(MA/XX)	EXISTING MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	EXISTING PEDESTRIAN PUSHBUTTON	CA/X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
	PROPOSED VIDEO DETECTION	(CA/X)	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
	EXISTING VIDEO DETECTION		PROPOSED SPAN WIRE
	PROPOSED MICROWAVE DETECTION	XX	EXISTING SPAN WIRE
	EXISTING MICROWAVE DETECTION		RIGHT-OF-WAY OR PROPERTY LINE
	OVERHEAD SIGNING		PROPOSED SPAN INSULATOR
	PROPOSED OPTICOM RECEIVER		EXISTING SPAN INSULATOR
	EXISTING OPTICOM RECEIVER	P	SERVICE PEDESTAL
	PROPOSED MAST ARM		PROPOSED CCTV
	EXISTING MAST ARM		EXISTING CCTV
	PROPOSED LUMINAIRE		PROPOSED PLASTIC DRUMS
	EXISTING LUMINAIRE		EXISTING PLASTIC DRUMS
	PROPOSED LOOP DETECTOR (TYPE 1 OR 2)		
	EXISTING LOOP DETECTOR (TYPE 1 OR 2)		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC- DOVER, DELAWARE
2. POLE BASES, CABINET BASE, AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED EXCEPT WHERE SHOWN.
3. ALL GALVANIZED RIGID CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
4. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY FOR THE UTILITY MARKOUTS PRIOR TO THE BEGINNING OF CONSTRUCTION. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
5. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.
6. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (5.0% OR FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHALL BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL. ALL PEDESTRIAN SIGNAL HEADS SHALL BE COUNTDOWN TYPE.
7. ALL 4", 3", 2.5", AND 2" CONDUITS SHALL BE SCHEDULE 80 PVC WITH THE EXCEPTION OF 4" BORED CONDUIT WHICH SHALL BE SDR-13.5 HDPE. ALL 1" CONDUITS LESS THAN OR EQUAL TO 6'-0" SHALL BE LIQUID TIGHT FLEXIBLE NON-METALLIC AND ALL 1" CONDUITS GREATER THAN 6'-0" SHALL BE RIGID GALVANIZED.

RECOMMENDED _____ DATE: 05/15/13

RECOMMENDED Chetna Dave DATE: 7/12/13

RECOMMENDED _____ DATE: _____

APPROVED TRAFFIC ENGINEER _____ DATE: 7/12/13

APPROVED FOR INSTALLATION
CHIEF TRAFFIC ENGINEER _____ DATE: 7/12/13

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SCALE
0 30 60 90
FEET

SR 26, ATLANTIC AVENUE FROM CLARKSVILLE TO ASSAWOMAN CANAL

CONTRACT	PERMIT NO.	S027P	
T200411210	DESIGNED BY:	MSK	
COUNTY	CHECKED BY:	BAM	
SUSSEX			

SIGNAL PLAN
SR 26 @ CENTRAL AVENUE

SHEET NO.	536
TOTAL SHTS.	589

7/10/2013
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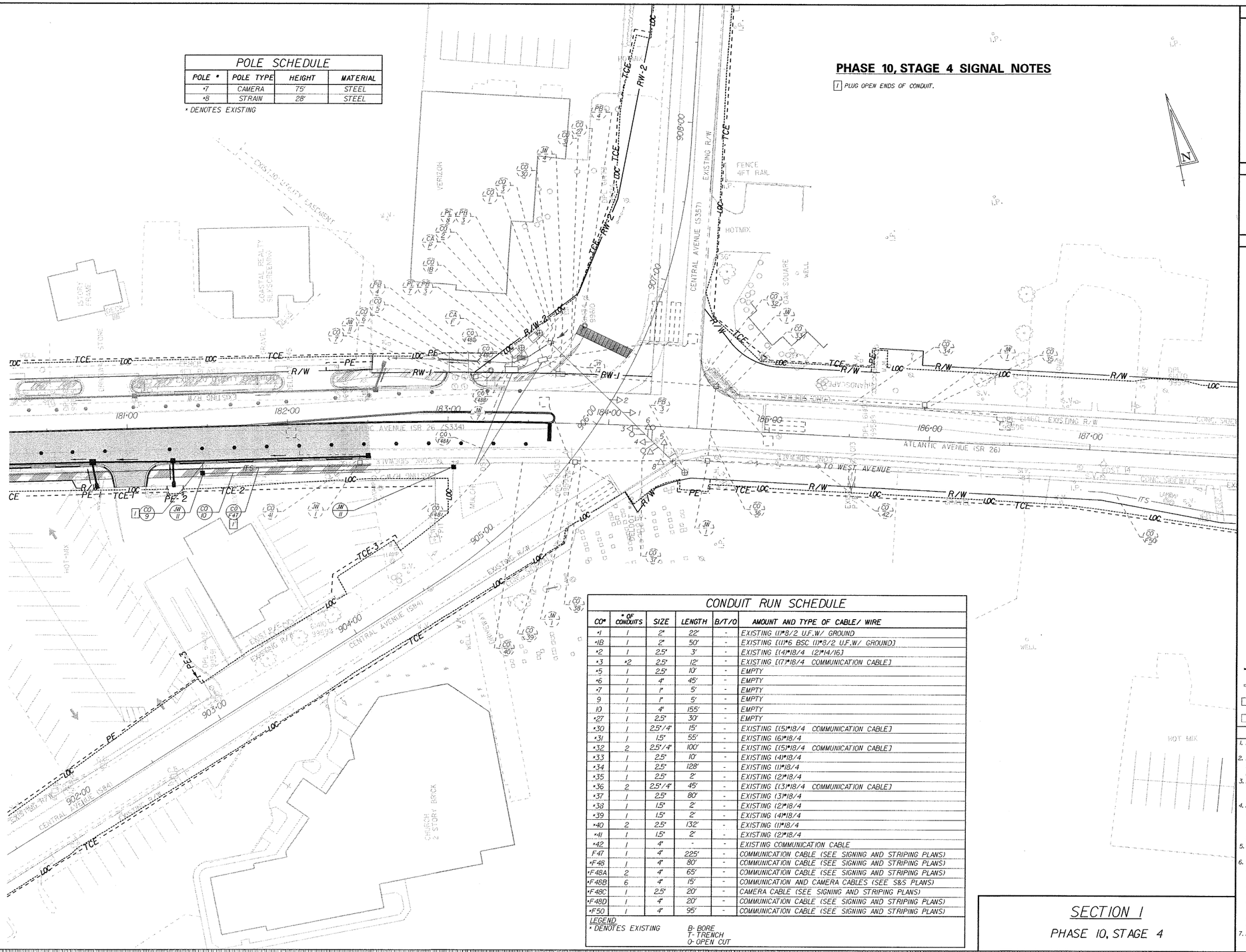
POLE SCHEDULE

POLE *	POLE TYPE	HEIGHT	MATERIAL
*7	CAMERA	75'	STEEL
*8	STRAIN	28'	STEEL

* DENOTES EXISTING

PHASE 10, STAGE 4 SIGNAL NOTES

1 PLUG OPEN ENDS OF CONDUIT.



CONDUIT RUN SCHEDULE

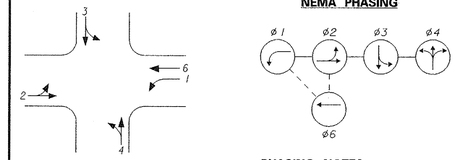
CO*	* OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
*1	1	2"	22'	-	EXISTING (1)#8/2 U.F.W./ GROUND
*1B	1	2"	50'	-	EXISTING [(1)#6 BSC (1)#8/2 U.F.W./ GROUND]
*2	1	2.5"	3'	-	EXISTING [(4)#18/4 (2)#14/16]
*3	*2	2.5"	12'	-	EXISTING [(7)#18/4 COMMUNICATION CABLE]
*5	1	2.5"	10'	-	EMPTY
*6	1	4"	45'	-	EMPTY
*7	1	1"	5'	-	EMPTY
9	1	1"	5'	-	EMPTY
10	1	4"	155'	-	EMPTY
*27	1	2.5"	30'	-	EMPTY
*30	1	2.5"/4"	15'	-	EXISTING [(5)#18/4 COMMUNICATION CABLE]
*31	1	1.5"	55'	-	EXISTING (6)#18/4
*32	2	2.5"/4"	100'	-	EXISTING [(5)#18/4 COMMUNICATION CABLE]
*33	1	2.5"	10'	-	EXISTING (4)#18/4
*34	1	2.5"	128'	-	EXISTING (1)#18/4
*35	1	2.5"	2'	-	EXISTING (2)#18/4
*36	2	2.5"/4"	45'	-	EXISTING [(3)#18/4 COMMUNICATION CABLE]
*37	1	2.5"	80'	-	EXISTING (3)#18/4
*38	1	1.5"	2'	-	EXISTING (2)#18/4
*39	1	1.5"	2'	-	EXISTING (4)#18/4
*40	2	2.5"	132'	-	EXISTING (1)#18/4
*41	1	1.5"	2'	-	EXISTING (2)#18/4
*42	1	4"	-	-	EXISTING COMMUNICATION CABLE
F47	1	4"	225'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F48	1	4"	80'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F48A	2	4"	65'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F48B	6	4"	15'	-	COMMUNICATION AND CAMERA CABLES (SEE S&S PLANS)
*F48C	1	2.5"	20'	-	CAMERA CABLE (SEE SIGNING AND STRIPING PLANS)
*F48D	1	4"	20'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F50	1	4"	95'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)

LEGEND
* DENOTES EXISTING

B- BORE
T- TRENCH
O- OPEN CUT

SIGNAL PHASING

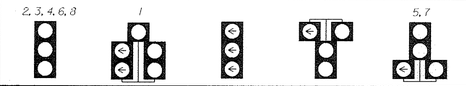
NEMA PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

PROPOSED SIGNAL CABINET		(RM/C)	REMOVE BY CONTRACTOR
EXISTING SIGNAL CABINET		(RM/O)	REMOVE BY OTHERS
PROPOSED SIGNAL POLE BASE		(AB)	ABANDON
EXISTING SIGNAL POLE BASE		(PB/X)	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
PROPOSED PEDESTRIAN POLE BASE		(PB/X)	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
EXISTING PEDESTRIAN POLE BASE		(PL/X)	PROPOSED POLE IDENTIFIER (* OF POLE)
PROPOSED WOOD POLE		(PL/X)	EXISTING POLE IDENTIFIER (* OF POLE)
EXISTING WOOD POLE		(JW/X)	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
PROPOSED JUNCTION WELL		(JW/X)	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
EXISTING JUNCTION WELL		(CO/*)	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
PROPOSED SIGNAL HEAD		(CO/*)	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
EXISTING SIGNAL HEAD		(OH/*)	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
PROPOSED PEDESTRIAN SIGNAL HEAD		(OH/*)	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
EXISTING PEDESTRIAN SIGNAL HEAD		(MA/XX)	PROPOSED MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
PROPOSED PEDESTRIAN PUSHBUTTON		(MA/XX)	EXISTING MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
EXISTING PEDESTRIAN PUSHBUTTON		(CA/X)	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
PROPOSED VIDEO DETECTION		(CA/X)	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
EXISTING VIDEO DETECTION			PROPOSED SPAN WIRE
PROPOSED MICROWAVE DETECTION		XX	EXISTING SPAN WIRE
EXISTING MICROWAVE DETECTION			RIGHT-OF-WAY OR PROPERTY LINE
OVERHEAD SIGNING			PROPOSED SPAN INSULATOR
PROPOSED OPTICOM RECEIVER			EXISTING SPAN INSULATOR
EXISTING OPTICOM RECEIVER		P	SERVICE PEDESTAL
PROPOSED MAST ARM			PROPOSED CCTV
EXISTING MAST ARM			EXISTING CCTV
PROPOSED LUMINAIRE			PROPOSED PLASTIC DRUMS
EXISTING LUMINAIRE			EXISTING PLASTIC DRUMS
PROPOSED LOOP DETECTOR (TYPE I OR 2)			
EXISTING LOOP DETECTOR (TYPE I OR 2)			

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC- DOVER, DELAWARE.
2. POLE BASES, CABINET BASE, AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED EXCEPT WHERE SHOWN.
3. ALL GALVANIZED RIGID CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS, SET SCREW, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
4. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY FOR THE UTILITY MARKOUTS PRIOR TO THE BEGINNING OF CONSTRUCTION. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
5. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.
6. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (SOUR FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHALL BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL. ALL PEDESTRIAN SIGNAL HEADS SHALL BE COUNTDOWN TYPE.
7. ALL 4", 3", 2.5", AND 2" CONDUITS SHALL BE SCHEDULE 80 PVC WITH THE EXCEPTION OF 4" BORED CONDUIT WHICH SHALL BE SDR-13.5 HDPE. ALL 1" CONDUITS LESS THAN OR EQUAL TO 6'-0" SHALL BE LIQUID TIGHT FLEXIBLE NON-METALLIC AND ALL 1" CONDUITS GREATER THAN 6'-0" SHALL BE RIGID GALVANIZED.

SECTION 1

PHASE 10, STAGE 4

RECOMMENDED B. Stadler DATE: 05/15/13

RECOMMENDED Chelsea Dare DATE: 7/12/13

RECOMMENDED _____ DATE: _____

APPROVED TRAFFIC ENGINEER Mark C. Alston DATE: 7/12/13

APPROVED FOR INSTALLATION
CHIEF TRAFFIC ENGINEER _____ DATE: 7/12/13

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SCALE
0 30 60 90
FEET

SR 26, ATLANTIC AVENUE FROM CLARKSVILLE TO ASSAWOMAN CANAL

CONTRACT	T200411210
COUNTY	SUSSEX
PERMIT NO.	S027P
DESIGNED BY:	MSK
CHECKED BY:	BAM

SIGNAL PLAN
SR 26 @ CENTRAL AVENUE

SHEET NO.	537
TOTAL SHTS.	589

7/0/2013
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SECTION 1

PHASE 10, STAGE 6

SPAN WIRE SCHEDULE

SPAN	LENGTH	SPAN MOUNT HEIGHT	5% SAG	SPAN LOW POINT	BOTTOM OF LOWEST HEAD
NORTH	113 FT	27.0 FT	5.65 FT	21.35 FT	16.85 FT
EAST	91 FT	26.6 FT	4.55 FT	22.05 FT	17.55 FT
SOUTH	120 FT	27.0 FT	6.0 FT	21.00 FT	16.50 FT
WEST	93 FT	26.6 FT	4.65 FT	21.95 FT	17.45 FT

NOTE: FIELD ADJUSTMENTS AS REQUIRED

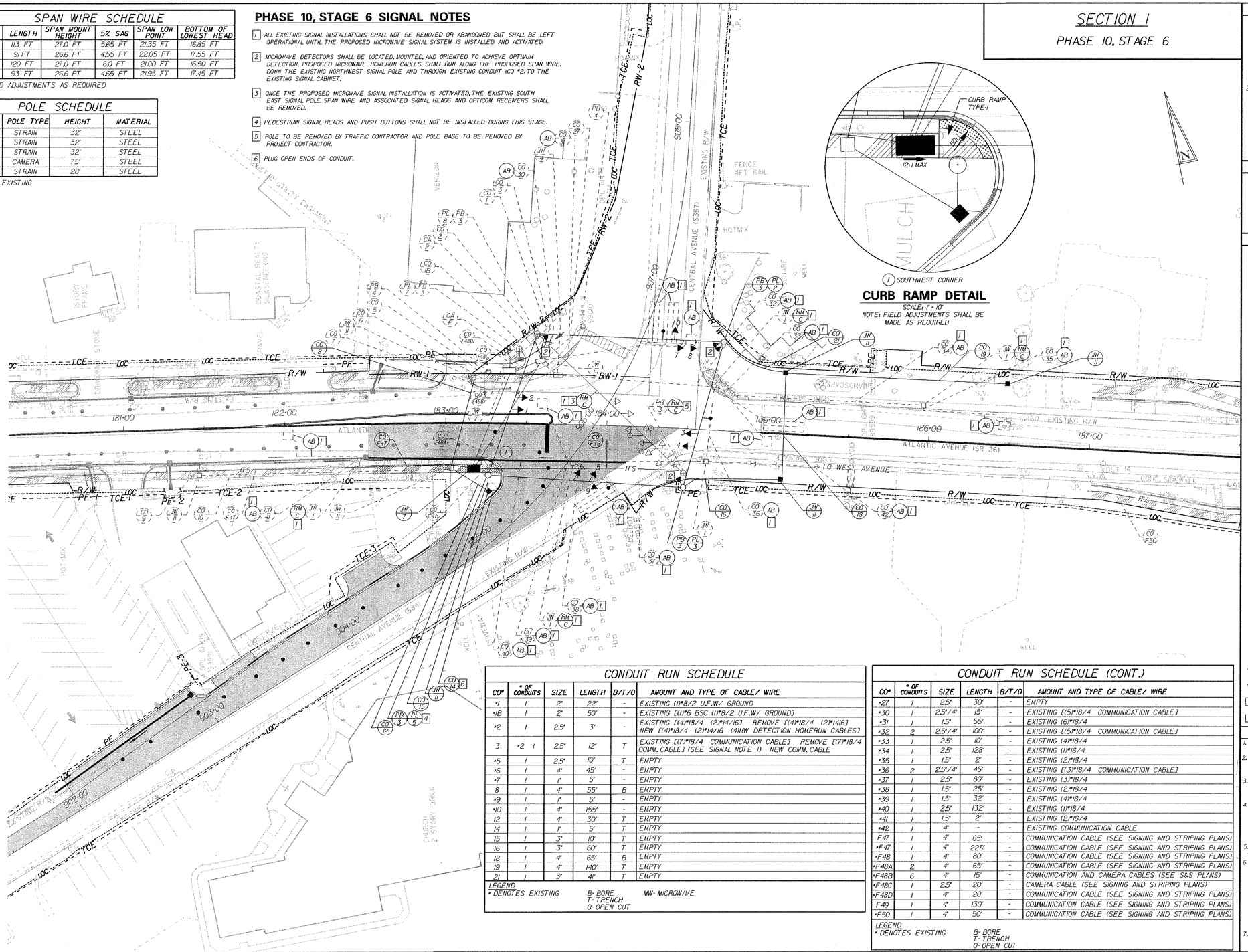
POLE SCHEDULE

POLE *	POLE TYPE	HEIGHT	MATERIAL
2	STRAIN	32'	STEEL
3	STRAIN	32'	STEEL
5	STRAIN	32'	STEEL
*7	CAMERA	75'	STEEL
*8	STRAIN	28'	STEEL

* DENOTES EXISTING

PHASE 10, STAGE 6 SIGNAL NOTES

1. ALL EXISTING SIGNAL INSTALLATIONS SHALL NOT BE REMOVED OR ABANDONED BUT SHALL BE LEFT OPERATIONAL UNTIL THE PROPOSED MICROWAVE SIGNAL SYSTEM IS INSTALLED AND ACTIVATED.
2. MICROWAVE DETECTORS SHALL BE LOCATED, MOUNTED, AND ORIENTED TO ACHIEVE OPTIMUM DETECTION. PROPOSED MICROWAVE HOMERUN CABLES SHALL RUN ALONG THE PROPOSED SPAN WIRE. DOWN THE EXISTING NORTHWEST SIGNAL POLE AND THROUGH EXISTING CONDUIT (CO *2) TO THE EXISTING SIGNAL CABINET.
3. ONCE THE PROPOSED MICROWAVE SIGNAL INSTALLATION IS ACTIVATED, THE EXISTING SOUTH EAST SIGNAL POLE, SPAN WIRE AND ASSOCIATED SIGNAL HEADS AND OPTICOM RECEIVERS SHALL BE REMOVED.
4. PEDESTRIAN SIGNAL HEADS AND PUSH BUTTONS SHALL NOT BE INSTALLED DURING THIS STAGE.
5. POLE TO BE REMOVED BY TRAFFIC CONTRACTOR AND POLE BASE TO BE REMOVED BY PROJECT CONTRACTOR.
6. PLUG OPEN ENDS OF CONDUIT.



CURB RAMP DETAIL

SCALE: 1" = 10'

NOTE: FIELD ADJUSTMENTS SHALL BE MADE AS REQUIRED

CONDUIT RUN SCHEDULE

CO*	* OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
*1	1	2"	22'	-	EXISTING (1)#8/2 U.F.W/ GROUND
*1B	1	2"	50'	-	EXISTING [(1)#6 BSC (1)#8/2 U.F.W/ GROUND]
*2	1	2.5"	3'	-	EXISTING [(4)#18/4 (2)#14/16] REMOVE [(4)#18/4 (2)#16] NEW [(4)#18/4 (2)#14/16 (4)MW DETECTION HOMERUN CABLES]
3	*2 1	2.5"	12'	T	EXISTING [(7)#18/4 COMMUNICATION CABLE] REMOVE [(7)#18/4 COMM. CABLE] (SEE SIGNAL NOTE 1) NEW COMM. CABLE
*5	1	2.5"	10'	T	EMPTY
*6	1	4"	45'	-	EMPTY
*7	1	1"	5'	-	EMPTY
8	1	4"	55'	B	EMPTY
*9	1	1"	5'	-	EMPTY
*10	1	4"	155'	-	EMPTY
12	1	4"	30'	T	EMPTY
14	1	1"	5'	T	EMPTY
15	1	3"	10'	T	EMPTY
16	1	3"	60'	T	EMPTY
18	1	4"	65'	B	EMPTY
19	1	4"	140'	T	EMPTY
21	1	3"	41'	T	EMPTY

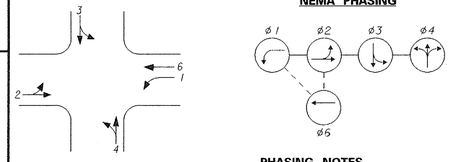
LEGEND
* DENOTES EXISTING
B- BORE
T- TRENCH
O- OPEN CUT
MW- MICROWAVE

CONDUIT RUN SCHEDULE (CONT.)

CO*	* OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
*27	1	2.5"	30'	-	EMPTY
*30	1	2.5"/4"	15'	-	EXISTING [(5)#18/4 COMMUNICATION CABLE]
*31	1	1.5"	55'	-	EXISTING (6)#18/4
*32	2	2.5"/4"	100'	-	EXISTING [(5)#18/4 COMMUNICATION CABLE]
*33	1	2.5"	10'	-	EXISTING (4)#18/4
*34	1	2.5"	128'	-	EXISTING (1)#18/4
*35	1	1.5"	2'	-	EXISTING (2)#18/4
*36	2	2.5"/4"	45'	-	EXISTING [(3)#18/4 COMMUNICATION CABLE]
*37	1	2.5"	80'	-	EXISTING (3)#18/4
*38	1	1.5"	25'	-	EXISTING (2)#18/4
*39	1	1.5"	32'	-	EXISTING (4)#18/4
*40	1	2.5"	132'	-	EXISTING (1)#18/4
*41	1	1.5"	2'	-	EXISTING (2)#18/4
*42	1	4"	-	-	EXISTING COMMUNICATION CABLE
F47	1	4"	65'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F47	1	4"	225'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F48	1	4"	80'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F48A	2	4"	65'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F48B	6	4"	15'	-	COMMUNICATION AND CAMERA CABLES (SEE S&S PLANS)
*F48C	1	2.5"	20'	-	CAMERA CABLE (SEE SIGNING AND STRIPING PLANS)
*F48D	1	4"	20'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
F49	1	4"	130'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F50	1	4"	50'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)

LEGEND
* DENOTES EXISTING
B- BORE
T- TRENCH
O- OPEN CUT

SIGNAL PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

■	PROPOSED SIGNAL CABINET	(RM C)	REMOVE BY CONTRACTOR
□	EXISTING SIGNAL CABINET	(RM O)	REMOVE BY OTHERS
⊙	PROPOSED SIGNAL POLE BASE	(AB)	ABANDON
⊗	EXISTING SIGNAL POLE BASE	(PB X)	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
◉	PROPOSED PEDESTRIAN POLE BASE	(PB X)	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
◎	EXISTING PEDESTRIAN POLE BASE	(PL X)	PROPOSED POLE IDENTIFIER (* OF POLE)
●	PROPOSED WOOD POLE	(PL X)	EXISTING POLE IDENTIFIER (* OF POLE)
○	EXISTING WOOD POLE	(JW X)	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
■	PROPOSED JUNCTION WELL	(JW X)	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
□	EXISTING JUNCTION WELL	(CO *)	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
→	PROPOSED SIGNAL HEAD	(CO *)	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
▷	EXISTING SIGNAL HEAD	(OH *)	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
⊐	PROPOSED PEDESTRIAN SIGNAL HEAD	(OH *)	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
⊐	EXISTING PEDESTRIAN SIGNAL HEAD	(MA XX)	PROPOSED MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
→	PROPOSED PEDESTRIAN PUSHBUTTON	(MA XX)	EXISTING MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
⊸	EXISTING PEDESTRIAN PUSHBUTTON	(CA X)	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
◀	PROPOSED VIDEO DETECTION	(CA X)	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
◁	EXISTING VIDEO DETECTION		PROPOSED SPAN WIRE
◀	PROPOSED MICROWAVE DETECTION	XX	EXISTING SPAN WIRE
◁	EXISTING MICROWAVE DETECTION		RIGHT-OF-WAY OR PROPERTY LINE
⊣	OVERHEAD SIGNING	◆	PROPOSED SPAN INSULATOR
●—	PROPOSED OPTICOM RECEIVER	◇	EXISTING SPAN INSULATOR
○—	EXISTING OPTICOM RECEIVER	P	SERVICE PEDESTAL
▶	PROPOSED MAST ARM		PROPOSED CCTV
▷	EXISTING MAST ARM		EXISTING CCTV
●—	PROPOSED LUMINAIRE	●	PROPOSED PLASTIC DRUMS
○—	EXISTING LUMINAIRE	⊗	EXISTING PLASTIC DRUMS
	PROPOSED LOOP DETECTOR (TYPE 1 OR 2)		
	EXISTING LOOP DETECTOR (TYPE 1 OR 2)		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC- DOVER, DELAWARE
2. POLE BASES, CABINET BASE, AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED EXCEPT WHERE SHOWN.
3. ALL GALVANIZED RIGID CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
4. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY FOR THE UTILITY MARKOUTS PRIOR TO THE BEGINNING OF CONSTRUCTION. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
5. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.
6. PROPOSED FOLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (5%) OR FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THESE FOLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHALL BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL. ALL PEDESTRIAN SIGNAL HEADS SHALL BE COUNTDOWN TYPE.
7. ALL 4", 3", 2.5", AND 2" CONDUITS SHALL BE SCHEDULE 80 PVC WITH THE EXCEPTION OF 4" BORED CONDUIT WHICH SHALL BE SDR-13.5 HDPE. ALL 1" CONDUITS LESS THAN OR EQUAL TO 6'-0" SHALL BE LIQUID TIGHT FLEXIBLE NON-METALLIC AND ALL 1" CONDUITS GREATER THAN 6'-0" SHALL BE RIGID GALVANIZED.

RECOMMENDED _____ DATE: 05/15/13

RECOMMENDED Chitra Desai DATE: 7/12/13

RECOMMENDED _____ DATE: _____

APPROVED TRAFFIC ENGINEER _____ DATE: 7/12/13

APPROVED FOR INSTALLATION
CHIEF TRAFFIC ENGINEER _____ DATE: 7/12/13

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SCALE
0 30 60 90
FEET

SR 26, ATLANTIC AVENUE FROM CLARKSVILLE TO ASSAWOMAN CANAL

CONTRACT	T200111210	PERMIT NO.	S027P
COUNTY	SUSSEX	DESIGNED BY:	MSK
		CHECKED BY:	BAM

SIGNAL PLAN SR 26 @ CENTRAL AVENUE

SHEET NO.	TOTAL SHTS.
538	589

7/16/2013
15:05:37
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SPAN WIRE SCHEDULE

SPAN	LENGTH	SPAN MOUNT HEIGHT	5% SAG	SPAN LOW POINT	BOTTOM OF LOWEST HEAD
*NORTH	113 FT	27.0 FT	5.65 FT	21.35 FT	16.85 FT
*EAST	91 FT	26.6 FT	4.55 FT	22.05 FT	17.55 FT
*SOUTH	120 FT	27.0 FT	6.0 FT	21.00 FT	16.50 FT
*WEST	93 FT	26.6 FT	4.65 FT	21.95 FT	17.45 FT

* DENOTES EXISTING

POLE SCHEDULE

POLE *	POLE TYPE	HEIGHT	MATERIAL
*2	STRAIN	32'	STEEL
*3	STRAIN	32'	STEEL
*5	STRAIN	32'	STEEL
*7	CAMERA	75'	STEEL
*8	STRAIN	28'	STEEL

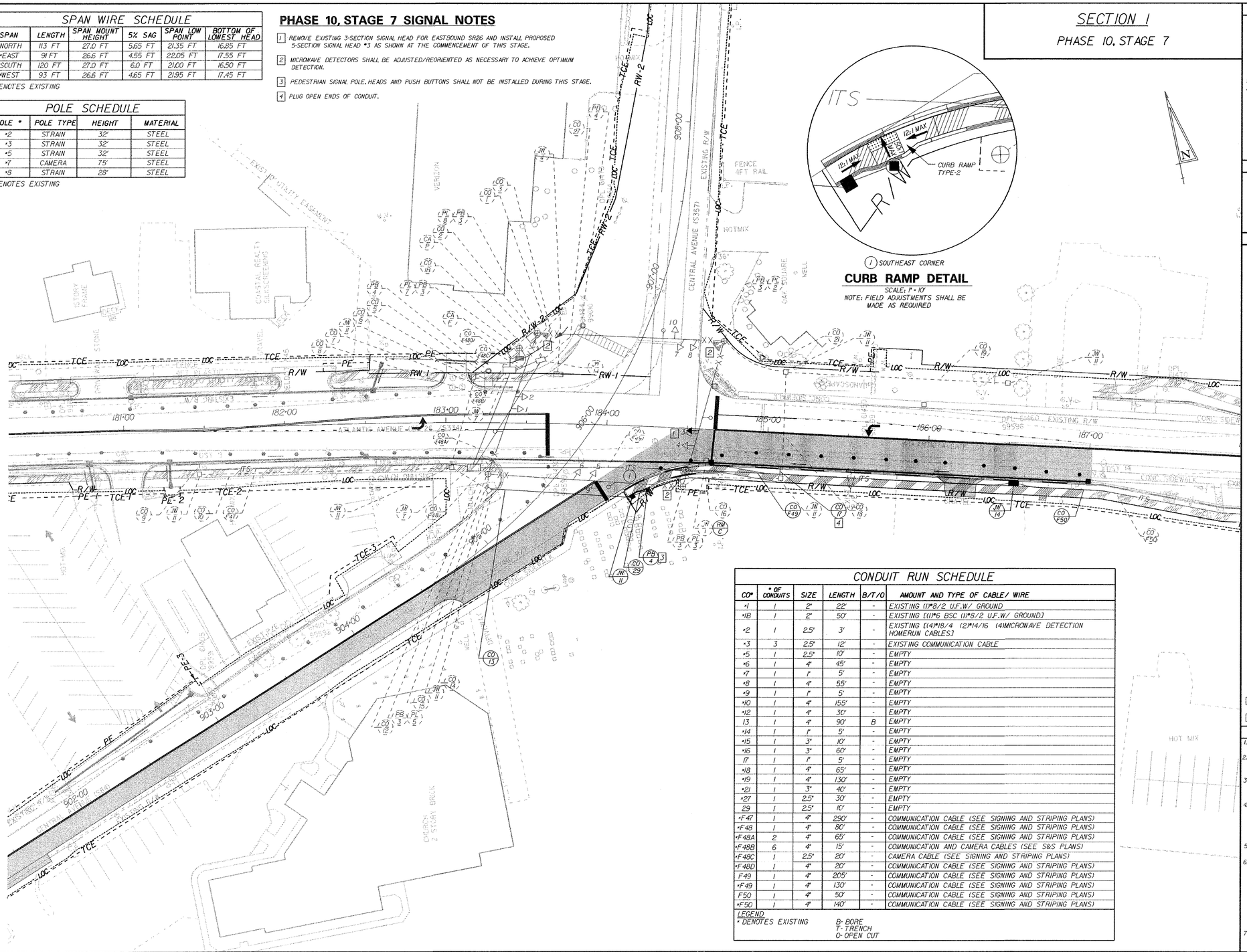
* DENOTES EXISTING

PHASE 10, STAGE 7 SIGNAL NOTES

1. REMOVE EXISTING 3-SECTION SIGNAL HEAD FOR EASTBOUND SR26 AND INSTALL PROPOSED 5-SECTION SIGNAL HEAD *3 AS SHOWN AT THE COMMENCEMENT OF THIS STAGE.
2. MICROWAVE DETECTORS SHALL BE ADJUSTED/REORIENTED AS NECESSARY TO ACHIEVE OPTIMUM DETECTION.
3. PEDESTRIAN SIGNAL POLE, HEADS AND PUSH BUTTONS SHALL NOT BE INSTALLED DURING THIS STAGE.
4. PLUG OPEN ENDS OF CONDUIT.

SECTION I

PHASE 10, STAGE 7



(1) SOUTHEAST CORNER

CURB RAMP DETAIL

SCALE: 1" = 10'

NOTE: FIELD ADJUSTMENTS SHALL BE MADE AS REQUIRED

CONDUIT RUN SCHEDULE

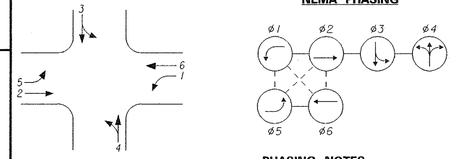
CO*	* OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
*1	1	2"	22'	-	EXISTING (1)#8/2 U.F.W./ GROUND
*1B	1	2"	50'	-	EXISTING ((1)#6 BSC (1)#8/2 U.F.W./ GROUND)
*2	1	2.5"	3'	-	EXISTING ((4)#18/4 (2)#14/16 (4)MICROWAVE DETECTION HOMERUN CABLES)
*3	3	2.5"	12'	-	EXISTING COMMUNICATION CABLE
*5	1	2.5"	10'	-	EMPTY
*6	1	4"	45'	-	EMPTY
*7	1	1"	5'	-	EMPTY
*8	1	4"	55'	-	EMPTY
*9	1	1"	5'	-	EMPTY
*10	1	4"	155'	-	EMPTY
*12	1	4"	30'	-	EMPTY
13	1	4"	90'	B	EMPTY
*14	1	1"	5'	-	EMPTY
*15	1	3"	10'	-	EMPTY
*16	1	3"	60'	-	EMPTY
17	1	1"	5'	-	EMPTY
*18	1	4"	65'	-	EMPTY
*19	1	4"	130'	-	EMPTY
*21	1	3"	40'	-	EMPTY
*27	1	2.5"	30'	-	EMPTY
29	1	2.5"	10'	-	EMPTY
*F47	1	4"	290'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F48	1	4"	80'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F48A	2	4"	65'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F48B	6	4"	15'	-	COMMUNICATION AND CAMERA CABLES (SEE S&S PLANS)
*F48C	1	2.5"	20'	-	CAMERA CABLE (SEE SIGNING AND STRIPING PLANS)
*F48D	1	4"	20'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
F49	1	4"	205'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F49	1	4"	130'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
F50	1	4"	50'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F50	1	4"	140'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)

LEGEND
* DENOTES EXISTING

B- BORE
T- TRENCH
O- OPEN CUT

SIGNAL PHASING

NEMA PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

PROPOSED SIGNAL CABINET	(RM/C) REMOVE BY CONTRACTOR
EXISTING SIGNAL CABINET	(RM/O) REMOVE BY OTHERS
PROPOSED SIGNAL POLE BASE	(AB) ABANDON
EXISTING SIGNAL POLE BASE	(PB/X) PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
PROPOSED PEDESTRIAN POLE BASE	(PB/X) EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
EXISTING PEDESTRIAN POLE BASE	(PL/X) PROPOSED POLE IDENTIFIER (* OF POLE)
PROPOSED WOOD POLE	(PL/X) EXISTING POLE IDENTIFIER (* OF POLE)
EXISTING WOOD POLE	(JW/X) PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
PROPOSED JUNCTION WELL	(JW/X) EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
EXISTING JUNCTION WELL	(CO/•) PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
PROPOSED SIGNAL HEAD	(CO/•) EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
EXISTING SIGNAL HEAD	(OH/•) PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
PROPOSED PEDESTRIAN SIGNAL HEAD	(OH/•) EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
EXISTING PEDESTRIAN SIGNAL HEAD	(MA/XX) PROPOSED MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
PROPOSED PEDESTRIAN PUSHBUTTON	(MA/XX) EXISTING MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
EXISTING PEDESTRIAN PUSHBUTTON	(CA/X) PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
PROPOSED VIDEO DETECTION	(CA/X) EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
EXISTING VIDEO DETECTION	PROPOSED SPAN WIRE
PROPOSED MICROWAVE DETECTION	XX EXISTING SPAN WIRE
EXISTING MICROWAVE DETECTION	RIGHT-OF-WAY OR PROPERTY LINE
OVERHEAD SIGNING	PROPOSED SPAN INSULATOR
PROPOSED OPTICOM RECEIVER	EXISTING SPAN INSULATOR
EXISTING OPTICOM RECEIVER	SERVICE PEDESTAL
PROPOSED MAST ARM	PROPOSED CCTV
EXISTING MAST ARM	EXISTING CCTV
PROPOSED LUMINAIRE	PROPOSED PLASTIC DRUMS
EXISTING LUMINAIRE	EXISTING PLASTIC DRUMS
PROPOSED LOOP DETECTOR (TYPE 1OR 2)	
EXISTING LOOP DETECTOR (TYPE 1OR 2)	

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC- DOVER, DELAWARE
2. POLE BASES, CABINET BASE, AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED EXCEPT WHERE SHOWN.
3. ALL GALVANIZED RIGID CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
4. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY FOR THE UTILITY MARKOUTS PRIOR TO THE BEGINNING OF CONSTRUCTION. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
5. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.
6. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (5.0U OR FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHALL BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL. ALL PEDESTRIAN SIGNAL HEADS SHALL BE COUNTDOWN TYPE.
7. ALL 4", 3", 2.5", AND 2" CONDUITS SHALL BE SCHEDULE 80 PVC WITH THE EXCEPTION OF 4" BORED CONDUIT WHICH SHALL BE SDR-13.5 HDPE. ALL 1" CONDUITS LESS THAN OR EQUAL TO 6'-0" SHALL BE LIQUID TIGHT FLEXIBLE NON-METALLIC AND ALL 1" CONDUITS GREATER THAN 6'-0" SHALL BE RIGID GALVANIZED.

RECOMMENDED [signature]	DATE: 05/15/13	RECOMMENDED Chutna Dave	DATE: 7/12/13
RECOMMENDED	DATE:	APPROVED TRAFFIC ENGINEER [signature]	DATE: 7/12/13
APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER [signature]	DATE: 7/12/13		

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SCALE 0 30 60 90 FEET

SR 26, ATLANTIC AVENUE FROM CLARKSVILLE TO ASSAWOMAN CANAL

CONTRACT	T200411210	PERMIT NO.	S027P
COUNTY	SUSSEX	DESIGNED BY:	MSK
		CHECKED BY:	BAM

SIGNAL PLAN

SR 26 @ CENTRAL AVENUE

SHEET NO. 539

TOTAL SHTS. 589

7/10/2013
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SPAN WIRE SCHEDULE

SPAN	LENGTH	SPAN MOUNT HEIGHT	5% SAG	SPAN LOW POINT	BOTTOM OF LOWEST HEAD
*NORTH	113 FT	27.0 FT	5.65 FT	21.35 FT	16.85 FT
*EAST	91 FT	26.6 FT	4.55 FT	22.05 FT	17.55 FT
*SOUTH	120 FT	27.0 FT	6.0 FT	21.00 FT	16.50 FT
*WEST	93 FT	26.6 FT	4.65 FT	21.95 FT	17.45 FT

* DENOTES EXISTING

POLE SCHEDULE

POLE *	POLE TYPE	HEIGHT	MATERIAL
*2	STRAIN	32'	STEEL
*3	STRAIN	32'	STEEL
*5	STRAIN	32'	STEEL
*7	CAMERA	75'	STEEL
*8	STRAIN	28'	STEEL

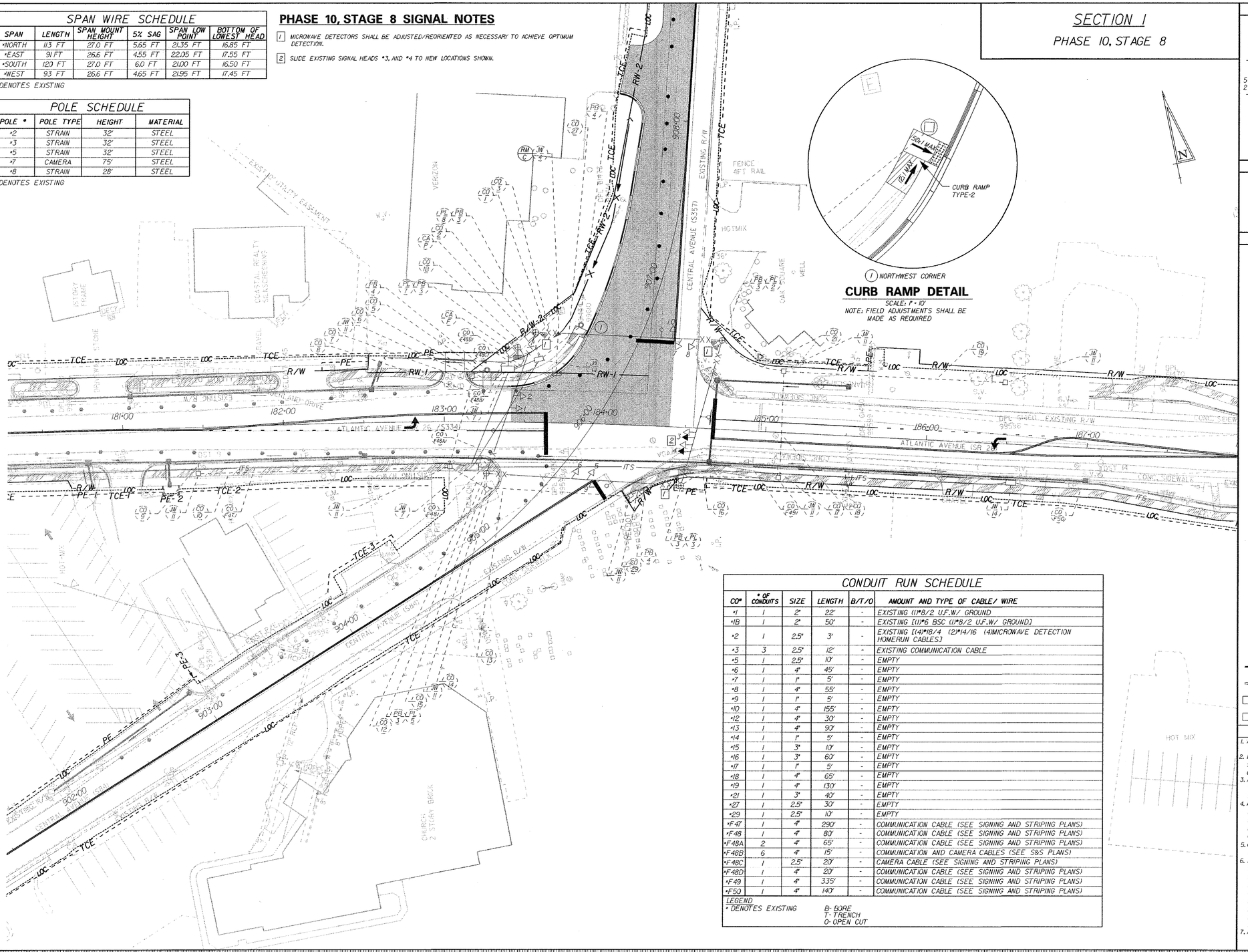
* DENOTES EXISTING

PHASE 10, STAGE 8 SIGNAL NOTES

1. MICROWAVE DETECTORS SHALL BE ADJUSTED/REORIENTED AS NECESSARY TO ACHIEVE OPTIMUM DETECTION.
2. SLIDE EXISTING SIGNAL HEADS *3, AND *4 TO NEW LOCATIONS SHOWN.

SECTION I

PHASE 10, STAGE 8



(1) NORTHWEST CORNER

CURB RAMP DETAIL

SCALE: 1" = 10'

NOTE: FIELD ADJUSTMENTS SHALL BE MADE AS REQUIRED

CONDUIT RUN SCHEDULE

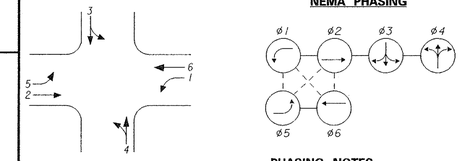
CO*	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
*1	1	2"	22'	-	EXISTING ((1)#8/2 U.F.W/ GROUND
*1B	1	2"	50'	-	EXISTING ((1)#6 BSC ((1)#8/2 U.F.W/ GROUND)
*2	1	2.5"	3'	-	EXISTING ((4)#18/4 (2)#14/16 (4)MICROWAVE DETECTION HOMERUN CABLES)
*3	3	2.5"	12'	-	EXISTING COMMUNICATION CABLE
*5	1	2.5"	10'	-	EMPTY
*6	1	4"	45'	-	EMPTY
*7	1	1"	5'	-	EMPTY
*8	1	4"	55'	-	EMPTY
*9	1	1"	5'	-	EMPTY
*10	1	4"	155'	-	EMPTY
*12	1	4"	30'	-	EMPTY
*13	1	4"	90'	-	EMPTY
*14	1	1"	5'	-	EMPTY
*15	1	3"	10'	-	EMPTY
*16	1	3"	60'	-	EMPTY
*17	1	1"	5'	-	EMPTY
*18	1	4"	65'	-	EMPTY
*19	1	4"	130'	-	EMPTY
*21	1	3"	40'	-	EMPTY
*27	1	2.5"	30'	-	EMPTY
*29	1	2.5"	10'	-	EMPTY
*F47	1	4"	290'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F48	1	4"	80'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F48A	2	4"	65'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F48B	6	4"	15'	-	COMMUNICATION AND CAMERA CABLES (SEE S&S PLANS)
*F48C	1	2.5"	20'	-	CAMERA CABLE (SEE SIGNING AND STRIPING PLANS)
*F48D	1	4"	20'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F49	1	4"	335'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F50	1	4"	140'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)

LEGEND
* DENOTES EXISTING

B- BORE
T- TRENCH
O- OPEN CUT

SIGNAL PHASING

NEMA PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

	PROPOSED SIGNAL CABINET	(RM/C)	REMOVE BY CONTRACTOR
	EXISTING SIGNAL CABINET	(RM/O)	REMOVE BY OTHERS
	PROPOSED SIGNAL POLE BASE	(AB)	ABANDON
	EXISTING SIGNAL POLE BASE	(PB/X)	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	PROPOSED PEDESTRIAN POLE BASE	(PB/X)	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	EXISTING PEDESTRIAN POLE BASE	(PL/X)	PROPOSED POLE IDENTIFIER (* OF POLE)
	PROPOSED WOOD POLE	(PL/X)	EXISTING POLE IDENTIFIER (* OF POLE)
	EXISTING WOOD POLE	(JW/X)	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	PROPOSED JUNCTION WELL	(JW/X)	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	EXISTING JUNCTION WELL	(CO/*)	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
	PROPOSED SIGNAL HEAD	(CO/*)	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
	EXISTING SIGNAL HEAD	(OH/*)	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
	PROPOSED PEDESTRIAN SIGNAL HEAD	(OH/*)	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
	EXISTING PEDESTRIAN SIGNAL HEAD	(MA/XX)	PROPOSED MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	PROPOSED PEDESTRIAN PUSHBUTTON	(MA/XX)	EXISTING MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	EXISTING PEDESTRIAN PUSHBUTTON	(CA/X)	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
	PROPOSED VIDEO DETECTION	(CA/X)	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
	EXISTING VIDEO DETECTION		PROPOSED SPAN WIRE
	PROPOSED MICROWAVE DETECTION	XX	EXISTING SPAN WIRE
	EXISTING MICROWAVE DETECTION		RIGHT-OF-WAY OR PROPERTY LINE
	OVERHEAD SIGNING		PROPOSED SPAN INSULATOR
	PROPOSED OPTICOM RECEIVER		EXISTING SPAN INSULATOR
	EXISTING OPTICOM RECEIVER	P	SERVICE PEDESTAL
	PROPOSED MAST ARM		PROPOSED CCTV
	EXISTING MAST ARM		EXISTING CCTV
	PROPOSED LUMINAIRE		PROPOSED PLASTIC DRUMS
	EXISTING LUMINAIRE		EXISTING PLASTIC DRUMS
	PROPOSED LOOP DETECTOR (TYPE 1 OR 2)		
	EXISTING LOOP DETECTOR (TYPE 1 OR 2)		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC- DOVER, DELAWARE
2. POLE BASES, CABINET BASE, AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED EXCEPT WHERE SHOWN.
3. ALL GALVANIZED RIGID CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
4. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY FOR THE UTILITY MARKOUTS PRIOR TO THE BEGINNING OF CONSTRUCTION. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
5. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.
6. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (5% OR FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHALL BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL. ALL PEDESTRIAN SIGNAL HEADS SHALL BE COUNTDOWN TYPE.
7. ALL 4", 3", 2.5", AND 2" CONDUITS SHALL BE SCHEDULE 80 PVC WITH THE EXCEPTION OF 4" BORED CONDUIT WHICH SHALL BE SDR-13.5 HDPE. ALL 1" CONDUITS LESS THAN OR EQUAL TO 6'-0" SHALL BE LIQUID TIGHT FLEXIBLE NON-METALLIC AND ALL 1" CONDUITS GREATER THAN 6'-0" SHALL BE RIGID GALVANIZED.

RECOMMENDED [signature]	DATE: 05/15/13	RECOMMENDED Chelma Davis	DATE: 7/12/13	RECOMMENDED _____ DATE:
APPROVED TRAFFIC ENGINEER [signature]	DATE: 7/12/13	APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER [signature]	DATE: 7/12/13	

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SCALE
0 30 60 90
FEET

SR 26, ATLANTIC AVENUE FROM CLARKSVILLE TO ASSAWOMAN CANAL

CONTRACT	T200411210	PERMIT NO.	S027P
COUNTY	SUSSEX	DESIGNED BY:	MSK
		CHECKED BY:	BAM

SIGNAL PLAN
SR 26 @ CENTRAL AVENUE

SHEET NO.	540
TOTAL SHTS.	589

7/10/2013
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SPAN WIRE SCHEDULE

SPAN	LENGTH	SPAN MOUNT HEIGHT	5% SAG	SPAN LOW POINT	BOTTOM OF LOWEST HEAD
*NORTH	113 FT	27.0 FT	5.65 FT	21.35 FT	16.85 FT
*EAST	91 FT	26.6 FT	4.55 FT	22.05 FT	17.55 FT
*SOUTH	120 FT	27.0 FT	6.0 FT	21.00 FT	16.50 FT
*WEST	93 FT	26.6 FT	4.65 FT	21.95 FT	17.45 FT

* DENOTES EXISTING

POLE SCHEDULE

POLE *	POLE TYPE	HEIGHT	MATERIAL
1	PEDESTRIAN	10'	ALUMINUM
*2	STRAIN	32'	STEEL
*3	STRAIN	32'	STEEL
4	PEDESTRIAN	10'	ALUMINUM
*5	STRAIN	32'	STEEL
6	PEDESTRIAN	10'	ALUMINUM
*7	CAMERA	75'	STEEL
*8	STRAIN	28'	STEEL
9	PEDESTRIAN	10'	ALUMINUM

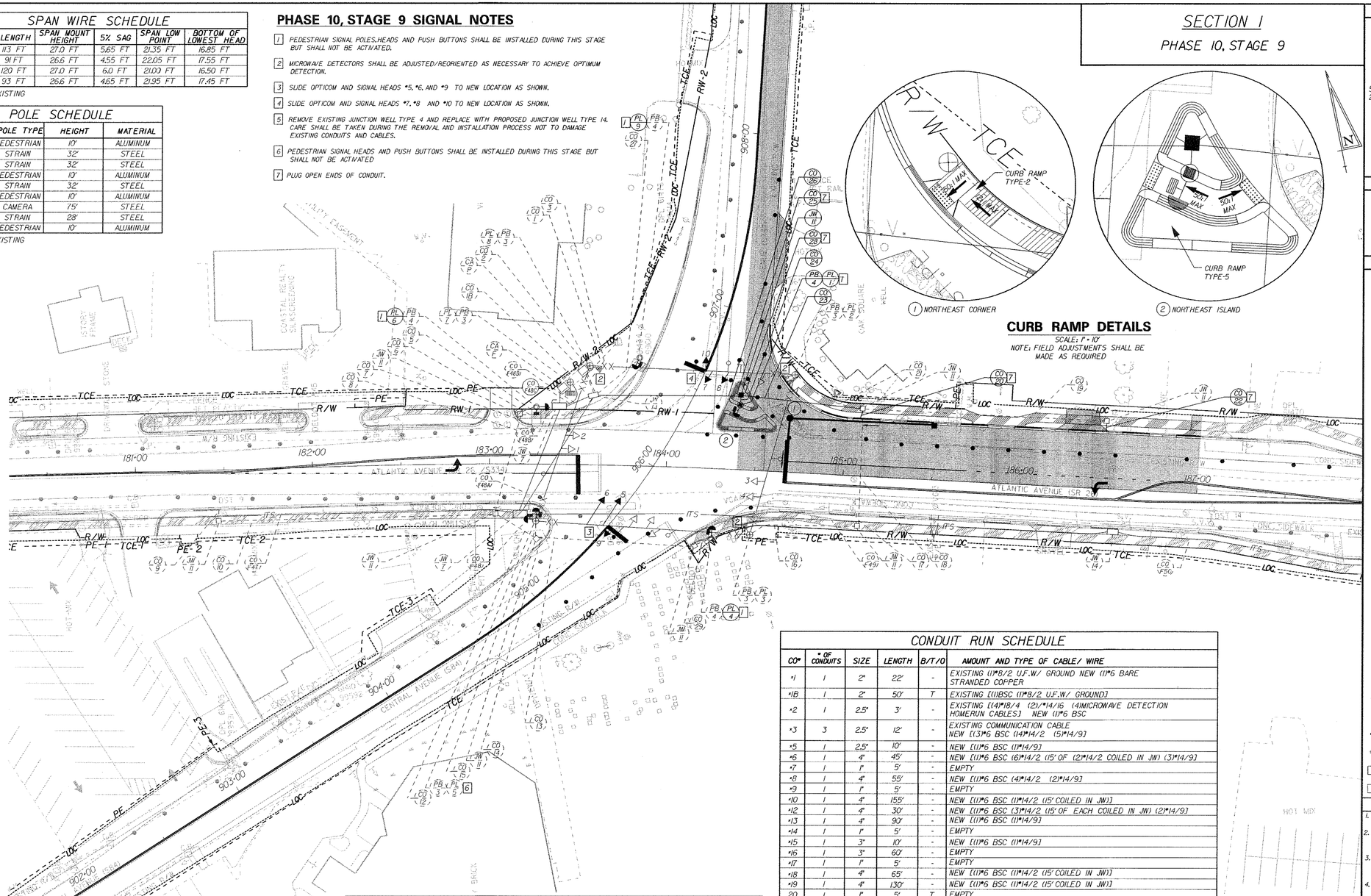
* DENOTES EXISTING

PHASE 10, STAGE 9 SIGNAL NOTES

1. PEDESTRIAN SIGNAL POLES, HEADS AND PUSH BUTTONS SHALL BE INSTALLED DURING THIS STAGE BUT SHALL NOT BE ACTIVATED.
2. MICROWAVE DETECTORS SHALL BE ADJUSTED/REORIENTED AS NECESSARY TO ACHIEVE OPTIMUM DETECTION.
3. SLIDE OPTICOM AND SIGNAL HEADS *5, *6, AND *9 TO NEW LOCATION AS SHOWN.
4. SLIDE OPTICOM AND SIGNAL HEADS *7, *8 AND *10 TO NEW LOCATION AS SHOWN.
5. REMOVE EXISTING JUNCTION WELL TYPE 4 AND REPLACE WITH PROPOSED JUNCTION WELL TYPE 14. CARE SHALL BE TAKEN DURING THE REMOVAL AND INSTALLATION PROCESS NOT TO DAMAGE EXISTING CONDUITS AND CABLES.
6. PEDESTRIAN SIGNAL HEADS AND PUSH BUTTONS SHALL BE INSTALLED DURING THIS STAGE BUT SHALL NOT BE ACTIVATED
7. PLUG OPEN ENDS OF CONDUIT.

SECTION I

PHASE 10, STAGE 9



CONDUIT RUN SCHEDULE

CO*	* OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
*1	1	2"	22'	-	EXISTING (1)#8/2 U.F.W./ GROUND NEW (1)#6 BARE STRANDED COPPER
*1B	1	2"	50'	T	EXISTING [(1)BSC (1)#8/2 U.F.W./ GROUND]
*2	1	2.5"	3'	-	EXISTING [(4)#18/4 (2)/#14/16 (4)MICROWAVE DETECTION HOMERUN CABLES] NEW (1)#6 BSC
*3	3	2.5"	12'	-	EXISTING COMMUNICATION CABLE NEW [(3)#6 BSC (4)#14/4/2 (5)#14/9]
*5	1	2.5"	10'	-	NEW [(1)#6 BSC (1)#14/9]
*6	1	4"	45'	-	NEW [(1)#6 BSC (6)#14/2 (15' OF (2)#14/2 COILED IN JW) (3)#14/9]
*7	1	1"	5'	-	EMPTY
*8	1	4"	55'	-	NEW [(1)#6 BSC (4)#14/2 (2)#14/9]
*9	1	1"	5'	-	EMPTY
*10	1	4"	155'	-	NEW [(1)#6 BSC (1)#14/2 (15' COILED IN JW)]
*12	1	4"	30'	-	NEW [(1)#6 BSC (3)#14/2 (15' OF EACH COILED IN JW) (2)#14/9]
*13	1	4"	90'	-	NEW [(1)#6 BSC (1)#14/9]
*14	1	1"	5'	-	EMPTY
*15	1	3"	10'	-	NEW [(1)#6 BSC (1)#14/9]
*16	1	3"	60'	-	EMPTY
*17	1	1"	5'	-	EMPTY
*18	1	4"	65'	-	NEW [(1)#6 BSC (1)#14/2 (15' COILED IN JW)]
*19	1	4"	130'	-	NEW [(1)#6 BSC (1)#14/2 (15' COILED IN JW)]
20	1	1"	5'	T	EMPTY
*21	1	3"	40'	-	EMPTY
22	1	1"	5'	T	EMPTY
23	1	4"	70'	T	NEW [(1)#6 BSC (3)#14/2 (15' OF (1)#14/2 COILED IN JW)]
24	1	2.5"	5'	T	NEW [(1)#6 BSC (1)#14/9]
25	2	1"	5'	T	EMPTY
26	1	4"	80'	B	NEW [(1)#6 BSC (8)#14/2 (15' EACH OF (5)#14/2 COILED IN JW) (1)#14/9)]
*27	1	2.5"	30'	-	NEW [(1)#6 BSC (1)#14/9]
28	1	1"	5'	T	EMPTY
*29	1	2.5"	10'	-	NEW [(1)#6 BSC (1)#14/9]

LEGEND
* DENOTES EXISTING
B- BORE
T- TRENCH
O- OPEN CUT

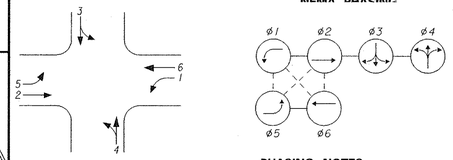
CONDUIT RUN SCHEDULE (CONT.)

CO*	* OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
*F47	1	4"	290'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F48	1	4"	80'	T	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F48A	2	4"	65'	T	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F48B	6	4"	15'	-	COMMUNICATION AND CAMERA CABLES (SEE S&S PLANS)
*F48C	2	2.5"	20'	-	CAMERA CABLE (SEE SIGNING AND STRIPING PLANS)
*F48D	1	4"	20'	T	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F49	1	4"	335'	T	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F50	1	4"	140'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)

LEGEND
* DENOTES EXISTING
B- BORE
T- TRENCH
O- OPEN CUT

SIGNAL PHASING

NEMA PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

	PROPOSED SIGNAL CABINET	(RM/C)	REMOVE BY CONTRACTOR
	EXISTING SIGNAL CABINET	(RM/O)	REMOVE BY OTHERS
	PROPOSED SIGNAL POLE BASE	(AB)	ABANDON
	EXISTING SIGNAL POLE BASE	(PB/X)	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	PROPOSED PEDESTRIAN POLE BASE	(PB/X)	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	EXISTING PEDESTRIAN POLE BASE	(PL/X)	PROPOSED POLE IDENTIFIER (# OF POLE)
	PROPOSED WOOD POLE	(PL/X)	EXISTING POLE IDENTIFIER (# OF POLE)
	EXISTING WOOD POLE	(JW/X)	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	PROPOSED JUNCTION WELL	(JW/X)	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	EXISTING JUNCTION WELL	(CO/*)	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)
	PROPOSED SIGNAL HEAD	(CO/*)	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)
	EXISTING SIGNAL HEAD	(OH/*)	PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
	PROPOSED PEDESTRIAN SIGNAL HEAD	(OH/*)	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
	EXISTING PEDESTRIAN SIGNAL HEAD	(MA/XX)	PROPOSED MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	PROPOSED PEDESTRIAN PUSHBUTTON	(MA/XX)	EXISTING MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	EXISTING PEDESTRIAN PUSHBUTTON	(CA/X)	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
	PROPOSED VIDEO DETECTION	(CA/X)	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
	EXISTING VIDEO DETECTION		PROPOSED SPAN WIRE
	PROPOSED MICROWAVE DETECTION	XX	EXISTING SPAN WIRE
	EXISTING MICROWAVE DETECTION		RIGHT-OF-WAY OR PROPERTY LINE
	OVERHEAD SIGNING		PROPOSED SPAN INSULATOR
	PROPOSED OPTICOM RECEIVER		EXISTING SPAN INSULATOR
	EXISTING OPTICOM RECEIVER	P	SERVICE PEDESTAL
	PROPOSED MAST ARM		PROPOSED CCTV
	EXISTING MAST ARM		EXISTING CCTV
	PROPOSED LUMINAIRE		PROPOSED PLASTIC DRUMS
	EXISTING LUMINAIRE		EXISTING PLASTIC DRUMS
	PROPOSED LOOP DETECTOR (TYPE 1 OR 2)		
	EXISTING LOOP DETECTOR (TYPE 1 OR 2)		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC- DOVER, DELAWARE
2. POLE BASES, CABINET BASE, AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED EXCEPT WHERE SHOWN.
3. ALL GALVANIZED RIGID CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
4. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY FOR THE UTILITY MARKOUTS PRIOR TO THE BEGINNING OF CONSTRUCTION. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
5. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.
6. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (5.0%) OR FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHALL BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL. ALL PEDESTRIAN SIGNAL HEADS SHALL BE COUNTDOWN TYPE.
7. ALL 4", 3", 2.5", AND 2" CONDUITS SHALL BE SCHEDULE 80 PVC WITH THE EXCEPTION OF 4" BORED CONDUIT WHICH SHALL BE SDR-13.5 HDPE. ALL 1" CONDUITS LESS THAN OR EQUAL TO 6'-0" SHALL BE LIQUID TIGHT FLEXIBLE NON-METALLIC AND ALL 1" CONDUITS GREATER THAN 6'-0" SHALL BE RIGID GALVANIZED.

RECOMMENDED _____ DATE: 05/15/13

RECOMMENDED Chuck Dare DATE: 7/12/13

RECOMMENDED _____ DATE: _____

APPROVED TRAFFIC ENGINEER _____ DATE: 7/12/13

APPROVED FOR INSTALLATION
CHIEF TRAFFIC ENGINEER _____ DATE: 7/12/13

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SCALE
0 30 60 90
FEET

SR 26, ATLANTIC AVENUE FROM CLARKSVILLE TO ASSAWOMAN CANAL

CONTRACT	T200411210	PERMIT NO.	S027P
COUNTY	SUSSEX	DESIGNED BY:	MSK
		CHECKED BY:	BAM

SIGNAL PLAN
SR 26 @ CENTRAL AVENUE

SHEET NO.	541
TOTAL SHTS.	589

7/09/2013
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SECTION 1

PHASE 13, STAGE 1

SPAN WIRE SCHEDULE

SPAN	LENGTH	SPAN MOUNT HEIGHT	5% SAG	SPAN LOW POINT	BOTTOM OF LOWEST HEAD
*NORTH	113 FT	27.0 FT	5.65 FT	21.35 FT	16.85 FT
*EAST	91 FT	26.6 FT	4.55 FT	22.05 FT	17.55 FT
*SOUTH	120 FT	27.0 FT	6.0 FT	21.00 FT	16.50 FT
*WEST	93 FT	26.6 FT	4.65 FT	21.95 FT	17.45 FT

* DENOTES EXISTING

POLE SCHEDULE

POLE *	POLE TYPE	HEIGHT	MATERIAL
*1	PEDESTRIAN	10'	ALUMINUM
*2	STRAIN	32'	STEEL
*3	STRAIN	32'	STEEL
*4	PEDESTRIAN	10'	ALUMINUM
*5	STRAIN	32'	STEEL
*6	PEDESTRIAN	10'	ALUMINUM
*7	CAMERA	75'	STEEL
*8	STRAIN	28'	STEEL
*9	PEDESTRIAN	10'	ALUMINUM

* DENOTES EXISTING

PHASE 13, STAGE 1 SIGNAL NOTES

1. REMOVE EXISTING INVERTED-T SIGNAL HEADS FOR NORTHBOUND AND SOUTHBOUND CENTRAL AVENUE AND INSTALL PROPOSED 5-SECTION SIGNAL HEADS *5 AND *7 AT ULTIMATE LOCATIONS SHOWN.
2. REMOVE EXISTING SUPPLEMENTAL INVERTED-T SIGNAL HEADS FOR NORTHBOUND AND SOUTHBOUND CENTRAL AVENUE AND INSTALL PROPOSED SUPPLEMENTAL 3-SECTION SIGNAL HEADS *9 AND *10 AT ULTIMATE LOCATIONS SHOWN.
3. ACTIVATE PROPOSED TRAFFIC SIGNAL AND PEDESTRIAN SIGNALS AND DEACTIVATE MICROWAVE DETECTION SIGNAL INSTALLATION. ACTIVATION AND DEACTIVATION OF THE SIGNAL SYSTEMS SHALL BE COORDINATED TO ALLOW FOR A SMOOTH TRANSITION.
4. REMOVE ALL MICROWAVE DETECTORS AND ASSOCIATED CABLES AFTER DEACTIVATION.

PROPOSED SIGNING

- Central Ave — D3-1 8"x24"
- Atlantic Ave — D3-1 90"x24"
- R3-1 24"x24"

CONDUIT RUN SCHEDULE

CO*	* OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
*1	1	2"	22'	-	EXISTING [(1)*6 BSC (1)*8/2 U.F.W./ GROUND]
*1B	1	2"	50'	-	EXISTING [(1)*6 BSC (1)*8/2 U.F.W./ GROUND]
*2	1	2.5"	3'	-	EXISTING [(1)*6 BSC (4)*18/4 (2)/*14/16 (4)MICROWAVE DETECTION HOMERUN CABLES] REMOVE (4)MICROWAVE DETECTION HOMERUN CABLES
*3	3	2.5"	12'	-	EXISTING [(3)*6 BSC (14)*14/2 (5)*14/9 COMMUNICATION CABLE]
*5	1	2.5"	10'	-	EXISTING [(1)*6 BSC (1)*14/9]
*6	1	4"	45'	-	EXISTING [(1)*6 BSC (6)*14/2 (3)*14/9]
*7	1	1"	5'	-	NEW (4)*14/1
*8	1	4"	55'	-	EXISTING [(1)*6 BSC (4)*14/2 (2)*14/9]
*9	1	1"	5'	-	NEW (2)*14/1
*10	1	4"	155'	-	EXISTING [(1)*6 BSC (1)*14/2]
*12	1	4"	30'	-	EXISTING [(1)*6 BSC (3)*14/2 (2)*14/9]
*13	1	4"	90'	-	EXISTING [(1)*6 BSC (1)*14/9]
*14	1	1"	5'	-	NEW (6)*14/1
*15	1	3"	10'	-	EXISTING [(1)*6 BSC (1)*14/9]
*16	1	3"	60'	-	EMPTY
*17	1	1"	5'	-	NEW (2)*14/1
*18	1	4"	65'	-	EXISTING [(1)*6 BSC (1)*14/2]
*19	1	4"	130'	-	EXISTING [(1)*6 BSC (1)*14/2]
*20	1	1"	5'	-	NEW (2)*14/1
*21	1	3"	40'	-	EMPTY
*22	1	1"	5'	-	NEW (2)*14/1
*23	1	4"	70'	-	EXISTING [(1)*6 BSC (3)*14/2]
*24	2	2.5"	5'	-	EXISTING [(1)*6 BSC (1)*14/9]
*25	2	1"	5'	-	NEW (6)*14/1
*26	1	4"	80'	-	EXISTING [(1)*6 BSC (8)*14/2 (1)*14/9]
*27	1	2.5"	30'	-	EXISTING [(1)*6 BSC (1)*14/9]
*28	1	1"	5'	-	NEW (2)*14/1
*29	1	2.5"	10'	-	EXISTING [(1)*6 BSC (1)*14/9]

LEGEND
* DENOTES EXISTING B- BORE T- TRENCH O- OPEN CUT

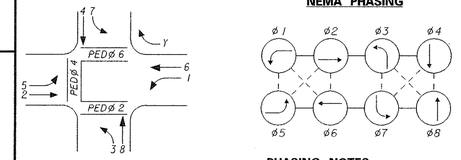
CONDUIT RUN SCHEDULE (CONT.)

CO*	* OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
*F47	1	4"	290'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F48	1	4"	80'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F48A	2	4"	65'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F48B	6	4"	15'	-	COMMUNICATION AND CAMERA CABLES (SEE S&S PLANS)
*F48C	1	2.5"	20'	-	CAMERA CABLE (SEE SIGNING AND STRIPING PLANS)
*F48D	1	4"	20'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F49	1	4"	335'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F50	1	4"	140'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)

LEGEND
* DENOTES EXISTING B- BORE T- TRENCH O- OPEN CUT

SIGNAL PHASING

NEMA PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

PROPOSED SIGNAL CABINET	RM/C	REMOVE BY CONTRACTOR
EXISTING SIGNAL CABINET	RM/O	REMOVE BY OTHERS
PROPOSED SIGNAL POLE BASE	AB	ABANDON
EXISTING SIGNAL POLE BASE	PB/X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
PROPOSED PEDESTRIAN POLE BASE	(PB/X)	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
EXISTING PEDESTRIAN POLE BASE	PL/X	PROPOSED POLE IDENTIFIER (* OF POLE)
PROPOSED WOOD POLE	(PL/X)	EXISTING POLE IDENTIFIER (* OF POLE)
EXISTING WOOD POLE	JW/X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
PROPOSED JUNCTION WELL	(JW/X)	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
EXISTING JUNCTION WELL	CO/*	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
PROPOSED SIGNAL HEAD	(CO/*)	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
EXISTING SIGNAL HEAD	OH/*	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
PROPOSED PEDESTRIAN SIGNAL HEAD	(OH/*)	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
EXISTING PEDESTRIAN SIGNAL HEAD	MA/XX	PROPOSED MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
PROPOSED PUSHBUTTON	(MA/XX)	EXISTING MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
EXISTING PEDESTRIAN PUSHBUTTON	CA/X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
PROPOSED VIDEO DETECTION	(CA/X)	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
EXISTING VIDEO DETECTION		PROPOSED SPAN WIRE
PROPOSED MICROWAVE DETECTION	XX	EXISTING SPAN WIRE
EXISTING MICROWAVE DETECTION		RIGHT-OF-WAY OR PROPERTY LINE
OVERHEAD SIGNING		PROPOSED SPAN INSULATOR
PROPOSED OPTICOM RECEIVER		EXISTING SPAN INSULATOR
EXISTING OPTICOM RECEIVER	P	SERVICE PEDESTAL
PROPOSED MAST ARM		PROPOSED CCTV
EXISTING MAST ARM		EXISTING CCTV
PROPOSED LUMINAIRE		PROPOSED PLASTIC DRUMS
EXISTING LUMINAIRE		EXISTING PLASTIC DRUMS
PROPOSED LOOP DETECTOR (TYPE 1 OR 2)		
EXISTING LOOP DETECTOR (TYPE 1 OR 2)		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC- DOVER, DELAWARE
2. POLE BASES, CABINET BASE, AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED EXCEPT WHERE SHOWN.
3. ALL GALVANIZED RIGID CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
4. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY FOR THE UTILITY MARKOUTS PRIOR TO THE BEGINNING OF CONSTRUCTION. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
5. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.
6. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (5.0% OR FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHALL BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL. ALL PEDESTRIAN SIGNAL HEADS SHALL BE COUNTDOWN TYPE.
7. ALL 4", 3", 2.5", AND 2" CONDUITS SHALL BE SCHEDULE 80 PVC WITH THE EXCEPTION OF 4" BORED CONDUIT WHICH SHALL BE SDR-13.5 HDPE. ALL 1" CONDUITS LESS THAN OR EQUAL TO 6'-0" SHALL BE LIQUID TIGHT FLEXIBLE NON-METALLIC AND ALL 1" CONDUITS GREATER THAN 6'-0" SHALL BE RIGID GALVANIZED.

RECOMMENDED _____ DATE: 05/15/13

RECOMMENDED _____ DATE: 7/12/13

RECOMMENDED _____ DATE: _____

APPROVED TRAFFIC ENGINEER _____ DATE: 7/12/13

APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER _____ DATE: 7/12/13

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SCALE 0 30 60 90 FEET

SR 26, ATLANTIC AVENUE FROM CLARKSVILLE TO ASSAWOMAN CANAL

CONTRACT	T200411210	PERMIT NO.	S027P
COUNTY	SUSSEX	DESIGNED BY:	MSK
		CHECKED BY:	BAM

SIGNAL PLAN
SR 26 @ CENTRAL AVENUE

SHEET NO. 542
TOTAL SHTS. 589

7/10/2013
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SECTION I
ULTIMATE

SPAN WIRE SCHEDULE

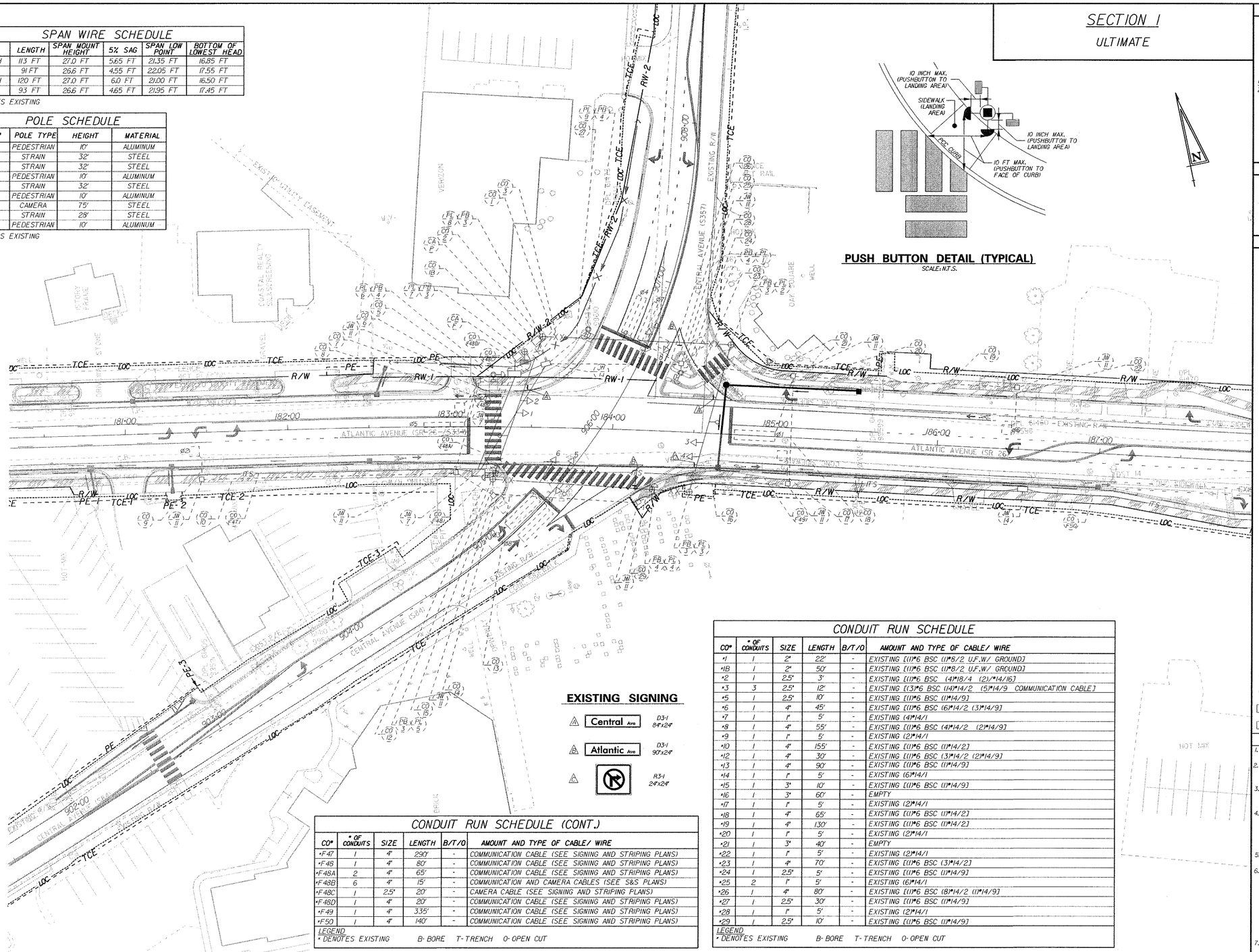
SPAN	LENGTH	SPAN MOUNT HEIGHT	5% SAG	SPAN LOW POINT	BOTTOM OF LOWEST HEAD
*NORTH	113 FT	27.0 FT	5.65 FT	21.35 FT	16.85 FT
*EAST	91 FT	26.6 FT	4.55 FT	22.05 FT	17.55 FT
*SOUTH	120 FT	27.0 FT	6.0 FT	21.00 FT	16.50 FT
*WEST	93 FT	26.6 FT	4.65 FT	21.95 FT	17.45 FT

* DENOTES EXISTING

POLE SCHEDULE

POLE *	POLE TYPE	HEIGHT	MATERIAL
*1	PEDESTRIAN	10'	ALUMINUM
*2	STRAIN	32'	STEEL
*3	STRAIN	32'	STEEL
*4	PEDESTRIAN	10'	ALUMINUM
*5	STRAIN	32'	STEEL
*6	PEDESTRIAN	10'	ALUMINUM
*7	CAMERA	75'	STEEL
*8	STRAIN	28'	STEEL
*9	PEDESTRIAN	10'	ALUMINUM

* DENOTES EXISTING



PUSH BUTTON DETAIL (TYPICAL)
SCALE: N.T.S.

EXISTING SIGNING

A	Central Ave	D3-1 84"x24"
A	Atlantic Ave	D3-1 90"x24"
A		R3-1 24"x24"

CONDUIT RUN SCHEDULE (CONT.)

CO*	* OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
*F47	1	4"	290'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F48	1	4"	80'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F48A	2	4"	65'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F48B	6	4"	15'	-	COMMUNICATION AND CAMERA CABLES (SEE S&S PLANS)
*F48C	1	2.5"	20'	-	CAMERA CABLE (SEE SIGNING AND STRIPING PLANS)
*F48D	1	4"	20'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F49	1	4"	335'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F50	1	4"	140'	-	COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)

LEGEND
* DENOTES EXISTING B- BORE T- TRENCH O- OPEN CUT

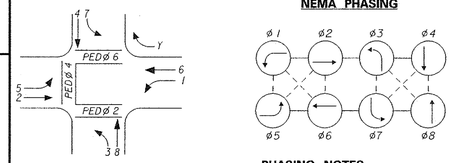
CONDUIT RUN SCHEDULE

CO*	* OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
*1	1	2"	22'	-	EXISTING ((1)#6 BSC (1)#8/2 U.F.W/ GROUND)
*1B	1	2"	50'	-	EXISTING ((1)#6 BSC (1)#8/2 U.F.W/ GROUND)
*2	1	2.5"	3'	-	EXISTING ((1)#6 BSC (4)#18/4 (2)/#14/16)
*3	3	2.5"	12'	-	EXISTING ((3)#6 BSC (14)#14/2 (5)#14/9 COMMUNICATION CABLE)
*5	1	2.5"	10'	-	EXISTING ((1)#6 BSC (1)#14/9)
*6	1	4"	45'	-	EXISTING ((1)#6 BSC (6)#14/2 (3)#14/9)
*7	1	1"	5'	-	EXISTING (4)#14/1)
*8	1	4"	55'	-	EXISTING ((1)#6 BSC (4)#14/2 (2)#14/9)
*9	1	1"	5'	-	EXISTING (2)#14/1)
*10	1	4"	155'	-	EXISTING ((1)#6 BSC (1)#14/2)
*12	1	4"	30'	-	EXISTING ((1)#6 BSC (3)#14/2 (2)#14/9)
*13	1	4"	90'	-	EXISTING ((1)#6 BSC (1)#14/9)
*14	1	1"	5'	-	EXISTING (6)#14/1)
*15	1	3"	10'	-	EXISTING ((1)#6 BSC (1)#14/9)
*16	1	3"	60'	-	EMPTY
*17	1	1"	5'	-	EXISTING (2)#14/1)
*18	1	4"	65'	-	EXISTING ((1)#6 BSC (1)#14/2)
*19	1	4"	130'	-	EXISTING ((1)#6 BSC (1)#14/2)
*20	1	1"	5'	-	EXISTING (2)#14/1)
*21	1	3"	40'	-	EMPTY
*22	1	1"	5'	-	EXISTING (2)#14/1)
*23	1	4"	70'	-	EXISTING ((1)#6 BSC (3)#14/2)
*24	1	2.5"	5'	-	EXISTING ((1)#6 BSC (1)#14/9)
*25	2	1"	5'	-	EXISTING (6)#14/1)
*26	1	4"	80'	-	EXISTING ((1)#6 BSC (8)#14/2 ((1)#14/9)
*27	1	2.5"	30'	-	EXISTING ((1)#6 BSC (1)#14/9)
*28	1	1"	5'	-	EXISTING (2)#14/1)
*29	1	2.5"	10'	-	EXISTING ((1)#6 BSC (1)#14/9)

LEGEND
* DENOTES EXISTING B- BORE T- TRENCH O- OPEN CUT

SIGNAL PHASING

NEMA PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

	PROPOSED SIGNAL CABINET	(RM/C)	REMOVE BY CONTRACTOR
	EXISTING SIGNAL CABINET	(RM/O)	REMOVE BY OTHERS
	PROPOSED SIGNAL POLE BASE	(AB)	ABANDON
	EXISTING SIGNAL POLE BASE	(PB/X)	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	PROPOSED PEDESTRIAN POLE BASE	(PB/X)	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	EXISTING PEDESTRIAN POLE BASE	(FL/X)	PROPOSED POLE IDENTIFIER (# OF POLE)
	PROPOSED WOOD POLE	(FL/X)	EXISTING POLE IDENTIFIER (# OF POLE)
	EXISTING WOOD POLE	(JW/X)	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	PROPOSED JUNCTION WELL	(JW/X)	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	EXISTING JUNCTION WELL	(CO/*)	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)
	PROPOSED SIGNAL HEAD	(CO/*)	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)
	EXISTING SIGNAL HEAD	(OH/*)	PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
	PROPOSED PEDESTRIAN SIGNAL HEAD	(OH/*)	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
	EXISTING PEDESTRIAN SIGNAL HEAD	(MA/XX)	PROPOSED MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	PROPOSED PEDESTRIAN PUSHBUTTON	(MA/XX)	EXISTING MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	EXISTING PEDESTRIAN PUSHBUTTON	(CA/X)	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
	PROPOSED VIDEO DETECTION	(CA/X)	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
	EXISTING VIDEO DETECTION		PROPOSED SPAN WIRE
	PROPOSED MICROWAVE DETECTION	XX	EXISTING SPAN WIRE
	EXISTING MICROWAVE DETECTION		RIGHT-OF-WAY OR PROPERTY LINE
	OVERHEAD SIGNING		PROPOSED SPAN INSULATOR
	PROPOSED OPTICOM RECEIVER		EXISTING SPAN INSULATOR
	EXISTING OPTICOM RECEIVER	P	SERVICE PEDESTAL
	PROPOSED MAST ARM		PROPOSED CCTV
	EXISTING MAST ARM		EXISTING CCTV
	PROPOSED LUMINAIRE		PROPOSED PLASTIC DRUMS
	EXISTING LUMINAIRE		EXISTING PLASTIC DRUMS
	PROPOSED LOOP DETECTOR (TYPE 1 OR 2)		
	EXISTING LOOP DETECTOR (TYPE 1 OR 2)		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC- DOVER, DELAWARE
2. POLE BASES, CABINET BASE, AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED EXCEPT WHERE SHOWN.
3. ALL GALVANIZED RIGID CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
4. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY FOR THE UTILITY MARKOUTS PRIOR TO THE BEGINNING OF CONSTRUCTION. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
5. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.
6. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (5.0) OR FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHALL BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL. ALL PEDESTRIAN SIGNAL HEADS SHALL BE COUNTDOWN TYPE.
7. ALL 4", 3", 2.5", AND 2" CONDUITS SHALL BE SCHEDULE 80 PVC WITH THE EXCEPTION OF 4" BORED CONDUIT WHICH SHALL BE SDR-13.5 HDPE. ALL 1" CONDUITS LESS THAN OR EQUAL TO 6'-0" SHALL BE LIQUID TIGHT FLEXIBLE NON-METALLIC AND ALL 1" CONDUITS GREATER THAN 6'-0" SHALL BE RIGID GALVANIZED.

RECOMMENDED B. SADLER DATE: 05/15/13

RECOMMENDED Chutney Dave DATE: 7/12/13

RECOMMENDED _____ DATE: _____

APPROVED TRAFFIC ENGINEER Myron C. Hitch DATE: 7/12/13

APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER _____ DATE: 7/12/13

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SCALE 0 30 60 90 FEET

SR 26, ATLANTIC AVENUE FROM CLARKSVILLE TO ASSAWOMAN CANAL

CONTRACT	PERMIT NO.	S027P
T200411210	DESIGNED BY:	MSK
COUNTY	CHECKED BY:	BAM
SUSSEX		

SIGNAL PLAN SR 26 @ CENTRAL AVENUE (ULTIMATE)

SHEET NO.	TOTAL SHTS.
543	589

7/09/2013
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(650122)

CONDUIT RUN SCHEDULE

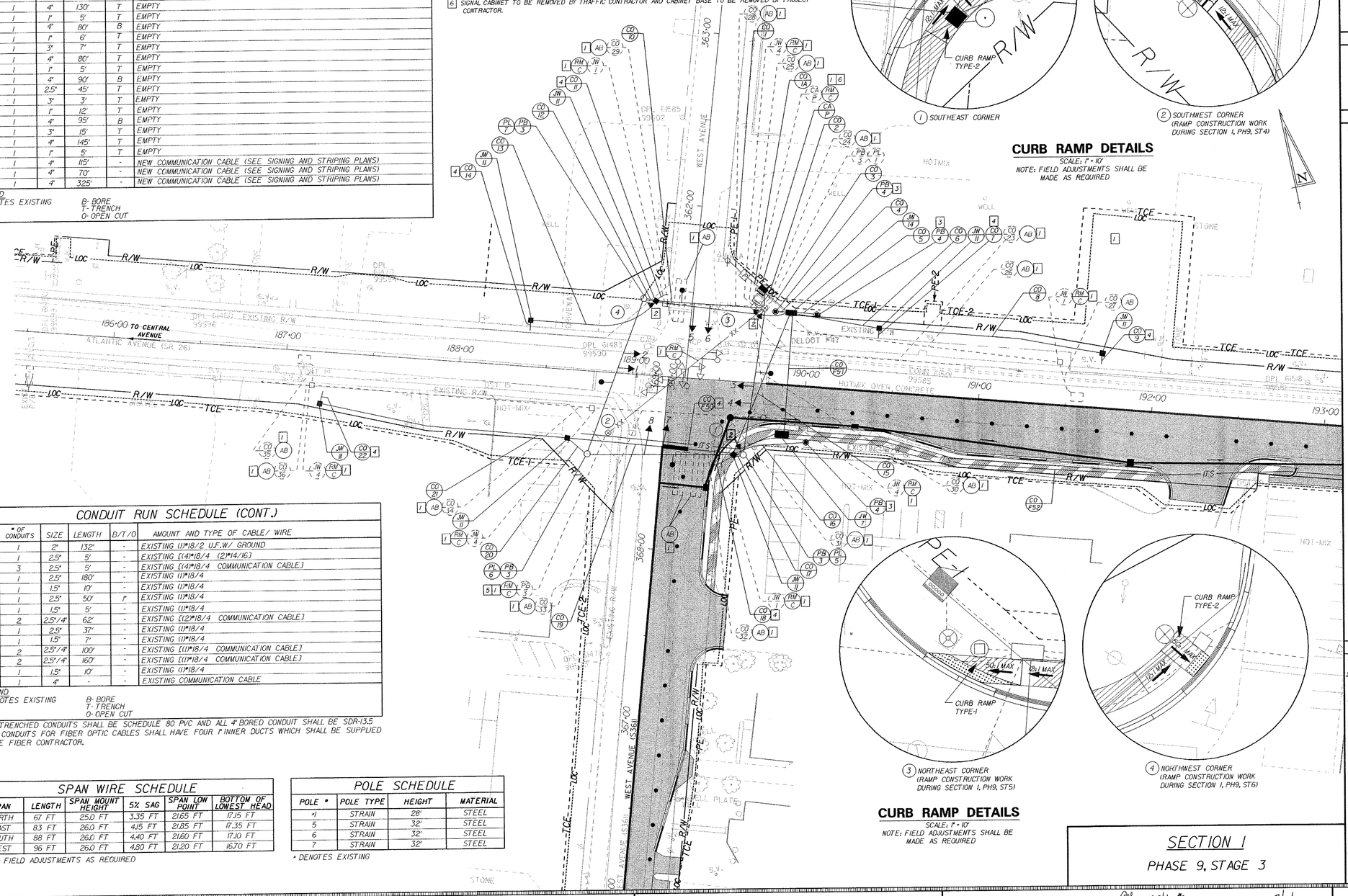
CO*	* OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
1	1	2"	10'	T	NEW [(1)#6 BARE STRANDED COPPER (1)#8/2 U.F.W/ GROUND]
1A	1	2"	10'	T	NEW [(1)#6 BSC (1)#8/2 U.F.W/ GROUND]
2	1	2.5"	10'	T	NEW [(1)#6 BSC (4)#18/4 (2)#14/16 (4)MICROWAVE DETECTION HR CABLES]
3	3	4"	20'	T	NEW COMMUNICATION CABLE
4	1	2.5"	7'	-	EMPTY
5	1	2.5"	15'	T	EMPTY
6	1	4"	50'	T	EMPTY
7	1	1"	5'	T	EMPTY
8	1	4"	130'	T	EMPTY
9	1	1"	5'	T	EMPTY
10	1	4"	80'	B	EMPTY
11	1	1"	6'	T	EMPTY
12	1	3"	7'	T	EMPTY
13	1	4"	80'	T	EMPTY
14	1	1"	5'	T	EMPTY
15	1	4"	90'	B	EMPTY
16	1	2.5"	45'	T	EMPTY
17	1	3"	3'	T	EMPTY
18	1	1"	12'	T	EMPTY
19	1	4"	95'	B	EMPTY
20	1	3"	15'	T	EMPTY
21	1	4"	145'	T	EMPTY
22	1	1"	5'	T	EMPTY
F50	1	4"	115'	-	NEW COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
F51	1	4"	70'	-	NEW COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
F52	1	4"	325'	-	NEW COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)

LEGEND
* DENOTES EXISTING

B- BORE
T- TRENCH
O- OPEN CUT

PHASE 9, STAGE 3 SIGNAL NOTES

1. EXISTING SIGNAL INSTALLATION SHALL NOT BE ABANDONED OR REMOVED UNTIL PROPOSED MICROWAVE DETECTION SIGNAL INSTALLATION IS COMPLETE AND ACTIVATED.
2. PROPOSED MICROWAVE DETECTORS SHALL BE LOCATED, MOUNTED, AND ORIENTED TO ACHIEVE OPTIMUM DETECTION. PROPOSED MICROWAVE HOMERUN CABLES SHALL RUN ALONG THE PROPOSED SPAN WIRE, DOWN THE NORTHEAST SIGNAL POLE AND THROUGH CONDUIT (CO *2) TO THE SIGNAL CABINET.
3. PEDESTRIAN SIGNAL POLES, HEADS AND PUSH BUTTONS SHALL NOT BE INSTALLED IN THIS STAGE.
4. PLUG OPEN ENDS OF CONDUIT.
5. POLE TO BE REMOVED BY TRAFFIC CONTRACTOR AND POLE BASE TO BE REMOVED BY PROJECT CONTRACTOR.
6. SIGNAL CABINET TO BE REMOVED BY TRAFFIC CONTRACTOR AND CABINET BASE TO BE REMOVED BY PROJECT CONTRACTOR.



CURB RAMP DETAILS

SCALE: 1" = 10'
NOTE: FIELD ADJUSTMENTS SHALL BE MADE AS REQUIRED

CONDUIT RUN SCHEDULE (CONT.)

CO*	* OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
*23	1	2"	132'	-	EXISTING (1)#18/2 U.F.W/ GROUND
*24	1	2.5"	5'	-	EXISTING [(4)#18/4 (2)#14/16]
*25	3	2.5"	5'	-	EXISTING [(4)#18/4 COMMUNICATION CABLE]
*26	1	2.5"	180'	-	EXISTING (1)#18/4
*27	1	1.5"	10'	-	EXISTING (1)#18/4
*28	1	2.5"	50'	T	EXISTING (1)#18/4
*29	1	1.5"	5'	-	EXISTING (1)#18/4
*30	2	2.5"/4"	62'	-	EXISTING [(2)#18/4 COMMUNICATION CABLE]
*31	1	2.5"	37'	-	EXISTING (1)#18/4
*32	1	1.5"	7'	-	EXISTING (1)#18/4
*33	2	2.5"/4"	100'	-	EXISTING [(1)#18/4 COMMUNICATION CABLE]
*34	2	2.5"/4"	160'	-	EXISTING [(1)#18/4 COMMUNICATION CABLE]
*35	1	1.5"	10'	-	EXISTING (1)#18/4
*36	1	4"	-	-	EXISTING COMMUNICATION CABLE

LEGEND
* DENOTES EXISTING

B- BORE
T- TRENCH
O- OPEN CUT

ALL 4" TRENCHED CONDUITS SHALL BE SCHEDULE 80 PVC AND ALL 4" BORED CONDUIT SHALL BE SDR-13.5 HDPE. CONDUITS FOR FIBER OPTIC CABLES SHALL HAVE FOUR 1" INNER DUCTS WHICH SHALL BE SUPPLIED BY THE FIBER CONTRACTOR.

SPAN WIRE SCHEDULE

SPAN	LENGTH	SPAN MOUNT HEIGHT	5% SAG	SPAN LOW POINT	BOTTOM OF LOWEST HEAD
NORTH	67 FT	25.0 FT	3.35 FT	21.65 FT	17.15 FT
EAST	83 FT	26.0 FT	4.15 FT	21.85 FT	17.35 FT
SOUTH	88 FT	26.0 FT	4.40 FT	21.60 FT	17.10 FT
WEST	96 FT	26.0 FT	4.80 FT	21.20 FT	16.70 FT

NOTE: FIELD ADJUSTMENTS AS REQUIRED

POLE SCHEDULE

POLE *	POLE TYPE	HEIGHT	MATERIAL
*1	STRAIN	28'	STEEL
5	STRAIN	32'	STEEL
6	STRAIN	32'	STEEL
7	STRAIN	32'	STEEL

* DENOTES EXISTING

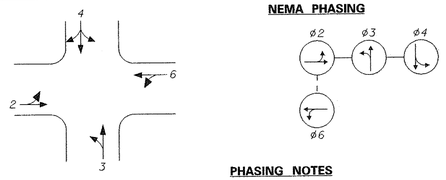
CURB RAMP DETAILS

SCALE: 1" = 10'
NOTE: FIELD ADJUSTMENTS SHALL BE MADE AS REQUIRED

SECTION 1
PHASE 9, STAGE 3

SIGNAL PHASING

NEMA PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

	PROPOSED SIGNAL CABINET	(RM C)	REMOVE BY CONTRACTOR
	EXISTING SIGNAL CABINET	(RM O)	REMOVE BY OTHERS
	PROPOSED SIGNAL POLE BASE	(AB)	ABANDON
	EXISTING SIGNAL POLE BASE	(PB X)	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	PROPOSED PEDESTRIAN POLE BASE	(PB X)	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	EXISTING PEDESTRIAN POLE BASE	(PL X)	PROPOSED POLE IDENTIFIER (* OF POLE)
	PROPOSED WOOD POLE	(PL X)	EXISTING POLE IDENTIFIER (* OF POLE)
	EXISTING WOOD POLE	(JW X)	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	PROPOSED JUNCTION WELL	(JW X)	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	EXISTING JUNCTION WELL	(CO •)	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
	PROPOSED SIGNAL HEAD	(CO •)	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
	EXISTING SIGNAL HEAD	(OH •)	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
	PROPOSED PEDESTRIAN SIGNAL HEAD	(OH •)	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
	EXISTING PEDESTRIAN SIGNAL HEAD	(MA XX)	PROPOSED MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	PROPOSED PEDESTRIAN PUSHBUTTON	(MA XX)	EXISTING MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	EXISTING PEDESTRIAN PUSHBUTTON	(CA X)	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
	PROPOSED VIDEO DETECTION	(CA X)	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
	EXISTING VIDEO DETECTION		PROPOSED SPAN WIRE
	PROPOSED MICROWAVE DETECTION	XX	EXISTING SPAN WIRE
	EXISTING MICROWAVE DETECTION		RIGHT-OF-WAY OR PROPERTY LINE
	OVERHEAD SIGNING		PROPOSED SPAN INSULATOR
	PROPOSED OPTICOM RECEIVER		EXISTING SPAN INSULATOR
	EXISTING OPTICOM RECEIVER	P	SERVICE PEDESTAL
	PROPOSED MAST ARM		PROPOSED CCTV
	EXISTING MAST ARM		EXISTING CCTV
	PROPOSED LUMINAIRE		PROPOSED PLASTIC DRUMS
	EXISTING LUMINAIRE		EXISTING PLASTIC DRUMS
	PROPOSED LOOP DETECTOR (TYPE 1 OR 2)		
	EXISTING LOOP DETECTOR (TYPE 1 OR 2)		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-DOVER, DELAWARE.
2. POLE BASES, CABINET BASE, AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED EXCEPT WHERE SHOWN.
3. ALL GALVANIZED RIGID CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
4. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY FOR THE UTILITY MARKOUTS PRIOR TO THE BEGINNING OF CONSTRUCTION. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
5. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.
6. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (5% OR FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHALL BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL. ALL PEDESTRIAN SIGNAL HEADS SHALL BE COUNTDOWN TYPE.
7. ALL 4", 3", 2.5", AND 2" CONDUITS SHALL BE SCHEDULE 80 PVC WITH THE EXCEPTION OF 4" BORED CONDUIT WHICH SHALL BE SDR-13.5 HDPE. ALL 1" CONDUITS LESS THAN OR EQUAL TO 6'-0" SHALL BE LIQUID TIGHT FLEXIBLE NON-METALLIC AND ALL 1" CONDUITS GREATER THAN 6'-0" SHALL BE RIGID GALVANIZED.

RECOMMENDED _____ DATE: 05/15/13

RECOMMENDED Cristina Dave DATE: 7/12/13

RECOMMENDED _____ DATE: _____

APPROVED TRAFFIC ENGINEER _____ DATE: 7/12/13

APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER _____ DATE: 7/12/13

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SCALE
0 30 60 90
FEET

SR 26, ATLANTIC AVENUE FROM CLARKSVILLE TO ASSAWOMAN CANAL

CONTRACT	T200411210
COUNTY	SUSSEX
PERMIT NO.	
DESIGNED BY:	MSK
CHECKED BY:	BAM

SIGNAL PLAN
SR 26 @ WEST AVENUE

SHEET NO.	544
TOTAL SHTS.	589

7/10/2013
J:\PROJECTS\sr26mainline\Survey\tp-i-9-3_signal_west.dgn
16:02:29

SPAN WIRE SCHEDULE

SPAN	LENGTH	SPAN MOUNT HEIGHT	5% SAG	SPAN LOW POINT	BOTTOM OF LOWEST HEAD
*NORTH	67 FT	25.0 FT	3.35 FT	21.65 FT	17.15 FT
*EAST	83 FT	26.0 FT	4.15 FT	21.85 FT	17.35 FT
*SOUTH	88 FT	26.0 FT	4.40 FT	21.60 FT	17.10 FT
*WEST	96 FT	26.0 FT	4.80 FT	21.20 FT	16.70 FT

NOTE: FIELD ADJUSTMENTS AS REQUIRED

POLE SCHEDULE

POLE *	POLE TYPE	HEIGHT	MATERIAL
*1	STRAIN	28'	STEEL
2	PEDESTRIAN	10'	ALUMINUM
3	PEDESTRIAN	10'	ALUMINUM
4	PEDESTRIAN	10'	ALUMINUM
*5	STRAIN	32'	STEEL
*6	STRAIN	32'	STEEL
*7	STRAIN	32'	STEEL

* DENOTES EXISTING

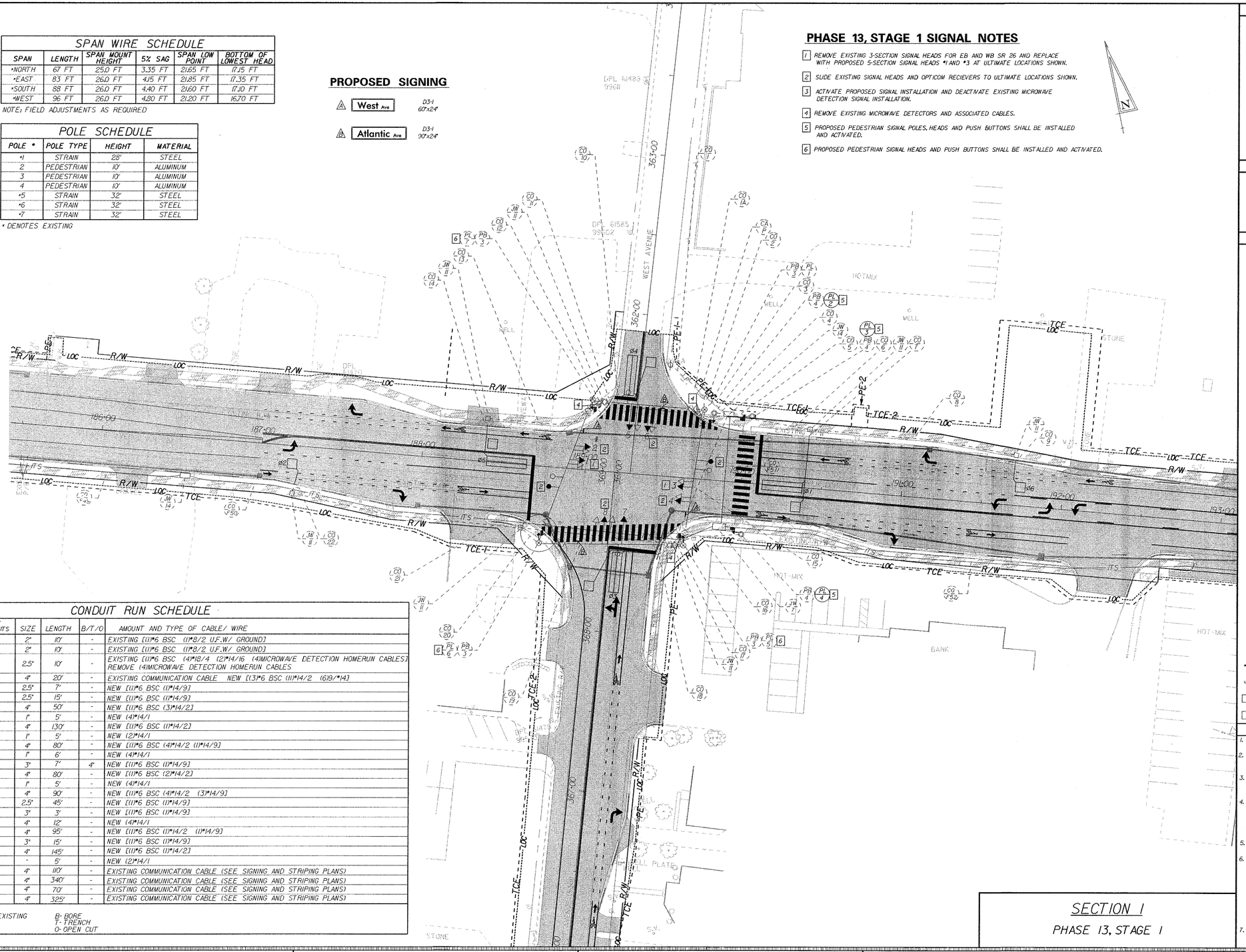
PROPOSED SIGNING

A West Ave D3-1 60"x24"

B Atlantic Ave D3-1 30"x24"

PHASE 13, STAGE 1 SIGNAL NOTES

1. REMOVE EXISTING 3-SECTION SIGNAL HEADS FOR EB AND WB SR 26 AND REPLACE WITH PROPOSED 5-SECTION SIGNAL HEADS *1 AND *3 AT ULTIMATE LOCATIONS SHOWN.
2. SLIDE EXISTING SIGNAL HEADS AND OPTICOM RECIEVERS TO ULTIMATE LOCATIONS SHOWN.
3. ACTIVATE PROPOSED SIGNAL INSTALLATION AND DEACTIVATE EXISTING MICROWAVE DETECTION SIGNAL INSTALLATION.
4. REMOVE EXISTING MICROWAVE DETECTORS AND ASSOCIATED CABLES.
5. PROPOSED PEDESTRIAN SIGNAL POLES, HEADS AND PUSH BUTTONS SHALL BE INSTALLED AND ACTIVATED.
6. PROPOSED PEDESTRIAN SIGNAL HEADS AND PUSH BUTTONS SHALL BE INSTALLED AND ACTIVATED.



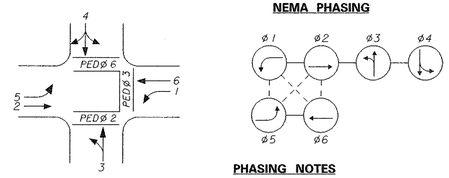
CONDUIT RUN SCHEDULE

CO*	* OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
*1	1	2"	10'	-	EXISTING [(1)*6 BSC (1)*8/2 U.F.W/ GROUND]
*1A	1	2"	10'	-	EXISTING [(1)*6 BSC (1)*8/2 U.F.W/ GROUND]
*2	1	2.5"	10'	-	EXISTING [(1)*6 BSC (4)*18/4 (2)*14/16 (4)MICROWAVE DETECTION HOMERUN CABLES] REMOVE (4)MICROWAVE DETECTION HOMERUN CABLES
*3	3	4"	20'	-	EXISTING COMMUNICATION CABLE NEW [(3)*6 BSC (1)*14/2 (6)9/*14]
*4	1	2.5"	7'	-	NEW [(1)*6 BSC (1)*14/9]
*5	1	2.5"	15'	-	NEW [(1)*6 BSC (1)*14/9]
*6	1	4"	50'	-	NEW [(1)*6 BSC (3)*14/2]
*7	1	1"	5'	-	NEW (4)*14/1
*8	1	4"	130'	-	NEW [(1)*6 BSC (1)*14/2]
*9	1	1"	5'	-	NEW (2)*14/1
*10	1	4"	80'	-	NEW [(1)*6 BSC (4)*14/2 (1)*14/9]
*11	1	1"	6'	-	NEW (4)*14/1
*12	1	3"	7'	4"	NEW [(1)*6 BSC (1)*14/9]
*13	1	4"	80'	-	NEW [(1)*6 BSC (2)*14/2]
*14	1	1"	5'	-	NEW (4)*14/1
*15	1	4"	90'	-	NEW [(1)*6 BSC (4)*14/2 (3)*14/9]
*16	1	2.5"	45'	-	NEW [(1)*6 BSC (1)*14/9]
*17	1	3"	3'	-	NEW [(1)*6 BSC (1)*14/9]
*18	1	4"	12'	-	NEW (4)*14/1
*19	1	4"	95'	-	NEW [(1)*6 BSC (1)*14/2 (1)*14/9]
*20	1	3"	15'	-	NEW [(1)*6 BSC (1)*14/9]
*21	1	4"	145'	-	NEW [(1)*6 BSC (1)*14/2]
*22	1	-	5'	-	NEW (2)*14/1
*F49	1	4"	110'	-	EXISTING COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F50	1	4"	340'	-	EXISTING COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F51	1	4"	70'	-	EXISTING COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F52	1	4"	325'	-	EXISTING COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)

LEGEND
* DENOTES EXISTING
B- BORE
T- TRENCH
O- OPEN CUT

SIGNAL PHASING

NEMA PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

	PROPOSED SIGNAL CABINET	(RM/C)	REMOVE BY CONTRACTOR
	EXISTING SIGNAL CABINET	(RM/O)	REMOVE BY OTHERS
	PROPOSED SIGNAL POLE BASE	(AB)	ABANDON
	EXISTING SIGNAL POLE BASE	(PB/X)	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	PROPOSED PEDESTRIAN POLE BASE	(PB/X)	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	EXISTING PEDESTRIAN POLE BASE	(PL/X)	PROPOSED POLE IDENTIFIER (# OF POLE)
	PROPOSED WOOD POLE	(PL/X)	EXISTING POLE IDENTIFIER (# OF POLE)
	EXISTING WOOD POLE	(JW/X)	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	PROPOSED JUNCTION WELL	(JW/X)	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	EXISTING JUNCTION WELL	(CO/•)	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)
	PROPOSED SIGNAL HEAD	(CO/•)	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)
	EXISTING SIGNAL HEAD	(OH/•)	PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
	PROPOSED PEDESTRIAN SIGNAL HEAD	(OH/•)	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
	EXISTING PEDESTRIAN SIGNAL HEAD	(MA/XX)	PROPOSED MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	PROPOSED PEDESTRIAN PUSHBUTTON	(MA/XX)	EXISTING MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	EXISTING PEDESTRIAN PUSHBUTTON	(CA/X)	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
	PROPOSED VIDEO DETECTION	(CA/X)	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
	EXISTING VIDEO DETECTION		PROPOSED SPAN WIRE
	PROPOSED MICROWAVE DETECTION	XX	EXISTING SPAN WIRE
	EXISTING MICROWAVE DETECTION		RIGHT-OF-WAY OR PROPERTY LINE
	OVERHEAD SIGNING		PROPOSED SPAN INSULATOR
	PROPOSED OPTICOM RECEIVER		EXISTING SPAN INSULATOR
	EXISTING OPTICOM RECEIVER	P	SERVICE PEDESTAL
	PROPOSED MAST ARM		PROPOSED CCTV
	EXISTING MAST ARM		EXISTING CCTV
	PROPOSED LUMINAIRE		PROPOSED PLASTIC DRUMS
	EXISTING LUMINAIRE		EXISTING PLASTIC DRUMS
	PROPOSED LOOP DETECTOR (TYPE 1 OR 2)		
	EXISTING LOOP DETECTOR (TYPE 1 OR 2)		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-DOVER, DELAWARE
2. POLE BASES, CABINET BASE, AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED EXCEPT WHERE SHOWN.
3. ALL GALVANIZED RIGID CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
4. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY FOR THE UTILITY MARKOUTS PRIOR TO THE BEGINNING OF CONSTRUCTION. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
5. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.
6. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (5Ø) OR FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHALL BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL. ALL PEDESTRIAN SIGNAL HEADS SHALL BE COUNTDOWN TYPE.
7. ALL #1, #3, #5, AND #7 CONDUITS SHALL BE SCHEDULE 80 PVC WITH THE EXCEPTION OF 4" BORED CONDUIT WHICH SHALL BE SDR-13.5 HDPE. ALL 1" CONDUITS LESS THAN OR EQUAL TO 6'-0" SHALL BE LIQUID TIGHT FLEXIBLE NON-METALLIC AND ALL 1" CONDUITS GREATER THAN 6'-0" SHALL BE RIGID GALVANIZED.

RECOMMENDED _____ DATE: 05/15/13

RECOMMENDED Christina Dane DATE: 7/12/13

RECOMMENDED _____ DATE: _____

APPROVED TRAFFIC ENGINEER _____ DATE: 7/12/13

APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER _____ DATE: 7/12/13

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SCALE 0 30 60 90 FEET

SR 26, ATLANTIC AVENUE FROM CLARKSVILLE TO ASSAWOMAN CANAL

CONTRACT	PERMIT NO.	S299
T200411210	DESIGNED BY:	MSK
COUNTY	CHECKED BY:	BAM
SUSSEX		

SIGNAL PLAN SR 26 @ WEST AVENUE

SHEET NO. 545

TOTAL SHTS. 589

7/10/2013
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SPAN WIRE SCHEDULE

SPAN	LENGTH	SPAN MOUNT HEIGHT	5% SAG	SPAN LOW POINT	BOTTOM OF LOWEST HEAD
*NORTH	67 FT	25.0 FT	3.35 FT	21.65 FT	17.15 FT
*EAST	83 FT	26.0 FT	4.15 FT	21.85 FT	17.35 FT
*SOUTH	88 FT	26.0 FT	4.40 FT	21.60 FT	17.10 FT
*WEST	96 FT	26.0 FT	4.80 FT	21.20 FT	16.70 FT

NOTE: FIELD ADJUSTMENTS AS REQUIRED

POLE SCHEDULE

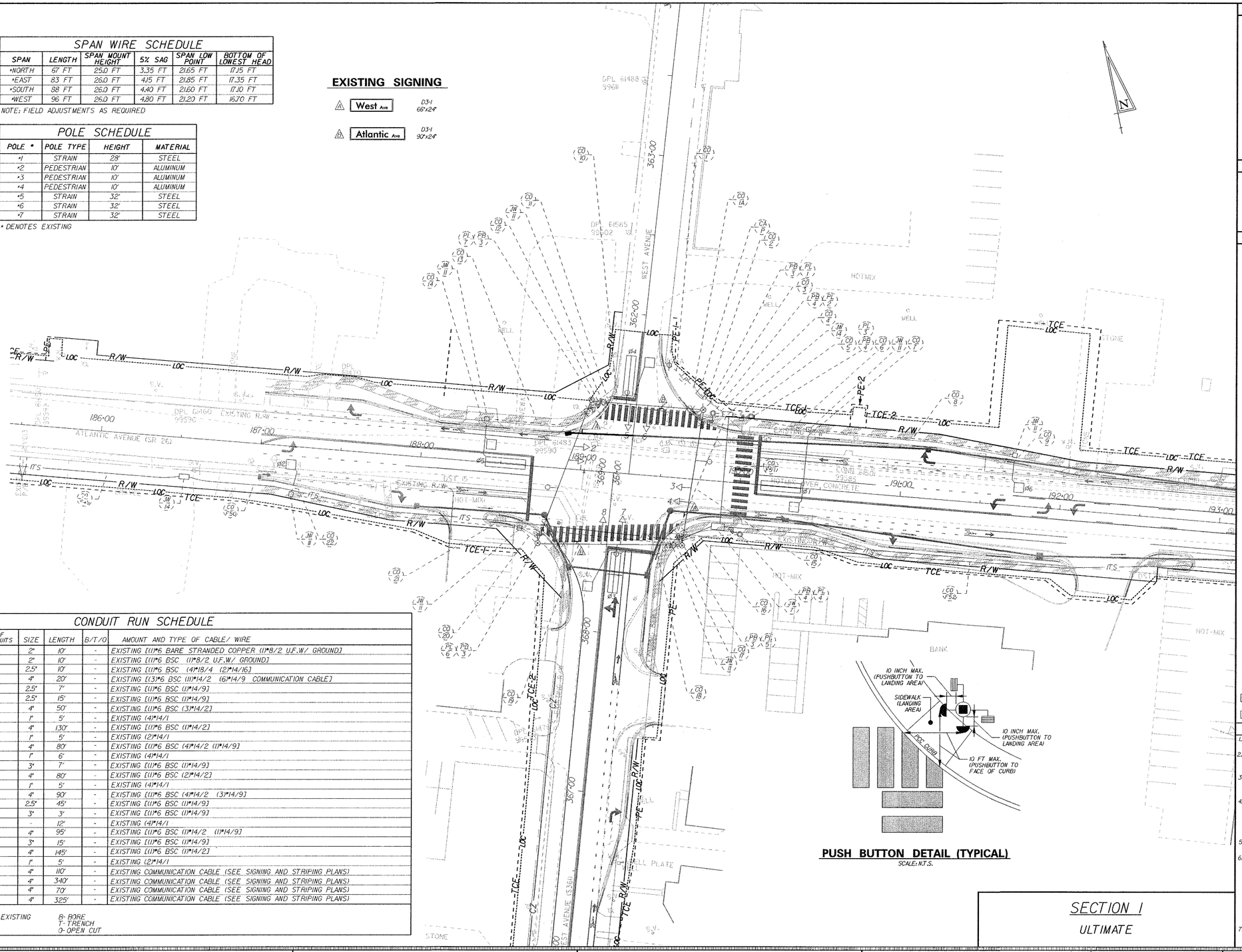
POLE *	POLE TYPE	HEIGHT	MATERIAL
*1	STRAIN	28'	STEEL
*2	PEDESTRIAN	10'	ALUMINUM
*3	PEDESTRIAN	10'	ALUMINUM
*4	PEDESTRIAN	10'	ALUMINUM
*5	STRAIN	32'	STEEL
*6	STRAIN	32'	STEEL
*7	STRAIN	32'	STEEL

* DENOTES EXISTING

EXISTING SIGNING

D3-1 66"x24" — West Ave

D3-1 90"x24" — Atlantic Ave



PUSH BUTTON DETAIL (TYPICAL)

SCALE: N.T.S.

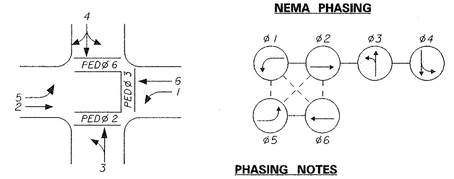
CONDUIT RUN SCHEDULE

CO*	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
*1	1	2"	10'	-	EXISTING ((1)#6 BARE STRANDED COPPER ((1)#8/2 U.F.W/ GROUND)
*1A	1	2"	10'	-	EXISTING ((1)#6 BSC ((1)#8/2 U.F.W/ GROUND)
*2	1	2.5"	10'	-	EXISTING ((1)#6 BSC (4)#18/4 (2)#14/16)
*3	3	4"	20'	-	EXISTING ((3)#6 BSC ((1)#14/2 (6)#14/9 COMMUNICATION CABLE)
*4	1	2.5"	7'	-	EXISTING ((1)#6 BSC ((1)#14/9)
*5	1	2.5"	15'	-	EXISTING ((1)#6 BSC ((1)#14/9)
*6	1	4"	50'	-	EXISTING ((1)#6 BSC (3)#14/2)
*7	1	1"	5'	-	EXISTING (4)#14/1
*8	1	4"	130'	-	EXISTING ((1)#6 BSC ((1)#14/2)
*9	1	1"	5'	-	EXISTING (2)#14/1
*10	1	4"	80'	-	EXISTING ((1)#6 BSC (4)#14/2 ((1)#14/9)
*11	1	1"	6'	-	EXISTING (4)#14/1
*12	1	3"	7'	-	EXISTING ((1)#6 BSC ((1)#14/9)
*13	1	4"	80'	-	EXISTING ((1)#6 BSC (2)#14/2)
*14	1	1"	5'	-	EXISTING (4)#14/1
*15	1	4"	90'	-	EXISTING ((1)#6 BSC (4)#14/2 (3)#14/9)
*16	1	2.5"	45'	-	EXISTING ((1)#6 BSC ((1)#14/9)
*17	1	3"	3'	-	EXISTING ((1)#6 BSC ((1)#14/9)
*18	1	-	12'	-	EXISTING (4)#14/1
*19	1	4"	95'	-	EXISTING ((1)#6 BSC ((1)#14/2 ((1)#14/9)
*20	1	3"	15'	-	EXISTING ((1)#6 BSC ((1)#14/9)
*21	1	4"	145'	-	EXISTING ((1)#6 BSC ((1)#14/2)
*22	1	1"	5'	-	EXISTING (2)#14/1
*F49	1	4"	110'	-	EXISTING COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F50	1	4"	340'	-	EXISTING COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F51	1	4"	70'	-	EXISTING COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)
*F52	1	4"	325'	-	EXISTING COMMUNICATION CABLE (SEE SIGNING AND STRIPING PLANS)

LEGEND
* DENOTES EXISTING — B- BORE, T- TRENCH, O- OPEN CUT

SIGNAL PHASING

NEMA PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

	PROPOSED SIGNAL CABINET	(RM/C)	REMOVE BY CONTRACTOR
	EXISTING SIGNAL CABINET	(RM/O)	REMOVE BY OTHERS
	PROPOSED SIGNAL POLE BASE	(AB)	ABANDON
	EXISTING SIGNAL POLE BASE	(PB/X)	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	PROPOSED PEDESTRIAN POLE BASE	(PB/X)	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
	EXISTING PEDESTRIAN POLE BASE	(PL/X)	PROPOSED POLE IDENTIFIER (* OF POLE)
	PROPOSED WOOD POLE	(PL/X)	EXISTING POLE IDENTIFIER (* OF POLE)
	EXISTING WOOD POLE	(JW/X)	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	PROPOSED JUNCTION WELL	(JW/X)	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	EXISTING JUNCTION WELL	(CO/•)	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
	PROPOSED SIGNAL HEAD	(CO/•)	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
	EXISTING SIGNAL HEAD	(OH/•)	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
	PROPOSED PEDESTRIAN SIGNAL HEAD	(OH/•)	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
	EXISTING PEDESTRIAN SIGNAL HEAD	(MA/XX)	PROPOSED MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	PROPOSED PEDESTRIAN PUSHBUTTON	(MA/XX)	EXISTING MAST ARM IDENTIFIER (SEE MAST ARM SCHEDULE)
	EXISTING PEDESTRIAN PUSHBUTTON	(CA/X)	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
	PROPOSED VIDEO DETECTION	(CA/X)	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
	EXISTING VIDEO DETECTION		PROPOSED SPAN WIRE
	PROPOSED MICROWAVE DETECTION	XX	EXISTING SPAN WIRE
	EXISTING MICROWAVE DETECTION		RIGHT-OF-WAY OR PROPERTY LINE
	OVERHEAD SIGNING		PROPOSED SPAN INSULATOR
	PROPOSED OPTICOM RECEIVER		EXISTING SPAN INSULATOR
	EXISTING OPTICOM RECEIVER	P	SERVICE PEDESTAL
	PROPOSED MAST ARM		PROPOSED CCTV
	EXISTING MAST ARM		EXISTING CCTV
	PROPOSED LUMINAIRE		PROPOSED PLASTIC DRUMS
	EXISTING LUMINAIRE		EXISTING PLASTIC DRUMS
	PROPOSED LOOP DETECTOR (TYPE 1 OR 2)		
	EXISTING LOOP DETECTOR (TYPE 1 OR 2)		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-DOVER, DELAWARE
2. POLE BASES, CABINET BASE, AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED EXCEPT WHERE SHOWN.
3. ALL GALVANIZED RIGID CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
4. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY FOR THE UTILITY MARKOUTS PRIOR TO THE BEGINNING OF CONSTRUCTION. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
5. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.
6. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (5.0%) OR FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHALL BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL. ALL PEDESTRIAN SIGNAL HEADS SHALL BE COUNTDOWN TYPE.
7. ALL 4", 3", 2.5", AND 2" CONDUITS SHALL BE SCHEDULE 80 PVC WITH THE EXCEPTION OF 4" BORED CONDUIT WHICH SHALL BE SDR-13.5 HDPE. ALL 1" CONDUITS LESS THAN OR EQUAL TO 6'-0" SHALL BE LIQUID TIGHT FLEXIBLE NON-METALLIC AND ALL 1" CONDUITS GREATER THAN 6'-0" SHALL BE RIGID GALVANIZED.

SECTION 1
ULTIMATE

RECOMMENDED _____ DATE: 05/15/13

RECOMMENDED Clutna Dave DATE: 7/12/13

RECOMMENDED _____ DATE: _____

APPROVED TRAFFIC ENGINEER _____ DATE: 7/12/13

APPROVED FOR INSTALLATION
CHIEF TRAFFIC ENGINEER _____ DATE: 7/12/13

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

SCALE 0 30 60 90 FEET

SR 26, ATLANTIC AVENUE FROM CLARKSVILLE TO ASSAWOMAN CANAL

CONTRACT	T200411210
COUNTY	SUSSEX
PERMIT NO.	S299
DESIGNED BY:	MSK
CHECKED BY:	BAM

SIGNAL PLAN SR 26 @ WEST AVENUE (ULTIMATE)

SHEET NO. 546
TOTAL SHTS. 589

7/10/2013
16:45:59
68459/JECTS\sr26mainline\Survey\tp1-ultimate_signal_west.dgn

ADDITIONAL GENERAL SIGNAL NOTES

3. POLE BASES, CABINET BASES, AND CONDUIT JUNCTION WELLS TO BE REMOVED IN ACCORDANCE WITH SECTION 211 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY THE ENGINEER. EXISTING CONDUIT SHALL BE ABANDONED.

4. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED, AND COMPRESSION FITTING ARE NOT ACCEPTABLE.

5. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHOULD BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (5.0% OR FLATTER) LANDING AREA OF THE CURB RAMP WHEN POSSIBLE. WHERE THERE ARE PHYSICAL CONSTRAINTS THAT MAKE IT IMPRACTICAL TO PLACE THE PEDESTRIAN PUSHBUTTON ADJACENT TO A LEVEL ALL-WEATHER SURFACE, THE SURFACE SHOULD BE AS LEVEL AS FEASIBLE. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE ADJOINING SIDEWALK, AND SHOULD BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE DOES NOT EXCEED 10 INCHES FROM THE ADJOINING SIDEWALK TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE.

6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF ALL UNDERGROUND SIGNAL EQUIPMENT SUCH AS JUNCTION WELLS, CABINET FOUNDATION, POLE BASES, AND CONDUIT. DELDOT'S TRAFFIC CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF ALL ELECTRICAL CABLES AND ABOVE GROUND SIGNAL EQUIPMENT SUCH AS MAST ARMS, SPAN WIRES, POLES, CABINETS, SERVICE PEDESTALS, AND SIGNAL HEADS, AS NECESSARY.

7. PRIOR TO SHIFTING LANES TO THE PHASE 1 SETUP, SIGNAL CONTROLLER CABINET, MAST ARMS, TEMPORARY WOOD POLES, SPAN WIRE, SIGNAL HEADS, FISHEYE CAMERAS, OPTICOMS, AND NECESSARY CABLES SHALL BE INSTALLED. ALL SIGNAL HEADS ARE TO BE CONTROLLED BY THE PROPOSED CONTROLLER CABINET DURING THIS PHASE. THE EXISTING CONTROLLER AND SIGNAL SETUP SHALL BE MAINTAINED UNTIL THE PROPOSED SIGNAL LAYOUT IS OPERATIONAL. IN ADDITION, THE EXISTING POWER SOURCE TO THE EXISTING CONTROLLER CABINET SHALL BE MAINTAINED UNTIL THE PROPOSED CONTROLLER CABINET IS POWERED FROM THE PROPOSED POWER SOURCE.

8 ALL VIDEO DETECTORS SHALL BE INSTALLED ON THE MAST ARMS TO ACHIEVE OPTIMUM DETECTION PER MANUFACTURER'S SPECIFICATIONS. THE DESIRED DETECTION ZONES SHALL BE SET AND APPROVED BY DELDOT.

9. ALL EXISTING SIGNAL EQUIPMENT TO REMAIN UNLESS OTHERWISE NOTED.

10. INSTALL CONDUITS *24 AND *25 AT A MINIMUM OF 24" IN ORDER TO AVOID CONFLICTS WITH RIP RAP APRON.

11. INSTALL TEMPORARY 50' CLASS II WOODEN POLES AT STATION 982+43 OFFSET 75' RIGHT AND AT STATION 983+95 OFFSET 87' LEFT WITH THREE GUY WIRES.

12. REMOVE ALL SIGNAL HEADS FROM EXISTING SPAN WIRE. INSTALL SIGNAL HEADS *1-4, *7 AND *8 ON THE TEMPORARY SPAN WIRE. INSTALL SIGNAL HEADS *5 AND *6 ON MAST ARM *2.

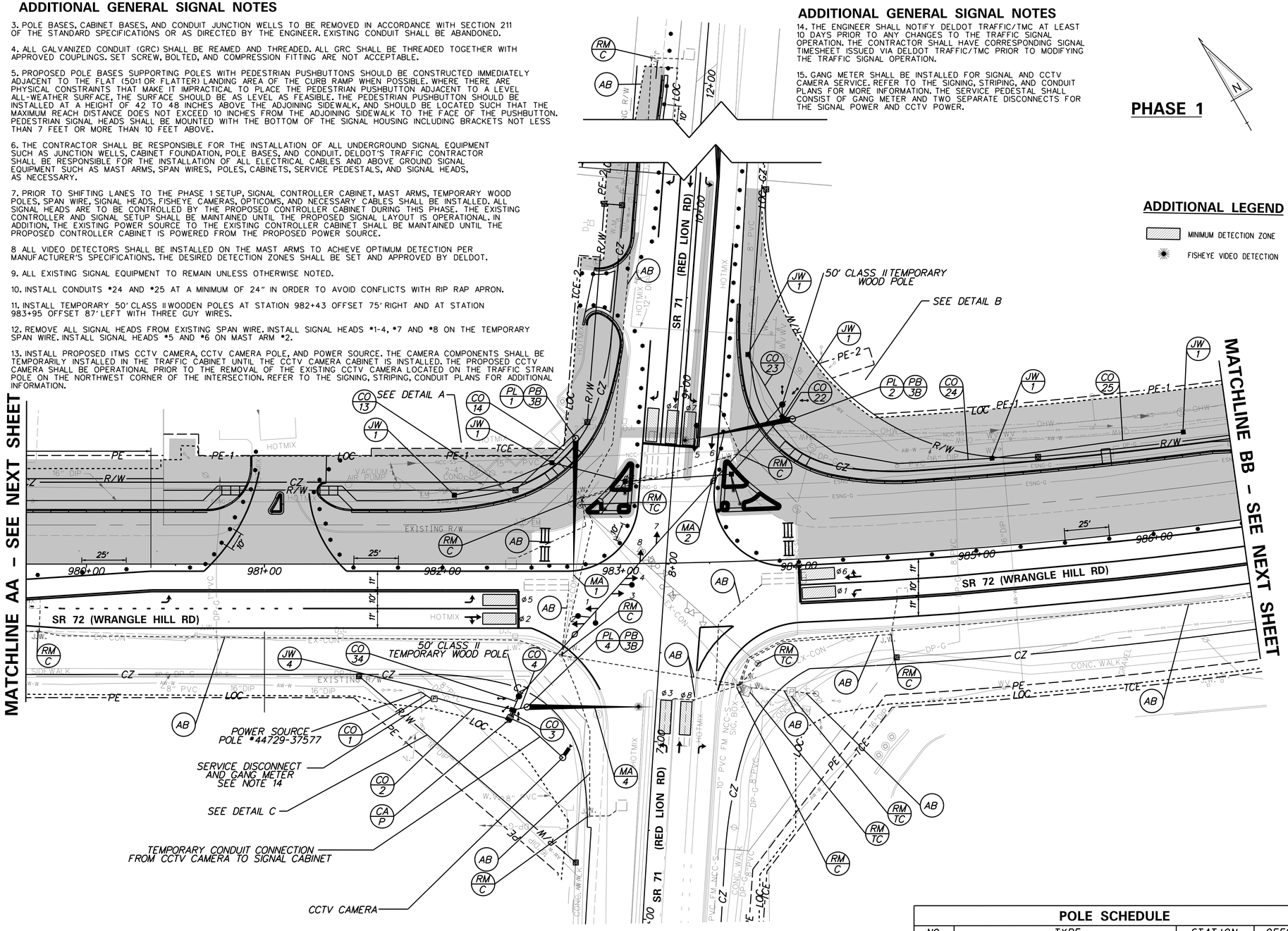
13. INSTALL PROPOSED ITMS CCTV CAMERA, CCTV CAMERA POLE, AND POWER SOURCE. THE CAMERA COMPONENTS SHALL BE TEMPORARILY INSTALLED IN THE TRAFFIC CABINET UNTIL THE CCTV CAMERA CABINET IS INSTALLED. THE PROPOSED CCTV CAMERA SHALL BE OPERATIONAL PRIOR TO THE REMOVAL OF THE EXISTING CCTV CAMERA LOCATED ON THE TRAFFIC STRAIN POLE ON THE NORTHWEST CORNER OF THE INTERSECTION. REFER TO THE SIGNING, STRIPING, CONDUIT PLANS FOR ADDITIONAL INFORMATION.

ADDITIONAL GENERAL SIGNAL NOTES

14. THE ENGINEER SHALL NOTIFY DELDOT TRAFFIC/TMC AT LEAST 10 DAYS PRIOR TO ANY CHANGES TO THE TRAFFIC SIGNAL OPERATION. THE CONTRACTOR SHALL HAVE CORRESPONDING SIGNAL TIMESHEET ISSUED VIA DELDOT TRAFFIC/TMC PRIOR TO MODIFYING THE TRAFFIC SIGNAL OPERATION.

15. GANG METER SHALL BE INSTALLED FOR SIGNAL AND CCTV CAMERA SERVICE. REFER TO THE SIGNING, STRIPING, AND CONDUIT PLANS FOR MORE INFORMATION. THE SERVICE PEDESTAL SHALL CONSIST OF GANG METER AND TWO SEPARATE DISCONNECTS FOR THE SIGNAL POWER AND CCTV POWER.

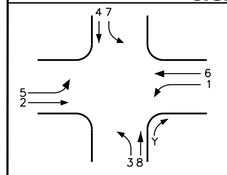
PHASE 1



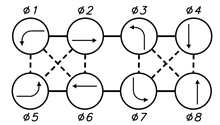
ADDITIONAL LEGEND

- MINIMUM DETECTION ZONE
- FISHEYE VIDEO DETECTION

SIGNAL PHASING



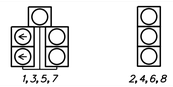
NEMA PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

AB	ABANDON	OH •	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH •	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO •	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO •	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (* OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (* OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1	⬚	□
LOOP DETECTOR, TYPE 2	⬚⬚	▭
LUMINAIRE	—○	—●
MAST ARM	⟩	▶
MICROWAVE DETECTION	◀	◀
OPTICOM RECEIVER	—○	—●
OVERHEAD SIGNING	⊣	⊣
PEDESTRIAN POLE/BASE	◎	◉
PEDESTRIAN PUSHBUTTON	—▯	—▶
PEDESTRIAN SIGNAL HEAD	▭	▬
RIGHT-OF-WAY	— — —	—R/W—
SERVICE PEDESTAL	P	P
SIGNAL CABINET	▭	■
SIGNAL HEAD	—▷	—▶
SIGNAL POLE/BASE	⊗	⊙
CCTV CAMERA	CCTV	■
SPAN WIRE	— XX —	—◇—
UTILITY POLE	⊘	●
VIDEO DETECTION	◀	◀

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.

MAST ARM SCHEDULE

NO.	LENGTH	NO. OF SIGNAL HEADS	S.F. OF SIGNAGE
1	80' MAST ARM	-	- S.F.
2	60' MAST ARM	1-3 SECTION & 1-5 SECTION	- S.F.
4	70' MAST ARM	-	- S.F.

SPAN WIRE SCHEDULE

SPAN	LENGTH	SPAN MOUNT HEIGHT	SAG	SPAN LOW POINT	BOTTOM OF LOWEST HEAD
TEMP.	220'	31 FT	11 FT @ 5.0%	20.0 FT	17.0 FT

FIELD ADJUSTMENTS AS NECESSARY
LOW POINT TAKEN WITH RESPECT TO THE ROADWAY ELEVATION

POLE SCHEDULE

NO.	TYPE	STATION	OFFSET
1	80' MAST ARM W/ TYPE 3B BASE	982+75	71' LT
2	60' MAST ARM W/ TYPE 3B BASE	984+00	79' LT
4	70' MAST ARM W/ TYPE 3B BASE	982+48	80' RT
5	PEDESTAL POLE W/ TYPE 4A BASE	982+93	31' LT
6	PEDESTAL POLE W/ TYPE 4A BASE	983+03	40' LT
7	PEDESTAL POLE W/ TYPE 4A BASE	983+65	40' LT
8	PEDESTAL POLE W/ TYPE 4A BASE	983+68	32' LT

PREPARED BY
JMT

Mir Abe Waked — 10/15/2021
THIS SEAL APPLIES TO ALL SHEETS BEARING THE "JMT" SECTION DESIGNATION. — DATE

MIR A. WAHED — LICENSE — No. 14810 — DELAWARE — PROFESSIONAL ENGINEER
SEAL

CONCURRENCE FOR INSTALLATION

CHIEF OF TRAFFIC ENGINEERING — 10/18/2021 DATE

ADDENDA / REVISIONS

SCALE
0 30 60 90
FEET

SR 72,
McCOY ROAD
TO SR 71

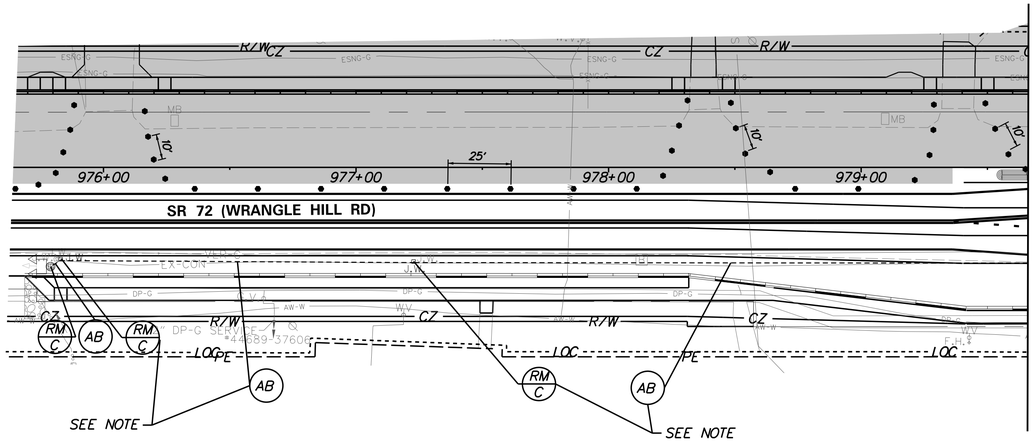
CONTRACT	PERMIT NO.	N266
T200601102	DESIGNED BY: J. SMITH	
COUNTY	CHECKED BY: M. WAHED	
NEW CASTLE		

SIGNAL PLAN
WRANGLE HILL ROAD (SR 72)
AND RED LION ROAD (SR 71)

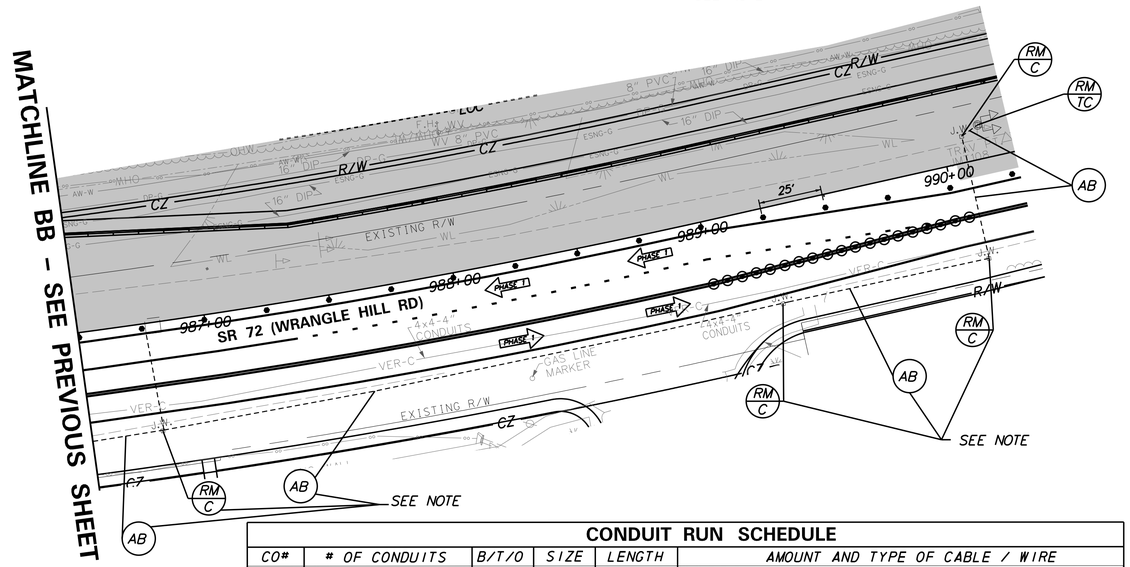
SECTION	JMT
SHEET NO.	234

PLOTTED BY: JDSMITH DATE: 10/13/2021 [SHEET1: SG01_SR 72 and 71_Phs 1_01]
FILE LOCATION: Q:\NDE\110500_017_SR_72_McCOY_RD_TO_SR\CADD\CADD SR 72 ROADWAY WIDENING\SG_SR 72 AND SR 71.DGN

NOTE: DURING PHASE 2 REMOVE JUNCTION WELLS AND CONDUIT.



MATCHLINE AA – SEE SHEET 1

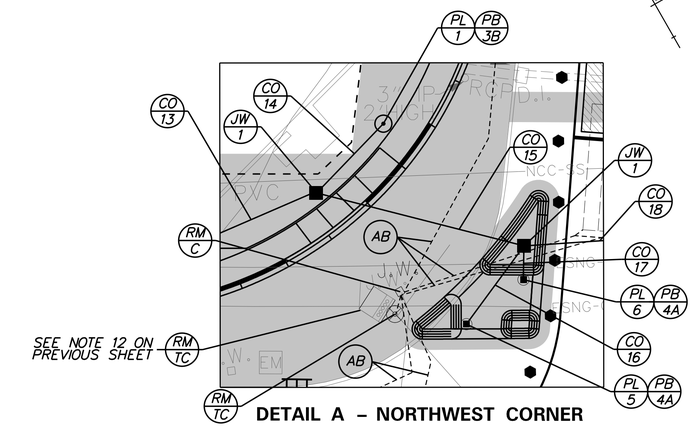


CONDUIT RUN SCHEDULE

CO#	# OF CONDUITS	B/T/O	SIZE	LENGTH	AMOUNT AND TYPE OF CABLE / WIRE
1	1 (GALV. STEEL)	T	2"	10'	(2)1/#6, (1)1/#6 GRD
2	1 (GALV. STEEL)	T	2"	45'	(1)2/#8 U.F. W/GROUND
3	4	T	4"	5'	(4)4/#18, (3)16/#14, GRIDSMART CAT5E CABLE, (4)1/#6 GRD
4	1	T	3"	10'	GRIDSMART CAT5E CABLE, (1)1/#6 GRD
13	1	T	4"	60'	EMPTY
14	1	T	3"	20'	EMPTY
15	1	T	4"	45'	EMPTY
16	1	T	2.5"	20'	EMPTY
17	1	T	2.5"	10'	EMPTY
18	1 (SCHD 80 HDPE)	B	4"	60'	EMPTY
19	1	T	2.5"	20'	EMPTY
20	1	T	2.5"	20'	EMPTY
21	1	T	4"	45'	EMPTY
22	1	T	3"	10'	(1)16/#14, (1) 4/#18, GRIDSMART CAT5E CABLE, (1)1/#6 GRD
23	1	T	4"	40'	EMPTY
24	1	T	4"	125'	EMPTY
25	1	T	4"	110'	EMPTY
34	1	T	3"	10'	(3)16/#14, (4)4/#18, GRIDSMART CAT5E CABLE, (1)1/#6 GRD
35	1	T	3'	10'	(1)16/#14, (1) 4/#18 GRIDSMART CAT5E CABLE, (1)1/#6 GRD

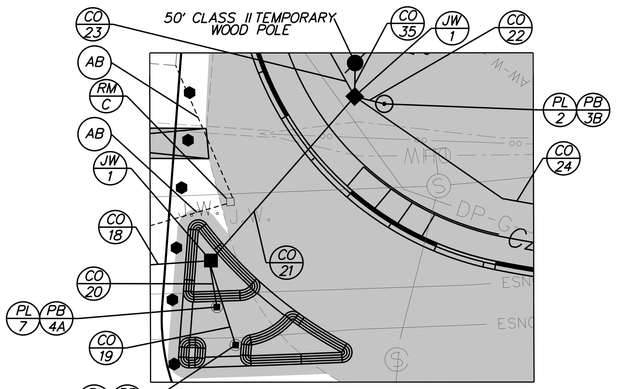
B=BORE, T=TRENCH, O=OPEN CUT
ALL CONDUITS SHALL BE SCHEDULE 80 PVC UNLESS OTHERWISE NOTED.

PHASE 1



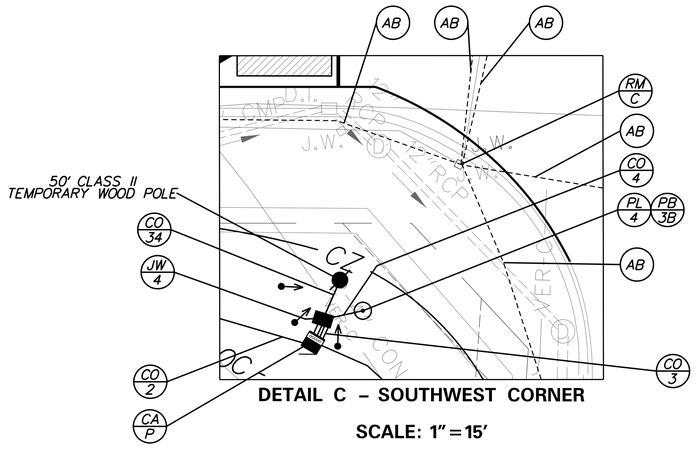
DETAIL A – NORTHWEST CORNER

SCALE: 1" = 15'



DETAIL B – NORTHEAST CORNER

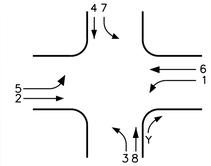
SCALE: 1" = 15'



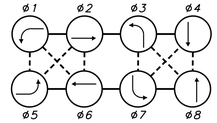
DETAIL C – SOUTHWEST CORNER

SCALE: 1" = 15'

SIGNAL PHASING



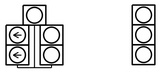
NEMA PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



1,3,5,7 2,4,6,8

LEGEND

AB	ABANDON	OH •	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH •	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO •	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO •	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (* OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (* OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
CCTV CAMERA		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.

PREPARED BY
JMT

Mir Abe Waked — 10/15/2021
THIS SEAL APPLIES TO ALL SHEETS BEARING THE "JMT" SECTION DESIGNATION. — DATE

MIR A. WAHED LICENSE No. 14810 DELAWARE PROFESSIONAL ENGINEER
SEAL

CONCURRENCE FOR INSTALLATION

CHIEF OF TRAFFIC ENGINEERING — 10/18/2021 DATE

ADDENDA / REVISIONS

SCALE
0 30 60 90
FEET

SR 72,
McCOY ROAD
TO SR 71

CONTRACT	PERMIT NO.	N266
T200601102	DESIGNED BY: J. SMITH	
COUNTY	CHECKED BY: M. WAHED	
NEW CASTLE		

SIGNAL PLAN
WRANGLE HILL ROAD (SR 72)
AND RED LION ROAD (SR 71)

SECTION	JMT
SHEET NO.	235

PLOTTED BY: JDSMITH DATE: 10/14/2021
FILE LOCATION: Q:\NDE\110500_017_SR_72_MCCOY_RD_TO_SR\CADD\CADD SR 72 ROADWAY WIDENING\SG_SR 72 AND SR 71.DGN [SHEET: SG02_SR 72 and 71_Phs 1_02]

ADDITIONAL GENERAL SIGNAL NOTES

3. POLE BASES, CABINET BASES, AND CONDUIT JUNCTION WELLS TO BE REMOVED IN ACCORDANCE WITH SECTION 211 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY THE ENGINEER. EXISTING CONDUIT SHALL BE ABANDONED.

4. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED, AND COMPRESSION FITTING ARE NOT ACCEPTABLE.

5. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHOULD BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (50:1 OR FLATTER) LANDING AREA OF THE CURB RAMP WHEN POSSIBLE. WHERE THERE ARE PHYSICAL CONSTRAINTS THAT MAKE IT IMPRACTICAL TO PLACE THE PEDESTRIAN PUSHBUTTON ADJACENT TO A LEVEL ALL-WEATHER SURFACE, THE SURFACE SHOULD BE AS LEVEL AS FEASIBLE. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE ADJOINING SIDEWALK, AND SHOULD BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE DOES NOT EXCEED 10 INCHES FROM THE ADJOINING SIDEWALK TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE.

6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF ALL UNDERGROUND SIGNAL EQUIPMENT SUCH AS JUNCTION WELLS, CABINET FOUNDATION, POLE BASES, AND CONDUIT. DELDOT'S TRAFFIC CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF ALL ELECTRICAL CABLES AND ABOVE GROUND SIGNAL EQUIPMENT SUCH AS MAST ARMS, SPAN WIRES, POLES, CABINETS, SERVICE PEDESTALS, AND SIGNAL HEADS, AS NECESSARY.

7. ADJUST VIDEO DETECTION ZONES AS NECESSARY.

8 SLIDE SIGNAL HEADS *1-4 AND *7-8 PER THE PLANS. SIGNAL HEADS *5-6 TO REMAIN.

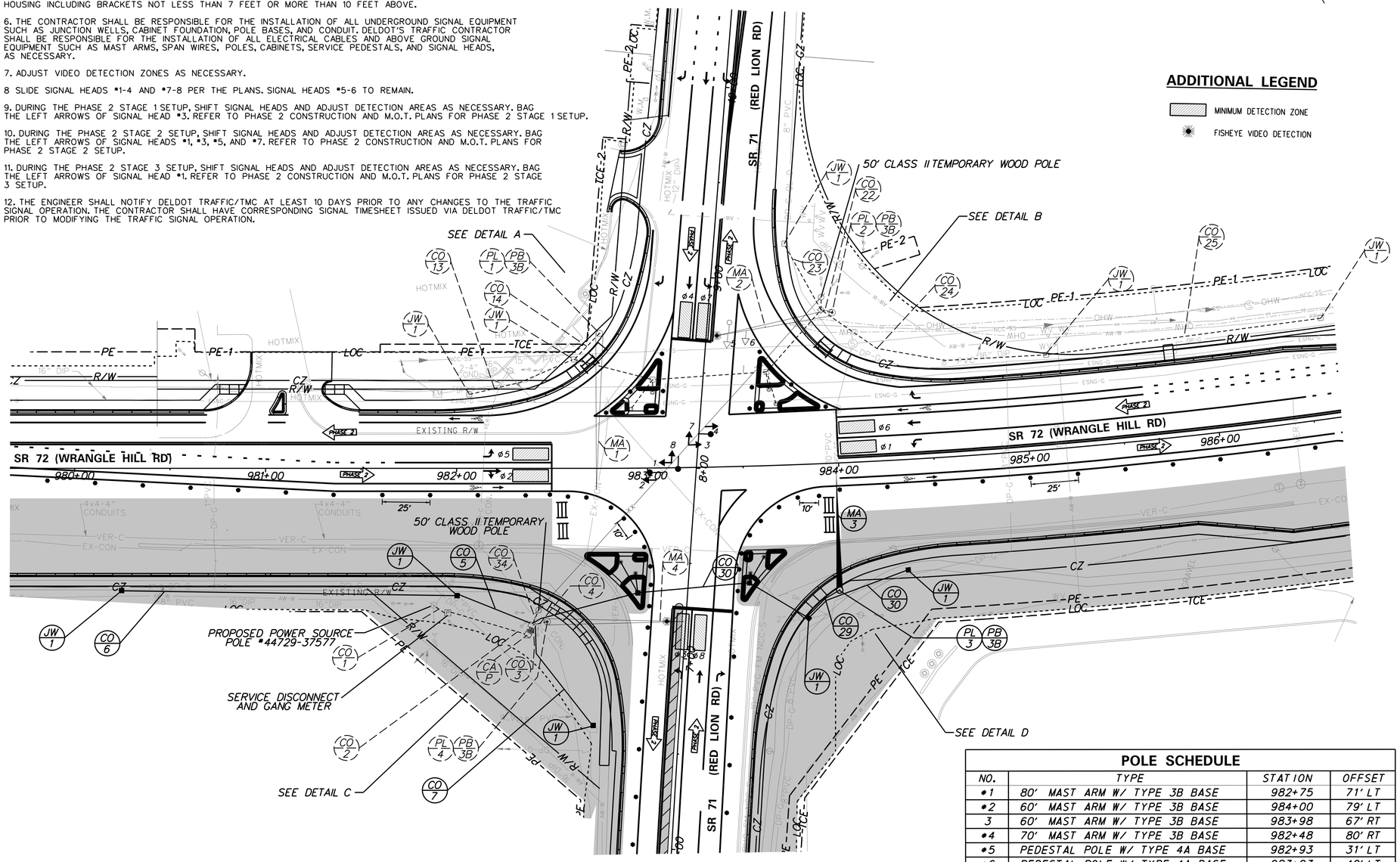
9. DURING THE PHASE 2 STAGE 1 SETUP, SHIFT SIGNAL HEADS AND ADJUST DETECTION AREAS AS NECESSARY. BAG THE LEFT ARROWS OF SIGNAL HEAD *3. REFER TO PHASE 2 CONSTRUCTION AND M.O.T. PLANS FOR PHASE 2 STAGE 1 SETUP.

10. DURING THE PHASE 2 STAGE 2 SETUP, SHIFT SIGNAL HEADS AND ADJUST DETECTION AREAS AS NECESSARY. BAG THE LEFT ARROWS OF SIGNAL HEADS *1, *3, *5, AND *7. REFER TO PHASE 2 CONSTRUCTION AND M.O.T. PLANS FOR PHASE 2 STAGE 2 SETUP.

11. DURING THE PHASE 2 STAGE 3 SETUP, SHIFT SIGNAL HEADS AND ADJUST DETECTION AREAS AS NECESSARY. BAG THE LEFT ARROWS OF SIGNAL HEAD *1. REFER TO PHASE 2 CONSTRUCTION AND M.O.T. PLANS FOR PHASE 2 STAGE 3 SETUP.

12. THE ENGINEER SHALL NOTIFY DELDOT TRAFFIC/TMC AT LEAST 10 DAYS PRIOR TO ANY CHANGES TO THE TRAFFIC SIGNAL OPERATION. THE CONTRACTOR SHALL HAVE CORRESPONDING SIGNAL TIMESHEET ISSUED VIA DELDOT TRAFFIC/TMC PRIOR TO MODIFYING THE TRAFFIC SIGNAL OPERATION.

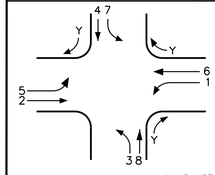
PHASE 2



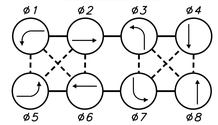
ADDITIONAL LEGEND

- MINIMUM DETECTION ZONE
- FISHEYE VIDEO DETECTION

SIGNAL PHASING



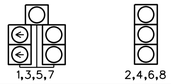
NEMA PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

AB	ABANDON	OH •	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH •	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO •	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO •	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (* OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (* OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL		
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
CCTV CAMERA		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION		

GENERAL SIGNAL NOTES

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MAST ARM SCHEDULE

NO.	LENGTH	NO. OF SIGNAL HEADS	S.F. OF SIGNAGE
*1	80' MAST ARM	-	- S.F.
*2	60' MAST ARM	1-3 SECTION & 1-5 SECTION	- S.F.
3	60' MAST ARM	-	- S.F.
*4	70' MAST ARM	-	- S.F.

* - EXISTING OR CONSTRUCTED DURING PREVIOUS PHASE

SPAN WIRE SCHEDULE

SPAN	LENGTH	SPAN MOUNT HEIGHT	SAG	SPAN LOW POINT	BOTTOM OF LOWEST HEAD
*TEMP.	220'	31 FT	11 FT @ 5.0%	20.0 FT	17.0 FT

* - EXISTING OR CONSTRUCTED DURING PREVIOUS PHASE
FIELD ADJUSTMENTS AS NECESSARY
LOW POINT TAKEN WITH RESPECT TO THE ROADWAY ELEVATION

POLE SCHEDULE

NO.	TYPE	STATION	OFFSET
*1	80' MAST ARM W/ TYPE 3B BASE	982+75	71' LT
*2	60' MAST ARM W/ TYPE 3B BASE	984+00	79' LT
3	60' MAST ARM W/ TYPE 3B BASE	983+98	67' RT
*4	70' MAST ARM W/ TYPE 3B BASE	982+48	80' RT
*5	PEDESTAL POLE W/ TYPE 4A BASE	982+93	31' LT
*6	PEDESTAL POLE W/ TYPE 4A BASE	983+03	40' LT
*7	PEDESTAL POLE W/ TYPE 4A BASE	983+65	40' LT
*8	PEDESTAL POLE W/ TYPE 4A BASE	983+68	32' LT
9	PEDESTAL POLE W/ TYPE 4A BASE	983+60	48' RT
10	PEDESTAL POLE W/ TYPE 4A BASE	983+52	56' RT
11	PEDESTAL POLE W/ TYPE 4A BASE	982+93	55' RT
12	PEDESTAL POLE W/ TYPE 4A BASE	982+86	49' RT

* - EXISTING OR CONSTRUCTED DURING PREVIOUS PHASE

PREPARED BY
JMT

Mir A. Wahed — 10/15/2021
THIS SEAL APPLIES TO ALL SHEETS BEARING THE "JMT" SECTION DESIGNATION. — DATE

MIR A. WAHED LICENSE No. 14810 DELAWARE PROFESSIONAL ENGINEER
SEAL

CONCURRENCE FOR INSTALLATION

CHIEF OF TRAFFIC ENGINEERING — 10/18/2021 DATE

ADDENDA / REVISIONS

SCALE 0 30 60 90 FEET

SR 72, McCOY ROAD TO SR 71

CONTRACT	PERMIT NO.	N266
T200601102	DESIGNED BY: J. SMITH	
COUNTY	CHECKED BY: M. WAHED	
NEW CASTLE		

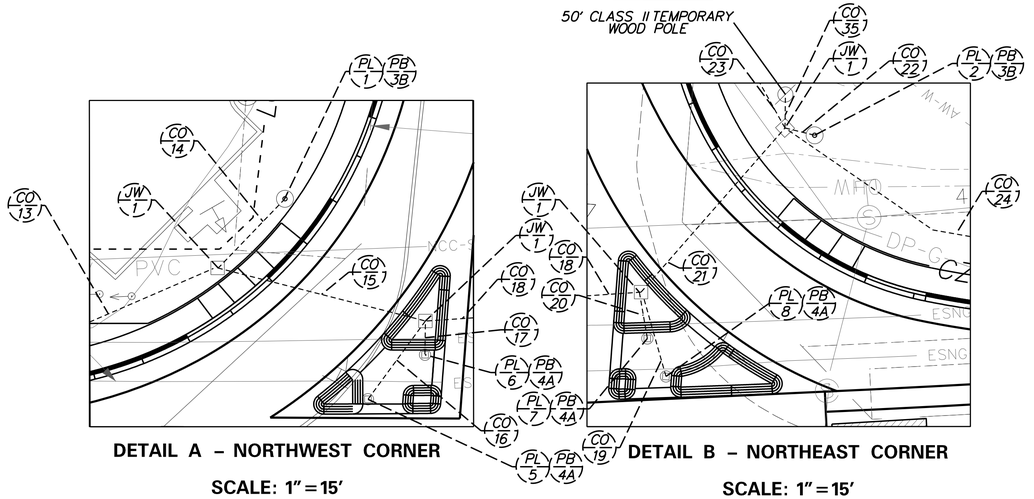
SIGNAL PLAN WRANGLE HILL ROAD (SR 72) AND RED LION ROAD (SR 71)

SECTION JMT
SHEET NO. 236

PLOTTED BY: JDSMITH DATE: 10/13/2021
FILE LOCATION: Q:\NDE\110500_017_SR_72_MCCOY_RD_TO_SR\CADD\CADD SR 72 ROADWAY WIDENING\SG_SR 72 AND SR 71.DGN [SHEET: SG03_SR 72 and 71_Phs 2_01]

PLOTTED BY: JDSMITH DATE: 10/13/2021
FILE LOCATION: Q:\NDE\110500_017_SR_72_MCCOY_RD_TO_SR\CADD\CADD SR 72 ROADWAY WIDENING\SG_SR 72 AND SR 71.DGN [SHEET: SG04_SR72 and 71_Phs 2_02]

PHASE 2

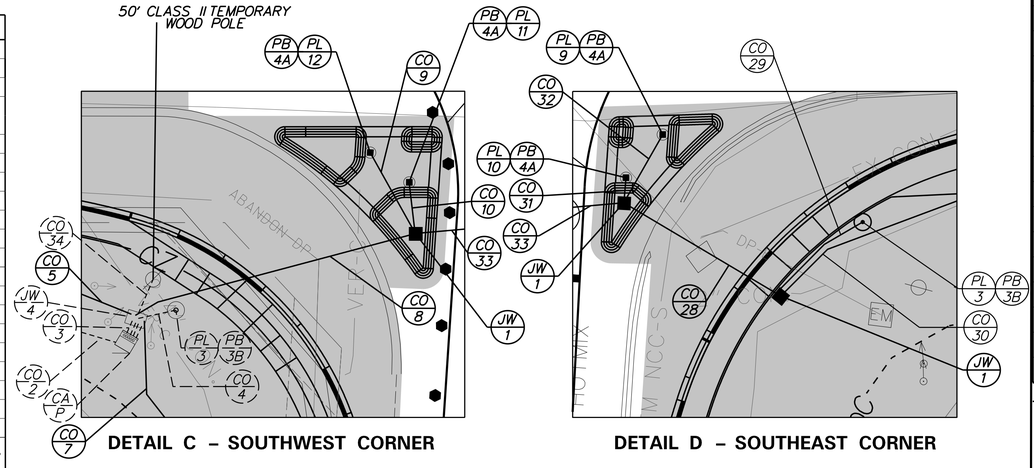


DETAIL A – NORTHWEST CORNER

SCALE: 1″ = 15′

DETAIL B – NORTHEAST CORNER

SCALE: 1″ = 15′



DETAIL C – SOUTHWEST CORNER

SCALE: 1″ = 15′

DETAIL D – SOUTHEAST CORNER

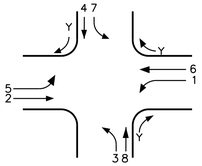
SCALE: 1″ = 15′

CONDUIT RUN SCHEDULE

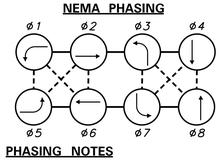
CO#	# OF CONDUITS	B/T/O	SIZE	LENGTH	AMOUNT AND TYPE OF CABLE / WIRE
*1	1 (GALV. STEEL)	-	2″	10′	EX. [(2)1/#6, (1)1/#6 GRD]
*2	1 (GALV. STEEL)	-	2″	45′	EX. [(1)2/#8 U.F. W/GROUND]
*3	4	-	4″	5′	EX. [(4)4/#18, (3)16/#14, GRIDSMART CAT5E CABLE, (4)1/#6 GRD]
*4	1	-	3″	10′	EX. [GRIDSMART CAT5E CABLE, (1)1/#6 GRD]
5	1	T	4″	45′	EMPTY
6	1	T	4″	180′	EMPTY
7	1	T	4″	65′	EMPTY
8	1	T	4″	60′	EMPTY
9	1	T	2.5″	20′	EMPTY
10	1	T	2.5″	15′	EMPTY
*13	1	-	4″	60′	EMPTY
*14	1	-	3″	20′	EMPTY
*15	1	-	4″	45′	EMPTY
*16	1	-	2.5″	20′	EMPTY
*17	1	-	2.5″	10′	EMPTY
*18	1 (SCHD 80 HDPE)	-	4″	60′	EMPTY
*19	1	-	2.5″	20′	EMPTY
*20	1	-	2.5″	10′	EMPTY
*21	1	-	4″	45′	EMPTY
*22	1	-	3″	10′	EX. [(1)16/#14, (1) 4/#18, GRIDSMART CAT5E CABLE, (1)1/#6 GRD]
*23	1	-	4″	40′	EMPTY
*24	1	-	4″	125′	EMPTY
*25	1	-	4″	110′	EMPTY
28	1	T	4″	40′	EMPTY
29	1	T	3″	25′	EMPTY
30	1	T	4″	60′	EMPTY
31	1	T	2.5″	5′	EMPTY
32	1	T	2.5″	20′	EMPTY
33	1 (SCHD 80 HDPE)	B	4″	60′	EMPTY
*34	1	-	3″	10′	EX. [(3)16/#14, (4)4/#18, GRIDSMART CAT5E CABLE, (1)1/#6 GRD]
*35	1	-	3′	10′	EX. [(1)16/#14, (1) 4/#18 GRIDSMART CAT5E CABLE, (1)1/#6 GRD]

\# - EXISTING OR CONSTRUCTED DURING PREVIOUS PHASE
B=BORE, T=TRENCH, O=OPEN CUT
ALL CONDUITS SHALL BE SCHEDULE 80 PVC UNLESS OTHERWISE NOTED.

SIGNAL PHASING



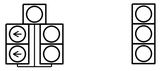
NEMA PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



1, 3, 5, 7 — 2, 4, 6, 8

LEGEND

AB	ABANDON	OH •	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH •	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
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CO •	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (* OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (* OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
CCTV CAMERA		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION		

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PREPARED BY
JMT

Mir A. Wahed — 10/15/2021
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MIR A. WAHED LICENSE No. 14810 DELAWARE PROFESSIONAL ENGINEER
SEAL

CONCURRENCE FOR INSTALLATION

CHIEF OF TRAFFIC ENGINEERING — 10/18/2021 DATE

ADDENDA / REVISIONS							
		AS NOTED	SR 72, McCOY ROAD TO SR 71	CONTRACT T200601102	PERMIT NO. N266	SIGNAL PLAN WRANGLE HILL ROAD (SR 72) AND RED LION ROAD (SR 71)	SECTION JMT
				COUNTY NEW CASTLE	DESIGNED BY: J. SMITH		SHEET NO. 237
					CHECKED BY: M. WAHED		

ADDITIONAL GENERAL SIGNAL NOTES

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7. ADJUST VIDEO DETECTION ZONES AS NECESSARY.

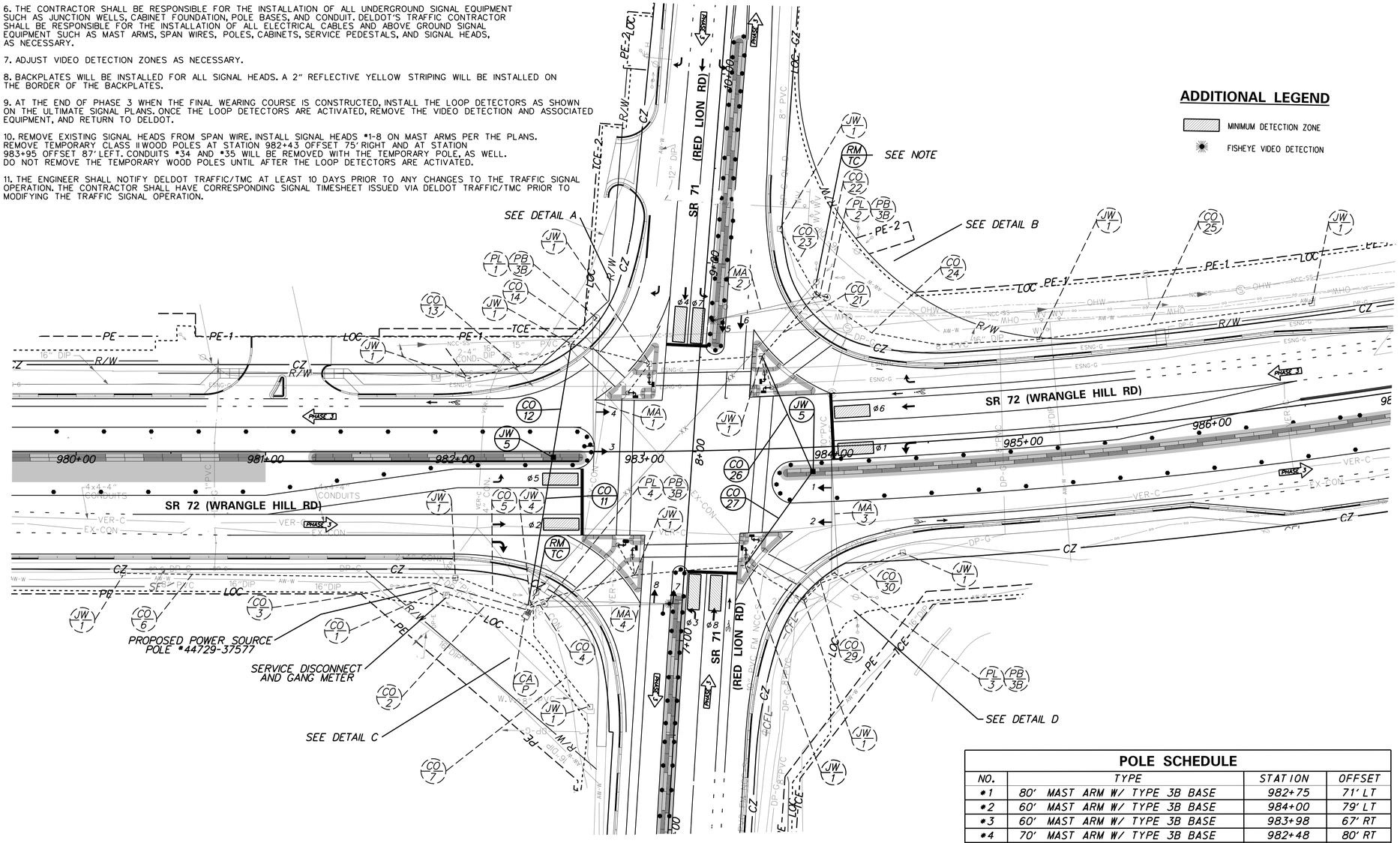
8. BACKPLATES WILL BE INSTALLED FOR ALL SIGNAL HEADS. A 2" REFLECTIVE YELLOW STRIPING WILL BE INSTALLED ON THE BORDER OF THE BACKPLATES.

9. AT THE END OF PHASE 3 WHEN THE FINAL WEARING COURSE IS CONSTRUCTED, INSTALL THE LOOP DETECTORS AS SHOWN ON THE ULTIMATE SIGNAL PLANS. ONCE THE LOOP DETECTORS ARE ACTIVATED, REMOVE THE VIDEO DETECTION AND ASSOCIATED EQUIPMENT, AND RETURN TO DELDOT.

10. REMOVE EXISTING SIGNAL HEADS FROM SPAN WIRE. INSTALL SIGNAL HEADS #1-8 ON MAST ARMS PER THE PLANS. REMOVE TEMPORARY CLASS II WOOD POLES AT STATION 982+43 OFFSET 75' RIGHT AND AT STATION 983+95 OFFSET 87' LEFT. CONDUITS #34 AND #35 WILL BE REMOVED WITH THE TEMPORARY POLE, AS WELL. DO NOT REMOVE THE TEMPORARY WOOD POLES UNTIL AFTER THE LOOP DETECTORS ARE ACTIVATED.

11. THE ENGINEER SHALL NOTIFY DELDOT TRAFFIC/TMC AT LEAST 10 DAYS PRIOR TO ANY CHANGES TO THE TRAFFIC SIGNAL OPERATION. THE CONTRACTOR SHALL HAVE CORRESPONDING SIGNAL TIMESHEET ISSUED VIA DELDOT TRAFFIC/TMC PRIOR TO MODIFYING THE TRAFFIC SIGNAL OPERATION.

PHASE 3



ADDITIONAL LEGEND

- MINIMUM DETECTION ZONE
- FISHEYE VIDEO DETECTION

MAST ARM SCHEDULE

NO.	LENGTH	NO. OF SIGNAL HEADS	S.F. OF SIGNAGE
#1	80' MAST ARM	1 - 3 SECTION, 1 - 5 SECTION	- S.F.
#2	60' MAST ARM	1 - 3 SECTION, 1 - 5 SECTION	- S.F.
#3	60' MAST ARM	1 - 3 SECTION, 1 - 5 SECTION	- S.F.
#4	70' MAST ARM	1 - 3 SECTION, 1 - 5 SECTION	- S.F.

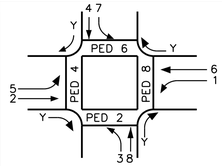
- EXISTING OR CONSTRUCTED DURING PREVIOUS PHASE

POLE SCHEDULE

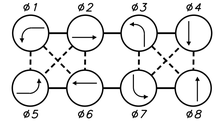
NO.	TYPE	STATION	OFFSET
#1	80' MAST ARM W/ TYPE 3B BASE	982+75	71' LT
#2	60' MAST ARM W/ TYPE 3B BASE	984+00	79' LT
#3	60' MAST ARM W/ TYPE 3B BASE	983+98	67' RT
#4	70' MAST ARM W/ TYPE 3B BASE	982+48	80' RT
#5	PEDESTAL POLE W/ TYPE 4A BASE	982+93	31' LT
#6	PEDESTAL POLE W/ TYPE 4A BASE	983+03	40' LT
#7	PEDESTAL POLE W/ TYPE 4A BASE	983+65	40' LT
#8	PEDESTAL POLE W/ TYPE 4A BASE	983+68	32' LT
#9	PEDESTAL POLE W/ TYPE 4A BASE	983+60	48' RT
#10	PEDESTAL POLE W/ TYPE 4A BASE	983+52	56' RT
#11	PEDESTAL POLE W/ TYPE 4A BASE	982+93	55' RT
#12	PEDESTAL POLE W/ TYPE 4A BASE	982+86	49' RT

- EXISTING OR CONSTRUCTED DURING PREVIOUS PHASE

SIGNAL PHASING



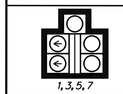
NEMA PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

AB	ABANDON	OH •	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH •	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO •	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO •	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (* OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (* OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1	⬚	▭
LOOP DETECTOR, TYPE 2	⬚	▭
LUMINAIRE	——○	——●
MAST ARM	——▷	——▶
MICROWAVE DETECTION	——◁	——◁
OPTICOM RECEIVER	——○	——●
OVERHEAD SIGNING	——⊣	——⊣
PEDESTRIAN POLE/BASE	○	◉
PEDESTRIAN PUSHBUTTON	——▷	——▶
PEDESTRIAN SIGNAL HEAD	——▱	——▰
RIGHT-OF-WAY	———	——R/W——
SERVICE PEDESTAL	P	P
SIGNAL CABINET	▯	▮
SIGNAL HEAD	——▷	——▶
SIGNAL POLE/BASE	⊗	⊙
CCTV CAMERA	CCTV	■◀
SPAN WIRE	—— XX ——	——◇——
UTILITY POLE	⊘	◥
VIDEO DETECTION	◀	◀

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
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PREPARED BY
JMT

Mir Abe Wahed — 10/15/2021
THIS SEAL APPLIES TO ALL SHEETS BEARING THE "JMT" SECTION DESIGNATION. — DATE

MIR A. WAHED — LICENSE — No. 14810 — DELAWARE — PROFESSIONAL ENGINEER
SEAL

CONCURRENCE FOR INSTALLATION

CHIEF OF TRAFFIC ENGINEERING — 10/18/2021 DATE

ADDENDA / REVISIONS

SCALE 0 30 60 90 FEET

SR 72, McCOY ROAD TO SR 71

CONTRACT	PERMIT NO.	N266
T200601102	DESIGNED BY: J. SMITH	
COUNTY: NEW CASTLE	CHECKED BY: M. WAHED	

SIGNAL PLAN WRANGLE HILL ROAD (SR 72) AND RED LION ROAD (SR 71)

SECTION: JMT
SHEET NO.: 238

PLOTTED BY: JDSMITH DATE: 10/13/2021
FILE LOCATION: Q:\NDE\110500_017_SR_72_MCCOY_RD_TO_SR\CADD\CADD SR 72 ROADWAY WIDENING\SG_SR 72 AND SR 71.DGN [SHEET: SG05_SR 72 and 71_Phs 3_01]

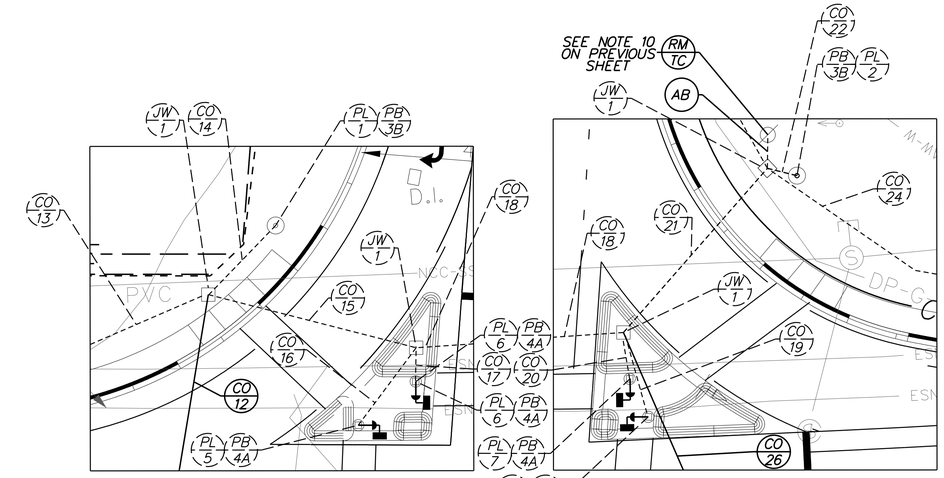
PLOTTED BY: JDSMITH DATE: 10/14/2021
FILE LOCATION: Q:\NDE\110500_017_SR_72_MCCOY_RD_TO_SR\CADD\CADD SR 72 ROADWAY WIDENING\SG_SR 72 AND SR 71.DGN [SHEET: SG06_SR 72 and 71_Phs 3_02]

CONDUIT RUN SCHEDULE

CO#	# OF CONDUITS	B/T/O	SIZE	LENGTH	AMOUNT AND TYPE OF CABLE / WIRE
#1	1 (GALV. STEEL)	-	2"	10'	EX. [(2)1/#6, (1)1/#6 GRD]
#2	1 (GALV. STEEL)	-	2"	45'	EX. [(1)2/#8 U.F. W/GROUND]
#3	4	-	4"	5'	NEW [(1)16/#14,(8)5/#14], EX. [(3)16/#14, (4)4/#18,GRIDSMART CAT5E CABLE,(4)1/#6 GRD]
#4	1	-	3"	10'	NEW [(1)16/#14,(1)4/#18], EX.[GRIDSMART CAT5E CABLE,(1)1/#6 GRD]
#5	1	-	4"	45'	EMPTY
#6	1	-	4"	180'	EMPTY
#7	1	-	4"	65'	EMPTY
#8	1	-	4"	60'	NEW [(1)16/#14,(1)4/#18,(4)5/#14,(1)1/#6 GRD]
#9	1	-	2.5"	20'	NEW [(1)5/#14, (1)1/#6 GRD]
#10	1	-	2.5"	15'	NEW [(1)5/#14, (1)1/#6 GRD]
11	1 (SCHD 80 HDPE)	B	4"	80'	NEW [(2)16/#14,(2)4/#18,(4)5/#14,(1)1/#6 GRD]
12	1 (SCHD 80 HDPE)	B	4"	65'	NEW [(2)16/#14,(2)4/#18,(4)5/#14,(1)1/#6 GRD]
#13	1	-	4"	60'	EMPTY
#14	1	-	3"	20'	NEW [(1)16/#14,(1)4/#18, (1)1/#6 GRD]
#15	1	-	4"	45'	NEW [(1)16/#14,(1)4/#18,(4)5/#14,(1)1/#6 GRD]
#16	1	-	2.5"	20'	NEW [(1)5/#14, (1)1/#6 GRD]
#17	1	-	2.5"	10'	NEW [(1)5/#14, (1)1/#6 GRD]
#18	1 (SCHD 80 HDPE)	-	4"	60'	NEW [(1)16/#14,(1)4/#18,(2)5/#14,(1)1/#6 GRD]
#19	1	-	2.5"	20'	NEW [(1)5/#14,(1)1/#6 GRD]
#20	1	-	2.5"	10'	NEW [(1)5/#14, (1)1/#6 GRD]
#21	1	-	4"	45'	NEW [(1)16/#14,(1)4/#18,(1)1/#6 GRD]
#22	1	-	3"	10'	EX. [(1)16/#14,(1) 4/#18, GRIDSMART CAT5E CABLE,(1)1/#6 GRD]
#23	1	-	4"	40'	EMPTY
#24	1	-	4"	125'	EMPTY
#25	1	-	4"	110'	EMPTY
26	1 (SCHD 80 HDPE)	B	4"	70'	EMPTY
27	1 (SCHD 80 HDPE)	B	4"	65'	EMPTY
#28	1	-	4"	40'	NEW [(1)16/#14,(1)4/#18,(1)1/#6 GRD]
#29	1	-	3"	25'	NEW [(1)16/#14,(1)4/#18,(1)1/#6 GRD]
#30	1	-	4"	60'	EMPTY
#31	1	-	2.5"	5'	NEW [(1)5/#14, (1)1/#6 GRD]
#32	1	-	2.5"	20'	NEW [(1)5/#14,(1)1/#6 GRD]
#33	1 (SCHD 80 HDPE)	-	4"	60'	NEW [(1)16/#14,(1)4/#18,(2)5/#14,(1)1/#6 GRD]
#34	1	-	3"	10'	EX. [GRIDSMART CAT5E CABLE, (1)1/#6 GRD], REMOVE [(3)16/#14,(4)4/#18]
#35	1	-	3'	10'	EX. [GRIDSMART CAT5E CABLE,(1)1/#6 GRD], REMOVE [(1)16/#14,(1) 4/#18]

* - EXISTING OR CONSTRUCTED DURING PREVIOUS PHASE
B=BORE, T=TRENCH, O=OPEN CUT
ALL CONDUITS SHALL BE SCHEDULE 80 PVC UNLESS OTHERWISE NOTED.

PHASE 3

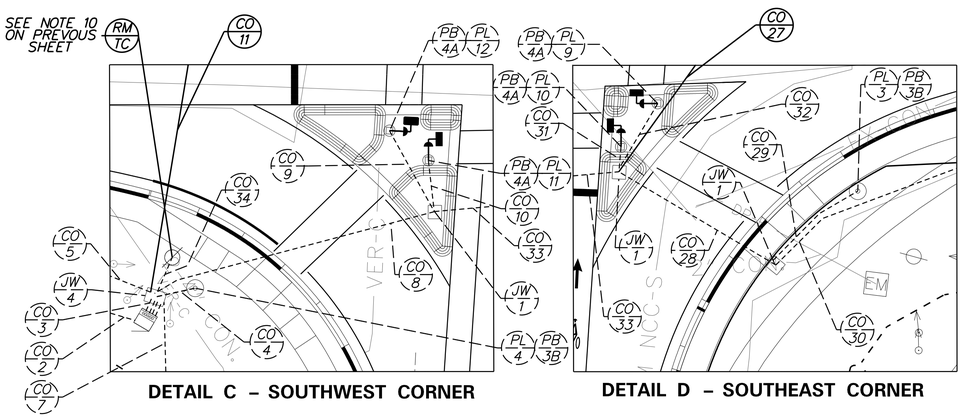


DETAIL A – NORTHWEST CORNER

SCALE: 1" = 15'

DETAIL B – NORTHEAST CORNER

SCALE: 1" = 15'



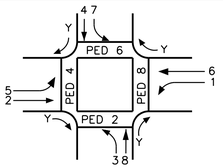
DETAIL C – SOUTHWEST CORNER

SCALE: 1" = 15'

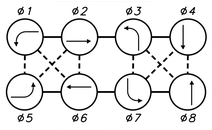
DETAIL D – SOUTHEAST CORNER

SCALE: 1" = 15'

SIGNAL PHASING



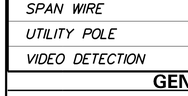
NEMA PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



1,3,5,7 2,4,6,8

LEGEND

AB	ABANDON	OH •	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH •	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO •	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO •	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (* OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (* OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1	⬚	▭
LOOP DETECTOR, TYPE 2	⬚	▬
LUMINAIRE	—○	—●
MAST ARM	➢	➤
MICROWAVE DETECTION	◀	◀
OPTICOM RECEIVER	—○	—●
OVERHEAD SIGNING	⊣	⊣
PEDESTRIAN POLE/BASE	◎	◉
PEDESTRIAN PUSHBUTTON	—▷	—▶
PEDESTRIAN SIGNAL HEAD	▱	▰
RIGHT-OF-WAY	———	——R/W——
SERVICE PEDESTAL	P	P
SIGNAL CABINET	▯	▮
SIGNAL HEAD	—▷	—▶
SIGNAL POLE/BASE	⊗	⊙
CCTV CAMERA	CCTV	■
SPAN WIRE	—XX—	—◇—
UTILITY POLE	⊘	●
VIDEO DETECTION	◀	◀

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.

PREPARED BY
JMT

Mir Ahe Wahed — 10/15/2021
THIS SEAL APPLIES TO ALL SHEETS BEARING THE "JMT" SECTION DESIGNATION. — DATE

MIR A. WAHED LICENSE: No. 14810 DELAWARE PROFESSIONAL ENGINEER
SEAL

CONCURRENCE FOR INSTALLATION

CHIEF OF TRAFFIC ENGINEERING — 10/18/2021 DATE

ADDENDA / REVISIONS							

AS NOTED	SR 72, McCOY ROAD TO SR 71	CONTRACT T200601102	PERMIT NO. N266	SIGNAL PLAN WRANGLE HILL ROAD (SR 72) AND RED LION ROAD (SR 71)
		COUNTY NEW CASTLE	DESIGNED BY: J. SMITH	SECTION JMT
			CHECKED BY: M. WAHED	SHEET NO. 239

3. POLE BASES, CABINET BASES, AND CONDUIT JUNCTION WELLS TO BE REMOVED IN ACCORDANCE WITH SECTION 211 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY THE ENGINEER. EXISTING CONDUIT SHALL BE ABANDONED.

4. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED, AND COMPRESSION FITTING ARE NOT ACCEPTABLE.

5. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHOULD BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (50:1 OR FLATTER) LANDING AREA OF THE CURB RAMP WHEN POSSIBLE. WHERE THERE ARE PHYSICAL CONSTRAINTS THAT MAKE IT IMPRACTICAL TO PLACE THE PEDESTRIAN PUSHBUTTON ADJACENT TO A LEVEL ALL-WEATHER SURFACE, THE SURFACE SHOULD BE AS LEVEL AS FEASIBLE. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE ADJOINING SIDEWALK, AND SHOULD BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE DOES NOT EXCEED 10 INCHES FROM THE ADJOINING SIDEWALK TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE.

6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF ALL UNDERGROUND SIGNAL EQUIPMENT SUCH AS JUNCTION WELLS, CABINET FOUNDATION, POLE BASES, AND CONDUIT. DELDOT'S TRAFFIC CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF ALL ELECTRICAL CABLES AND ABOVE GROUND SIGNAL EQUIPMENT SUCH AS MAST ARMS, SPAN WIRES, POLES, CABINETS, SERVICE PEDESTALS, AND SIGNAL HEADS, AS NECESSARY.

7. BACKPLATES WILL BE INSTALLED FOR ALL SIGNAL HEADS. A 2" REFLECTIVE YELLOW STRIPING WILL BE INSTALLED ON THE BORDER OF THE BACKPLATES.

8. R10-3E SIGNS SHALL BE INSTALLED ON POLES WITH ONE PEDESTRIAN SIGNAL HEAD.

9. INSTALL CONDUITS #24 AND #25 AT A MINIMUM OF 24" IN ORDER TO AVOID CONFLICTS WITH RIP RAP APRONS.

10. INSTALL PASSAGE DETECTION LOOPS ALONG SR 72 IN EACH THROUGH TRAVEL LANE, 250 FEET IN ADVANCE OF THE STOP BAR, IN ACCORDANCE WITH TABLE IV-7 FROM THE 2015 DELDOT TRAFFIC DESIGN MANUAL.

11. WHEN THE FINAL WEARING COURSE IS CONSTRUCTED, INSTALL THE LOOP DETECTION AS SHOWN ON THE PLANS.

12. ALL SIGNAL HEAD CABLES SHALL BE REPLACED AT THE END OF CONSTRUCTION.

13. THE SIGNAL HEAD WILL RECEIVE POWER FROM THE UTILITY POLE #44737-37580 AT STATION 981+88 OFFSET 72' RIGHT.

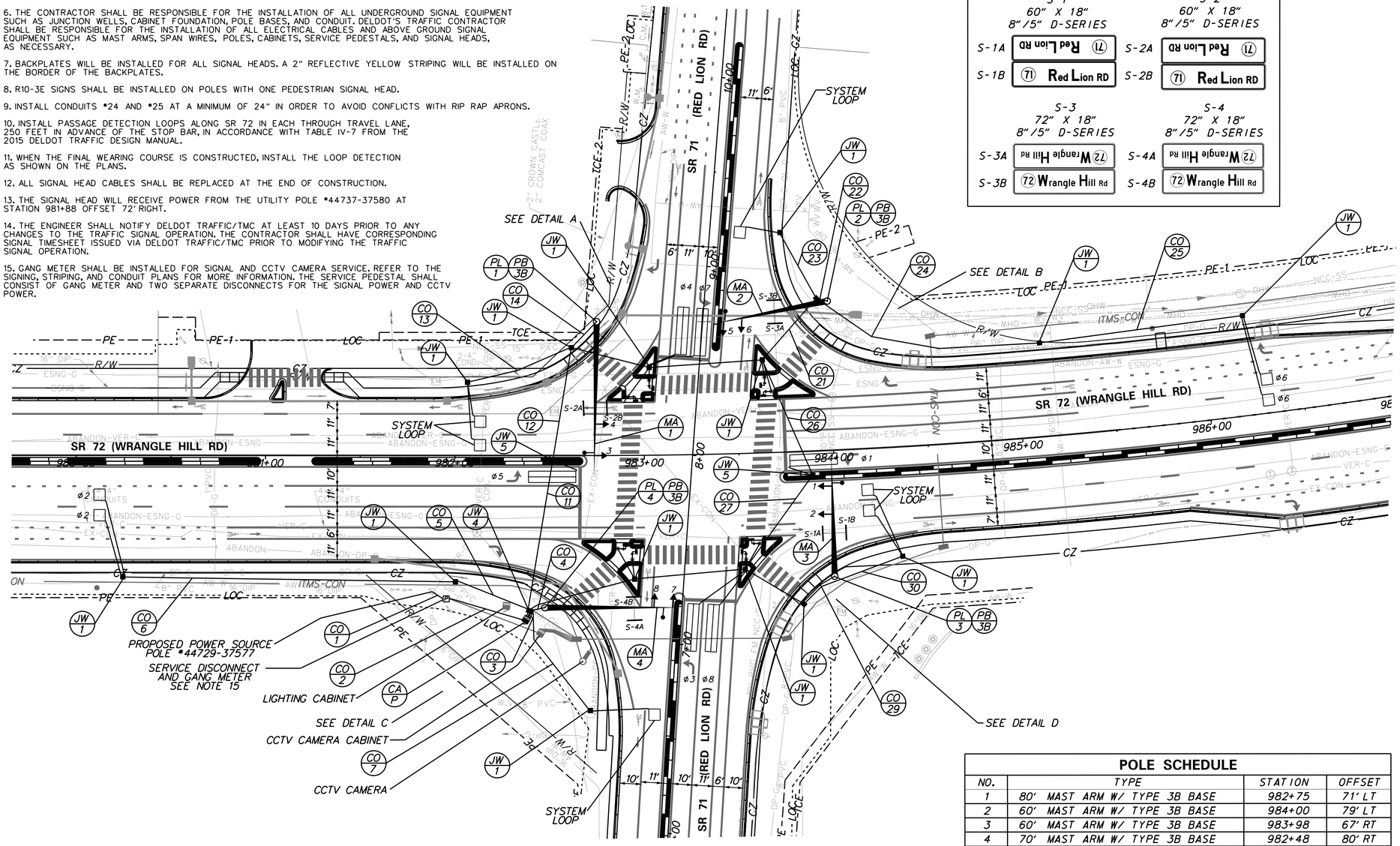
14. THE ENGINEER SHALL NOTIFY DELDOT TRAFFIC/TMC AT LEAST 10 DAYS PRIOR TO ANY CHANGES TO THE TRAFFIC SIGNAL OPERATION. THE CONTRACTOR SHALL HAVE CORRESPONDING SIGNAL TIMESHEET ISSUED VIA DELDOT TRAFFIC/TMC PRIOR TO MODIFYING THE TRAFFIC SIGNAL OPERATION.

15. GANG METER SHALL BE INSTALLED FOR SIGNAL AND CCTV CAMERA SERVICE. REFER TO THE SIGNING, STRIPING, AND CONDUIT PLANS FOR MORE INFORMATION. THE SERVICE PEDESTAL SHALL CONSIST OF GANG METER AND TWO SEPARATE DISCONNECTS FOR THE SIGNAL POWER AND CCTV POWER.

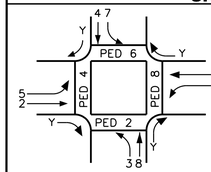
ULTIMATE

OVERHEAD SIGN DETAILS

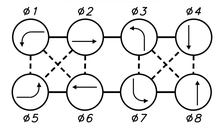
S-1 60" X 18" 8"/5" D-SERIES	S-2 60" X 18" 8"/5" D-SERIES
S-1A (71) Red Lion Rd	S-2A (71) Red Lion Rd
S-1B (71) Red Lion RD	S-2B (71) Red Lion RD
S-3 72" X 18" 8"/5" D-SERIES	**S-4 72" X 18" 8"/5" D-SERIES**
S-3A (72) Wrangle Hill Rd	S-4A (72) Wrangle Hill Rd
S-3B (72) Wrangle Hill Rd	S-4B (72) Wrangle Hill Rd



SIGNAL PHASING



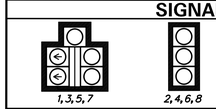
NEMA PHASING



PHASING NOTES

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2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

AB	ABANDON	OH •	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH •	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO •	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO •	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (* OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (* OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1	⬚	▭
LOOP DETECTOR, TYPE 2	▭	▬
LUMINAIRE	—○	—●
MAST ARM	➢	➤
MICROWAVE DETECTION	◂	◂
OPTICOM RECEIVER	—○	—●
OVERHEAD SIGNING	⊣	⊣
PEDESTRIAN POLE/BASE	○	◉
PEDESTRIAN PUSHBUTTON	—▷	—▶
PEDESTRIAN SIGNAL HEAD	⊐	⊐
RIGHT-OF-WAY	———	R/W
SERVICE PEDESTAL	P	P
SIGNAL CABINET	▯	▮
SIGNAL HEAD	—▷	→
SIGNAL POLE/BASE	⊗	⊙
CCTV CAMERA		■◂
SPAN WIRE	— XX —	—◇—
UTILITY POLE	⊘	●
VIDEO DETECTION	◂	◂

GENERAL SIGNAL NOTES

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POLE SCHEDULE

NO.	TYPE	STATION	OFFSET
1	80' MAST ARM W/ TYPE 3B BASE	982+75	71' LT
2	60' MAST ARM W/ TYPE 3B BASE	984+00	79' LT
3	60' MAST ARM W/ TYPE 3B BASE	983+98	67' RT
4	70' MAST ARM W/ TYPE 3B BASE	982+48	80' RT
5	PEDESTAL POLE W/ TYPE 4A BASE	982+93	31' LT
6	PEDESTAL POLE W/ TYPE 4A BASE	983+03	40' LT
7	PEDESTAL POLE W/ TYPE 4A BASE	983+65	40' LT
8	PEDESTAL POLE W/ TYPE 4A BASE	983+68	32' LT
9	PEDESTAL POLE W/ TYPE 4A BASE	983+60	48' RT
10	PEDESTAL POLE W/ TYPE 4A BASE	983+52	56' RT
11	PEDESTAL POLE W/ TYPE 4A BASE	982+93	55' RT
12	PEDESTAL POLE W/ TYPE 4A BASE	982+86	49' RT

MAST ARM SCHEDULE

NO.	LENGTH	NO. OF SIGNAL HEADS	S.F. OF SIGNAGE
1	80' MAST ARM	1 - 3 SECTION, 1 - 5 SECTION	15 S.F.
2	60' MAST ARM	1 - 3 SECTION, 1 - 5 SECTION	18 S.F.
3	60' MAST ARM	1 - 3 SECTION, 1 - 5 SECTION	15 S.F.
4	70' MAST ARM	1 - 3 SECTION, 1 - 5 SECTION	18 S.F.

PREPARED BY
JMT

Mir A. Wahed — 10/15/2021
THIS SEAL APPLIES TO ALL SHEETS BEARING THE "JMT" SECTION DESIGNATION.
DATE

MIR A. WAHED LICENSE No. 14810 DELAWARE PROFESSIONAL ENGINEER
SEAL

CONCURRENCE FOR INSTALLATION

CHIEF OF TRAFFIC ENGINEERING — 10/18/2021 DATE

ADDENDA / REVISIONS

SCALE 0 30 60 90 FEET

SR 72, McCOY ROAD TO SR 71

CONTRACT	PERMIT NO.	N266
T200601102	DESIGNED BY: J. SMITH	
COUNTY	CHECKED BY: M. WAHED	
NEW CASTLE		

SIGNAL PLAN WRANGLE HILL ROAD (SR 72) AND RED LION ROAD (SR 71)

SECTION: JMT
SHEET NO.: 240

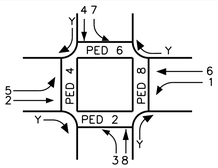
PLOTTED BY: JDSMITH DATE: 10/13/2021 [SHEET: SG07_SR 72 and 71_UIL_01]
FILE LOCATION: Q:\NDE\110500_017_SR_72_McCOY_RD_TO_SR\CADD\CADD SR 72 ROADWAY WIDENING\SG_SR 72 AND SR 71.DGN

PLOTTED BY: JDSMITH DATE: 10/13/2021 [SHEET1-SG08_SR 72 and 71_UIL_02]
FILE LOCATION: Q:\NDE\110500_017_SR_72_McCOY_RD_TO_SR\CADD\CADD SR 72 ROADWAY WIDENING\SG_SR 72 AND SR 71.DGN

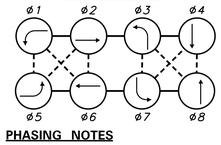
ULTIMATE



SIGNAL PHASING



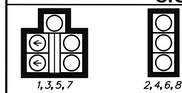
NEMA PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



1,3,5,7 2,4,6,8

LEGEND

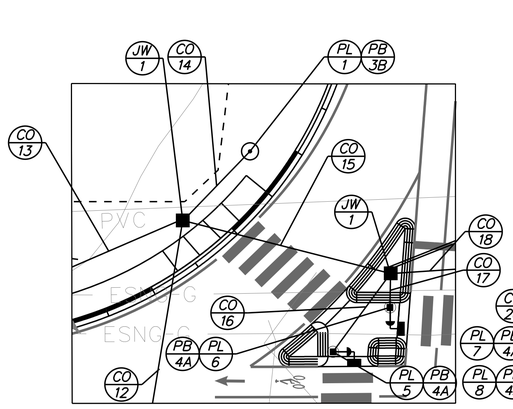
AB	ABANDON	OH •	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH •	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO •	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO •	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (* OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (* OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		□
LOOP DETECTOR, TYPE 2		▭
LUMINAIRE	—○	—◆
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER	—○	—●
OVERHEAD SIGNING	—H	—H
PEDESTRIAN POLE/BASE	◎	◉
PEDESTRIAN PUSHBUTTON	—○	—→
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD	—▷	—→
SIGNAL POLE/BASE	⊗	⊙
CCTV CAMERA		
SPAN WIRE	— XX —	
UTILITY POLE		
VIDEO DETECTION		

CONDUIT RUN SCHEDULE

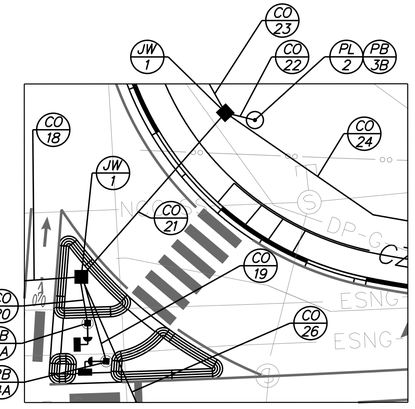
CO#	# OF CONDUITS	B/T/O	SIZE	LENGTH	AMOUNT AND TYPE OF CABLE / WIRE
1	1 (GALV. STEEL)	T	2"	10'	(2)1/#6, (1)1/#6 GRD
2	1 (GALV. STEEL)	T	2"	45'	(1)2/#8 U.F. W/GROUND
3	4	T	4"	10'	(4)16/#14,(4)4/#18,(16)2/#14, (8)5/#14,(4)1/#6 GRD
4	1	T	3"	5'	(1)16/#14,(1)4/#18, (1)1/#6 GRD
5	1	T	4"	45'	(2)2/#14, (1)1/#6 GRD
6	1	T	4"	180'	(2)2/#14, (1)1/#6 GRD
7	1	T	4"	65'	(1)2/#14, (1)1/#6 GRD
8	1	T	4"	60'	(1)16/#14,(1)4/#18,(5)2/#14,(4)5/#14,(1)1/#6 GRD
9	1	T	2.5"	20'	(1)5/#14, (1)1/#6 GRD
10	1	T	2.5"	15'	(1)5/#14, (1)1/#6 GRD
11	1 (SCHD 80 HDPE)	B	4"	80'	(2)16/#14,(2)4/#18,(8)2/#14,(4)5/#14,(1)1/#6 GRD
12	1 (SCHD 80 HDPE)	B	4"	65'	(2)16/#14,(2)4/#18,(7)2/#14,(4)5/#14,(1)1/#6 GRD
13	1	T	4"	60'	(2)2/#14, (1)1/#6 GRD
14	1	T	3"	20'	(1)16/#14,(1)4/#18, (1)1/#6 GRD
15	1	T	4"	45'	(1)16/#14,(1)4/#18,(5)2/#14,(4)5/#14,(1)1/#6 GRD
16	1	T	2.5"	20'	(1)5/#14, (1)1/#6 GRD
17	1	T	2.5"	10'	(1)5/#14, (1)1/#6 GRD
18	1 (SCHD 80 HDPE)	B	4"	60'	(1)16/#14,(1)4/#18,(3)2/#14,(2)5/#14,(1)1/#6 GRD
19	1	T	2.5"	20'	(1)5/#14,(1)1/#6 GRD
20	1	T	2.5"	20'	(1)5/#14, (1)1/#6 GRD
21	1	T	4"	45'	(1)16/#14,(1)4/#18,(3)2/#14,(1)1/#6 GRD
22	1	T	3"	10'	(1)16/#14,(1)4/#18, (1)1/#6 GRD
23	1	T	4"	40'	(1)2/#14, (1)1/#6 GRD
24	1	T	4"	125'	(2)2/#14, (1)1/#6 GRD
25	1	T	4"	110'	(2)2/#14, (1)1/#6 GRD
26	1 (SCHD 80 HDPE)	B	4"	70'	EMPTY
27	1 (SCHD 80 HDPE)	B	4"	65'	(1)2/#14, (1)1/#6 GRD
28	1	T	4"	40'	(1)16/#14,(1)4/#18,(2)2/#14,(1)1/#6 GRD
29	1	T	3"	25'	(1)16/#14,(1)4/#18,(1)1/#6 GRD
30	1	T	4"	60'	(2)2/#14, (1)1/#6 GRD
31	1	T	2.5"	5'	(1)5/#14, (1)1/#6 GRD
32	1	T	2.5"	20'	(1)5/#14,(1)1/#6 GRD
33	1 (SCHD 80 HDPE)	B	4"	60'	(1)16/#14,(1)4/#18,(5)2/#14,(2)5/#14,(1)1/#6 GRD

B=BORE, T=TRENCH, O=OPEN CUT
ALL CONDUITS SHALL BE SCHEDULE 80 PVC UNLESS OTHERWISE NOTED.



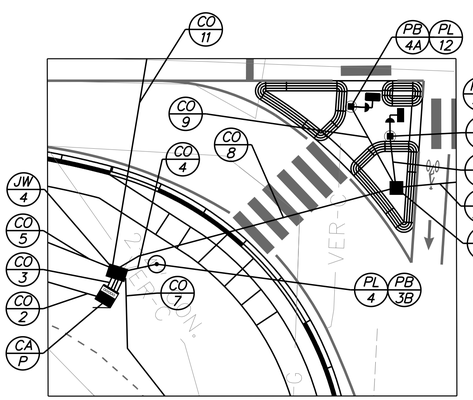
DETAIL A – NORTHWEST CORNER

SCALE: 1" = 15'



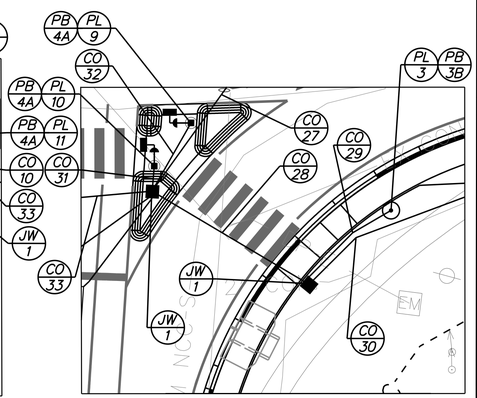
DETAIL B – NORTHEAST CORNER

SCALE: 1" = 15'



DETAIL C – SOUTHWEST CORNER

SCALE: 1" = 15'



DETAIL D – SOUTHEAST CORNER

SCALE: 1" = 15'

PREPARED BY
JMT

Mir Abe Waked — 10/15/2021
THIS SEAL APPLIES TO ALL SHEETS BEARING THE "JMT" SECTION DESIGNATION. — DATE

MIR A. WAHED LICENSE No. 14810 DELAWARE PROFESSIONAL ENGINEER
SEAL

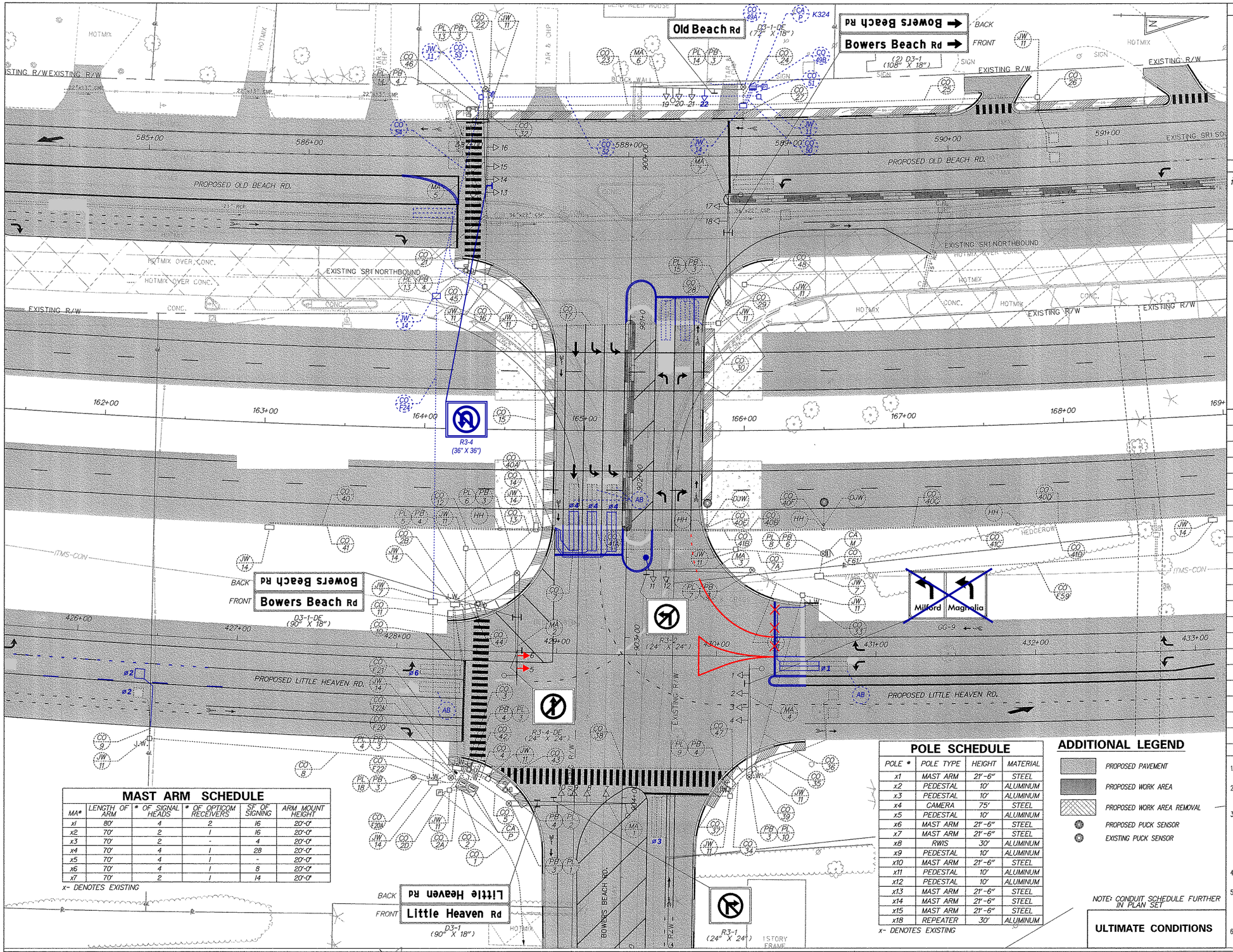
CONCURRENCE FOR INSTALLATION

CHIEF OF TRAFFIC ENGINEERING — 10/18/2021 DATE

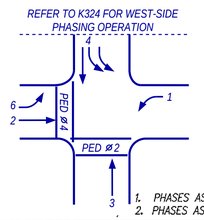
GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.

ADDENDA / REVISIONS		AS NOTED	SR 72, McCOY ROAD TO SR 71	CONTRACT T200601102	PERMIT NO. N266	SIGNAL PLAN WRANGLE HILL ROAD (SR 72) AND RED LION ROAD (SR 71)	SECTION JMT
				COUNTY NEW CASTLE	DESIGNED BY: J. SMITH		SHEET NO. 241
					CHECKED BY: M. WAHED		



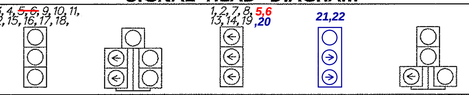
SIGNAL PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

AB	ABANDON	OH#	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH#	PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (# OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (# OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA X	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA X	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W. □	■
LOOP DETECTOR, TYPE 1	□	□
LOOP DETECTOR, TYPE 2	▭	▭
LUMINAIRE	—○	—●
MAST ARM	▷	▶
MICROWAVE DETECTION	—◀	—◀
OPTICOM RECEIVER	—○	—●
OVERHEAD SIGNING	—⊣	—⊣
PEDESTRIAN POLE/BASE	⊙	◉
PEDESTRIAN PUSHBUTTON	—D	—▶
PEDESTRIAN SIGNAL HEAD	—P	—P
RIGHT-OF-WAY	— — —	— — —
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD	—▷	—▶
SIGNAL POLE/BASE	—⊗	—⊙
SPAN INSULATOR	—◇	—◆
SPAN WIRE	—XX—	———
UTILITY POLE	—⊘	—●
CAMERA (CCTV)	—▪	—▪

MAST ARM SCHEDULE

MA#	LENGTH OF ARM	# OF SIGNAL HEADS	# OF OPTICOM RECEIVERS	SF OF SIGNING	ARM MOUNT HEIGHT
x1	80'	4	2	16	20'-0"
x2	70'	2	1	16	20'-0"
x3	70'	2	-	4	20'-0"
x4	70'	4	1	28	20'-0"
x5	70'	4	1	-	20'-0"
x6	70'	4	1	8	20'-0"
x7	70'	2	1	14	20'-0"

x- DENOTES EXISTING

POLE SCHEDULE

POLE #	POLE TYPE	HEIGHT	MATERIAL
x1	MAST ARM	21'-6"	STEEL
x2	PEDESTAL	10'	ALUMINUM
x3	PEDESTAL	10'	ALUMINUM
x4	CAMERA	75'	STEEL
x5	PEDESTAL	10'	ALUMINUM
x6	MAST ARM	21'-6"	STEEL
x7	MAST ARM	21'-6"	STEEL
x8	RWIS	30'	ALUMINUM
x9	PEDESTAL	10'	ALUMINUM
x10	MAST ARM	21'-6"	STEEL
x11	PEDESTAL	10'	ALUMINUM
x12	PEDESTAL	10'	ALUMINUM
x13	MAST ARM	21'-6"	STEEL
x14	MAST ARM	21'-6"	STEEL
x15	MAST ARM	21'-6"	STEEL
x18	REPEATER	30'	ALUMINUM

x- DENOTES EXISTING

ADDITIONAL LEGEND

- PROPOSED PAVEMENT
- PROPOSED WORK AREA
- PROPOSED WORK AREA REMOVAL
- PROPOSED PUCK SENSOR
- EXISTING PUCK SENSOR

NOTE: CONDUIT SCHEDULE FURTHER IN PLAN SET

ULTIMATE CONDITIONS

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-DOVER, DELAWARE.
2. POLE BASES, CABINET BASE AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.
3. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (5OH FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES, THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAT 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL.
4. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
5. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
6. CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.

RECOMMENDED _____ DATE: _____

RECOMMENDED [signature] DATE: 12/5/14

RECOMMENDED [signature] DATE: 12/2/14

APPROVED TRAFFIC ENGINEER [signature] DATE: 12/5/14

APPROVED FOR INSTALLATION
CHIEF TRAFFIC ENGINEER [signature] DATE: 12/9/14

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

REVISED SIGNAL PLAN PER TMC RECOMMENDATIONS TO SEPARATE WEST AND EAST INTERSECTION OPERATION. SEE SIGNAL PLAN K324 FOR ADDITIONAL PLAN INFORMATION MSK - 3/14/2019

REVISED SIGNAL PLAN PER TMC RECOMMENDATIONS FOR LITTLE HEAVEN RD STRIPING AND SIGNAL HEAD DISPLAY UPDATES. MSK - 6/26/2019

SCALE 0 30 60 90 FEET

SR1, LITTLE HEAVEN GRADE SEPARATED INTERSECTION

CONTRACT	T200412202	PERMIT NO.	K145
COUNTY	KENT	DESIGNED BY:	MSK
		CHECKED BY:	BAM

SIGNAL PLAN
SR1 @ BOWERS BEACH RD

SHEET NO.	603
TOTAL SHTS.	641

12/2/2014
G:\PROJECTS\03517.00 (DELDOT AGMT 1223 DOTS Open End)\03517.16 SR1, LITTLE HEAVEN FINAL DESIGN\DGN Files\signal_bowers09.dgn
3:22:51 PM

ADDITIONAL GENERAL SIGNAL NOTES

3. POLE BASES, CABINET BASE AND CONDUIT JUNCTION WELLS TO BE REMOVED IN ACCORDANCE WITH SECTION 211 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.

4. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED, AND COMPRESSION FITTING ARE NOT ACCEPTABLE.

5. POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHOULD BE CONSTRUCTED IMMEDIATLY ADJACENT TO THE FLAT (5%) OR FLATTED LANDING AREA OF THE PEDESTRIAN CONNECTION OR SIDEWALK, IN ACCORDANCE WITH THE ADA BEST PRACTICES. THE PEDESTRIAN PUSHBUTTON SHALL BE INSTALLED AT A MINIMUN HEIGHT OF 15 INCHES AND A MAXIMUM HEIGHT OF 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, BUT SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES. THE PEDESTRIAN PUSHBUTTON SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE DOES NOT EXCEED 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN AIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING, INCLUDING BRACKETS, NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE THE GROUND.

6. ALL PEDESTRIAN SIGNAL HEADS SHALL BE COUNTDOWN SIGNALS. R10-3e SIGNS SHOULD BE INSTALLED ON POLES WITH ONE PEDESTRAIN SIGNAL HEAD. R10-3e-DE SIGNS SHALL BE INSTALLED ON POLES WITH TWO PEDESTRIAN SIGNAL HEADS.

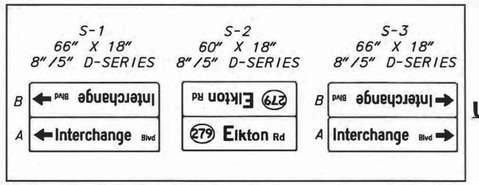
7. INSTALL PASSAGE DETECTION LOOPS ALONG ELKTON ROAD IN EACH THROUGH TRAVEL LANE 300' IN ADVANCE OF THE STOP BAR IN ACCORDANCE WITH TABLE IV-7 FROM THE DELDOT TRAFFIC DESIGN MANUAL.

8. CONDUIT 22 SHOULD BE INSTALLED AT A DEPTH OF 4 FEET SUCH THAT IT IS BELOW THE UNDERDRAIN OUTLET.

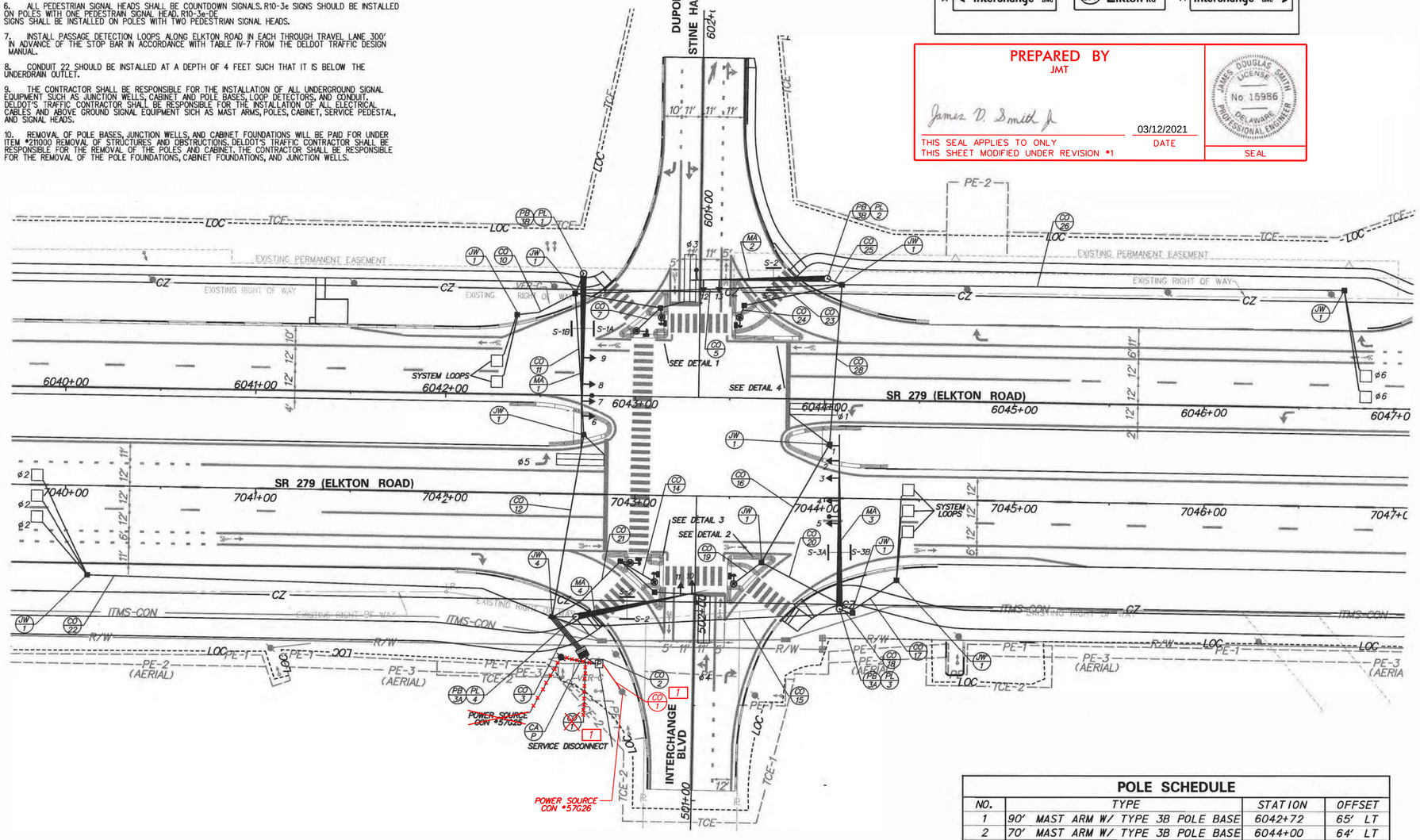
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF ALL UNDERGROUND SIGNAL EQUIPMENT SUCH AS JUNCTION WELLS, CABINET AND POLE BASES, LOOP DETECTORS, AND CONDUIT. DELDOT'S TRAFFIC CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF ALL ELECTRICAL CABLES AND ABOVE GROUND SIGNAL EQUIPMENT SICH AS MAST ARMS, POLES, CABINET, SERVICE PEDESTAL, AND SIGNAL HEADS.

10. REMOVAL OF POLE BASES, JUNCTION WELLS, AND CABINET FOUNDATIONS WILL BE PAID FOR UNDER ITEM #211000 REMOVAL OF STRUCTURES AND OBSTRUCTIONS. DELDOT'S TRAFFIC CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF THE POLES AND CABINET. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF THE POLE FOUNDATIONS, CABINET FOUNDATIONS, AND JUNCTION WELLS.

OVERHEAD SIGN DETAILS



ULTIMATE



MAST ARM SCHEDULE

MA NO.	LENGTH	NO. OF HEADS	S.F. OF SIGNING
1	90' MAST ARM	4-3 SECTION	8.25 SF
2	70' MAST ARM	1-4 SECTION, 1-3 SECTION	7.5 SF
3	90' MAST ARM	5-3 SECTION	8.25 SF
4	70' MAST ARM	1-4 SECTION, 1-3 SECTION	7.5 SF

POLE SCHEDULE

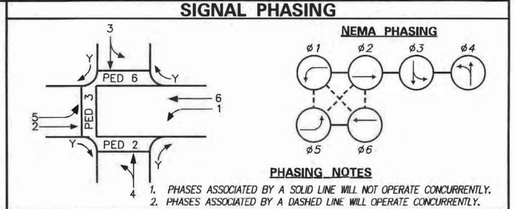
NO.	TYPE	STATION	OFFSET
1	90' MAST ARM W/ TYPE 3B POLE BASE	6042+72	65' LT
2	70' MAST ARM W/ TYPE 3B POLE BASE	6044+00	64' LT
3	90' MAST ARM W/ TYPE 3A POLE BASE	7044+09	58' RT
4	70' MAST ARM W/ TYPE 3A POLE BASE	7042+70	65' RT
5	PEDESTAL POLE W/ TYPE 4A BASE	6043+13	42' LT
6	PEDESTAL POLE W/ TYPE 4A BASE	6043+00	35' LT
7	PEDESTAL POLE W/ TYPE 4A BASE	6043+55	43' LT
8	PEDESTAL POLE W/ TYPE 4A BASE	7043+53	46' RT
9	PEDESTAL POLE W/ TYPE 4A BASE	7043+11	46' RT
10	PEDESTAL POLE W/ TYPE 4A BASE	7042+98	36' RT

PREPARED BY
JMT

James D. Smith Jr. 03/12/2021
THIS SEAL APPLIES TO ONLY THIS SHEET MODIFIED UNDER REVISION *1 — DATE

JAMES DOUGLAS SMITH LICENSE No. 15986 DELAWARE PROFESSIONAL ENGINEER
SEAL

SIGNAL PHASING



PHASING NOTES
1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

AB	ABANDON	OH •	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH •	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO •	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO •	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (* OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (* OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		□
LOOP DETECTOR, TYPE 2		▭
LUMINAIRE		—◆
MAST ARM		▶
MICROWAVE DETECTION	◀	◀
OPTICOM RECEIVER	—○	—●
OVERHEAD SIGNING		⊣
PEDESTRIAN POLE/BASE	○	◉
PEDESTRIAN PUSHBUTTON	—▷	—▶
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL		P
SIGNAL CABINET		
SIGNAL HEAD	—▷	→
SIGNAL POLE/BASE	⊗	⊙
CCTV CAMERA		
SPAN WIRE	—XX—	—◇—
UTILITY POLE		
VIDEO DETECTION		

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.

PREPARED BY
JOHNSON, MIRMIRAN & THOMPSON

Mir Aly Waked 12/17/2018
THIS SEAL APPLIES TO ALL SHEETS BEARING THE "JMT" SECTION DESIGNATION. — DATE

MIR A. WAHED LICENSE No. 14810 DELAWARE PROFESSIONAL ENGINEER
SEAL

APPROVED FOR INSTALLATION

Mark Luft 12/19/18
CHIEF TRAFFIC ENGINEER — DATE

ADDENDA / REVISIONS

1	REPLACED PAGES 1 THRU 432	11-15-2019 (LB)
1	REVISED POWER SOURCE - JDS 3/12/2021	

SCALE 0 30 60 90 FEET

ELKTON ROAD, MD LINE TO CASHO MILL ROAD

CONTRACT	PERMIT NO.	N017P
T201504401	DESIGNED BY: ALM (JMT)	
COUNTY	CHECKED BY: MAW (JMT)	
NEW CASTLE		

SIGNAL PLAN
SR 279 (ELKTON ROAD)
@ INTERCHANGE BLVD

SECTION	JMT
SHEET NO.	414

JMT

PLOTTED BY: JDSMITH DATE: 12/17/2018
FILE LOCATION: Q:\NDE\140659_007_ELKTON_RD_CASHO_MILL\CADD\SG ULT_PRINT FILES.DGN [SHEET: SG27]

ADDITIONAL GENERAL SIGNAL NOTES

6. EXISTING RIGHT OF WAY AND PROPERTY LINES ARE BASED ON A FIELD SURVEY AND ARE SHOWN FOR GRAPHICAL PURPOSES ONLY. THESE LINES DO NOT REFLECT INFORMATION ON DELDOT CONTRACT 64-12-009 AS THIS INFORMATION WAS NOT AVAILABLE AT THE TIME OF THE SURVEY. THESE LINES MAY BE SUBJECT TO CHANGE WHEN THIS INFORMATION IS RECEIVED.

7. INSTALL PROPOSED SIGNAL POLES, MAST ARMS, AND TRAFFIC SIGNALS PRIOR TO REMOVING EXISTING TRAFFIC SIGNAL EQUIPMENT.

8. THE CABINET BASE SHALL BE INSTALLED SO THAT IS LEVEL WITH THE SIDEWALK. IN ADDITION, THE CABINET BASE SHALL BE ADJACENT TO THE SIDEWALK.

9. REMOVE 2 FEET OFF THE TOP OF THE EXISTING FOUNDATIONS.

10. INSTALL CDMA AT THIS INTERSECTION.

11. CONTRACTOR SHALL REMOVE ALL EXISTING WIRING FROM EXISTING CONDUIT BEING ABANDONED.

12. MAINTAIN PEDESTRIAN ACCESS UTILIZING PEDESTRIAN FLAGGERS AND TEMPORARY PEDESTRIAN PATHWAYS AS NECESSARY.

13. CONTRACTOR SHALL UTILIZE TYPICAL APPLICATIONS FROM CHAPTER 6 OF THE DEMUTCD AS NEEDED TO COMPLETE THE WORK.

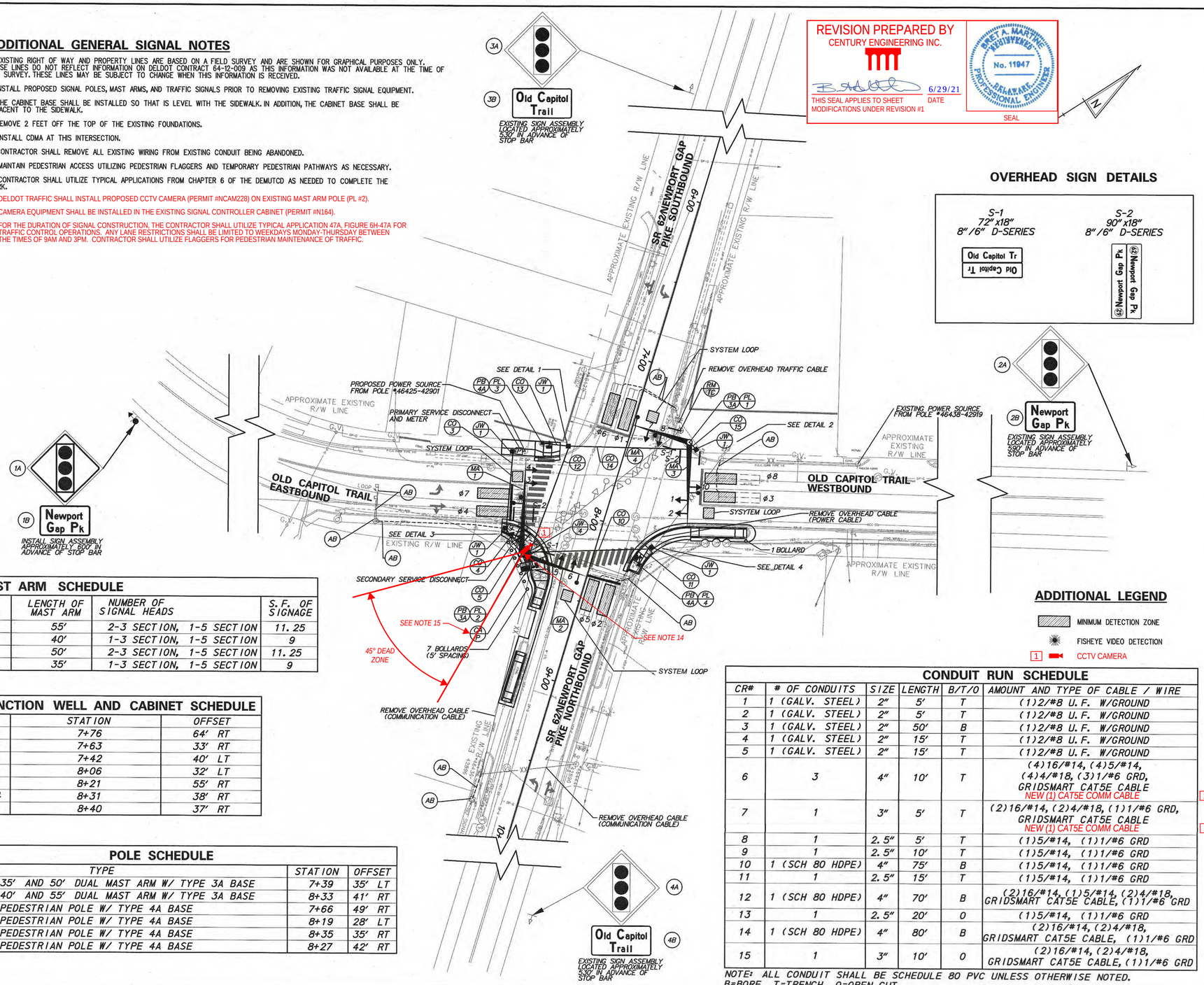
14. DELDOT TRAFFIC SHALL INSTALL PROPOSED CCTV CAMERA (PERMIT #NCAM228) ON EXISTING MAST ARM POLE (PL #2).

15. CAMERA EQUIPMENT SHALL BE INSTALLED IN THE EXISTING SIGNAL CONTROLLER CABINET (PERMIT #N164).

[1] 16. FOR THE DURATION OF SIGNAL CONSTRUCTION, THE CONTRACTOR SHALL UTILIZE TYPICAL APPLICATION 47A, FIGURE 6H-47A FOR TRAFFIC CONTROL OPERATIONS. ANY LANE RESTRICTIONS SHALL BE LIMITED TO WEEKDAYS MONDAY-THURSDAY BETWEEN THE TIMES OF 9AM AND 3PM. CONTRACTOR SHALL UTILIZE FLAGGERS FOR PEDESTRIAN MAINTENANCE OF TRAFFIC.

REVISION PREPARED BY
CENTURY ENGINEERING INC.
6/29/21
DATE
THIS SEAL APPLIES TO SHEET
MODIFICATIONS UNDER REVISION #1

BRET A. MARTINE
No. 11947
DELAWARE
PROFESSIONAL ENGINEER
SEAL



OVERHEAD SIGN DETAILS

MAST ARM SCHEDULE

NO.	LENGTH OF MAST ARM	NUMBER OF SIGNAL HEADS	S.F. OF SIGNAGE
1	55'	2-3 SECTION, 1-5 SECTION	11.25
2	40'	1-3 SECTION, 1-5 SECTION	9
3	50'	2-3 SECTION, 1-5 SECTION	11.25
4	35'	1-3 SECTION, 1-5 SECTION	9

JUNCTION WELL AND CABINET SCHEDULE

NO.	STATION	OFFSET
JW1	7+76	64' RT
JW1	7+63	33' RT
JW1	7+42	40' LT
JW1	8+06	32' LT
JW1	8+21	55' RT
JW4	8+31	38' RT
CA	8+40	37' RT

POLE SCHEDULE

NO.	TYPE	STATION	OFFSET
1	35' AND 50' DUAL MAST ARM W/ TYPE 3A BASE	7+39	35' LT
2	40' AND 55' DUAL MAST ARM W/ TYPE 3A BASE	8+33	41' RT
3	PEDESTRIAN POLE W/ TYPE 4A BASE	7+66	49' RT
4	PEDESTRIAN POLE W/ TYPE 4A BASE	8+19	28' LT
5	PEDESTRIAN POLE W/ TYPE 4A BASE	8+35	35' RT
6	PEDESTRIAN POLE W/ TYPE 4A BASE	8+27	42' RT

ADDITIONAL LEGEND

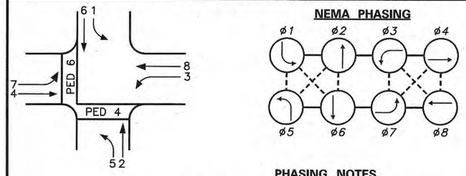
MINIMUM DETECTION ZONE
FISHEYE VIDEO DETECTION
[1] CCTV CAMERA

CONDUIT RUN SCHEDULE

CR#	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE / WIRE
1	1 (GALV. STEEL)	2"	5'	T	(1)2/#8 U.F. W/GROUND
2	1 (GALV. STEEL)	2"	5'	T	(1)2/#8 U.F. W/GROUND
3	1 (GALV. STEEL)	2"	50'	B	(1)2/#8 U.F. W/GROUND
4	1 (GALV. STEEL)	2"	15'	T	(1)2/#8 U.F. W/GROUND
5	1 (GALV. STEEL)	2"	15'	T	(1)2/#8 U.F. W/GROUND
6	3	4"	10'	T	(4)16/#14, (4)5/#14, (4)4/#18, (3)1/#6 GRD, GRIDSMART CAT5E CABLE NEW (1) CAT5E COMM CABLE [1]
7	1	3"	5'	T	(2)16/#14, (2)4/#18, (1)1/#6 GRD, GRIDSMART CAT5E CABLE NEW (1) CAT5E COMM CABLE [1]
8	1	2.5"	5'	T	(1)5/#14, (1)1/#6 GRD
9	1	2.5"	10'	T	(1)5/#14, (1)1/#6 GRD
10	1 (SCH 80 HDPE)	4"	75'	B	(1)5/#14, (1)1/#6 GRD
11	1	2.5"	15'	T	(1)5/#14, (1)1/#6 GRD
12	1 (SCH 80 HDPE)	4"	70'	B	(2)16/#14, (1)5/#14, (2)4/#18, GRIDSMART CAT5E CABLE, (1)1/#6 GRD
13	1	2.5"	20'	O	(1)5/#14, (1)1/#6 GRD
14	1 (SCH 80 HDPE)	4"	80'	B	(2)16/#14, (2)4/#18, GRIDSMART CAT5E CABLE, (1)1/#6 GRD
15	1	3"	10'	O	(2)16/#14, (2)4/#18, GRIDSMART CAT5E CABLE, (1)1/#6 GRD

NOTE: ALL CONDUIT SHALL BE SCHEDULE 80 PVC UNLESS OTHERWISE NOTED.
B=BORE, T=TRENCH, O=OPEN CUT

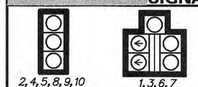
SIGNAL PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1	⬚	▭
LOOP DETECTOR, TYPE 2	▭	▭
LUMINAIRE	—○	—●
MAST ARM	▷	▶
MICROWAVE DETECTION	◀	◀
OPTICOM RECEIVER	—○	—●
OVERHEAD SIGNING		⊣
PEDESTRIAN POLE/BASE	○	◉
PEDESTRIAN PUSHBUTTON	—▯	—▮
PEDESTRIAN SIGNAL HEAD	▱	▰
RIGHT-OF-WAY	———	——R/W——
SERVICE PEDESTAL		P
SIGNAL CABINET	▯	▮
SIGNAL HEAD	—▷	—▶
SIGNAL POLE/BASE	⊗	⊙
SPAN INSULATOR	◇	◆
SPAN WIRE	—XX—	—◇—
UTILITY POLE	⊘	⊘
VIDEO DETECTION	◀	◀

(AB) ABANDON
(CA/X) EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
(CA/X) PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
(CO/•) EXISTING CONDUIT RUN IDENTIFIER (• OF CONDUIT RUN)
(CO/•) PROPOSED CONDUIT RUN IDENTIFIER (• OF CONDUIT RUN)
(JW/X) EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
(JW/X) PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
(MA/XX) EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)
(MA/XX) PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)
(OH/•) EXISTING OVERHEAD RUN IDENTIFIER (• OF OVERHEAD RUN)
(OH/•) PROPOSED OVERHEAD RUN IDENTIFIER (• OF OVERHEAD RUN)
(PB/X) EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
(PB/X) PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
(PL/X) EXISTING POLE IDENTIFIER (• OF POLE)
(PL/X) PROPOSED POLE IDENTIFIER (• OF POLE)
(RM/C) REMOVE BY CONTRACTOR
(RM/O) REMOVE BY OTHERS
(RM/TC) REMOVE BY TRAFFIC CONTRACTOR

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.

2. POLE BASES, CABINET BASES, AND CONDUIT JUNCTION WELLS TO BE REMOVED IN ACCORDANCE WITH SECTION 211 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY THE ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.

3. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED, AND COMPRESSION FITTING ARE NOT ACCEPTABLE.

4. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PRECEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY, BEFORE CONSTRUCTION.

5. PROPOSED POLE BASES WITH PEDESTRIAN PUSH BUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (5%1 OR FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THE PEDESTRIAN PUSH BUTTONS SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSH BUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING, INCLUDING BRACKETS, NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL. ALL PEDESTRIAN SIGNAL HEADS WILL BE COUNTDOWN SIGNALS.

RECOMMENDED _____ DATE: _____
RECOMMENDED _____ DATE: _____
RECOMMENDED _____ DATE: 3/16/18
APPROVED TRAFFIC ENGINEER _____ DATE: 03/16/2018
APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER _____ DATE: 3/20/18

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS
[1] INSTALLED PROPOSED CCTV ON EXISTING MAST ARM POLE UTILIZING EXISTING CONDUIT PATHWAY & EXISTING SIGNAL CABINET
M.KUBOVCIK (CEI) 06/28/21 - (CONTRACT T202100505)

SCALE
0 30 60 90
FEET

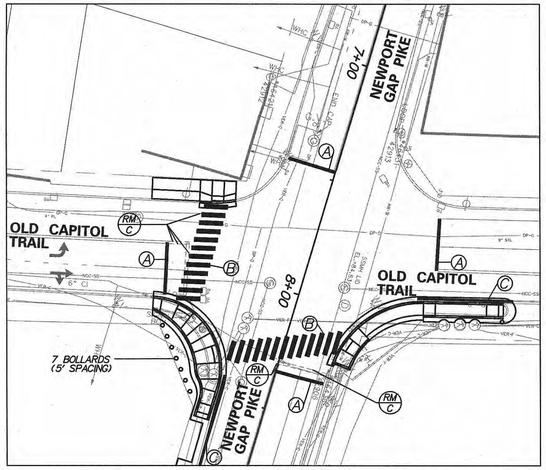
N164 NEWPORT GAP PIKE AND OLD CAPITOL TRAIL

CONTRACT	T201704002
COUNTY	NEW CASTLE
PERMIT NO: [1]	N164 & NCAM228
DESIGNED BY:	JDS (JMT)
CHECKED BY:	MAW (JMT)

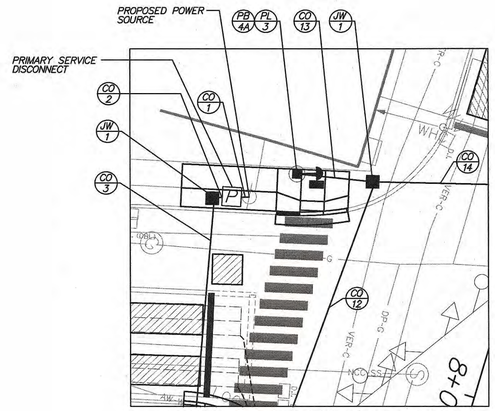
SIGNAL PLAN NEWPORT GAP PIKE @ OLD CAPITOL TRAIL

SHEET NO.	1
TOTAL SHTS.	6

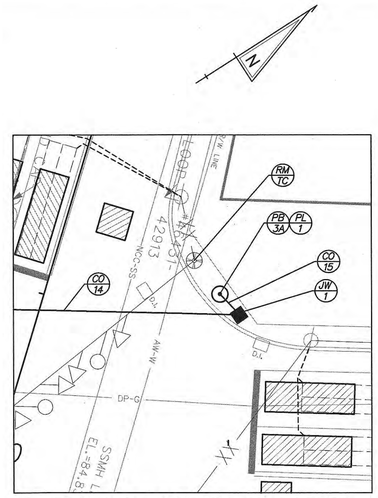
PLOTTED BY: JDSMITH DATE: 2/7/2018
[SHEET: Print Sheet]
J:\PROJECTS\EE\150151_000_TRAFFIC_ENGINEERING_\CADD\201 THREE SIGNAL DESIGN\NEWPORT GAP PIKE AND OLD CAPITOL TRAIL\SG.DGN



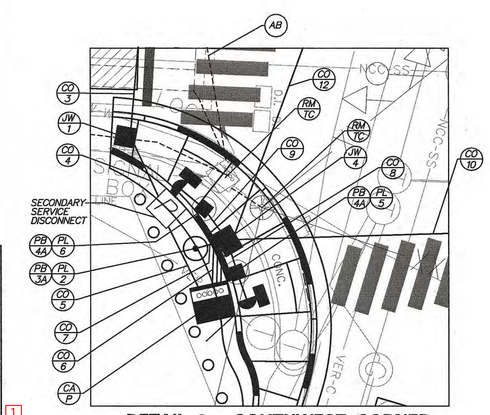
PAVEMENT STRIPING INFORMATION
SCALE: 1"=30'



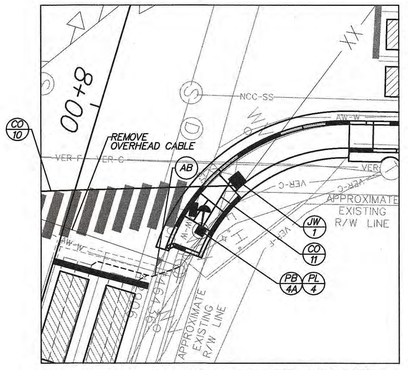
DETAIL 1 – NORTHWEST CORNER
SCALE: 1"=15'



DETAIL 2 – NORTHEAST CORNER
SCALE: 1"=15'



DETAIL 3 – SOUTHWEST CORNER
SCALE: 1"=10'



DETAIL 4 – SOUTHEAST CORNER
SCALE: 1"=15'

JUNCTION WELL AND CABINET SCHEDULE

NO.	STATION	OFFSET
JW1	7+76	64' RT
JW1	7+63	33' RT
JW1	7+42	40' LT
JW1	8+06	32' LT
JW1	8+21	55' RT
JW4	8+31	38' RT
CA	8+40	37' RT

POLE SCHEDULE

NO.	TYPE	STATION	OFFSET
1	35' AND 50' DUAL MAST ARM W/ TYPE 3A BASE	7+39	35' LT
2	40' AND 55' DUAL MAST ARM W/ TYPE 3A BASE	8+33	41' RT
3	PEDESTRIAN POLE W/ TYPE 4A BASE	7+66	49' RT
4	PEDESTRIAN POLE W/ TYPE 4A BASE	8+19	28' LT
5	PEDESTRIAN POLE W/ TYPE 4A BASE	8+35	35' RT
6	PEDESTRIAN POLE W/ TYPE 4A BASE	8+27	42' RT

CONDUIT RUN SCHEDULE

CR#	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE / WIRE	
1	1 (GALV. STEEL)	2"	5'	T	(1)2/#8 U.F. W/GROUND	
2	1 (GALV. STEEL)	2"	5'	T	(1)2/#8 U.F. W/GROUND	
3	1 (GALV. STEEL)	2"	50'	B	(1)2/#8 U.F. W/GROUND	
4	1 (GALV. STEEL)	2"	15'	T	(1)2/#8 U.F. W/GROUND	
5	1 (GALV. STEEL)	2"	15'	T	(1)2/#8 U.F. W/GROUND	
6	3	4"	10'	T	(4)16/#14, (4)5/#14, (4)4/#18, (3)1/#6 GRD GRIDSMART CAT5E CABLE NEW (1) CAT5E COMM CABLE	1
7	1	3"	5'	T	(2)16/#14, (2)4/#18, (1)1/#6 GRD, GRIDSMART CAT5E CABLE NEW (1) CAT5E COMM CABLE	1
8	1	2.5"	5'	T	(1)5/#14, (1)1/#6 GRD	
9	1	2.5"	10'	T	(1)5/#14, (1)1/#6 GRD	
10	1 (SCH 80 HDPE)	4"	75'	B	(1)5/#14, (1)1/#6 GRD	
11	1	2.5"	15'	T	(1)5/#14, (1)1/#6 GRD	
12	1 (SCH 80 HDPE)	4"	70'	B	(2)16/#14, (1)5/#14, (2)4/#18, GRIDSMART CAT5E CABLE, (1)1/#6 GRD	
13	1	2.5"	20'	O	(1)5/#14, (1)1/#6 GRD	
14	1 (SCH 80 HDPE)	4"	80'	B	(2)16/#14, (2)4/#18, GRIDSMART CAT5E CABLE, (1)1/#6 GRD	
15	1	3"	10'	O	(2)16/#14, (2)4/#18, GRIDSMART CAT5E CABLE, (1)1/#6 GRD	

NOTE: ALL CONDUIT SHALL BE SCHEDULE 80 PVC UNLESS OTHERWISE NOTED.
B=BORE, T=TRENCH, O=OPEN CUT

REVISION PREPARED BY
CENTURY ENGINEERING INC.

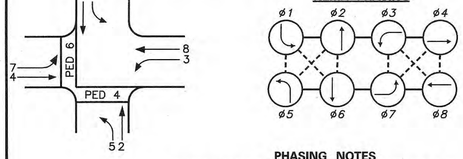
6/29/21
THIS SEAL APPLIES TO SHEET MODIFICATIONS UNDER REVISION #1 — DATE

BRET A. MARTINE — 1997 — No. 11947 — DELAWARE — PROFESSIONAL ENGINEER
SEAL

PAVEMENT MARKINGS LEGEND

SYMBOL	ITEM	QUANTITY
(A)	16" SOLID WHITE ALKYD THERMOPLASTIC PAVEMENT STRIPING (ITEM 817002)	125 SF
(B)	24" SOLID WHITE ALKYD THERMOPLASTIC PAVEMENT STRIPING (ITEM 817002)	505 SF
(C)	EPOXY RESIN PAINT PAVEMENT STRIPING, WHITE 5" SOLID (ITEM 817013)	105 LF

SIGNAL PHASING



PHASING NOTES
1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

AB	ABANDON	OH	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH	PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (# OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (# OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		□
LOOP DETECTOR, TYPE 2		▭
LUMINAIRE	—○	—✦
MAST ARM	⊢	⊢
MICROWAVE DETECTION	⊣	⊣
OPTICOM RECEIVER	—○	—●
OVERHEAD SIGNING		⊣
PEDESTRIAN POLE/BASE	○	◉
PEDESTRIAN PUSHBUTTON	—▯	—▮
PEDESTRIAN SIGNAL HEAD	—▭	—▬
RIGHT-OF-WAY		—R/W—
SERVICE PEDESTAL		P
SIGNAL CABINET	▭	▮
SIGNAL HEAD	—▷	—▶
SIGNAL POLE/BASE	⊗	⊙
SPAN INSULATOR	◇	◆
SPAN WIRE	—XX—	—◇—
UTILITY POLE	⊘	⊘
VIDEO DETECTION	◁	◀

GENERAL SIGNAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.

2. POLE BASES, CABINET BASES, AND CONDUIT JUNCTION WELLS TO BE REMOVED IN ACCORDANCE WITH SECTION 211 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY THE ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.

3. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED, AND COMPRESSION FITTING ARE NOT ACCEPTABLE.

4. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PRECEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY, BEFORE CONSTRUCTION.

5. PROPOSED POLE BASES WITH PEDESTRIAN PUSH BUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (5.01 OR FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THE PEDESTRIAN PUSH BUTTONS SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSH BUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING, INCLUDING BRACKETS, NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL. ALL PEDESTRIAN SIGNAL HEADS WILL BE COUNTDOWN SIGNALS.

RECOMMENDED _____ DATE:_____
RECOMMENDED _____ DATE:_____
RECOMMENDED _____ DATE: 3/16/18
APPROVED TRAFFIC ENGINEER _____ DATE: 03/16/2018
APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER _____ DATE: 3/20/18

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS
1 INSTALLED PROPOSED CCTV ON EXISTING MAST
ARM POLE UTILIZING EXISTING CONDUIT PATHWAY
& EXISTING SIGNAL CABINET
M.KUBOVCIK (CEI) 06/28/21 - (CONTRACT T202100505)

N/A

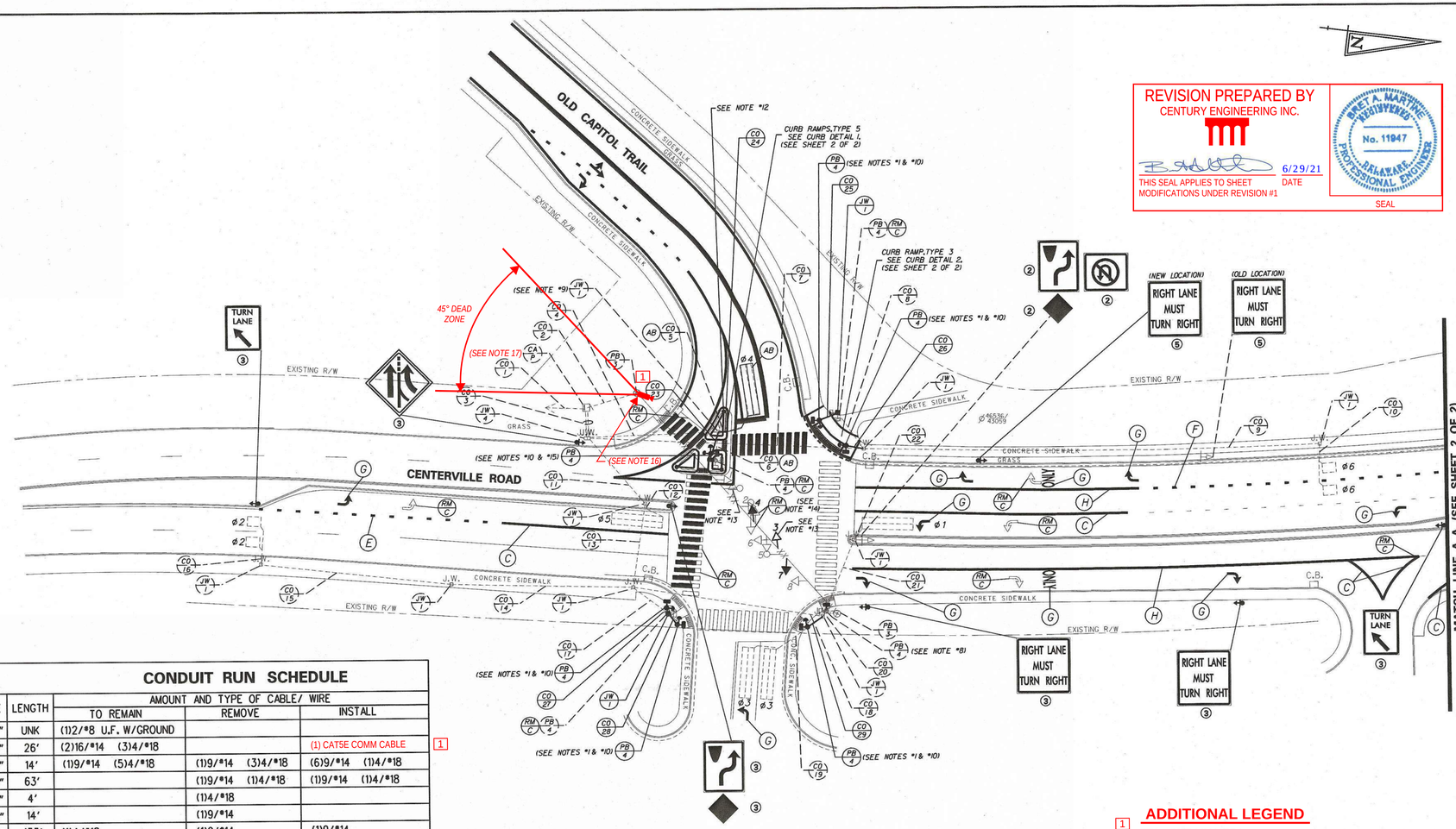
N164 NEWPORT GAP PIKE AND OLD CAPITOL TRAIL

CONTRACT T201704002
COUNTY NEW CASTLE
PERMIT NO. 1 N164 & NCAM228
DESIGNED BY: JDS (JMT)
CHECKED BY: MAW (JMT)

SIGNAL PLAN NEWPORT GAP PIKE @ OLD CAPITOL TRAIL

SHEET NO. 2
TOTAL SHTS. 6

PLOTTED BY: JDSMITH DATE: 2/7/2018
FILE: N:\PROJECTS\150151_000_TRAFFIC_ENGINEERING_\CADD\2017 THREE SIGNAL DESIGN\NEWPORT GAP PIKE AND OLD CAPITOL TRAIL\SG.DGN [SHEET= Print Sheet]



CONDUIT RUN SCHEDULE

CO*	*OF CON	SIZE	LENGTH	AMOUNT AND TYPE OF CABLE/ WIRE		
				TO REMAIN	REMOVE	INSTALL
*1	1	2.0"	UNK	(1)2/*8 U.F. W/GROUND		
*2	1	2.5"	26'	(2)16/*14 (3)4/*18		(1) CAT5E COMM CABLE [1]
*3	2	2.5"	14'	(1)9/*14 (5)4/*18	(1)9/*14 (3)4/*18	(6)9/*14 (1)4/*18
*4	1	2.5"	63'		(1)9/*14 (1)4/*18	(1)9/*14 (1)4/*18
*5	1	1.5"	4'		(1)4/*18	
*6	1	2.5"	14'		(1)9/*14	
*7	1	2.5"	133'	(1)4/*18	(1)9/*14	(1)9/*14
*8	1	2.5"	22'		(1)9/*14	(1)9/*14
*9	1	2.5"	168'	(1)4/*18		
*10	1	1.5"	6'	(1)4/*18		
*11	1	2.5"	42'	(1)9/*14 (4)4/*18	(1)9/*14	(3)9/*14
*12	1	1.5"	3'	(1)4/*18		
*13	1	2.5"	41'	(1)9/*14 (3)4/*18	(1)9/*14	(3)9/*14
*14	1	2.5"	88'	(1)4/*18		
*15	1	2.5"	93'	(1)4/*18		
*16	1	1.5"	5'	(1)4/*18		
*17	1	2.5"	22'		(1)9/*14	(2)9/*14
*18	1	2.5"	93'	(1)9/*14 (2)4/*18		(1)9/*14
*19	1	1.5"	22'	(1)4/*18		
*20	1	2.5"	3'	(1)9/*14		
*21	1	2.5"	41'	(1)4/*18		
*22	1	1.5"	3'	(1)4/*18		
23	1	2.5"	12'			(1)9/*14
24	1	1.5"	5'			(1)4/*18
25	1	2.5"	10'			(1)9/*14
26	1	2.5"	9'			(1)9/*14
27	1	2.5"	3'			(1)9/*14
28	1	2.5"	7'			(1)9/*14
29	1	2.5"	10'			(1)9/*14

* DENOTES EXISTING

PAVEMENT MARKINGS LEGEND

SYMBOL	QUANTITY	ITEM
(A)		4" SOLID YELLOW EPOXY RESIN PAINT PAVEMENT STRIPING
(B)		4" SOLID DOUBLE YELLOW EPOXY RESIN PAINT PAVEMENT STRIPING
(C)	215 LF.	4" SOLID WHITE EPOXY RESIN PAINT PAVEMENT STRIPING
(D)		4" DASHED WHITE EPOXY RESIN PAINT (10' LINE, 30' GAP) PAVEMENT STRIPING
(E)	26 LF.	4" DASHED WHITE EPOXY RESIN PAINT (2' LINE, 6' GAP) PAVEMENT STRIPING
(F)	62 LF.	8" DASHED WHITE EPOXY RESIN PAINT (2' LINE, 6' GAP) PAVEMENT STRIPING
(G)	594 S.F.	SYMBOL/LEGEND ALKYD-THERMOPLASTIC PAVEMENT STRIPING
(H)	450 LF.	8" SOLID WHITE EPOXY RESIN PAINT PAVEMENT STRIPING
(I)		PREFORMED RETROREFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS, SYMBOL/LEGEND

SIGNING LEGEND By State Forces
1. REMOVE EXISTING SIGN
2. EXISTING SIGN TO REMAIN
3. PLACE NEW SIGN
4. RENEW EXISTING SIGN
5. REPOSITION EXISTING SIGN

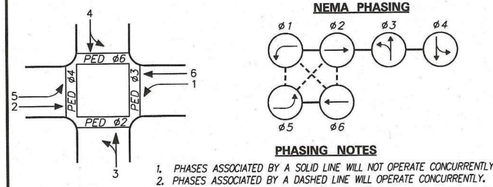
REVISION PREPARED BY
CENTURY ENGINEERING INC.
6/29/21
THIS SEAL APPLIES TO SHEET MODIFICATIONS UNDER REVISION #1
DATE
SEAL

[1] **ADDITIONAL LEGEND**
CCTV CAMERA

CONSTRUCTION NOTES:

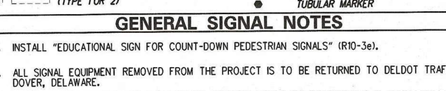
10. PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (5.0% OR FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL.
11. EXISTING SIGNAL EQUIPMENT LAYOUT AND CONDUIT/WIRING INFORMATION BASED ON FIELD OBSERVATIONS AND TRAFFIC SIGNAL PLAN DATED 6/10/04, CONTRACT *21-011-03.
12. THE CONTRACTOR SHALL INSTALL A TUBULAR MARKER (FLEXI-POST) ON ALL THREE (3) CORNERS OF THE CHANNELIZING ISLAND, AS SHOWN. EACH TUBULAR MARKER SHALL BE RETOREFLECTORIZED IN ACCORDANCE WITH SECTION 6F.60 OF THE DELDOT MUTCD.
13. RELOCATE EXISTING 4-SECTION INVERTED "I" SIGNAL HEAD *3 FACING EASTBOUND CAPITOL TRAIL APPROXIMATELY 34' NORTH OF ITS PRESENT LOCATION.
14. REMOVE EXISTING 3-SECTION HEADS WITH GREEN LEFT ARROW INDICATION FACING OLD CAPITOL TRAIL AND PARK & RIDE LOT APPROACHES. REPLACE WITH 3-SECTION HEADS *4 AND *7 AS SHOWN.
15. INSTALL "EDUCATIONAL SIGN FOR COUNT-DOWN PEDESTRIAN SIGNALS" (R10-3e-DE).
16. DELDOT TRAFFIC SHALL INSTALL PROPOSED CCTV CAMERA (PERMIT #NCAM229) ON EXISTING SOUTHWEST STRAIN POLE.
17. CAMERA EQUIPMENT SHALL BE INSTALLED IN THE EXISTING SIGNAL CONTROLLER CABINET (PERMIT #N282). [1]
18. FOR THE DURATION OF SIGNAL CONSTRUCTION, THE CONTRACTOR SHALL UTILIZE TYPICAL APPLICATION 47A, FIGURE 6H-47A FOR TRAFFIC CONTROL OPERATIONS. ANY LANE RESTRICTIONS SHALL BE LIMITED TO WEEKDAYS MONDAY-THURSDAY BETWEEN THE TIMES OF 9AM AND 3PM. CONTRACTOR SHALL UTILIZE FLAGGERS FOR PEDESTRIAN MAINTENANCE OF TRAFFIC.

SIGNAL PHASING



PHASING NOTES
1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

- PROPOSED SIGNAL CABINET
- EXISTING SIGNAL CABINET
- PROPOSED SIGNAL POLE BASE
- EXISTING SIGNAL POLE BASE
- PROPOSED PEDESTRIAN POLE BASE
- EXISTING PEDESTRIAN POLE BASE
- PROPOSED WOOD POLE
- EXISTING UTILITY POLE
- PROPOSED JUNCTION WELL
- EXISTING JUNCTION WELL
- PROPOSED SIGNAL HEAD
- EXISTING SIGNAL HEAD
- PROPOSED PEDESTRIAN SIGNAL HEAD
- EXISTING PEDESTRIAN SIGNAL HEAD
- PROPOSED PEDESTRIAN PUSHBUTTON
- EXISTING PEDESTRIAN PUSHBUTTON
- PROPOSED VIDEO DETECTION
- EXISTING VIDEO DETECTION
- PROPOSED MICROWAVE DETECTION
- EXISTING MICROWAVE DETECTION
- OVERHEAD SIGNING
- PROPOSED OPTICOM RECEIVER
- EXISTING OPTICOM RECEIVER
- PROPOSED MAST ARM
- EXISTING MAST ARM
- PROPOSED LUMINAIRE
- EXISTING LUMINAIRE
- PROPOSED LOOP DETECTOR (TYPE 1 OR 2)
- EXISTING LOOP DETECTOR (TYPE 1 OR 2)
- REMOVE BY CONTRACTOR
- REMOVE BY OTHERS
- ABANDON
- PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
- EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
- PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
- EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
- PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)
- EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)
- PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
- EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
- PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)
- EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)
- PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
- EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
- PROPOSED SPAN WIRE
- EXISTING SPAN WIRE
- RIGHT-OF-WAY OR PROPERTY LINE
- PROPOSED SPAN INSULATOR
- EXISTING SPAN INSULATOR
- SERVICE PEDESTAL
- EXISTING HIGHWAY SIGN
- PROPOSED HIGHWAY SIGN
- TUBULAR MARKER

GENERAL SIGNAL NOTES

1. INSTALL "EDUCATIONAL SIGN FOR COUNT-DOWN PEDESTRIAN SIGNALS" (R10-3e).
2. ALL SIGNAL EQUIPMENT REMOVED FROM THE PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
3. POLE BASES, CABINET BASE AND CONDUIT JUNCTION WELLS TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER.
4. ALL GALVANIZED CONDUIT (GRC) SHALL BE REMOVED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED, AND COMPRESSION FITTING ARE NOT ACCEPTABLE.
5. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.
6. ALL PEDESTRIAN SIGNALS SHALL CONTAIN PEDESTRIAN COUNTDOWN DISPLAYS.
7. ALL ABANDONED CONDUITS TO HAVE WIRES REMOVED.
8. REMOVE EXISTING PEDESTRIAN SIGNAL HEAD AND REPLACE WITH COUNTDOWN HEAD.
9. RESET EXISTING JUNCTION WELL FLUSH WITH SURFACE OF PROPOSED PORK CHOP ISLAND.

RECOMMENDED Lisa Delyaur DATE: 1/5/2012
RECOMMENDED _____ DATE: _____
RECOMMENDED _____ DATE: _____
APPROVED TRAFFIC ENGINEER _____ DATE: 1/6/12
APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER _____ DATE: 1/6/12

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS
[1] INSTALLED PROPOSED CCTV ON EXISTING STRAIN POLE UTILIZING EXISTING CONDUIT PATHWAY & EXISTING SIGNAL CABINET
M.KUBOVCIK (CEI) 06/28/21 - (CONTRACT T202100505)

SCALE 0 30 60 90 FEET

PAVEMENT & REHABILITATION, NORTH I, 2011

CONTRACT T201106101
COUNTY NEW CASTLE
[1] PERMIT NO. N282 & NCAM229
DESIGNED BY: SJE
CHECKED BY: LYD

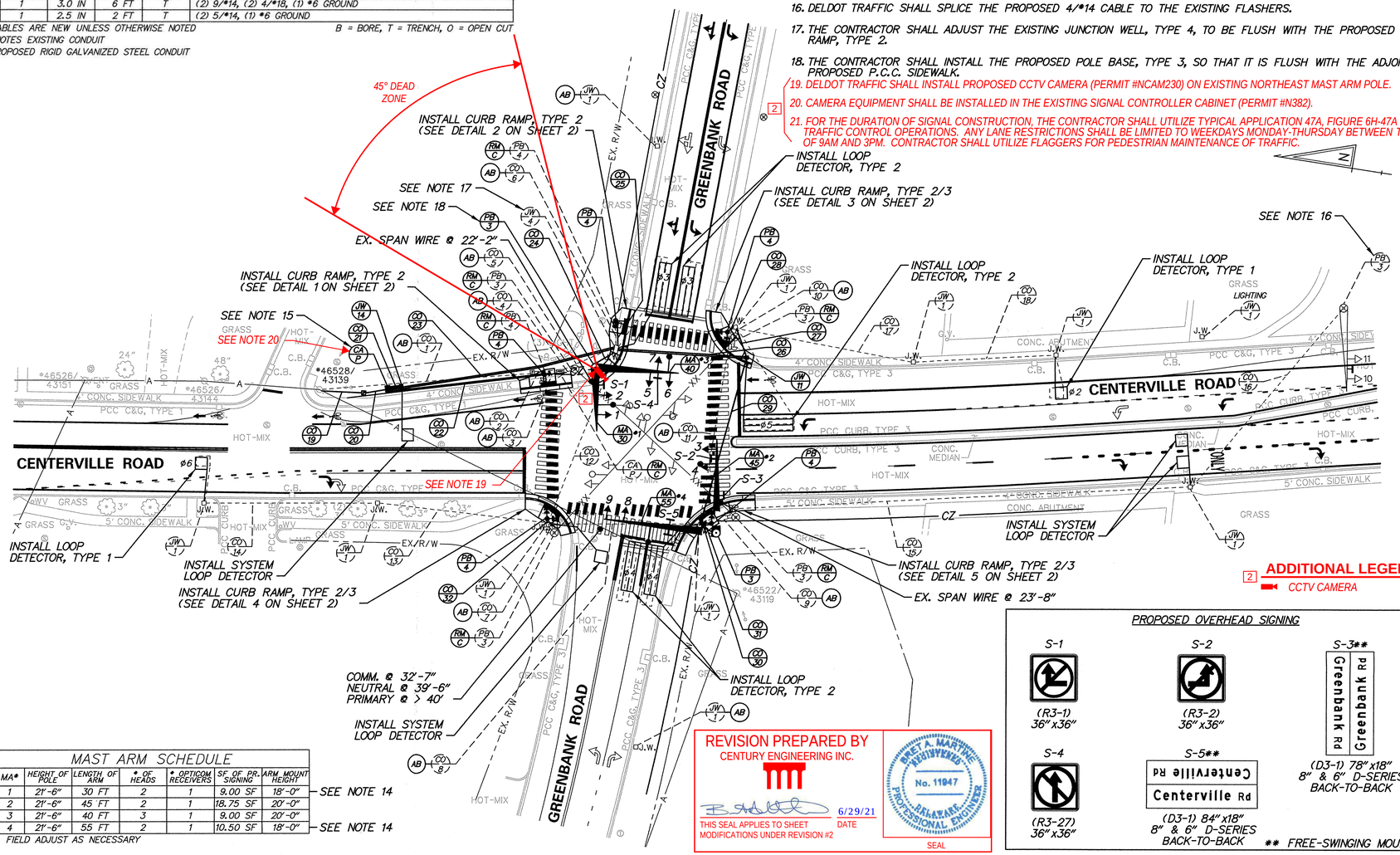
SIGNAL PLAN CENTERVILLE ROAD @ OLD CAPITOL TRAIL

SHEET NO. 1
TOTAL SHTS. 2

CONDUIT RUN SCHEDULE

CO*	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
12*	1	2.5 IN	92 FT	-	<REMOVE EX. (3) 9/*14, EX. (4) 4/*18, EX. (1) 4/*14>, (2) 5/*14, (2) 2/*14, (1) *6 GROUND
13*	1	1.5 IN	86 FT	-	<REMOVE EX. (1) 4/*18>, (1) 2/*14, (1) *6 GROUND
14*	1	2.5 IN	86 FT	-	<REMOVE EX. (1) 4/*18>, (1) 2/*14, (1) *6 GROUND
15*	1	1.5 IN	249 FT	-	<REMOVE EX. (1) 4/*14>, (1) 4/*14, (2) 2/*14, (1) *6 GROUND
16*	1	1.5 IN	117 FT	-	<REMOVE EX. (1) 4/*14>, (1) 4/*14, (1) *6 GROUND
17*	1	1.5 IN	90 FT	-	<REMOVE EX. (1) 4/*18>, (1) 2/*14, (1) *6 GROUND
18*	1	2.5 IN	71 FT	-	<REMOVE EX. (1) 4/*18>, (1) 2/*14, (1) *6 GROUND
19**	1	2.0 IN	20 FT	T	(1) 2/*8 U.F. W/GROUND - LINE SIDE
20**	1	2.0 IN	10 FT	T	(1) 2/*8 U.F. W/GROUND - LOAD SIDE
21	4	4.0 IN	6 FT	T	(4) 9/*14, (4) 4/*18, (8) 5/*14, (2) 4/*14, (11) 2/*14, (4) *6 GROUND NEW (1) CAT5E COMM CABLE [2]
22	1	2.5 IN	72 FT	T	(1) 5/*14, (1) *6 GROUND
23	2	4.0 IN	111 FT	T	(4) 9/*14, (4) 4/*18, (7) 5/*14, (2) 4/*14, (10) 2/*14, (2) *6 GROUND NEW (1) CAT5E COMM CABLE [2]
24	1	3.0 IN	11 FT	T	(2) 9/*14, (2) 4/*18, (1) 4/*14, (1) *6 GROUND NEW (1) CAT5E COMM CABLE [2]
25	1	2.5 IN	13 FT	T	(1) 5/*14, (1) *6 GROUND
26	2	4.0 IN	66 FT	B	(2) 9/*14, (2) 4/*18, (4) 5/*14, (1) 4/*14, (6) 2/*14, (2) *6 GROUND
27	1	4.0 IN	16 FT	T	(2) 5/*14, (1) 2/*14, (1) *6 GROUND
28	1	2.5 IN	4 FT	T	(2) 5/*14, (1) *6 GROUND
29	1	4.0 IN	87 FT	B	(2) 9/*14, (2) 4/*18, (2) 5/*14, (1) 4/*14, (4) 2/*14, (1) *6 GROUND
30	1	2.5 IN	4 FT	T	(2) 5/*14, (1) *6 GROUND
31	1	3.0 IN	6 FT	T	(2) 9/*14, (2) 4/*18, (1) *6 GROUND
32	1	2.5 IN	2 FT	T	(2) 5/*14, (1) *6 GROUND

ALL CABLES ARE NEW UNLESS OTHERWISE NOTED B = BORE, T = TRENCH, O = OPEN CUT
* DENOTES EXISTING CONDUIT
** PROPOSED RIGID GALVANIZED STEEL CONDUIT



MAST ARM SCHEDULE

MA*	HEIGHT OF POLE	LENGTH OF ARM	# OF HEADS	# OPTICOM RECEIVERS	SF OF PR. SIGNING	ARM MOUNT HEIGHT	
1	21'-6"	30 FT	2	1	9.00 SF	18'-0"	SEE NOTE 14
2	21'-6"	45 FT	2	1	18.75 SF	20'-0"	
3	21'-6"	40 FT	3	1	9.00 SF	20'-0"	
4	21'-6"	55 FT	2	1	10.50 SF	18'-0"	SEE NOTE 14

* FIELD ADJUST AS NECESSARY

NOTES:

8. PROPOSED PEDESTRIAN POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (50:1 OR FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/ SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL.
9. ALL PEDESTRIAN SIGNALS SHALL CONTAIN PEDESTRIAN COUNTDOWN DISPLAYS.
10. ALL WORK PERFORMED UNDER THIS PROJECT IS INTENDED TO OCCUR WITHIN DELDOT'S EXISTING RIGHT-OF-WAY BASED ON THE ARCHIVED PLANS FOR CONTRACT NO. 21-011-03.
11. IF GRADING WILL BE STEEPER THAN 6:1 ADJACENT TO THE CURB RAMP OR SIDEWALK, THEN A TYPE 1-8 CURB OR RETAINING WALL SHOULD BE USED TO ELIMINATE THE NEED FOR THE STEEP SLOPE.
12. EXISTING CONDUIT RUNS NOS. 1-11 SHALL BE ABANDONED AND ALL EXISTING CABLES SHALL BE REMOVED.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION AND REMOVAL OF ALL UNDERGROUND SIGNAL EQUIPMENT - E.G., JUNCTION WELLS, CABINET AND POLE BASES, AND CONDUIT. DELDOT'S TRAFFIC CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION AND REMOVAL OF ALL ELECTRICAL CABLES AND ABOVE GROUND SIGNAL EQUIPMENT - E.G., HEADS, OPTICOM RECEIVERS, SPAN WIRES, SERVICE PEDESTAL, POLES, MAST ARMS, AND CABINET.
14. DELDOT TRAFFIC SHALL ADJUST THE SIGNAL HEADS IN THE MAST ARM BRACKETS SO THAT THE BOTTOM OF THE SIGNAL HOUSINGS ARE AT LEAST 16'-0" ABOVE THE PAVEMENT.
15. DELDOT TRAFFIC SHALL INSTALL A CDMA IN THE PROPOSED SIGNAL CABINET.
16. DELDOT TRAFFIC SHALL SPLICE THE PROPOSED 4/*14 CABLE TO THE EXISTING FLASHERS.
17. THE CONTRACTOR SHALL ADJUST THE EXISTING JUNCTION WELL, TYPE 4, TO BE FLUSH WITH THE PROPOSED CURB RAMP, TYPE 2.
18. THE CONTRACTOR SHALL INSTALL THE PROPOSED POLE BASE, TYPE 3, SO THAT IT IS FLUSH WITH THE ADJOINING PROPOSED P.C.C. SIDEWALK.
19. DELDOT TRAFFIC SHALL INSTALL PROPOSED CCTV CAMERA (PERMIT #NCAM230) ON EXISTING NORTHEAST MAST ARM POLE.
20. CAMERA EQUIPMENT SHALL BE INSTALLED IN THE EXISTING SIGNAL CONTROLLER CABINET (PERMIT #N382).
21. FOR THE DURATION OF SIGNAL CONSTRUCTION, THE CONTRACTOR SHALL UTILIZE TYPICAL APPLICATION 47A, FIGURE 6H-47A FOR TRAFFIC CONTROL OPERATIONS. ANY LANE RESTRICTIONS SHALL BE LIMITED TO WEEKDAYS MONDAY-THURSDAY BETWEEN THE TIMES OF 9AM AND 3PM. CONTRACTOR SHALL UTILIZE FLAGGERS FOR PEDESTRIAN MAINTENANCE OF TRAFFIC.

REVISION PREPARED BY
CENTURY ENGINEERING INC.
6/29/21
THIS SEAL APPLIES TO SHEET MODIFICATIONS UNDER REVISION #2
DATE
SEAL

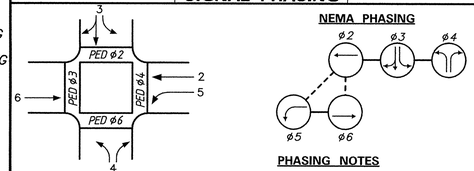
BRET A. MARTINE — DELAWARE — No. 11947 — PROFESSIONAL ENGINEER

PROPOSED OVERHEAD SIGNING

S-1 (R3-1) 36"x36"
S-2 (R3-2) 36"x36"
S-3** Greenbank Rd / Greenbank Rd (D3-1) 78"x18" 8" & 6" D-SERIES BACK-TO-BACK
S-4 (R3-27) 36"x36"
S-5** Centerville Rd / Centerville Rd (D3-1) 84"x18" 8" & 6" D-SERIES BACK-TO-BACK
** FREE-SWINGING MOUNTS

[2] ADDITIONAL LEGEND
CCTV CAMERA

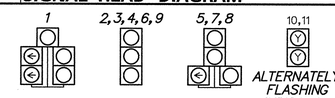
SIGNAL PHASING



PHASING NOTES
1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM

*ALL EXISTING SPAN WIRE MOUNTED SIGNAL HEADS SHALL BE REMOVED



LEGEND

AB	ABANDON	OH #	EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH #	PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO #	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (# OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (# OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL		P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
SPAN INSULATOR		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION		

GENERAL SIGNAL NOTES

1. PROPOSED LOOP DETECTORS:
   TYPE *1 - 6' x 6' - TO BE INSTALLED ON CENTERVILLE ROAD THROUGH MOVEMENTS.
   TYPE *2 - 6' x 25' - TO BE INSTALLED ON NB CENTERVILLE ROAD LEFT-TURN AND GREENBANK THROUGH AND LEFT-TURN MOVEMENTS.
   SYSTEM - 6' x 6' - TO BE INSTALLED IN GREENBANK ROAD AND CENTERVILLE ROAD RECEIVING LANES, AS SHOWN.
2. ALL PROPOSED SIGNAL POLES ARE DELDOT MAST ARMS.
3. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
4. POLE BASES AND CABINET BASE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.
5. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED, AND COMPRESSION FITTING ARE NOT ACCEPTABLE.
6. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.
7. ALL CONDUITS SHALL BE SCHEDULE 80 PVC WHEN INSTALLED BY TRENCHING AND SCHEDULE 80 HDPE WHEN INSTALLED BY BORING, UNLESS OTHERWISE NOTED.

RECOMMENDED _____ DATE:_____
RECOMMENDED _____ DATE:_____
RECOMMENDED _____ DATE: 10/13/14
APPROVED TRAFFIC ENGINEER _____ DATE: 10/14/14
APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER _____ DATE: 10/16/14

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS
[1] SIGNAL REBUILD - ADDED MAST ARMS, SYSTEM LOOPS, AND CDMA AND RECONSTRUCTED PED PHASES 2, 3, 4, AND 6 PER ADA/MUTCD. D.W.C. (WR&A) 10-14 (CONTRACT *T201206106)
[2] INSTALLED PROPOSED CCTV ON EXISTING MAST ARM POLE UTILIZING EXISTING CONDUIT PATHWAY & EXISTING SIGNAL CABINET M.KUBOVCIK (CEI) 06/28/21 - (CONTRACT T202100505)

SCALE 0 30 60 90 FEET

PAVEMENT & REHABILITATION
NORTH VI, 2012
(LOCATION 2)

CONTRACT T201206106
COUNTY NEW CASTLE
PERMIT NO. [2] N382 & NCAM230
DESIGNED BY: D.W.C. (WR&A)
CHECKED BY: M.J.B. (WR&A)

SIGNAL PLAN
CENTERVILLE ROAD @
GREENBANK ROAD

SHEET NO. 1
TOTAL SHTS. 2

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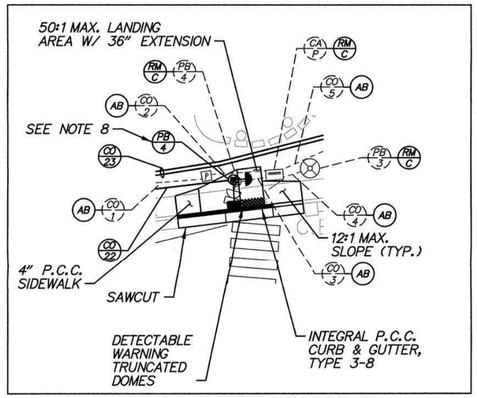
CONDUIT RUN SCHEDULE

CO#	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
12*	1	2.5 IN	92 FT	-	<REMOVE EX. (3) 9/#14, EX. (4) 4/#18, EX. (1) 4/#14>, (2) 5/#14, (2) 2/#14, (1) #6 GROUND
13*	1	1.5 IN	86 FT	-	<REMOVE EX. (1) 4/#18>, (1) 2/#14, (1) #6 GROUND
14*	1	2.5 IN	86 FT	-	<REMOVE EX. (1) 4/#18>, (1) 2/#14, (1) #6 GROUND
15*	1	1.5 IN	249 FT	-	<REMOVE EX. (1) 4/#14>, (1) 4/#14, (2) 2/#14, (1) #6 GROUND
16*	1	1.5 IN	117 FT	-	<REMOVE EX. (1) 4/#14>, (1) 4/#14, (1) #6 GROUND
17*	1	1.5 IN	90 FT	-	<REMOVE EX. (1) 4/#18>, (1) 2/#14, (1) #6 GROUND
18*	1	2.5 IN	71 FT	-	<REMOVE EX. (1) 4/#18>, (1) 2/#14, (1) #6 GROUND
19**	1	2.0 IN	20 FT	T	(1) 2/#8 U.F. W/GROUND - LINE SIDE
20**	1	2.0 IN	10 FT	T	(1) 2/#8 U.F. W/GROUND - LOAD SIDE
21	4	4.0 IN	6 FT	T	(4) 9/#14, (4) 4/#18, (8) 5/#14, (2) 4/#14, (11) 2/#14, (4) #6 GROUND
22	1	2.5 IN	72 FT	T	(1) 5/#14, (1) #6 GROUND NEW (1) CAT5E COMM CABLE [2]
22	1	2.5 IN	72 FT	T	(1) 5/#14, (1) #6 GROUND
23	2	4.0 IN	111 FT	T	(4) 9/#14, (4) 4/#18, (7) 5/#14, (2) 4/#14, (10) 2/#14, (2) #6 GROUND NEW (1) CAT5E COMM CABLE [2]
24	1	3.0 IN	11 FT	T	(2) 9/#14, (2) 4/#18, (1) 4/#14, (1) #6 GROUND NEW (1) CAT5E COMM CABLE [2]
25	1	2.5 IN	13 FT	T	(1) 5/#14, (1) #6 GROUND
26	2	4.0 IN	66 FT	B	(2) 9/#14, (2) 4/#18, (4) 5/#14, (1) 4/#14, (6) 2/#14, (2) #6 GROUND
27	1	4.0 IN	16 FT	T	(2) 5/#14, (1) 2/#14, (1) #6 GROUND
28	1	2.5 IN	4 FT	T	(2) 5/#14, (1) #6 GROUND
29	1	4.0 IN	87 FT	B	(2) 9/#14, (2) 4/#18, (2) 5/#14, (1) 4/#14, (4) 2/#14, (1) #6 GROUND
30	1	2.5 IN	4 FT	T	(2) 5/#14, (1) #6 GROUND
31	1	3.0 IN	6 FT	T	(2) 9/#14, (2) 4/#18, (1) #6 GROUND
32	1	2.5 IN	2 FT	T	(2) 5/#14, (1) #6 GROUND

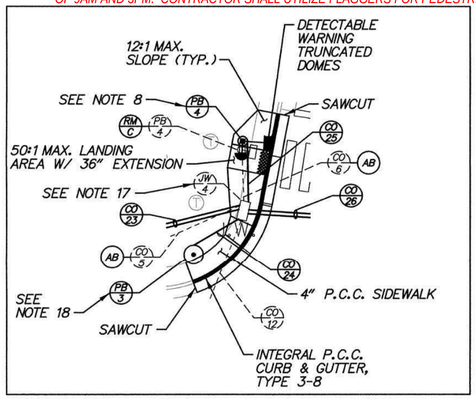
ALL CABLES ARE NEW UNLESS OTHERWISE NOTED B = BORE, T = TRENCH, O = OPEN CUT
* DENOTES EXISTING CONDUIT
** PROPOSED RIGID GALVANIZED STEEL CONDUIT

NOTES:

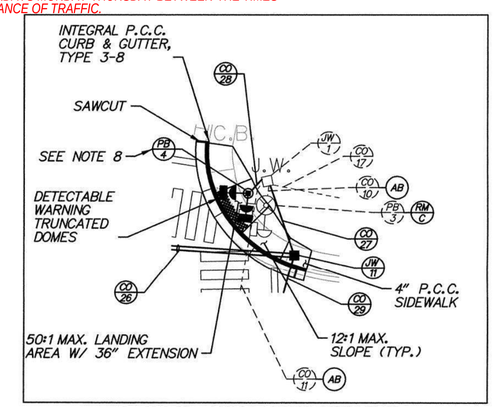
8. PROPOSED PEDESTRIAN POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (50:1 OR FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/ SIDEWALK, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL.
9. ALL PEDESTRIAN SIGNALS SHALL CONTAIN PEDESTRIAN COUNTDOWN DISPLAYS.
10. ALL WORK PERFORMED UNDER THIS PROJECT IS INTENDED TO OCCUR WITHIN DELDOT'S EXISTING RIGHT-OF-WAY BASED ON THE ARCHIVED PLANS FOR CONTRACT NO. 21-011-03.
11. IF GRADING WILL BE STEEPER THAN 6:1 ADJACENT TO THE CURB RAMP OR SIDEWALK, THEN A TYPE 1-8 CURB OR RETAINING WALL SHOULD BE USED TO ELIMINATE THE NEED FOR THE STEEP SLOPE.
12. EXISTING CONDUIT RUNS NOS. 1-11 SHALL BE ABANDONED AND ALL EXISTING CABLES SHALL BE REMOVED.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION AND REMOVAL OF ALL UNDERGROUND SIGNAL EQUIPMENT - E.G., JUNCTION WELLS, CABINET AND POLE BASES, AND CONDUIT. DELDOT'S TRAFFIC CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION AND REMOVAL OF ALL ELECTRICAL CABLES AND ABOVE GROUND SIGNAL EQUIPMENT - E.G., HEADS, OPTICOM RECEIVERS, SPAN WIRES, SERVICE PEDESTAL, POLES, MAST ARMS, AND CABINET.
14. DELDOT TRAFFIC SHALL ADJUST THE SIGNAL HEADS IN THE MAST ARM BRACKETS SO THAT THE BOTTOM OF THE SIGNAL HOUSINGS ARE AT LEAST 16'-0" ABOVE THE PAVEMENT.
15. DELDOT TRAFFIC SHALL INSTALL A CDMA IN THE PROPOSED SIGNAL CABINET.
16. DELDOT TRAFFIC SHALL SPLICE THE PROPOSED 4/#14 CABLE TO THE EXISTING FLASHERS.
17. THE CONTRACTOR SHALL ADJUST THE EXISTING JUNCTION WELL, TYPE 4, TO BE FLUSH WITH THE PROPOSED CURB RAMP, TYPE 2.
18. THE CONTRACTOR SHALL INSTALL THE PROPOSED POLE BASE, TYPE 3, SO THAT IT IS FLUSH WITH THE ADJOINING PROPOSED P.C.C. SIDEWALK.
19. DELDOT TRAFFIC SHALL INSTALL PROPOSED CCTV CAMERA (PERMIT #NCAM230) ON EXISTING NORTHEAST MAST ARM POLE.
20. CAMERA EQUIPMENT SHALL BE INSTALLED IN THE EXISTING SIGNAL CONTROLLER CABINET (PERMIT #N382). [2]
21. FOR THE DURATION OF SIGNAL CONSTRUCTION, THE CONTRACTOR SHALL UTILIZE TYPICAL APPLICATION 47A, FIGURE 6H-47A FOR TRAFFIC CONTROL OPERATIONS. ANY LANE RESTRICTIONS SHALL BE LIMITED TO WEEKDAYS MONDAY-THURSDAY BETWEEN THE TIMES OF 9AM AND 3PM. CONTRACTOR SHALL UTILIZE FLAGGERS FOR PEDESTRIAN MAINTENANCE OF TRAFFIC. [2]



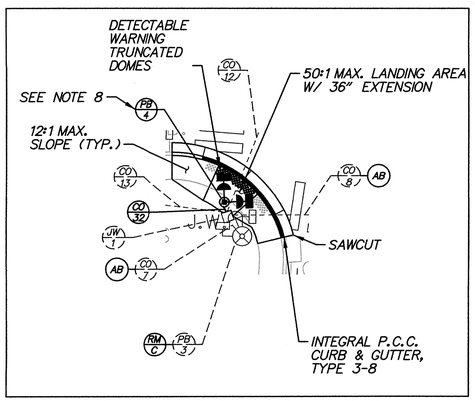
DETAIL 1 – CURB RAMP, TYPE 2
SCALE: 1" = 15'



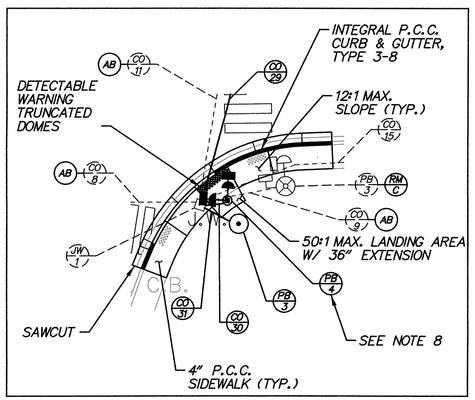
DETAIL 2 – CURB RAMP, TYPE 2
SCALE: 1" = 15'



DETAIL 3 – CURB RAMP, TYPE 2 / 3
SCALE: 1" = 15'



DETAIL 4 – CURB RAMP, TYPE 2 / 3
SCALE: 1" = 15'

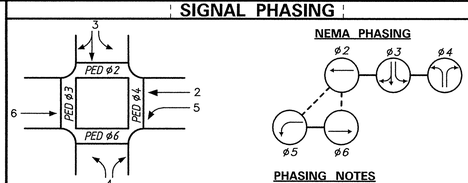


DETAIL 5 – CURB RAMP, TYPE 2 / 3
SCALE: 1" = 15'

REVISION PREPARED BY
CENTURY ENGINEERING INC.
B. [illegible] 6/29/21
THIS SEAL APPLIES TO SHEET MODIFICATIONS UNDER REVISION #2 — DATE

BRET A. MARTINO — No. 11947 — DELAWARE — PROFESSIONAL ENGINEER
SEAL

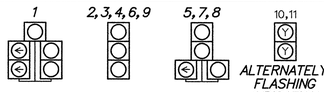
SIGNAL PHASING



PHASING NOTES
1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM

*ALL EXISTING SPAN WIRE MOUNTED SIGNAL HEADS SHALL BE REMOVED



LEGEND

AB	ABANDON	OH / *	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA / X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH / *	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA / X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB / X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO / *	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PB / X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO / *	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PL / X	EXISTING POLE IDENTIFIER (* OF POLE)
JW / X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL / X	PROPOSED POLE IDENTIFIER (* OF POLE)
JW / X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM / C	REMOVE BY CONTRACTOR
MA / XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM / O	REMOVE BY OTHERS
MA / XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM / TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL		P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
SPAN INSULATOR		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION		

GENERAL SIGNAL NOTES

1. PROPOSED LOOP DETECTORS:
   TYPE #1 - 6' x 6' - TO BE INSTALLED ON CENTERVILLE ROAD THROUGH MOVEMENTS.
   TYPE #2 - 6' x 25' - TO BE INSTALLED ON NB CENTERVILLE ROAD LEFT-TURN AND GREENBANK THROUGH AND LEFT-TURN MOVEMENTS.
   SYSTEM - 6' x 6' - TO BE INSTALLED IN GREENBANK ROAD AND CENTERVILLE ROAD RECEIVING LANES, AS SHOWN.
2. ALL PROPOSED SIGNAL POLES ARE DELDOT MAST ARMS.
3. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
4. POLE BASES AND CABINET BASE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.
5. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED, AND COMPRESSION FITTING ARE NOT ACCEPTABLE.
6. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.
7. ALL CONDUITS SHALL BE SCHEDULE 80 PVC WHEN INSTALLED BY TRENCHING AND SCHEDULE 80 HDPE WHEN INSTALLED BY BORING, UNLESS OTHERWISE NOTED.

RECOMMENDED _____ DATE: _____
RECOMMENDED _____ DATE: _____
RECOMMENDED [signature] DATE: 10/13/14
APPROVED TRAFFIC ENGINEER [signature] DATE: 10/14/14
APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER [signature] DATE: 10/16/14

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS
1 SIGNAL REBUILD - ADDED MAST ARMS, SYSTEM LOOPS, AND CDMA AND RECONSTRUCTED PED PHASES 2, 3, 4, AND 6 PER ADA/MUTCD. D.W.C. (WR&A) 10-14 (CONTRACT #T201206106)
2 INSTALLED PROPOSED CCTV ON EXISTING MAST ARM
POLE UTILIZING EXISTING CONDUIT PATHWAY
& EXISTING SIGNAL CABINET
M.KUBOVCIK (CEI) 06/28/21 - (CONTRACT T202100505)

SCALE 0 30 60 90 FEET

PAVEMENT & REHABILITATION NORTH VI, 2012 (LOCATION 2)

CONTRACT	T201206106
COUNTY	NEW CASTLE
PERMIT NO. [2]	N382 & NCAM230
DESIGNED BY: D.W.C. (WR&A)	
CHECKED BY: M.J.B. (WR&A)	

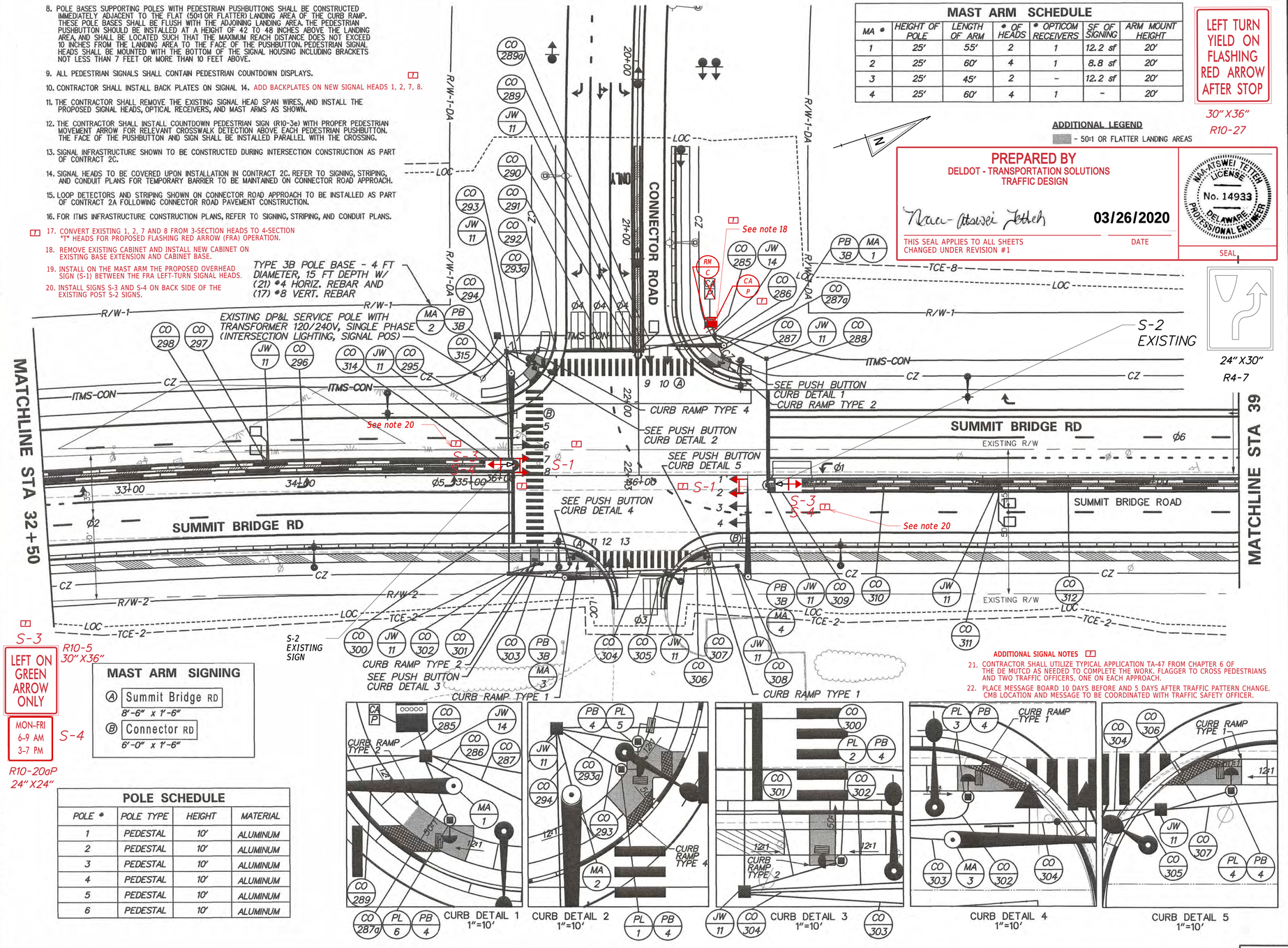
SIGNAL PLAN CENTERVILLE ROAD @ GREENBANK ROAD

SHEET NO.	2
TOTAL SHTS.	2

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GENERAL SIGNAL NOTES (CONT'D)

8. POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (5O:1 OR FLATTER) LANDING AREA OF THE CURB RAMP. THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE DOES NOT EXCEED 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE.
9. ALL PEDESTRIAN SIGNALS SHALL CONTAIN PEDESTRIAN COUNTDOWN DISPLAYS.
10. CONTRACTOR SHALL INSTALL BACK PLATES ON SIGNAL 14. ADD BACKPLATES ON NEW SIGNAL HEADS 1, 2, 7, 8.
11. THE CONTRACTOR SHALL REMOVE THE EXISTING SIGNAL HEAD SPAN WIRES, AND INSTALL THE PROPOSED SIGNAL HEADS, OPTICAL RECEIVERS, AND MAST ARMS AS SHOWN.
12. THE CONTRACTOR SHALL INSTALL COUNTDOWN PEDESTRIAN SIGN (R10-3e) WITH PROPER PEDESTRIAN MOVEMENT ARROW FOR RELEVANT CROSSWALK DETECTION ABOVE EACH PEDESTRIAN PUSHBUTTON. THE FACE OF THE PUSHBUTTON AND SIGN SHALL BE INSTALLED PARALLEL WITH THE CROSSING.
13. SIGNAL INFRASTRUCTURE SHOWN TO BE CONSTRUCTED DURING INTERSECTION CONSTRUCTION AS PART OF CONTRACT 2C.
14. SIGNAL HEADS TO BE COVERED UPON INSTALLATION IN CONTRACT 2C. REFER TO SIGNING, STRIPING, AND CONDUIT PLANS FOR TEMPORARY BARRIER TO BE MAINTAINED ON CONNECTOR ROAD APPROACH.
15. LOOP DETECTORS AND STRIPING SHOWN ON CONNECTOR ROAD APPROACH TO BE INSTALLED AS PART OF CONTRACT 2A FOLLOWING CONNECTOR ROAD PAVEMENT CONSTRUCTION.
16. FOR ITMS INFRASTRUCTURE CONSTRUCTION PLANS, REFER TO SIGNING, STRIPING, AND CONDUIT PLANS.
17. CONVERT EXISTING 1, 2, 7 AND 8 FROM 3-SECTION HEADS TO 4-SECTION "T" HEADS FOR PROPOSED FLASHING RED ARROW (FRA) OPERATION.
18. REMOVE EXISTING CABINET AND INSTALL NEW CABINET ON EXISTING BASE EXTENSION AND CABINET BASE.
19. INSTALL ON THE MAST ARM THE PROPOSED OVERHEAD SIGN (S-1) BETWEEN THE FRA LEFT-TURN SIGNAL HEADS.
20. INSTALL SIGNS S-3 AND S-4 ON BACK SIDE OF THE EXISTING POST S-2 SIGNS.



MAST ARM SCHEDULE

MA #	HEIGHT OF POLE	LENGTH OF ARM	# OF HEADS	# OPTICOM RECEIVERS	SF OF SIGNING	ARM MOUNT HEIGHT
1	25'	55'	2	1	12.2 sf	20'
2	25'	60'	4	1	8.8 sf	20'
3	25'	45'	2	-	12.2 sf	20'
4	25'	60'	4	1	-	20'

S-1

LEFT TURN YIELD ON FLASHING RED ARROW AFTER STOP

30"X36"

R10-27

ADDITIONAL LEGEND

▒ - 50:1 OR FLATTER LANDING AREAS

S-2

24"X30"

R4-7

S-3

LEFT ON GREEN ARROW ONLY

R10-5

30"X36"

S-4

MON-FRI 6-9 AM 3-7 PM

R10-20aP

24"X24"

MAST ARM SIGNING

Ⓐ Summit Bridge RD 8'-6" x 1'-6"

Ⓑ Connector RD 6'-0" x 1'-6"

POLE SCHEDULE

POLE #	POLE TYPE	HEIGHT	MATERIAL
1	PEDESTAL	10'	ALUMINUM
2	PEDESTAL	10'	ALUMINUM
3	PEDESTAL	10'	ALUMINUM
4	PEDESTAL	10'	ALUMINUM
5	PEDESTAL	10'	ALUMINUM
6	PEDESTAL	10'	ALUMINUM

ADDITIONAL SIGNAL NOTES

21. CONTRACTOR SHALL UTILIZE TYPICAL APPLICATION TA-47 FROM CHAPTER 6 OF THE DE MUTCD AS NEEDED TO COMPLETE THE WORK. FLAGGER TO CROSS PEDESTRIANS AND TWO TRAFFIC OFFICERS, ONE ON EACH APPROACH.
22. PLACE MESSAGE BOARD 10 DAYS BEFORE AND 5 DAYS AFTER TRAFFIC PATTERN CHANGE. CMB LOCATION AND MESSAGE TO BE COORDINATED WITH TRAFFIC SAFETY OFFICER.

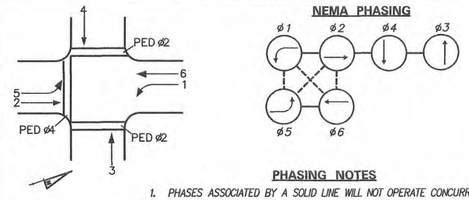
PREPARED BY
DELDOT - TRANSPORTATION SOLUTIONS
TRAFFIC DESIGN

Nora Aiswei Tetteh — 03/26/2020

THIS SEAL APPLIES TO ALL SHEETS CHANGED UNDER REVISION #1 — DATE

NORA AISWEI TETTEH LICENSE No. 14933 DELAWARE PROFESSIONAL ENGINEER — SEAL

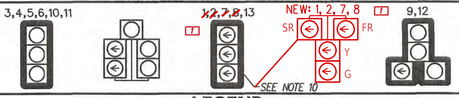
SIGNAL PHASING



PHASING NOTES

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

SIGNAL HEAD DIAGRAM



LEGEND

PROPOSED SIGNAL CABINET		REMOVE BY CONTRACTOR	RM C
EXISTING SIGNAL CABINET		REMOVE BY OTHERS	RM O
PROPOSED SIGNAL POLE BASE		ABANDON	AB
EXISTING SIGNAL POLE BASE		PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)	PB X
PROPOSED PEDESTRIAN POLE BASE		EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)	PB X
EXISTING PEDESTRIAN POLE BASE		PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	JW X
PROPOSED WOOD POLE		EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	JW X
EXISTING UTILITY POLE		PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	CO #
PROPOSED JUNCTION WELL		EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	CO #
EXISTING JUNCTION WELL		PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)	OH #
PROPOSED SIGNAL HEAD		EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)	OH #
EXISTING SIGNAL HEAD		PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	MA XX
PROPOSED PEDESTRIAN SIGNAL HEAD		EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	MA XX
EXISTING PEDESTRIAN SIGNAL HEAD		PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	CA X
PROPOSED PEDESTRIAN PUSHBUTTON		EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	CA X
EXISTING PEDESTRIAN PUSHBUTTON		PROPOSED SPAN WIRE	
PROPOSED VIDEO DETECTION		EXISTING SPAN WIRE	XX
EXISTING VIDEO DETECTION		RIGHT-OF-WAY OR PROPERTY LINE	
PROPOSED MICROWAVE DETECTION		PROPOSED SPAN INSULATOR	
EXISTING MICROWAVE DETECTION		EXISTING SPAN INSULATOR	
OVERHEAD SIGNING		SERVICE PEDESTAL	P
PROPOSED OPTICOM RECEIVER			
EXISTING OPTICOM RECEIVER			
PROPOSED MAST ARM			
EXISTING MAST ARM			
PROPOSED LUMINAIRE			
EXISTING LUMINAIRE			
PROPOSED LOOP DETECTOR (TYPE 1 OR 2)			
EXISTING LOOP DETECTOR (TYPE 1 OR 2)			

GENERAL SIGNAL NOTES

1. DETECTION - 50 M.P.H. - 5 SECONDS PASSAGE TIME AT 365 FEET FROM STOP BAR.
2. LOOP DETECTORS:
   TYPE #1 - 6' x 6' - TO BE INSTALLED ON MAIN STREET THROUGH MOVEMENTS.
   TYPE #2 - 6' x 25' - TO BE INSTALLED ON MAIN STREET LEFT TURN MOVEMENTS.
   TYPE #2 - 6' x 25' - TO BE INSTALLED ON SIDE STREET LEFT TURN MOVEMENTS.
3. ALL SIGNAL POLES WILL BE MAST ARMS.
4. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
5. POLE BASES, CABINET BASE AND CONDUIT JUNCTION WELLS TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.
6. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED, AND COMPRESSION FITTING ARE NOT ACCEPTABLE.
7. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.

SG04

RECOMMENDED _____ DATE: 11/9/16

RECOMMENDED _____ DATE: 10.26.16

APPROVED TRAFFIC ENGINEER _____ DATE: 10/20/16

APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER _____ DATE: 10/26/16

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

ADDED FRA (FLASHING RED ARROW)	
FOR NB AND SB SR 71 (3-2020-BAC)	

SCALE 0 30 60 90 FEET

SUMMIT BRIDGE ROAD AND ARMSTRONG CORNER ROAD INTERSECTION IMPROVEMENTS

CONTRACT	T201011301	
COUNTY	NEW CASTLE	
PERMIT NO.	N787	
DESIGNED BY:	KVH	
CHECKED BY:	STS	

SIGNAL PLAN SUMMIT BRIDGE RD (DE 71) INTERCHANGE CONNECTOR RD

SHEET NO.	SG04
	194
TOTAL SHTS.	
	197

S:\PROJECTS\TRANSPORTATION\NEW CASTLE\301\ROAD\T201011301\PLANS\SG\SG04.DGN

APPENDIX F

Sample Traffic Statement

DELAWARE DEPARTMENT OF TRANSPORTATION

TRAFFIC SIGNAL ESTIMATE

HSIP SC SR 24 at SR 5/SR 23 Intersection Improvements

CONTRACT #: T201200903
F.A.P. #: ESTP-0024(15)
PROJECT: HSIP SC SR 24 at SR 5/SR 23 Intersection Improvements

					INTERSECTION # 1: **S313: SR 24 @ Plaza Drive ("Bayshore Plaza") - Temporary**	UNIT COST	TOTAL COST
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	BYERS	BYERS
1	670	830008	1	EA	Adjust or Repair Existing Conduit Junction Well		
					TOTAL PROJECT CONTRACTOR ITEMS	→	

					INTERSECTION # 1: **S313: SR 24 @ Plaza Drive ("Bayshore Plaza") - Temporary**	UNIT COST	TOTAL COST
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC CONTRACTOR ITEMS)	BYERS	BYERS
1	95	832029	40	LF	Furnish & Install #8/2 wire UF W/ground [Advanced utility work contingency]	4.55	182.00
2	440	831523	40	LF	Furnish and Install 2" Galvanized Steel Conduit (Trench) [Advanced utility work contingency]	18.50	740.00
3	990	837011	8	EA	Realign or Slide Existing Signal Head	175.00	1,400.00
4	1070	844521	1	EA	Install Video Detection Device	500.00	500.00
5			2	LS	MOT	7000.00	14,000.00
					TOTAL TRAFFIC CONTRACTOR ITEMS	→	16,822.00

					INTERSECTION # 1: **S313: SR 24 @ Plaza Drive ("Bayshore Plaza") - Temporary**	UNIT COST	TOTAL COST
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	BYERS	BYERS
1	2080	999442	1	EA	Video Detector (Fisheye)	19000.00	19,000.00
2			1	LS	Power Feed "Make-Ready" DEC [Advanced utility work contingency]	2000.00	2,000.00
					TOTAL TRAFFIC SUPPLY ITEMS	→	21,000.00

TOTAL PROJECT CONTRACTOR ITEMS	→	→	
TOTAL TRAFFIC CONTRACTOR ITEMS	→	→	16,822.00
TOTAL TRAFFIC SUPPLY ITEMS	→	→	21,000.00
CONTINGENCIES	→	→	2,363.88
TOTAL COST	→	→	40,185.88

					INTERSECTION # 2: **S313: SR 24 @ Plaza Drive ("Bayshore Plaza") - Ultimate**	**UNIT COST**	**TOTAL COST**
LINE	**#**	**ITEM #**	**QTY**	**UOM**	**DESCRIPTION - (PROJECT CONTRACTOR ITEMS)**	**BYERS**	**BYERS**
1	135	846001	530	LF	Furnish & Install Loop Wire 1-conductor #14 AWG encased in ¼" Flexible Tubing in a Loop Sawcut		
2	140	846002	30	LF	Furnish & Install a 1-1/2 inch Galvanized Rigid Metal Conduit Detector Sleeve with Loop Wire		
3	305	831545	120	LF	Furnish and Install 4" HDPE SDR-13.5 Conduit (Bore)		
4	355	831514	25	LF	Furnish and Install 2-1/2" Schedule 80 PVC Conduit (Trench)		
5	360	831515	50	LF	Furnish and Install 3" Schedule 80 PVC Conduit (Trench)		
6	365	831516	130	LF	Furnish and Install 4" Schedule 80 PVC Conduit (Trench)		
7	650	830001	2	EA	Conduit Junction Well, Type 1, 20"x20" Precast Concrete		
8	670	830008	1	EA	Adjust or Repair Existing Conduit Junction Well		
9	700	833001	9	EA	Bonding & Grounding Existing Junction Well		
10	850	834005	1	EA	Pole Base Type 4A		
11	1225	830010	2	EA	Removal of Existing Junction Well		
					TOTAL PROJECT CONTRACTOR ITEMS	→	

					INTERSECTION # 2: **S313: SR 24 @ Plaza Drive ("Bayshore Plaza") - Ultimate**	**UNIT COST**	**TOTAL COST**
LINE	**#**	**ITEM #**	**QTY**	**UOM**	**DESCRIPTION - (TRAFFIC CONTRACTOR ITEMS)**	**BYERS**	**BYERS**
1	65	832008	560	LF	Furnish & Install 1-conductor #6 AWG Stranded Copper	2.30	1,288.00
2	80	832025	325	LF	Furnish & Install 4-conductor #18 AWG Shielded Opticom Cable	2.50	812.50
3	90	832027	750	LF	Furnish & Install 2-Conductor #14 AWG Aluminum Shielded Cable	2.50	1,875.00
4	110	832507	760	LF	Furnish & Install 14/5 Traffic Control Cable	2.65	2,014.00
5	115	832033	335	LF	Furnish & Install 14/9 Traffic Control Cable	3.20	1,072.00
6	885	836502	1	EA	Furnish and Install Pedestal Pole	1350.00	1,350.00
7	990	837011	6	EA	Realign or Slide Existing Signal Head	175.00	1,050.00
8	1000	837008	3	EA	Furnish & Install 16" LED Countdown Pedestrian Signal	650.00	1,950.00
9	1010	837010	4	EA	Furnish & Install Pedestrian Pushbutton with Sign	250.00	1,000.00
10	1035	837501	1	EA	Installation and Removal of Traffic Signal Head Indication/LED Module	175.00	175.00
11	1045	837508	1	EA	Furnish 16" LED Countdown Pedestrian Signal Head Indication Module	145.00	145.00
12	1140	823001	2	EA	Installation of Sign on Span Wire or Mast Arm	275.00	550.00
13	1235	832035	200	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	1.50	300.00
14	1260	837500	1	EA	Removal of Signal Head or Pedestrian Head from Pole or Pedestal	150.00	150.00
15	1290	842500	2	EA	Installation or Removal of Pedestrian Button on Wood or Metal Pole	100.00	200.00
16			1	LS	MOT	7000.00	7,000.00
					TOTAL TRAFFIC CONTRACTOR ITEMS	→	20,931.50

					INTERSECTION # 2: **S313: SR 24 @ Plaza Drive ("Bayshore Plaza") - Ultimate**	**UNIT COST**	**TOTAL COST**
LINE	**#**	**ITEM #**	**QTY**	**UOM**	**DESCRIPTION - (TRAFFIC SUPPLY ITEMS)**	**BYERS**	**BYERS**
1	2435	999601	6	EA	Rouleau Sign Brackets (2 per average sign, 3 per longer sign)	115.00	690.00
					TOTAL TRAFFIC SUPPLY ITEMS	→	690.00

TOTAL PROJECT CONTRACTOR ITEMS	→	→	
TOTAL TRAFFIC CONTRACTOR ITEMS	→	→	20,931.50
TOTAL TRAFFIC SUPPLY ITEMS	→	→	690.00
CONTINGENCIES	→	→	1,351.34
TOTAL COST	→	→	22,972.84

					INTERSECTION # 3: **S127: SR 24 @ SR 5 / SR 23 ("Road 22") - Temporary**	UNIT COST	TOTAL COST
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	BYERS	BYERS
1	670	830008	11	EA	Adjust or Repair Existing Conduit Junction Well		
					TOTAL PROJECT CONTRACTOR ITEMS	→	

					INTERSECTION # 3: **S127: SR 24 @ SR 5 / SR 23 ("Road 22") - Temporary**	UNIT COST	TOTAL COST
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC CONTRACTOR ITEMS)	BYERS	BYERS
1	990	837011	20	EA	Realign or Slide Existing Signal Head	175.00	3,500.00
2	1070	844521	1	EA	Install Video Detection Device	500.00	500.00
3	1210	838009	250	LF	Removal of Messenger Wire, Cable and Hardware [Advanced utility work contingency]	5.00	1,250.00
4	1215	838500	1	EA	Removal of Span Wire Attachment [Advanced utility work contingency]	300.00	300.00
5			5	LS	MOT	7000.00	35,000.00
					TOTAL TRAFFIC CONTRACTOR ITEMS	→	40,550.00

					INTERSECTION # 3: **S127: SR 24 @ SR 5 / SR 23 ("Road 22") - Temporary**	UNIT COST	TOTAL COST
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	BYERS	BYERS
1	2080	999442	1	EA	Video Detector (Fisheye)	19000.00	19,000.00
2			1	LS	Power Feed "Make-Ready" DEC [Advanced utility work contingency]	6000.00	6,000.00
					TOTAL TRAFFIC SUPPLY ITEMS	→	25,000.00

TOTAL PROJECT CONTRACTOR ITEMS	→ →	
TOTAL TRAFFIC CONTRACTOR ITEMS	→ →	40,550.00
TOTAL TRAFFIC SUPPLY ITEMS	→ →	25,000.00
CONTINGENCIES	→ →	4,096.88
TOTAL COST	→ →	69,646.88

					INTERSECTION # 4: **S127: SR 24 @ SR 5 / SR 23 ("Road 22") - Ultimate**	UNIT COST	TOTAL COST
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	BYERS	BYERS
1	15	835003	1	EA	Cabinet Base Type P		
2	135	846001	1070	LF	Furnish & Install Loop Wire 1-conductor #14 AWG encased in ¼" Flexible Tubing in a Loop Sawcut		
3	140	846002	50	LF	Furnish & Install a 1-1/2 inch Galvanized Rigid Metal Conduit Detector Sleeve with Loop Wire		
4	305	831545	435	LF	Furnish and Install 4" HDPE SDR-13.5 Conduit (Bore)		
5	355	831514	55	LF	Furnish and Install 2-1/2" Schedule 80 PVC Conduit (Trench)		
~~6~~	~~360~~	~~831515~~		~~LF~~	~~Furnish and Install 3" Schedule 80 PVC Conduit (Trench)~~		
7	365	831516	700	LF	Furnish and Install 4" Schedule 80 PVC Conduit (Trench)		
8	440	831523	15	LF	Furnish and Install 2" Galvanized Steel Conduit (Trench)		
9	455	831526	5	LF	Furnish and Install 4" Galvanized Steel Conduit (Trench)		
10	515	831541	15	LF	Furnish and Install 4" Galvanized Steel Conduit (On Structure)		
11	545	831574	315	LF	Furnish and Install Second and Subsequent Additional 4" PVC Conduits in Trench or Open Cut		
12	565	831578	205	LF	Furnish and Install Second and Subsequent Additional 4" HDPE 13.5 SDR Conduit Conduits in Directional Bore		
13	650	830001	8	EA	Conduit Junction Well, Type 1, 20"x20" Precast Concrete		
14	655	830002	4	EA	Conduit Junction Well, Type 4, 20"x42.5" Precast Concrete		
~~15~~	~~835~~	~~834002~~		~~EA~~	~~Pole Base Type 3A~~		
~~16~~	~~840~~	~~834003~~		~~EA~~	~~Pole Base Type 3B~~		
17	850	834005	5	EA	Pole Base Type 4A		
18	1225	830010	8	EA	Removal of Existing Junction Well		
19	1240	834501	3	CY	Removal of Concrete Pole Bases and Cabinet Foundations		
					TOTAL PROJECT CONTRACTOR ITEMS	→	

					INTERSECTION # 4: **S127: SR 24 @ SR 5 / SR 23 ("Road 22") - Ultimate**	UNIT COST	TOTAL COST
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC CONTRACTOR ITEMS)	BYERS	BYERS
1	65	832008	1355	LF	Furnish & Install 1-conductor #6 AWG Stranded Copper	2.30	3,116.50
2	80	832025	870	LF	Furnish & Install 4-conductor #18 AWG Shielded Opticom Cable	2.50	2,175.00
3	90	832027	2655	LF	Furnish & Install 2-Conductor #14 AWG Aluminum Shielded Cable	2.50	6,637.50
4	95	832029	20	LF	Furnish & Install #8/2 wire UF W/ground	4.55	91.00
5	110	832507	1230	LF	Furnish & Install 14/5 Traffic Control Cable	2.65	3,259.50
6	115	832033	890	LF	Furnish & Install 14/9 Traffic Control Cable	3.20	2,848.00
7	630	842005	1	EA	Removal of Electric Service on Wood or Metal Pole	350.00	350.00
8	635	842501	1	EA	Furnish & Install Electrical Utility Service Equipment (100 AMP)	1800.00	1,800.00
9	885	836502	5	EA	Furnish and Install Pedestal Pole	1350.00	6,750.00
10	~~890~~	~~836504~~	~~4~~	~~EA~~	~~Installation of Steel Mast Arm Pole with Single or Twin Mast arms up to 60'~~	~~2000.00~~	
11	970	837002	32	EA	Furnish & Install 12" LED Signal Head Section Rigid Mount	340.00	10,880.00
12	985	837007	8	EA	Furnish & Install Signal Head Backplate	325.00	2,600.00
13	995	844001	4	EA	Furnish & Install Opticom Emergency Preemption Detector	950.00	3,800.00
14	1000	837008	8	EA	Furnish & Install 16" LED Countdown Pedestrian Signal	650.00	5,200.00
15	1010	837010	8	EA	Furnish & Install Pedestrian Pushbutton with Sign	250.00	2,000.00
16	1135	822500	4	EA	Install Overhead Sign	300.00	1,200.00
17	1215	838500	4	EA	Removal of Span Wire Attachment	300.00	1,200.00
18	1255	836503	2	EA	Remove Steel Pole (Equal to or Greater than 15' and Less than 40'	275.00	550.00
19	1270	838504	12	EA	Removal of Signal Head or Opticom Detector from Span Wire or Mast Arm	225.00	2,700.00
20	1300	847002	2	EA	Installation or Removal of Base or Pad Mounted Cabinet	300.00	600.00
21			3	LS	MOT	7000.00	21,000.00
					TOTAL TRAFFIC CONTRACTOR ITEMS	→	78,757.50

					INTERSECTION # 4: **S127: SR 24 @ SR 5 / SR 23 ("Road 22") - Ultimate**	UNIT COST	TOTAL COST
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	BYERS	BYERS
1	2020	999421	1	EA	Complete P Cabinet w/12 Channel EPAC Controller(includes Mounting Rack w/Power Supply, 5-4 Ch	13950.00	13,950.00
2	2050	999427	1	EA	Base Extension (split) Aluminum w/Natural Mill Finish	550.00	550.00
3	2105	999461	1	EA	Optical Receiver Card (Emergency Preemption)	2751.00	2,751.00
4	~~2175~~	~~999489~~	~~4~~	~~EA~~	~~Steel Round Mast Arm Pole, TYPE B (45' - 60' Arm Length or 2-60' Arms)~~	~~8818.16~~	
5	~~2220~~	~~999498~~	~~1~~	~~EA~~	~~45' (13.7m) Steel Round Mast Arm~~	~~7770.88~~	
6	~~2225~~	~~999499~~	~~2~~	~~EA~~	~~50' (15.2m) Steel Round Mast Arm~~	~~7941.44~~	
7	~~2230~~	~~999500~~	~~1~~	~~EA~~	~~55' (16.8m) Steel Round Mast Arm~~	~~8641.36~~	
8	2435	999601	6	EA	Rouleau Sign Brackets (2 per average sign, 3 per longer sign)	115.00	690.00
9			1	LS	Power Feed "Make-Ready" DEC	2000.00	2,000.00
					TOTAL TRAFFIC SUPPLY ITEMS	→	19,941.00

TOTAL PROJECT CONTRACTOR ITEMS	→	→	
TOTAL TRAFFIC CONTRACTOR ITEMS	→	→	78,757.50
TOTAL TRAFFIC SUPPLY ITEMS	→	→	19,941.00
CONTINGENCIES	→	→	6,168.66
TOTAL COST	→	→	104,867.16

INTERSECTION # 5:	S127: SR 24 @ SR 5 / SR 23 ("Road 22") - Advance Traffic-only					UNIT COST	TOTAL COST
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	BYERS	BYERS
					TOTAL PROJECT CONTRACTOR ITEMS	→	

INTERSECTION # 5:	S127: SR 24 @ SR 5 / SR 23 ("Road 22") - Advance Traffic-only					UNIT COST	TOTAL COST
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC CONTRACTOR ITEMS)	BYERS	BYERS
1	360	831515	40	LF	Furnish and Install 3" Schedule 80 PVC Conduit (Trench)	12.00	480.00
2	650	830001	4	EA	Conduit Junction Well, Type 1, 20"x20" Precast Concrete	1100.00	4,400.00
3	715	802003	8	EA-DY	Arrow Panels, Type C	45.00	360.00
4	725	804001	8	EA-DY	Furnish & Maintain Portable Light Assembly (Flood Lights)	225.00	1,800.00
5	730	805001	240	EA-DY	Plastic Drums	4.00	960.00
6	735	806001	32	HR	Traffic Officers	75.00	2,400.00
7	740	808002	8	EA-DY	Furnish & Maintain Truck Mounted Attenuator, Type II	220.00	1,760.00
8	745	810001	64	EA-DY	Temporary Warning Signs and Plaques	18.00	1,152.00
9	760	811003	40	HR	Flagger, Sussex County, State	78.00	3,120.00
10	775	811015	8	HR	Flagger, Sussex County, State, Overtime	113.00	904.00
11	835	834002	3	EA	Pole Base Type 3A	3700.00	11,100.00
12	840	834003	1	EA	Pole Base Type 3B	4900.00	4,900.00
13	890	836504	4	EA	Installation of Steel Mast Arm Pole with Single or Twin Mast arms up to 60'	2000.00	8,000.00
14	1070	844521	1	EA	Install Video Detection Device	500.00	500.00
					TOTAL TRAFFIC CONTRACTOR ITEMS	→	41,836.00

INTERSECTION # 5:	S127: SR 24 @ SR 5 / SR 23 ("Road 22") - Advance Traffic-only					UNIT COST	TOTAL COST
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	BYERS	BYERS
1	2080	999442	1	EA	Video Detector (Fisheye)	19000.00	19,000.00
2	2175	999489	4	EA	Steel Round Mast Arm Pole, TYPE B (45' - 60' Arm Length or 2-60' Arms)	8818.16	35,272.64
3	2220	999498	1	EA	45' (13.7m) Steel Round Mast Arm	7770.88	7,770.88
4	2225	999499	1	EA	50' (15.2m) Steel Round Mast Arm	7941.44	7,941.44
5	2235	999501	2	EA	60' (16.8m) Steel Round Mast Arm	9468.16	18,936.32
					TOTAL TRAFFIC SUPPLY ITEMS	→	88,921.28

TOTAL PROJECT CONTRACTOR ITEMS	→ →	
TOTAL TRAFFIC CONTRACTOR ITEMS	→ →	41,836.00
TOTAL TRAFFIC SUPPLY ITEMS	→ →	88,921.28
CONTINGENCIES	→ →	8,172.33
TOTAL COST	→ →	138,929.61

MULTIPLE INTERSECTION SUMMARY

Intersection #1:	**S313: SR 24 @ Plaza Drive ("Bayshore Plaza") - Temporary**		
	TOTAL PROJECT CONTRACTOR ITEMS	→ →	
	TOTAL TRAFFIC CONTRACTOR ITEMS	→ →	16,822.00
	TOTAL TRAFFIC SUPPLY ITEMS	→ →	21,000.00
	CONTINGENCIES	→ →	2,363.88
Intersection #2:	**S313: SR 24 @ Plaza Drive ("Bayshore Plaza") - Ultimate**		
	TOTAL PROJECT CONTRACTOR ITEMS	→ →	
	TOTAL TRAFFIC CONTRACTOR ITEMS	→ →	20,931.50
	TOTAL TRAFFIC SUPPLY ITEMS	→ →	690.00
	CONTINGENCIES	→ →	1,351.34
Intersection #3:	**S127: SR 24 @ SR 5 / SR 23 ("Road 22") - Temporary**		
	TOTAL PROJECT CONTRACTOR ITEMS	→ →	
	TOTAL TRAFFIC CONTRACTOR ITEMS	→ →	40,550.00
	TOTAL TRAFFIC SUPPLY ITEMS	→ →	25,000.00
	CONTINGENCIES	→ →	4,096.88
Intersection #4:	**S127: SR 24 @ SR 5 / SR 23 ("Road 22") - Ultimate**		
	TOTAL PROJECT CONTRACTOR ITEMS	→ →	
	TOTAL TRAFFIC CONTRACTOR ITEMS	→ →	78,757.50
	TOTAL TRAFFIC SUPPLY ITEMS	→ →	19,941.00
	CONTINGENCIES	→ →	6,168.66
Intersection #5:	**S127: SR 24 @ SR 5 / SR 23 ("Road 22") - Advance Traffic-only**		
	TOTAL PROJECT CONTRACTOR ITEMS	→ →	
	TOTAL TRAFFIC CONTRACTOR ITEMS	→ →	41,836.00
	TOTAL TRAFFIC SUPPLY ITEMS	→ →	88,921.28
	CONTINGENCIES	→ →	8,172.33
	TOTAL	→ →	**376,602.36**

C:\Users\Josephus.vanBoekhold\AppData\Local\Microsoft\Windows\INetCache\Content.Outlook\9O1QW5H5\[T201200903_TS_rev110220.xlsx]Signals

TRAFFIC STATEMENT

Date : NOT YET SENT

DelDOT Traffic
169 Brick Store Landing Rd
Smyrna, Delaware 19977

To : Daniel Macchione
PS&E Project Coordinator

From : Bret A. Martine, PE, PTOE
Traffic Systems Design Engineer

Ref : Contract Number : T201500202 F.A.P. # : ESTP-K024(16)
Project Title : HEP KC, US 13, Lochmeath Way to Puncheon Run Connector

	No Involvement by Traffic
XX	PS&E Attached, Signal Involvement
XX	PS&E Attached, ITMS Involvement
XX	PS&E Attached, Highway Lighting Involvement
XX	PS&E Attached, Signing Involvement
XX	PS&E Attached, Pavement Markings Involvement
	Traffic ONLY, Pavement Markings

cc: Nick Mogle, Traffic Operations Manager (Interim)
Sandra DiOrrio, Support Services Administrator
Charlanne A. Thornton, Director of Finance
Jill Frey, Project Engineer/Designer
Traffic Project File Copy

TRAFFIC PROJECT COST SUMMARY

EP KC, US 13, Lochmeath Way to Puncheon Run Connec

T201500202

DESCRIPTION	ENGINEER'S ESTIMATE
TOTAL SIGNAL ESTIMATE	$3,127,992.60
TOTAL ITMS ESTIMATE	$536,911.20
TOTAL HIGHWAY LIGHTING ESTIMATE	$399,655.30
TOTAL ROADWAY SIGNING ESTIMATE	$76,277.40
MAINTENANCE FEE (5%)	$0.00

TOTAL ESTIMATE FOR PROJECT ---->	**$4,140,836.51**

DELAWARE DEPARTMENT OF TRANSPORTATION

TRAFFIC SIGNAL ESTIMATE

HEP KC, US 13, Lochmeath Way to Puncheon Run Connector

CONTRACT #: T201500202
F.A.P. #: ESTP-K024(16)
PROJECT: HEP KC, US 13, Lochmeath Way to Puncheon Run Connector

INTERSECTION # 1: **K284, US13 & Lochmeath Way**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	ROMMEL	ROMMEL
1					**PHASE 1, STAGE 3**		
2	650	830001	2	EA	Conduit Junction Well, Type 1, 20" x 20" Precast Concrete		
3	1225	830010	2	EA	Removal of Existing Junction Well		
4					**PHASE 1, STAGE 4**		
5	15	835003	1	EA	Cabinet Base Type P		
6	305	831545	760	LF	Furnish & Install 4" HDPE SDR-13.5 Conduit (Bore)		
7	365	831516	10	LF	Furnish & Install 4" Schedule 80 PVC Conduit (Trench)		
8	440	831523	115	LF	Furnish & Install 2" Galvanized Steel Conduit (Trench)		
9	445	831524	30	LF	Furnish & Install 2-1/2" Galvanized Steel Conduit (Trench)		
10	500	831538	30	LF	Furnish & Install 2" Galvanized Steel Conduit (On Structure)		
11	545	831574	20	LF	Furnish & Install Second and Subsequent Additional 4" PVC Conduits in Trench or Open Cut		
12	655	830002	3	EA	Conduit Junction Well, Type 4, 20" x 42-1/2" Precast Concrete		
13	670	830008	3	EA	Adjust or Repair Existing Conduit Junction Well		
14	1225	830010	5	EA	Removal of Existing Junction Well		
15	1240	834501	1	CY	Partial Removal of Concrete Pole Bases and Cabinet Foundations		
16					**PHASE 1, STAGE 6**		
17	360	831515	10	LF	Furnish & Install 3" Schedule 80 PVC Conduit (Trench)		
18	445	831524	20	LF	Furnish & Install 2-1/2" Galvanized Steel Conduit (Trench)		
19	505	831539	30	LF	Furnish & Install 2-1/2" Galvanized Steel Conduit (On Structure)		
20	650	830001	1	EA	Conduit Junction Well, Type 1, 20" x 20" Precast Concrete		
21	670	830008	1	EA	Adjust or Repair Existing Conduit Junction Well		
22	840	834003	1	EA	Pole Base Type 3B		
23	870	834008	1	EA	Sheeting for Pole Base		
24	1240	834501	1.5	CY	Partial Removal of Concrete Pole Bases and Cabinet Foundations		
25					**PHASE 1, STAGE 7**		
26	305	831545	140	LF	Furnish & Install 4" HDPE SDR-13.5 Conduit (Bore)		
27	355	831514	30	LF	Furnish & Install 2-1/2" Schedule 80 PVC Conduit (Trench)		
28	360	831515	35	LF	Furnish & Install 3" Schedule 80 PVC Conduit (Trench)		
29	365	831516	55	LF	Furnish & Install 4" Schedule 80 PVC Conduit (Trench)		
30	650	830001	4	EA	Conduit Junction Well, Type 1, 20" x 20" Precast Concrete		
31	670	830008	1	EA	Adjust or Repair Existing Conduit Junction Well		
32	840	834003	2	EA	Pole Base Type 3B		
33	850	834005	2	EA	Pole Base Type 4A		
34	870	834008	2	EA	Sheeting for Pole Base		
35	1240	834501	1.5	CY	Partial Removal of Concrete Pole Bases and Cabinet Foundations		
36					**PHASE 1, STAGE 8**		
37	140	846002	30	LF	Furnish & Install a 1 - 1/2" Galvanized Rigid Metal Conduit Detector Sleeve with Loop Wire		
38	305	831545	130	LF	Furnish & Install 4" HDPE SDR-13.5 Conduit (Bore)		
39	355	831514	35	LF	Furnish & Install 2-1/2" Schedule 80 PVC Conduit (Trench)		
40	360	831515	10	LF	Furnish & Install 3" Schedule 80 PVC Conduit (Trench)		
41	650	830001	2	EA	Conduit Junction Well, Type 1, 20" x 20" Precast Concrete		
42	670	830008	1	EA	Adjust or Repair Existing Conduit Junction Well		
43	835	834002	1	EA	Pole Base Type 3A		
44	850	834005	2	EA	Pole Base Type 4A		
45	870	834008	1	EA	Sheeting for Pole Base		
46					**ULTIMATE**		
47	135	846001	1410	LF	Furnish & Install Loop Wire 1-Conductor #14 AWG encased in 1/4" Flexible Tubing in a Loop Sawcut		
48	670	830008	7	EA	Adjust or Repair Existing Conduit Junction Well		
					TOTAL PROJECT CONTRACTOR ITEMS	→	

INTERSECTION # 1: **K284, US13 & Lochmeath Way**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC CONTRACTOR ITEMS)	UNIT COST ROMMEL	TOTAL COST ROMMEL
1					**PHASE 1, STAGE 3**		
2	710	808501	1	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	950.00
3	1070	844521	2	EA	Install Video Detection Device	565.00	1,130.00
4	1235	832035	2065	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	1,032.50
5	NIB003		350	LF	Install CAT-5e Cable	2.10	735.00
6	NIB053		2	LS	MOT Devices and Deployment	7000.00	14,000.00
7					**PHASE 1, STAGE 4**		
8	65	832008	110	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper	2.50	275.00
9	80	832025	900	LF	Furnish & Install 4-Conductor #18 AWG Shielded Opticom Cable	2.00	1,800.00
10	95	832029	115	LF	Furnish & Install #8/2 Wire UF W/ground	5.00	575.00
11	120	832034	450	LF	Furnish & Install 14/16 Traffic Control Cable	5.00	2,250.00
12	125	832504	150	LF	Furnish & Install #8 THHN Stranded Copper	1.00	150.00
13	150	832501	17	EA	Splicing of Electrical Cable Above Ground	75.00	1,275.00
14	630	842005	1	EA	Removal of Electric Service on Wood or Metal Pole	272.00	272.00
15	635	842501	1	EA	Furnish & Install Electric Utility Service Equipment (100 AMP)	2525.00	2,525.00
16	710	808501	2	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	1,900.00
17	880	836002	1	EA	Installation of Steel Pole (Equal to or Greater than 40')	725.00	725.00
18	990	837011	9	EA	Realign or Slide Existing Signal Head	255.00	2,295.00
19	1095	844526	2	EA	Relocate Video Detection Device	850.00	1,700.00
20	1235	832035	630	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	315.00
21	1300	847002	2	EA	Installation or Removal of Base or Pad Mounted Cabinet	2500.00	5,000.00
22	NIB003		310	LF	Install CAT-5e Cable	2.10	651.00
23					**PHASE 1, STAGE 6**		
24	65	832008	240	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper	2.50	600.00
25	80	832025	1150	LF	Furnish & Install 4-Conductor #18 AWG Shielded Opticom Cable	2.00	2,300.00
26	110	832507	350	LF	Furnish & Install 14/5 Traffic Control Cable	4.00	1,400.00
27	120	832034	640	LF	Furnish & Install 14/16 Traffic Control Cable	5.00	3,200.00
28	710	808501	3	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	2,850.00
29	895	836500	1	EA	Installation of Steel Mast Arm Pole with Single Mast Arm Greater than 70’	1632.00	1,632.00
30	915	841001	1	EA	Furnish & Install Weatherhead, up to 3", on Steel Pole	540.00	540.00
31	935	839502	2	EA	Furnish & Install Wood Pole, Class II (Heavy) – 50’	2100.00	4,200.00
32	970	837002	15	EA	Furnish & Install 12” LED Signal Head Section Rigid Mount	400.00	6,000.00
33	985	837007	5	EA	Furnish & Install Signal Head Backplate	445.00	2,225.00
34	990	837011	11	EA	Realign or Slide Existing Signal Head	255.00	2,805.00
35	990	837011	5	EA	Realign or Slide Existing Signal Head	255.00	1,275.00
36	995	844001	1	EA	Furnish & Install Opticom Emergency Preemption Detector	1525.00	1,525.00
37	1095	844526	2	EA	Relocate Video Detection Device	850.00	1,700.00
38	1140	823001	1	EA	Installation of Sign on Span Wire or Mast Arm	50.00	50.00
39	1195	838003	2	EA	Furnish & Install Dead End Messenger Wire Attachment	500.00	1,000.00
40	1200	838006	1	EA	Adjustment of Span or Messenger Wire	750.00	750.00
41	1205	838008	2	EA	Transfer of Existing Span or Messenger Attachment	1000.00	2,000.00
42	1220	840001	6	EA	Furnish & Install Down Guy and Anchor	550.00	3,300.00
43	1235	832035	650	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	325.00
44	1255	836503	2	EA	Remove Steel Pole (Equal to or Greater than 15’ and Less than 40’)	550.00	1,100.00
45	NIB003		200	LF	Install CAT-5e Cable	2.10	420.00
46					**PHASE 1, STAGE 7**		
47	65	832008	225	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper	2.50	562.50
48	80	832025	380	LF	Furnish & Install 4-Conductor #18 AWG Shielded Opticom Cable	2.00	760.00
49	105	832032	60	LF	Furnish & Install 14/4 Traffic Control Cable	5.00	300.00
50	110	832507	1020	LF	Furnish & Install 14/5 Traffic Control Cable	4.00	4,080.00
51	115	832033	50	LF	Furnish & Install 14/9 Traffic Control Cable	5.00	250.00
52	120	832034	170	LF	Furnish & Install 14/16 Traffic Control Cable	5.00	850.00
53	150	832501	2	EA	Splicing of Electrical Cable Above Ground	75.00	150.00
54	710	808501	2	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	1,900.00

55	885	836502	2	EA	Furnish & Install Pedestal Pole	1510.00	3,020.00
56	895	836500	2	EA	Installation of Steel Mast Arm Pole with Single Mast Arm Greater than 70’	1632.00	3,264.00
57	910	836507	2	EA	Furnish Pedestal Pole Transformer Base	400.00	800.00
58	970	837002	25	EA	Furnish & Install 12” LED Signal Head Section Rigid Mount	400.00	10,000.00
59	975	837004	7	EA	Furnish & Install 12” LED Signal Head Section Span Mount	370.00	2,590.00
60	985	837007	8	EA	Furnish & Install Signal Head Backplate	445.00	3,560.00
61	990	837011	6	EA	Realign or Slide Existing Signal Head	255.00	1,530.00
62	995	844001	3	EA	Furnish & Install Opticom Emergency Preemption Detector	1525.00	4,575.00
63	1000	837008	3	EA	Furnish & Install 16” LED Countdown Pedestrian Signal	925.00	2,775.00
64	1010	837010	3	EA	Furnish & Install Pedestrian Pushbutton with Sign	350.00	1,050.00
65	1095	844526	2	EA	Relocate Video Detection Device	850.00	1,700.00
66	1140	823001	2	EA	Installation of Sign on Span Wire or Mast Arm	50.00	100.00
67	1215	838500	2	EA	Removal of Span Wire Attachment	100.00	200.00
68	1235	832035	670	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	335.00
69	1255	836503	2	EA	Remove Steel Pole (Equal to or Greater than 15’ and Less than 40’)	550.00	1,100.00
70	1270	838504	15	EA	Removal of Signal Head or Opticom Detector from Span Wire or Mast Arm	136.00	2,040.00
71	NIB003		450	LF	Install CAT-5e Cable	2.10	945.00
72					**PHASE 1, STAGE 8**		
73	65	832008	200	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper	2.50	500.00
74	80	832025	380	LF	Furnish & Install 4-Conductor #18 AWG Shielded Opticom Cable	2.00	760.00
75	105	832032	60	LF	Furnish & Install 14/4 Traffic Control Cable	5.00	300.00
76	110	832507	1060	LF	Furnish & Install 14/5 Traffic Control Cable	4.00	4,240.00
77	115	832033	300	LF	Furnish & Install 14/9 Traffic Control Cable	5.00	1,500.00
78	710	808501	3	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	2,850.00
79	885	836502	2	EA	Furnish & Install Pedestal Pole	1510.00	3,020.00
80	895	836500	1	EA	Installation of Steel Mast Arm Pole with Single Mast Arm Greater than 70’	1632.00	1,632.00
81	910	836507	2	EA	Furnish Pedestal Pole Transformer Base	400.00	800.00
82	970	837002	7	EA	Furnish & Install 12” LED Signal Head Section Rigid Mount	400.00	2,800.00
83	985	837007	2	EA	Furnish & Install Signal Head Backplate	445.00	890.00
84	990	837011	6	EA	Realign or Slide Existing Signal Head	255.00	1,530.00
85	995	844001	1	EA	Furnish & Install Opticom Emergency Preemption Detector	1525.00	1,525.00
86	1000	837008	3	EA	Furnish & Install 16” LED Countdown Pedestrian Signal	925.00	2,775.00
87	1010	837010	3	EA	Furnish & Install Pedestrian Pushbutton with Sign	350.00	1,050.00
88	1095	844526	1	EA	Relocate Video Detection Device	850.00	850.00
89	1140	823001	1	EA	Installation of Sign on Span Wire or Mast Arm	50.00	50.00
90	1215	838500	2	EA	Removal of Span Wire Attachment	100.00	200.00
91	1230	831011	30	LF	Removal of Conduit from Wood Pole	2.00	60.00
92	1270	838504	3	EA	Removal of Signal Head or Opticom Detector from Span Wire or Mast Arm	136.00	408.00
93	1275	839003	2	EA	Removal of Wood Pole	550.00	1,100.00
94	1280	840005	6	EA	Removal of Down Guy and Anchor	272.00	1,632.00
95					**ULTIMATE**		
96	65	832008	725	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper	2.50	1,812.50
97	90	832027	7050	LF	Furnish & Install 2-Conductor #14 AWG Aluminum Shielded Cable	2.00	14,100.00
98	710	808501	1	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	950.00
99	990	837011	6	EA	Realign or Slide Existing Signal Head	255.00	1,530.00
100	1095	844526	4	EA	Relocate Video Detection Device	850.00	3,400.00
101	1235	832035	400	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	200.00
					TOTAL TRAFFIC CONTRACTOR ITEMS	→	181,653.50

INTERSECTION # 1: **K284, US13 & Lochmeath Way**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	UNIT COST ROMMEL	TOTAL COST ROMMEL
1					**PHASE 1, STAGE 3**		
2		999999	1	LS	Gridsmart Dual Camera Video Detection System	22750.00	22,750.00
3	2535	999621	1	EA	CDMA	1200.00	1,200.00
4					**PHASE 1, STAGE 4**		
5	2020	999421	1	EA	Complete P Cabinet w/12 Channel EPAC Controller (includes Mounting Rack w/Power Supply, 5-4 Ch	13950.00	13,950.00
6	2050	999427	1	EA	Base Extension (split) Aluminum w/Natural Mill Finish	550.00	550.00
7	2095	999458	1	EA	Patch Cables (One Per Cabinet)	240.00	240.00
8	2105	999461	1	EA	Optical Receiver Card (Emergency Preemption)	2751.00	2,751.00
9					**PHASE 1, STAGE 6**		
10	2180	999490	1	EA	Steel Round Mast Arm Pole, TYPE C (70' - 90' Arm Length)	10885.68	10,885.68
11	2240	999502	1	EA	70' (21.3m) Steel Round Mast Arm	12776.40	12,776.40
12	2435	999601	2	EA	Rouleau Sign Brackets (2 per average sign, 3 per longer sign)	115.00	230.00
13					**PHASE 1, STAGE 7**		
14	2180	999490	2	EA	Steel Round Mast Arm Pole, TYPE C (70' - 90' Arm Length)	10885.68	21,771.36
15	2240	999502	1	EA	70' (21.3m) Steel Round Mast Arm	12776.40	12,776.40
16	2245	999503	1	EA	80' (24.4m) Steel Round Mast Arm	14028.56	14,028.56
17	2435	999601	4	EA	Rouleau Sign Brackets (2 per average sign, 3 per longer sign)	115.00	460.00
18					**PHASE 1, STAGE 8**		
19	2180	999490	1	EA	Steel Round Mast Arm Pole, TYPE C (70' - 90' Arm Length)	10885.68	10,885.68
20	2240	999502	1	EA	70' (21.3m) Steel Round Mast Arm	12776.40	12,776.40
21	2435	999601	2	EA	Rouleau Sign Brackets (2 per average sign, 3 per longer sign)	115.00	230.00
22					**ULTIMATE**		
23							
					TOTAL TRAFFIC SUPPLY ITEMS	→	138,261.48

TOTAL PROJECT CONTRACTOR ITEMS	→ →	
TOTAL TRAFFIC CONTRACTOR ITEMS	→ →	181,653.50
TOTAL TRAFFIC SUPPLY ITEMS	→ →	138,261.48
CONTINGENCIES	→ →	31,991.50
TOTAL COST	→ →	351,906.48

INTERSECTION # 2: **K019P, US 13 & Thomas Harmon Drive**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	ROMMEL	ROMMEL
1					**PHASE 1, STAGE 3**		
2	650	830001	1	EA	Conduit Junction Well, Type 1, 20" x 20" Precast Concrete		
3	1225	830010	1	EA	Removal of Existing Junction Well		
4					**PHASE 1, STAGE 5**		
5	15	835003	1	EA	Cabinet Base Type P		
6	305	831545	715	LF	Furnish & Install 4" HDPE SDR-13.5 Conduit (Bore)		
7	360	831515	10	LF	Furnish & Install 3" Schedule 80 PVC Conduit (Trench)		
8	365	831516	240	LF	Furnish & Install 4" Schedule 80 PVC Conduit (Trench)		
9	440	831523	35	LF	Furnish & Install 2" Galvanized Steel Conduit (Trench)		
10	445	831524	15	LF	Furnish & Install 2-1/2" Galvanized Steel Conduit (Trench)		
11	500	831538	30	LF	Furnish & Install 2" Galvanized Steel Conduit (On Structure)		
12	505	831539	30	LF	Furnish & Install 2-1/2" Galvanized Steel Conduit (On Structure)		
13	545	831574	10	LF	Furnish & Install Second and Subsequent Additional 4" PVC Conduits in Trench or Open Cut		
14	650	830001	3	EA	Conduit Junction Well, Type 1, 20" x 20" Precast Concrete		
15	655	830002	3	EA	Conduit Junction Well, Type 4, 20" x 42-1/2" Precast Concrete		
16	670	830008	3	EA	Adjust or Repair Existing Conduit Junction Well		
17	840	834003	2	EA	Pole Base Type 3B		
18	870	834008	2	EA	Sheeting for Pole Base		
19	1225	830010	3	EA	Removal of Existing Junction Well		
20	1240	834501	2.5	CY	Partial Removal of Concrete Pole Bases and Cabinet Foundations		
21					**PHASE 1, STAGE 6**		
22	355	831514	20	LF	Furnish & Install 2-1/2" Schedule 80 PVC Conduit (Trench)		
23	360	831515	15	LF	Furnish & Install 3" Schedule 80 PVC Conduit (Trench)		
24	435	831564	15	LF	Furnish & Install 1-1/2" Galvanized Steel Conduit (Trench)		
25	670	830008	2	EA	Adjust or Repair Existing Conduit Junction Well		
26	840	834003	1	EA	Pole Base Type 3B		
27	850	834005	2	EA	Pole Base Type 4A		
28	870	834008	1	EA	Sheeting for Pole Base		
29	1225	830010	4	EA	Removal of Existing Junction Well		
30	1240	834501	0.5	CY	Partial Removal of Concrete Pole Bases and Cabinet Foundations		
31					**PHASE 1, STAGE 9**		
32	305	831545	185	LF	Furnish & Install 4" HDPE SDR-13.5 Conduit (Bore)		
33	355	831514	30	LF	Furnish & Install 2-1/2" Schedule 80 PVC Conduit (Trench)		
34	360	831515	10	LF	Furnish & Install 3" Schedule 80 PVC Conduit (Trench)		
35	650	830001	3	EA	Conduit Junction Well, Type 1, 20" x 20" Precast Concrete		
36	840	834003	1	EA	Pole Base Type 3B		
37	850	834005	2	EA	Pole Base Type 4A		
38	870	834008	1	EA	Sheeting for Pole Base		
39	1225	830010	5	EA	Removal of Existing Junction Well		
40	1240	834501	0.5	CY	Partial Removal of Concrete Pole Bases and Cabinet Foundations		
41					**ULTIMATE**		
42	135	846001	1805	LF	Furnish & Install Loop Wire 1-Conductor #14 AWG encased in 1/4" Flexible Tubing in a Loop Sawcut		
43	670	830008	6	EA	Adjust or Repair Existing Conduit Junction Well		
					TOTAL PROJECT CONTRACTOR ITEMS	→	

INTERSECTION # 2: **K019P, US 13 & Thomas Harmon Drive**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC CONTRACTOR ITEMS)	ROMMEL	ROMMEL
1					**PHASE 1, STAGE 3**		
2	710	808501	1	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	950.00
3	990	837011	2	EA	Realign or Slide Existing Signal Head	255.00	510.00
4	1070	844521	2	EA	Install Video Detection Device	565.00	1,130.00
5	1235	832035	2800	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	1,400.00
6	NIB003		450	LF	Install CAT-5e Cable	2.10	945.00
7	NIB053		2	LS	MOT Devices and Deployment	7000.00	14,000.00
8					**PHASE 1, STAGE 5**		
9	65	832008	410	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper	2.50	1,025.00
10	80	832025	970	LF	Furnish & Install 4-Conductor #18 AWG Shielded Opticom Cable	2.00	1,940.00
11	95	832029	40	LF	Furnish & Install #8/2 Wire UF W/ground	5.00	200.00
12	110	832507	780	LF	Furnish & Install 14/5 Traffic Control Cable	4.00	3,120.00
13	120	832034	660	LF	Furnish & Install 14/16 Traffic Control Cable	5.00	3,300.00
14	125	832504	130	LF	Furnish & Install #8 THHN Stranded Copper	1.00	130.00
15	150	832501	19	EA	Splicing of Electrical Cable Above Ground	75.00	1,425.00
16	630	842005	1	EA	Removal of Electric Service on Wood or Metal Pole	272.00	272.00
17	635	842501	1	EA	Furnish & Install Electric Utility Service Equipment (100 AMP)	2525.00	2,525.00
18	710	808501	3	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	2,850.00
19	875	836001	2	EA	Installation of Steel Pole (17' to 40')	550.00	1,100.00
20	915	841001	1	EA	Furnish & Install Weatherhead, up to 3", on Steel Pole	540.00	540.00
21	935	839502	2	EA	Furnish & Install Wood Pole, Class II (Heavy) – 50'	2100.00	4,200.00
22	990	837011	11	EA	Realign or Slide Existing Signal Head	255.00	2,805.00
23	1095	844526	2	EA	Relocate Video Detection Device	850.00	1,700.00
24	1185	838001	120	LF	Furnish & Install Span Wires, 7/16"	6.00	720.00
25	1195	838003	2	EA	Furnish & Install Dead End Messenger Wire Attachment	500.00	1,000.00
26	1200	838006	2	EA	Adjustment of Span or Messenger Wire	750.00	1,500.00
27	1215	838500	2	EA	Removal of Span Wire Attachment	100.00	200.00
28	1220	840001	6	EA	Furnish & Install Down Guy and Anchor	550.00	3,300.00
29	1235	832035	2900	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	1,450.00
30	1255	836503	2	EA	Remove Steel Pole (Equal to or Greater than 15' and Less than 40')	550.00	1,100.00
31	1265	838503	1400	LF	Removal of Cable from Messenger Wire	0.20	280.00
32	1300	847002	2	EA	Installation or Removal of Base or Pad Mounted Cabinet	2500.00	5,000.00
33	NIB003		400	LF	Install CAT-5e Cable	2.10	840.00
34					**PHASE 1, STAGE 6**		
35	65	832008	40	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper	2.50	100.00
36	80	832025	705	LF	Furnish & Install 4-Conductor #18 AWG Shielded Opticom Cable	2.00	1,410.00
37	105	832032	60	LF	Furnish & Install 14/4 Traffic Control Cable	5.00	300.00
38	110	832507	1350	LF	Furnish & Install 14/5 Traffic Control Cable	4.00	5,400.00
39	115	832033	210	LF	Furnish & Install 14/9 Traffic Control Cable	5.00	1,050.00
40	120	832034	340	LF	Furnish & Install 14/16 Traffic Control Cable	5.00	1,700.00
41	710	808501	3	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	2,850.00
42	885	836502	2	EA	Furnish & Install Pedestal Pole	1510.00	3,020.00
43	890	836504	1	EA	Installation of Steel Mast Arm Pole with Single or Twin Mast arms up to 60'	2200.00	2,200.00
44	895	836500	1	EA	Installation of Steel Mast Arm Pole with Single Mast Arm Greater than 70'	1632.00	1,632.00
45	910	836507	2	EA	Furnish Pedestal Pole Transformer Base	400.00	800.00
46	970	837002	25	EA	Furnish & Install 12" LED Signal Head Section Rigid Mount	400.00	10,000.00
47	980	837006	6	EA	Furnish & Install 12" LED Traffic Signal Head Indication Module	135.00	810.00
48	985	837007	8	EA	Furnish & Install Signal Head Backplate	445.00	3,560.00
49	990	837011	4	EA	Realign or Slide Existing Signal Head	255.00	1,020.00
50	990	837011	5	EA	Realign or Slide Existing Signal Head	255.00	1,275.00
51	995	844001	2	EA	Furnish & Install Opticom Emergency Preemption Detector	1525.00	3,050.00
52	1000	837008	3	EA	Furnish & Install 16" LED Countdown Pedestrian Signal	925.00	2,775.00
53	1010	837010	3	EA	Furnish & Install Pedestrian Pushbutton with Sign	350.00	1,050.00
54	1095	844526	2	EA	Relocate Video Detection Device	850.00	1,700.00
55	1140	823001	2	EA	Installation of Sign on Span Wire or Mast Arm	50.00	100.00
56	1145	823003	1	SF	Removal of Sign on Span Wire or Mast Arm	20.00	20.00
57	1235	832035	820	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	410.00
58	1250	836006	2	EA	Remove Pedestal Pole	272.00	544.00
59	1265	838503	370	LF	Removal of Cable from Messenger Wire	0.20	74.00
60	1270	838504	11	EA	Removal of Signal Head or Opticom Detector from Span Wire or Mast Arm	136.00	1,496.00

61					**PHASE 1, STAGE 9**		
62	65	832008	250	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper	2.50	625.00
63	80	832025	420	LF	Furnish & Install 4-Conductor #18 AWG Shielded Opticom Cable	2.00	840.00
64	105	832032	60	LF	Furnish & Install 14/4 Traffic Control Cable	5.00	300.00
65	110	832507	950	LF	Furnish & Install 14/5 Traffic Control Cable	4.00	3,800.00
66	115	832033	220	LF	Furnish & Install 14/9 Traffic Control Cable	5.00	1,100.00
67	120	832034	15	LF	Furnish & Install 14/16 Traffic Control Cable	5.00	75.00
68	670	830008	1	EA	Adjust or Repair Existing Conduit Junction Well	400.00	400.00
69	710	808501	3	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	2,850.00
70	885	836502	2	EA	Furnish & Install Pedestal Pole	1510.00	3,020.00
71	895	836500	2	EA	Installation of Steel Mast Arm Pole with Single Mast Arm Greater than 70’	1632.00	3,264.00
72	910	836507	2	EA	Furnish Pedestal Pole Transformer Base	400.00	800.00
73	970	837002	22	EA	Furnish & Install 12” LED Signal Head Section Rigid Mount	400.00	8,800.00
74	985	837007	7	EA	Furnish & Install Signal Head Backplate	445.00	3,115.00
75	990	837011	1	EA	Realign or Slide Existing Signal Head	255.00	255.00
76	995	844001	2	EA	Furnish & Install Opticom Emergency Preemption Detector	1525.00	3,050.00
77	1000	837008	3	EA	Furnish & Install 16” LED Countdown Pedestrian Signal	925.00	2,775.00
78	1010	837010	3	EA	Furnish & Install Pedestrian Pushbutton with Sign	350.00	1,050.00
79	1095	844526	2	EA	Relocate Video Detection Device	850.00	1,700.00
80	1140	823001	1	EA	Installation of Sign on Span Wire or Mast Arm	50.00	50.00
81	1215	838500	4	EA	Removal of Span Wire Attachment	100.00	400.00
82	1230	831011	30	LF	Removal of Conduit from Wood Pole	2.00	60.00
83	1235	832035	550	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	275.00
84	1250	836006	2	EA	Remove Pedestal Pole	272.00	544.00
85	1255	836503	2	EA	Remove Steel Pole (Equal to or Greater than 15’ and Less than 40’)	550.00	1,100.00
86	1265	838503	1350	LF	Removal of Cable from Messenger Wire	0.20	270.00
87	1270	838504	8	EA	Removal of Signal Head or Opticom Detector from Span Wire or Mast Arm	136.00	1,088.00
88	1275	839003	2	EA	Removal of Wood Pole	550.00	1,100.00
89	1280	840005	6	EA	Removal of Down Guy and Anchor	272.00	1,632.00
90					**ULTIMATE**		
91	65	832008	740	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper	2.50	1,850.00
92	85	832026	100	LF	Furnish & Install 1-Conductor #14 AWG Stranded Copper	2.00	200.00
93	90	832027	7100	LF	Furnish & Install 2-Conductor #14 AWG Aluminum Shielded Cable	2.00	14,200.00
94	710	808501	1	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	950.00
95	990	837011	2	EA	Realign or Slide Existing Signal Head	255.00	510.00
96	1095	844526	4	EA	Relocate Video Detection Device	850.00	3,400.00
97	1235	832035	350	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	175.00
					TOTAL TRAFFIC CONTRACTOR ITEMS	→	175,426.00

INTERSECTION # 2: **K019P, US 13 & Thomas Harmon Drive**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	UNIT COST ROMMEL	TOTAL COST ROMMEL
1					**PHASE 1, STAGE 3**		
2		999999	1	LS	Gridsmart Dual Camera Video Detection System	22750.00	22,750.00
3	2535	999621	1	EA	CDMA	1200.00	1,200.00
4					**PHASE 1, STAGE 5**		
5	2020	999421	1	EA	Complete P Cabinet w/12 Channel EPAC Controller (includes Mounting Rack w/Power Supply, 5-4 Ch	13950.00	13,950.00
6	2050	999427	1	EA	Base Extension (split) Aluminum w/Natural Mill Finish	550.00	550.00
7	2095	999458	1	EA	Patch Cables (One Per Cabinet)	240.00	240.00
8	2105	999461	1	EA	Optical Receiver Card (Emergency Preemption)	2751.00	2,751.00
9	2180	999490	2	EA	Steel Round Mast Arm Pole, TYPE C (70' - 90' Arm Length)	10885.68	21,771.36
10					**PHASE 1, STAGE 6**		
11	2175	999489	1	EA	Steel Round Mast Arm Pole, TYPE B (45' - 60' Arm Length or 2 - 60' Arms)	8818.16	8,818.16
12	2235	999501	1	EA	60' (16.8m) Steel Round Mast Arm	9468.16	9,468.16
13	2245	999503	1	EA	80' (24.4m) Steel Round Mast Arm	14028.56	14,028.56
14	2435	999601	5	EA	Rouleau Sign Brackets (2 per average sign, 3 per longer sign)	115.00	575.00
15					**PHASE 1, STAGE 9**		
16	2180	999490	1	EA	Steel Round Mast Arm Pole, TYPE C (70' - 90' Arm Length)	10885.68	10,885.68
17	2240	999502	1	EA	70' (21.3m) Steel Round Mast Arm	12776.40	12,776.40
18	2250	999504	1	EA	90' (27.4m) Steel Round Mast Arm	19848.40	19,848.40
19	2435	999601	3	EA	Rouleau Sign Brackets (2 per average sign, 3 per longer sign)	115.00	345.00
20					**ULTIMATE**		
21							
					TOTAL TRAFFIC SUPPLY ITEMS	→	139,957.72

TOTAL PROJECT CONTRACTOR ITEMS	→	→	
TOTAL TRAFFIC CONTRACTOR ITEMS	→	→	175,426.00
TOTAL TRAFFIC SUPPLY ITEMS	→	→	139,957.72
CONTINGENCIES	→	→	31,538.37
TOTAL COST	→	→	346,922.09

					INTERSECTION # 3: **K151, US 13 & Voshells Mill Road/Voshells Mill Star Hill Road**	UNIT COST	TOTAL COST
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	ROMMEL	ROMMEL
1					**PHASE 2, STAGE 3**		
2	305	831545	380	LF	Furnish & Install 4" HDPE SDR-13.5 Conduit (Bore)		
3	365	831516	530	LF	Furnish & Install 4" Schedule 80 PVC Conduit (Trench)		
4	650	830001	3	EA	Conduit Junction Well, Type 1, 20" x 20" Precast Concrete		
5	655	830002	3	EA	Conduit Junction Well, Type 4, 20" x 42-1/2" Precast Concrete		
6	1225	830010	4	EA	Removal of Existing Junction Well		
7					**PHASE 2, STAGE 4**		
8	1225	830010	6	EA	Removal of Existing Junction Well		
9					**PHASE 2, STAGE 6**		
10	445	831524	20	LF	Furnish & Install 2-1/2" Galvanized Steel Conduit (Trench)		
11	505	831539	30	LF	Furnish & Install 2-1/2" Galvanized Steel Conduit (On Structure)		
12	670	830008	1	EA	Adjust or Repair Existing Conduit Junction Well		
13					**PHASE 2, STAGE 7**		
14	15	835003	1	EA	Cabinet Base Type P		
15	305	831545	115	LF	Furnish & Install 4" HDPE SDR-13.5 Conduit (Bore)		
16	355	831514	30	LF	Furnish & Install 2-1/2" Schedule 80 PVC Conduit (Trench)		
17	360	831515	85	LF	Furnish & Install 3" Schedule 80 PVC Conduit (Trench)		
18	365	831516	50	LF	Furnish & Install 4" Schedule 80 PVC Conduit (Trench)		
19	445	831524	125	LF	Furnish & Install 2-1/2" Galvanized Steel Conduit (Trench)		
20	505	831539	60	LF	Furnish & Install 2-1/2" Galvanized Steel Conduit (On Structure)		
21	545	831574	10	LF	Furnish & Install Second and Subsequent Additional 4" PVC Conduits in Trench or Open Cut		
22	650	830001	3	EA	Conduit Junction Well, Type 1, 20" x 20" Precast Concrete		
23	670	830008	1	EA	Adjust or Repair Existing Conduit Junction Well		
24	835	834002	2	EA	Pole Base Type 3A		
25	850	834005	2	EA	Pole Base Type 4A		
26	870	834008	2	EA	Sheeting for Pole Base		
27	1225	830010	5	EA	Removal of Existing Junction Well		
28	1240	834501	2	CY	Partial Removal of Concrete Pole Bases and Cabinet Foundations		
29					**PHASE 2, STAGE 8**		
30	305	831545	155	LF	Furnish & Install 4" HDPE SDR-13.5 Conduit (Bore)		
31	355	831514	30	LF	Furnish & Install 2-1/2" Schedule 80 PVC Conduit (Trench)		
32	360	831515	40	LF	Furnish & Install 3" Schedule 80 PVC Conduit (Trench)		
33	650	830001	2	EA	Conduit Junction Well, Type 1, 20" x 20" Precast Concrete		
34	670	830008	1	EA	Adjust or Repair Existing Conduit Junction Well		
35	835	834002	2	EA	Pole Base Type 3A		
36	850	834005	2	EA	Pole Base Type 4A		
37	870	834008	2	EA	Sheeting for Pole Base		
38	1225	830010	3	EA	Removal of Existing Junction Well		
39	1240	834501	1	CY	Partial Removal of Concrete Pole Bases and Cabinet Foundations		
40					**ULTIMATE**		
41	135	846001	1475	LF	Furnish & Install Loop Wire 1-Conductor #14 AWG encased in 1/4" Flexible Tubing in a Loop Sawcut		
42	140	846002	15	LF	Furnish & Install a 1 - 1/2" Galvanized Rigid Metal Conduit Detector Sleeve with Loop Wire		
43	670	830008	8	EA	Adjust or Repair Existing Conduit Junction Well		
					TOTAL PROJECT CONTRACTOR ITEMS	→	

					INTERSECTION # 3: K151, US 13 & Voshells Mill Road/Voshells Mill Star Hill Road	UNIT COST	TOTAL COST
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC CONTRACTOR ITEMS)	ROMMEL	ROMMEL
1					**PHASE 2, STAGE 3**		
2	65	832008	360	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper	2.50	900.00
3	110	832507	360	LF	Furnish & Install 14/5 Traffic Control Cable	4.00	1,440.00
4	710	808501	1	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	950.00
5	1070	844521	2	EA	Install Video Detection Device	565.00	1,130.00
6	1235	832035	4290	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	2,145.00
7	NIB003		330	LF	Install CAT-5e Cable	2.10	693.00
8	NIB053		2	LS	MOT Devices and Deployment	7000.00	14,000.00
9					**PHASE 2, STAGE 4**		
10	710	808501	1	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	950.00
11	990	837011	8	EA	Realign or Slide Existing Signal Head	255.00	2,040.00
12	1095	844526	2	EA	Relocate Video Detection Device	850.00	1,700.00
13					**PHASE 2, STAGE 6**		
14	80	832025	900	LF	Furnish & Install 4-Conductor #18 AWG Shielded Opticom Cable	2.00	1,800.00
15	120	832034	505	LF	Furnish & Install 14/16 Traffic Control Cable	5.00	2,525.00
16	150	832501	16	EA	Splicing of Electrical Cable Above Ground	75.00	1,200.00
17	710	808501	1	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	950.00
18	915	841001	1	EA	Furnish & Install Weatherhead, up to 3", on Steel Pole	540.00	540.00
19	935	839502	1	EA	Furnish & Install Wood Pole, Class II (Heavy) – 50’	2100.00	2,100.00
20	990	837011	12	EA	Realign or Slide Existing Signal Head	255.00	3,060.00
21	1095	844526	2	EA	Relocate Video Detection Device	850.00	1,700.00
22	1195	838003	1	EA	Furnish & Install Dead End Messenger Wire Attachment	500.00	500.00
23	1200	838006	1	EA	Adjustment of Span or Messenger Wire	750.00	750.00
24	1205	838008	1	EA	Transfer of Existing Span or Messenger Attachment	1000.00	1,000.00
25	1210	838009	140	LF	Removal of Messenger Wire, Cable and Hardware	1.00	140.00
26	1215	838500	1	EA	Removal of Span Wire Attachment	100.00	100.00
27	1220	840001	3	EA	Furnish & Install Down Guy and Anchor	550.00	1,650.00
28	1235	832035	150	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	75.00
29	NIB003		120	LF	Install CAT-5e Cable	2.10	252.00
30					**PHASE 2, STAGE 7**		
31	65	832008	270	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper	2.50	675.00
32	80	832025	300	LF	Furnish & Install 4-Conductor #18 AWG Shielded Opticom Cable	2.00	600.00
33	95	832029	110	LF	Furnish & Install #8/2 Wire UF W/ground	5.00	550.00
34	105	832032	60	LF	Furnish & Install 14/4 Traffic Control Cable	5.00	300.00
35	110	832507	1135	LF	Furnish & Install 14/5 Traffic Control Cable	4.00	4,540.00
36	120	832034	150	LF	Furnish & Install 14/16 Traffic Control Cable	5.00	750.00
37	125	832504	130	LF	Furnish & Install #8 THHN Stranded Copper	1.00	130.00
38	630	842005	1	EA	Removal of Electric Service on Wood or Metal Pole	272.00	272.00
39	635	842501	1	EA	Furnish & Install Electric Utility Service Equipment (100 AMP)	2525.00	2,525.00
40	710	808501	2	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	1,900.00
41	885	836502	2	EA	Furnish & Install Pedestal Pole	1510.00	3,020.00
42	895	836500	2	EA	Installation of Steel Mast Arm Pole with Single Mast Arm Greater than 70’	1632.00	3,264.00
43	910	836507	2	EA	Furnish Pedestal Pole Transformer Base	400.00	800.00
44	970	837002	25	EA	Furnish & Install 12” LED Signal Head Section Rigid Mount	400.00	10,000.00
45	985	837007	8	EA	Furnish & Install Signal Head Backplate	445.00	3,560.00
46	990	837011	12	EA	Realign or Slide Existing Signal Head	255.00	3,060.00
47	995	844001	2	EA	Furnish & Install Opticom Emergency Preemption Detector	1525.00	3,050.00
48	1000	837008	3	EA	Furnish & Install 16” LED Countdown Pedestrian Signal	925.00	2,775.00
49	1010	837010	3	EA	Furnish & Install Pedestrian Pushbutton with Sign	350.00	1,050.00
50	1095	844526	2	EA	Relocate Video Detection Device	850.00	1,700.00
51	1140	823001	2	EA	Installation of Sign on Span Wire or Mast Arm	50.00	100.00
52	1235	832035	780	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	390.00
53	1250	836006	2	EA	Remove Pedestal Pole	272.00	544.00
54	1255	836503	1	EA	Remove Steel Pole (Equal to or Greater than 15’ and Less than 40’)	550.00	550.00
55	1300	847002	2	EA	Installation or Removal of Base or Pad Mounted Cabinet	2500.00	5,000.00
56	NIB003		120	LF	Install CAT-5e Cable	2.10	252.00

57					**PHASE 2, STAGE 8**		
58	65	832008	250	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper	2.50	625.00
59	80	832025	950	LF	Furnish & Install 4-Conductor #18 AWG Shielded Opticom Cable	2.00	1,900.00
60	105	832032	60	LF	Furnish & Install 14/4 Traffic Control Cable	5.00	300.00
61	110	832507	1700	LF	Furnish & Install 14/5 Traffic Control Cable	4.00	6,800.00
62	120	832034	800	LF	Furnish & Install 14/16 Traffic Control Cable	5.00	4,000.00
63	710	808501	2	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	1,900.00
64	885	836502	2	EA	Furnish & Install Pedestal Pole	1510.00	3,020.00
65	895	836500	2	EA	Installation of Steel Mast Arm Pole with Single Mast Arm Greater than 70’	1632.00	3,264.00
66	910	836507	2	EA	Furnish Pedestal Pole Transformer Base	400.00	800.00
67	970	837002	28	EA	Furnish & Install 12” LED Signal Head Section Rigid Mount	400.00	11,200.00
68	985	837007	9	EA	Furnish & Install Signal Head Backplate	445.00	4,005.00
69	990	837011	3	EA	Realign or Slide Existing Signal Head	255.00	765.00
70	995	844001	2	EA	Furnish & Install Opticom Emergency Preemption Detector	1525.00	3,050.00
71	1000	837008	3	EA	Furnish & Install 16” LED Countdown Pedestrian Signal	925.00	2,775.00
72	1010	837010	3	EA	Furnish & Install Pedestrian Pushbutton with Sign	350.00	1,050.00
73	1095	844526	2	EA	Relocate Video Detection Device	850.00	1,700.00
74	1140	823001	2	EA	Installation of Sign on Span Wire or Mast Arm	50.00	100.00
75	1215	838500	2	EA	Removal of Span Wire Attachment	100.00	200.00
76	1230	831011	30	LF	Removal of Conduit from Wood Pole	2.00	60.00
77	1235	832035	955	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	477.50
78	1250	836006	1	EA	Remove Pedestal Pole	272.00	272.00
79	1255	836503	1	EA	Remove Steel Pole (Equal to or Greater than 15’ and Less than 40’)	550.00	550.00
80	1270	838504	16	EA	Removal of Signal Head or Opticom Detector from Span Wire or Mast Arm	136.00	2,176.00
81	1275	839003	1	EA	Removal of Wood Pole	550.00	550.00
82	1280	840005	3	EA	Removal of Down Guy and Anchor	272.00	816.00
83	NIB003		400	LF	Install CAT-5e Cable	2.10	840.00
84					**ULTIMATE**		
85	65	832008	700	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper	2.50	1,750.00
86	90	832027	7290	LF	Furnish & Install 2-Conductor #14 AWG Aluminum Shielded Cable	2.00	14,580.00
87	710	808501	1	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	950.00
88	990	837011	7	EA	Realign or Slide Existing Signal Head	255.00	1,785.00
89	1095	844526	4	EA	Relocate Video Detection Device	850.00	3,400.00
90	1235	832035	465	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	232.50
					TOTAL TRAFFIC CONTRACTOR ITEMS	→	171,540.00

INTERSECTION # 3: **K151, US 13 & Voshells Mill Road/Voshells Mill Star Hill Road**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	UNIT COST ROMMEL	TOTAL COST ROMMEL
1					**PHASE 2, STAGE 3**		
2		999999	1	LS	Gridsmart Dual Camera Video Detection System	22750.00	22,750.00
3	2535	999621	1	EA	CDMA	1200.00	1,200.00
4					**PHASE 2, STAGE 4**		
5							
6					**PHASE 2, STAGE 6**		
7							
8					**PHASE 2, STAGE 7**		
9	2020	999421	1	EA	Complete P Cabinet w/12 Channel EPAC Controller (includes Mounting Rack w/Power Supply, 5-4 Ch	13950.00	13,950.00
10	2050	999427	1	EA	Base Extension (split) Aluminum w/Natural Mill Finish	550.00	550.00
11	2095	999458	1	EA	Patch Cables (One Per Cabinet)	240.00	240.00
12	2105	999461	1	EA	Optical Receiver Card (Emergency Preemption)	2751.00	2,751.00
13	2180	999490	2	EA	Steel Round Mast Arm Pole, TYPE C (70' - 90' Arm Length)	10885.68	21,771.36
14	2240	999502	1	EA	70' (21.3m) Steel Round Mast Arm	12776.40	12,776.40
15	2245	999503	1	EA	80' (24.4m) Steel Round Mast Arm	14028.56	14,028.56
16	2435	999601	4	EA	Rouleau Sign Brackets (2 per average sign, 3 per longer sign)	115.00	460.00
17					**PHASE 2, STAGE 8**		
18	2180	999490	2	EA	Steel Round Mast Arm Pole, TYPE C (70' - 90' Arm Length)	10885.68	21,771.36
19	2240	999502	1	EA	70' (21.3m) Steel Round Mast Arm	12776.40	12,776.40
20	2245	999503	1	EA	80' (24.4m) Steel Round Mast Arm	14028.56	14,028.56
21	2435	999601	4	EA	Rouleau Sign Brackets (2 per average sign, 3 per longer sign)	115.00	460.00
22					**ULTIMATE**		
23							
					TOTAL TRAFFIC SUPPLY ITEMS	→	139,513.64

TOTAL PROJECT CONTRACTOR ITEMS	→ →	
TOTAL TRAFFIC CONTRACTOR ITEMS	→ →	171,540.00
TOTAL TRAFFIC SUPPLY ITEMS	→ →	139,513.64
CONTINGENCIES	→ →	31,105.36
TOTAL COST	→ →	342,159.00

INTERSECTION # 4: **K317, US 13 & King Property**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	UNIT COST ROMMEL	TOTAL COST ROMMEL
1					**PHASE 2, STAGE 3**		
2	305	831545	225	LF	Furnish & Install 4" HDPE SDR-13.5 Conduit (Bore)		
3	365	831516	225	LF	Furnish & Install 4" Schedule 80 PVC Conduit (Trench)		
4	650	830001	1	EA	Conduit Junction Well, Type 1, 20" x 20" Precast Concrete		
5	655	830002	1	EA	Conduit Junction Well, Type 4, 20" x 42-1/2" Precast Concrete		
6	660	830003	2	EA	Conduit Junction Well, Type 5, 24" x 16" Precast Concrete		
7					**PHASE 2, STAGE 5**		
8	365	831516	185	LF	Furnish & Install 4" Schedule 80 PVC Conduit (Trench)		
9	650	830001	1	EA	Conduit Junction Well, Type 1, 20" x 20" Precast Concrete		
10	1225	830010	1	EA	Removal of Existing Junction Well		
11					**PHASE 2, STAGE 6**		
12	1225	830010	4	EA	Removal of Existing Junction Well		
13					**PHASE 2, STAGE 9**		
14	305	831545	190	LF	Furnish & Install 4" HDPE SDR-13.5 Conduit (Bore)		
15	355	831514	75	LF	Furnish & Install 2-1/2" Schedule 80 PVC Conduit (Trench)		
16	360	831515	316	LF	Furnish & Install 3" Schedule 80 PVC Conduit (Trench)		
17	365	831516	90	LF	Furnish & Install 4" Schedule 80 PVC Conduit (Trench)		
18	440	831523	20	LF	Furnish & Install 2" Galvanized Steel Conduit (Trench)		
19	500	831538	30	LF	Furnish & Install 2" Galvanized Steel Conduit (On Structure)		
20	650	830001	8	EA	Conduit Junction Well, Type 1, 20" x 20" Precast Concrete		
21	655	830002	2	EA	Conduit Junction Well, Type 4, 20" x 42-1/2" Precast Concrete		
22	670	830008	1	EA	Adjust or Repair Existing Conduit Junction Well		
23	840	834003	4	EA	Pole Base Type 3B		
24	850	834005	4	EA	Pole Base Type 4A		
25	870	834008	4	EA	Sheeting for Pole Base		
26	1225	830010	10	EA	Removal of Existing Junction Well		
27	1240	834501	1	CY	Partial Removal of Concrete Pole Bases and Cabinet Foundations		
28					**ULTIMATE**		
29	670	830008	7	EA	Adjust or Repair Existing Conduit Junction Well		
30	135	846001	1640	LF	Furnish & Install Loop Wire 1-Conductor #14 AWG encased in 1/4" Flexible Tubing in a Loop Sawcut		
					TOTAL PROJECT CONTRACTOR ITEMS	→	

					INTERSECTION # 4: **K317, US 13 & King Property**	UNIT COST	TOTAL COST
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC CONTRACTOR ITEMS)	ROMMEL	ROMMEL
1					**PHASE 2, STAGE 3**		
2	990	837011	5	EA	Realign or Slide Existing Signal Head	255.00	1,275.00
3	1070	844521	2	EA	Install Video Detection Device	565.00	1,130.00
4	1235	832035	532	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	266.00
5					**PHASE 2, STAGE 5**		
6	65	832008	278	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper	2.50	695.00
7	110	832507	278	LF	Furnish & Install 14/5 Traffic Control Cable	4.00	1,112.00
8	1235	832035	1623	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	811.50
9					**PHASE 2, STAGE 6**		
10	115	832033	150	LF	Furnish & Install 14/9 Traffic Control Cable	5.00	750.00
11	975	837004	6	EA	Furnish & Install 12" LED Signal Head Section Span Mount	370.00	2,220.00
12	990	837011	6	EA	Realign or Slide Existing Signal Head	255.00	1,530.00
13	1235	832035	1291	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	645.50
14					**PHASE 2, STAGE 9**		
15	65	832008	120	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper	2.50	300.00
16	80	832025	880	LF	Furnish & Install 4-Conductor #18 AWG Shielded Opticom Cable	2.00	1,760.00
17	95	832029	212	LF	Furnish & Install #8/2 Wire UF W/ground	5.00	1,060.00
18	110	832507	1252	LF	Furnish & Install 14/5 Traffic Control Cable	4.00	5,008.00
19	115	832033	844	LF	Furnish & Install 14/9 Traffic Control Cable	5.00	4,220.00
20	120	832034	466	LF	Furnish & Install 14/16 Traffic Control Cable	5.00	2,330.00
21	125	832504	130	LF	Furnish & Install #8 THHN Stranded Copper	1.00	130.00
22	150	832501	4	EA	Splicing of Electrical Cable Above Ground	75.00	300.00
23	630	842005	1	EA	Removal of Electric Service on Wood or Metal Pole	272.00	272.00
24	635	842501	1	EA	Furnish & Install Electric Utility Service Equipment (100 AMP)	2525.00	2,525.00
25	645	835500	1	EA	Furnish & Install Additional Disconnect Switch	1300.00	1,300.00
26	710	808501	1	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	950.00
27	885	836502	4	EA	Furnish & Install Pedestal Pole	1510.00	6,040.00
28	895	836500	4	EA	Installation of Steel Mast Arm Pole with Single Mast Arm Greater than 70'	1632.00	6,528.00
29	910	836507	4	EA	Furnish Pedestal Pole Transformer Base	400.00	1,600.00
30	970	837002	54	EA	Furnish & Install 12" LED Signal Head Section Rigid Mount	400.00	21,600.00
31	985	837007	18	EA	Furnish & Install Signal Head Backplate	445.00	8,010.00
32	995	844001	4	EA	Furnish & Install Opticom Emergency Preemption Detector	1525.00	6,100.00
33	1000	837008	6	EA	Furnish & Install 16" LED Countdown Pedestrian Signal	925.00	5,550.00
34	1010	837010	6	EA	Furnish & Install Pedestrian Pushbutton with Sign	350.00	2,100.00
35	1095	844526	2	EA	Relocate Video Detection Device	850.00	1,700.00
36	1140	823001	2	EA	Installation of Sign on Span Wire or Mast Arm	50.00	100.00
37	1215	838500	4	EA	Removal of Span Wire Attachment	100.00	400.00
38	1235	832035	1927	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	963.50
39	1250	836006	3	EA	Remove Pedestal Pole	272.00	816.00
40	1255	836503	4	EA	Remove Steel Pole (Equal to or Greater than 15' and Less than 40')	550.00	2,200.00
41	1270	838504	13	EA	Removal of Signal Head or Opticom Detector from Span Wire or Mast Arm	136.00	1,768.00
42					**ULTIMATE**		
43	65	832008	635	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper	2.50	1,587.50
44	90	832027	7344	LF	Furnish & Install 2-Conductor #14 AWG Aluminum Shielded Cable	2.00	14,688.00
45	145	832500	23	EA	Splicing of Electrical Cable Underground	75.00	1,725.00
46	1095	844526	2	EA	Relocate Video Detection Device	850.00	1,700.00
47	1235	832035	1110	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	555.00
					TOTAL TRAFFIC CONTRACTOR ITEMS	→	116,321.00

INTERSECTION # 4: **K317, US 13 & King Property**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	UNIT COST ROMMEL	TOTAL COST ROMMEL
1					**PHASE 2, STAGE 3**		
2	2076	999999	2	EA	GS-3-CAM Gridsmart Fisheye Video Detection Device (includes camera and CPU)	13750.00	27,500.00
3	2077	999999	2	EA	GS-3-SMC: Gridsmart Quick Connect Junction Box	220.00	440.00
4	2078	999999	2	EA	GS-3-A84: Gridsmart Fisheye 84" Mounting Arm with 90 degree bend	138.00	276.00
5	2079	999999	2	EA	GS-3-CBL: Gridsmart Cable (1000 ft min.) and Astro-Bracket Cable (AB-3009)	688.00	1,376.00
6	2535	999621	1	EA	CDMA	1200.00	1,200.00
7					**PHASE 2, STAGE 5**		
8							
9					**PHASE 2, STAGE 6**		
10							
11					**PHASE 2, STAGE 9**		
12	2180	999490	4	EA	Steel Round Mast Arm Pole, TYPE C (70' - 90' Arm Length)	10885.68	43,542.72
13	2245	999503	1	EA	80' (24.4m) Steel Round Mast Arm	14028.56	14,028.56
14	2250	999504	3	EA	90' (27.4m) Steel Round Mast Arm	19848.40	59,545.20
15	2435	999601	2	EA	Rouleau Sign Brackets (2 per average sign, 3 per longer sign)	115.00	230.00
16					**ULTIMATE**		
17							
					TOTAL TRAFFIC SUPPLY ITEMS	→	148,138.48

TOTAL PROJECT CONTRACTOR ITEMS	→ →	
TOTAL TRAFFIC CONTRACTOR ITEMS	→ →	116,321.00
TOTAL TRAFFIC SUPPLY ITEMS	→ →	148,138.48
CONTINGENCIES	→ →	26,445.95
TOTAL COST	→ →	290,905.43

INTERSECTION # 5: **K128, US 13 & SR 10**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	UNIT COST ROMMEL	TOTAL COST ROMMEL
1					**PHASE 3, STAGE 3**		
2							
3					**PHASE 3, STAGE 5**		
4	305	831545	420	LF	Furnish & Install 4" HDPE SDR-13.5 Conduit (Bore)		
5	365	831516	440	LF	Furnish & Install 4" Schedule 80 PVC Conduit (Trench)		
6	650	830001	2	EA	Conduit Junction Well, Type 1, 20" x 20" Precast Concrete		
7	655	830002	2	EA	Conduit Junction Well, Type 4, 20" x 42-1/2" Precast Concrete		
8	1225	830010	5	EA	Removal of Existing Junction Well		
9					**PHASE 3, STAGE 8**		
10	15	835003	1	EA	Cabinet Base Type P		
11	365	831516	15	LF	Furnish & Install 4" Schedule 80 PVC Conduit (Trench)		
12	440	831523	20	LF	Furnish & Install 2" Galvanized Steel Conduit (Trench)		
13	445	831524	15	LF	Furnish & Install 2-1/2" Galvanized Steel Conduit (Trench)		
14	500	831538	30	LF	Furnish & Install 2" Galvanized Steel Conduit (On Structure)		
15	505	831539	30	LF	Furnish & Install 2-1/2" Galvanized Steel Conduit (On Structure)		
16	655	830002	1	EA	Conduit Junction Well, Type 4, 20" x 42-1/2" Precast Concrete		
17	1225	830010	3	EA	Removal of Existing Junction Well		
18	1240	834501	0.5	CY	Partial Removal of Concrete Pole Bases and Cabinet Foundations		
19					**PHASE 3, STAGE 9**		
20	305	831545	230	LF	Furnish & Install 4" HDPE SDR-13.5 Conduit (Bore)		
21	355	831514	20	LF	Furnish & Install 2-1/2" Schedule 80 PVC Conduit (Trench)		
22	360	831515	25	LF	Furnish & Install 3" Schedule 80 PVC Conduit (Trench)		
23	435	831564	25	LF	Furnish & Install 1-1/2" Galvanized Steel Conduit (Trench)		
24	650	830001	3	EA	Conduit Junction Well, Type 1, 20" x 20" Precast Concrete		
25	670	830008	1	EA	Adjust or Repair Existing Conduit Junction Well		
26	840	834003	2	EA	Pole Base Type 3B		
27	850	834005	2	EA	Pole Base Type 4A		
28	870	834008	2	EA	Sheeting for Pole Base		
29	1225	830010	4	EA	Removal of Existing Junction Well		
30	1240	834501	0.5	CY	Partial Removal of Concrete Pole Bases and Cabinet Foundations		
31					**PHASE 3, STAGE 10**		
32	305	831545	130	LF	Furnish & Install 4" HDPE SDR-13.5 Conduit (Bore)		
33	355	831514	35	LF	Furnish & Install 2-1/2" Schedule 80 PVC Conduit (Trench)		
34	360	831515	60	LF	Furnish & Install 3" Schedule 80 PVC Conduit (Trench)		
35	650	830001	3	EA	Conduit Junction Well, Type 1, 20" x 20" Precast Concrete		
36	835	834002	1	EA	Pole Base Type 3A		
37	840	834003	1	EA	Pole Base Type 3B		
38	850	834005	2	EA	Pole Base Type 4A		
39	870	834008	2	EA	Sheeting for Pole Base		
40	1225	830010	6	EA	Removal of Existing Junction Well		
41	1240	834501	0.5	CY	Partial Removal of Concrete Pole Bases and Cabinet Foundations		
42					**ULTIMATE**		
43	670	830008	6	EA	Adjust or Repair Existing Conduit Junction Well		
44	135	846001	1925	LF	Furnish & Install Loop Wire 1-Conductor #14 AWG encased in 1/4" Flexible Tubing in a Loop Sawcut		
					TOTAL PROJECT CONTRACTOR ITEMS →		

INTERSECTION # 5: **K128, US 13 & SR 10**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC CONTRACTOR ITEMS)	UNIT COST ROMMEL	TOTAL COST ROMMEL
1					**PHASE 3, STAGE 3**		
2	1070	844521	2	EA	Install Video Detection Device	565.00	1,130.00
3					**PHASE 3, STAGE 5**		
4	1235	832035	2931	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	1,465.50
5	1270	838504	2	EA	Removal of Signal Head or Opticom Detector from Span Wire or Mast Arm	136.00	272.00
6					**PHASE 3, STAGE 8**		
7	65	832008	120	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper	2.50	300.00
8	80	832025	900	LF	Furnish & Install 4-Conductor #18 AWG Shielded Opticom Cable	2.00	1,800.00
9	95	832029	20	LF	Furnish & Install #8/2 Wire UF W/ground	5.00	100.00
10	115	832033	880	LF	Furnish & Install 14/9 Traffic Control Cable	5.00	4,400.00
11	120	832034	120	LF	Furnish & Install 14/16 Traffic Control Cable	5.00	600.00
12	125	832504	130	LF	Furnish & Install #8 THHN Stranded Copper	1.00	130.00
13	150	832501	4	EA	Splicing of Electrical Cable Above Ground	75.00	300.00
14	630	842005	1	EA	Removal of Electric Service on Wood or Metal Pole	272.00	272.00
15	635	842501	1	EA	Furnish & Install Electric Utility Service Equipment (100 AMP)	2525.00	2,525.00
16	710	808501	1	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	950.00
17	880	836002	1	EA	Installation of Steel Pole (Equal to or Greater than 40')	725.00	725.00
18	935	839502	4	EA	Furnish & Install Wood Pole, Class II (Heavy) – 50’	2100.00	8,400.00
19	990	837011	18	EA	Realign or Slide Existing Signal Head	255.00	4,590.00
20	1095	844526	2	EA	Relocate Video Detection Device	850.00	1,700.00
21	1185	838001	555	LF	Furnish & Install Span Wires, 7/16"	6.00	3,330.00
22	1210	838009	25	LF	Removal of Messenger Wire, Cable and Hardware	1.00	25.00
23	1215	838500	4	EA	Removal of Span Wire Attachment	100.00	400.00
24	1220	840001	12	EA	Furnish & Install Down Guy and Anchor	550.00	6,600.00
25	1235	832035	2986	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	1,493.00
26	1245	836005	1	EA	Remove Steel Pole (Equal to or Greater than 40’)	510.00	510.00
27	1255	836503	4	EA	Remove Steel Pole (Equal to or Greater than 15’ and Less than 40’)	550.00	2,200.00
28	1300	847002	3	EA	Installation or Removal of Base or Pad Mounted Cabinet	2500.00	7,500.00
29					**PHASE 3, STAGE 9**		
30	65	832008	285	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper	2.50	712.50
31	80	832025	495	LF	Furnish & Install 4-Conductor #18 AWG Shielded Opticom Cable	2.00	990.00
32	110	832507	465	LF	Furnish & Install 14/5 Traffic Control Cable	4.00	1,860.00
33	115	832033	210	LF	Furnish & Install 14/9 Traffic Control Cable	5.00	1,050.00
34	120	832034	285	LF	Furnish & Install 14/16 Traffic Control Cable	5.00	1,425.00
35	150	832501	2	EA	Splicing of Electrical Cable Above Ground	75.00	150.00
37	710	808501	1	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	950.00
38	885	836502	2	EA	Furnish & Install Pedestal Pole	1510.00	3,020.00
39	895	836500	2	EA	Installation of Steel Mast Arm Pole with Single Mast Arm Greater than 70’	1632.00	3,264.00
40	910	836507	2	EA	Furnish Pedestal Pole Transformer Base	400.00	800.00
41	970	837002	27	EA	Furnish & Install 12” LED Signal Head Section Rigid Mount	400.00	10,800.00
42	985	837007	9	EA	Furnish & Install Signal Head Backplate	445.00	4,005.00
43	990	837011	6	EA	Realign or Slide Existing Signal Head	255.00	1,530.00
44	995	844001	2	EA	Furnish & Install Opticom Emergency Preemption Detector	1525.00	3,050.00
45	1000	837008	3	EA	Furnish & Install 16” LED Countdown Pedestrian Signal	925.00	2,775.00
46	1010	837010	3	EA	Furnish & Install Pedestrian Pushbutton with Sign	350.00	1,050.00
47	1095	844526	1	EA	Relocate Video Detection Device	850.00	850.00
48	1140	823001	2	EA	Installation of Sign on Span Wire or Mast Arm	50.00	100.00

49					**PHASE 3, STAGE 10**		
50	65	832008	465	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper	2.50	1,162.50
51	80	832025	870	LF	Furnish & Install 4-Conductor #18 AWG Shielded Opticom Cable	2.00	1,740.00
52	110	832507	1090	LF	Furnish & Install 14/5 Traffic Control Cable	4.00	4,360.00
53	115	832033	210	LF	Furnish & Install 14/9 Traffic Control Cable	5.00	1,050.00
54	120	832034	660	LF	Furnish & Install 14/16 Traffic Control Cable	5.00	3,300.00
55	150	832501	2	EA	Splicing of Electrical Cable Above Ground	75.00	150.00
56	710	808501	1	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	950.00
57	885	836502	2	EA	Furnish & Install Pedestal Pole	1510.00	3,020.00
58	895	836500	2	EA	Installation of Steel Mast Arm Pole with Single Mast Arm Greater than 70’	1632.00	3,264.00
59	910	836507	2	EA	Furnish Pedestal Pole Transformer Base	400.00	800.00
60	970	837002	27	EA	Furnish & Install 12” LED Signal Head Section Rigid Mount	400.00	10,800.00
61	985	837007	9	EA	Furnish & Install Signal Head Backplate	445.00	4,005.00
62	995	844001	2	EA	Furnish & Install Opticom Emergency Preemption Detector	1525.00	3,050.00
63	1000	837008	3	EA	Furnish & Install 16” LED Countdown Pedestrian Signal	925.00	2,775.00
64	1010	837010	3	EA	Furnish & Install Pedestrian Pushbutton with Sign	350.00	1,050.00
65	1095	844526	1	EA	Relocate Video Detection Device	850.00	850.00
66	1140	823001	2	EA	Installation of Sign on Span Wire or Mast Arm	50.00	100.00
67	1215	838500	4	EA	Removal of Span Wire Attachment	100.00	400.00
68	1235	832035	345	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	172.50
69	1270	838504	22	EA	Removal of Signal Head or Opticom Detector from Span Wire or Mast Arm	136.00	2,992.00
70	1275	839003	4	EA	Removal of Wood Pole	550.00	2,200.00
71					**ULTIMATE**		
72	65	832008	640	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper	2.50	1,600.00
73	85	832026	150	LF	Furnish & Install 1-Conductor #14 AWG Stranded Copper	2.00	300.00
74	90	832027	8065	LF	Furnish & Install 2-Conductor #14 AWG Aluminum Shielded Cable	2.00	16,130.00
75	145	832500	25	EA	Splicing of Electrical Cable Underground	75.00	1,875.00
76	1095	844526	2	EA	Relocate Video Detection Device	850.00	1,700.00
77	1235	832035	520	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	260.00
					TOTAL TRAFFIC CONTRACTOR ITEMS	→	160,155.00

INTERSECTION # 5: **K128, US 13 & SR 10**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	UNIT COST ROMMEL	TOTAL COST ROMMEL
1					**PHASE 3, STAGE 3**		
2	2076	999999	2	EA	GS-3-CAM Gridsmart Fisheye Video Detection Device (includes camera and CPU)	13750.00	27,500.00
3	2077	999999	2	EA	GS-3-SMC: Gridsmart Quick Connect Junction Box	220.00	440.00
4	2078	999999	2	EA	GS-3-A84: Gridsmart Fisheye 84" Mounting Arm with 90 degree bend	138.00	276.00
5	2079	999999	2	EA	GS-3-CBL: Gridsmart Cable (1000 ft min.) and Astro-Bracket Cable (AB-3009)	688.00	1,376.00
6	2535	999621	1	EA	CDMA	1200.00	1,200.00
7					**PHASE 3, STAGE 5**		
8							
9					**PHASE 3, STAGE 8**		
10	2020	999421	1	EA	Complete P Cabinet w/12 Channel EPAC Controller (includes Mounting Rack w/Power Supply, 5-4 Ch	13950.00	13,950.00
11	2050	999427	1	EA	Base Extension (split) Aluminum w/Natural Mill Finish	550.00	550.00
12	2095	999458	1	EA	Patch Cables (One Per Cabinet)	240.00	240.00
13	2105	999461	1	EA	Optical Receiver Card (Emergency Preemption)	2751.00	2,751.00
14					**PHASE 3, STAGE 9**		
15	2180	999490	2	EA	Steel Round Mast Arm Pole, TYPE C (70' - 90' Arm Length)	10885.68	21,771.36
16	2245	999503	1	EA	80' (24.4m) Steel Round Mast Arm	14028.56	14,028.56
17	2250	999504	1	EA	90' (27.4m) Steel Round Mast Arm	19848.40	19,848.40
18	2435	999601	4	EA	Rouleau Sign Brackets (2 per average sign, 3 per longer sign)	115.00	460.00
19					**PHASE 3, STAGE 10**		
20	2180	999490	2	EA	Steel Round Mast Arm Pole, TYPE C (70' - 90' Arm Length)	10885.68	21,771.36
21	2245	999503	1	EA	80' (24.4m) Steel Round Mast Arm	14028.56	14,028.56
22	2250	999504	1	EA	90' (27.4m) Steel Round Mast Arm	19848.40	19,848.40
23	2435	999601	4	EA	Rouleau Sign Brackets (2 per average sign, 3 per longer sign)	115.00	460.00
24					**ULTIMATE**		
25							
					TOTAL TRAFFIC SUPPLY ITEMS	→	160,499.64

TOTAL PROJECT CONTRACTOR ITEMS	→ →	
TOTAL TRAFFIC CONTRACTOR ITEMS	→ →	160,155.00
TOTAL TRAFFIC SUPPLY ITEMS	→ →	160,499.64
CONTINGENCIES	→ →	32,065.46
TOTAL COST	→ →	352,720.10

INTERSECTION # 6: **K301, US 13 & Old North Road**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	UNIT COST ROMMEL	TOTAL COST ROMMEL
1					**PHASE 3, STAGE 3**		
2							
3					**PHASE 3, STAGE 4**		
4	305	831545	395	LF	Furnish & Install 4” HDPE SDR-13.5 Conduit (Bore)		
5	365	831516	450	LF	Furnish & Install 4” Schedule 80 PVC Conduit (Trench)		
6	650	830001	2	EA	Conduit Junction Well, Type 1, 20" x 20" Precast Concrete		
7	655	830002	2	EA	Conduit Junction Well, Type 4, 20" x 42-1/2" Precast Concrete		
8	1225	830010	6	EA	Removal of Existing Junction Well		
9					**PHASE 3, STAGE 8**		
10	305	831545	120	LF	Furnish & Install 4” HDPE SDR-13.5 Conduit (Bore)		
11	355	831514	40	LF	Furnish & Install 2-1/2” Schedule 80 PVC Conduit (Trench)		
12	360	831515	15	LF	Furnish & Install 3” Schedule 80 PVC Conduit (Trench)		
13	365	831516	50	LF	Furnish & Install 4” Schedule 80 PVC Conduit (Trench)		
14	445	831524	40	LF	Furnish & Install 2-1/2” Galvanized Steel Conduit (Trench)		
15	650	830001	3	EA	Conduit Junction Well, Type 1, 20" x 20" Precast Concrete		
16	655	830002	1	EA	Conduit Junction Well, Type 4, 20" x 42-1/2" Precast Concrete		
17	670	830008	1	EA	Adjust or Repair Existing Conduit Junction Well		
18	835	834002	2	EA	Pole Base Type 3A		
19	850	834005	2	EA	Pole Base Type 4A		
20	870	834008	2	EA	Sheeting for Pole Base		
21	1225	830010	1	EA	Removal of Existing Junction Well		
22	1240	834501	0.5	CY	Partial Removal of Concrete Pole Bases and Cabinet Foundations		
23					**PHASE 3, STAGE 11**		
24	15	835003	1	EA	Cabinet Base Type P		
25	305	831545	195	LF	Furnish & Install 4” HDPE SDR-13.5 Conduit (Bore)		
26	355	831514	30	LF	Furnish & Install 2-1/2” Schedule 80 PVC Conduit (Trench)		
27	360	831515	20	LF	Furnish & Install 3” Schedule 80 PVC Conduit (Trench)		
28	365	831516	30	LF	Furnish & Install 4” Schedule 80 PVC Conduit (Trench)		
29	440	831523	110	LF	Furnish & Install 2” Galvanized Steel Conduit (Trench)		
30	500	831538	30	LF	Furnish & Install 2” Galvanized Steel Conduit (On Structure)		
31	650	830001	3	EA	Conduit Junction Well, Type 1, 20" x 20" Precast Concrete		
32	655	830002	1	EA	Conduit Junction Well, Type 4, 20" x 42-1/2" Precast Concrete		
33	835	834002	2	EA	Pole Base Type 3A		
34	850	834005	2	EA	Pole Base Type 4A		
35	870	834008	2	EA	Sheeting for Pole Base		
36	1225	830010	5	EA	Removal of Existing Junction Well		
37	1240	834501	0.5	CY	Partial Removal of Concrete Pole Bases and Cabinet Foundations		
38					**ULTIMATE**		
39	670	830008	6	EA	Adjust or Repair Existing Conduit Junction Well		
40	135	846001	2550	LF	Furnish & Install Loop Wire 1-Conductor #14 AWG encased in 1/4" Flexible Tubing in a Loop Sawcut		
					TOTAL PROJECT CONTRACTOR ITEMS	→	

					INTERSECTION # 6: **K301, US 13 & Old North Road**	UNIT COST	TOTAL COST
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC CONTRACTOR ITEMS)	ROMMEL	ROMMEL
1					**PHASE 3, STAGE 3**		
2	1070	844521	2	EA	Install Video Detection Device	565.00	1,130.00
3	1235	832035	1781	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	890.50
4					**PHASE 3, STAGE 4**		
5							
6					**PHASE 3, STAGE 8**		
7	80	832025	1384	LF	Furnish & Install 4-Conductor #18 AWG Shielded Opticom Cable	2.00	2,768.00
8	115	832033	1064	LF	Furnish & Install 14/9 Traffic Control Cable	5.00	5,320.00
9	120	832034	160	LF	Furnish & Install 14/16 Traffic Control Cable	5.00	800.00
10	150	832501	4	EA	Splicing of Electrical Cable Above Ground	75.00	300.00
11	710	808501	2	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	1,900.00
12	895	836500	2	EA	Installation of Steel Mast Arm Pole with Single Mast Arm Greater than 70’	1632.00	3,264.00
13	910	836507	2	EA	Furnish Pedestal Pole Transformer Base	400.00	800.00
14	935	839502	2	EA	Furnish & Install Wood Pole, Class II (Heavy) – 50’	2100.00	4,200.00
15	970	837002	27	EA	Furnish & Install 12” LED Signal Head Section Rigid Mount	400.00	10,800.00
16	975	837004	6	EA	Furnish & Install 12” LED Signal Head Section Span Mount	370.00	2,220.00
17	985	837007	11	EA	Furnish & Install Signal Head Backplate	445.00	4,895.00
18	990	837011	8	EA	Realign or Slide Existing Signal Head	255.00	2,040.00
19	995	844001	2	EA	Furnish & Install Opticom Emergency Preemption Detector	1525.00	3,050.00
20	1095	844526	1	EA	Relocate Video Detection Device	850.00	850.00
21	1140	823001	2	EA	Installation of Sign on Span Wire or Mast Arm	50.00	100.00
22	1185	838001	266	LF	Furnish & Install Span Wires, 7/16"	6.00	1,596.00
23	1215	838500	4	EA	Removal of Span Wire Attachment	100.00	400.00
24	1220	840001	6	EA	Furnish & Install Down Guy and Anchor	550.00	3,300.00
25	1235	832035	150	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	75.00
26	1255	836503	4	EA	Remove Steel Pole (Equal to or Greater than 15’ and Less than 40’)	550.00	2,200.00
27					**PHASE 3, STAGE 11**		
28	65	832008	150	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper	2.50	375.00
29	80	832025	1320	LF	Furnish & Install 4-Conductor #18 AWG Shielded Opticom Cable	2.00	2,640.00
30	95	832029	100	LF	Furnish & Install #8/2 Wire UF W/ground	5.00	500.00
31	110	832507	1220	LF	Furnish & Install 14/5 Traffic Control Cable	4.00	4,880.00
32	115	832033	670	LF	Furnish & Install 14/9 Traffic Control Cable	5.00	3,350.00
33	120	832034	430	LF	Furnish & Install 14/16 Traffic Control Cable	5.00	2,150.00
34	125	832504	130	LF	Furnish & Install #8 THHN Stranded Copper	1.00	130.00
35	150	832501	2	EA	Splicing of Electrical Cable Above Ground	75.00	150.00
36	630	842005	2	EA	Removal of Electric Service on Wood or Metal Pole	272.00	544.00
37	635	842501	2	EA	Furnish & Install Electric Utility Service Equipment (100 AMP)	2525.00	5,050.00
38	710	808501	2	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	1,900.00
39	885	836502	2	EA	Furnish & Install Pedestal Pole	1510.00	3,020.00
40	895	836500	2	EA	Installation of Steel Mast Arm Pole with Single Mast Arm Greater than 70’	1632.00	3,264.00
41	910	836507	2	EA	Furnish Pedestal Pole Transformer Base	400.00	800.00
42	970	837002	27	EA	Furnish & Install 12” LED Signal Head Section Rigid Mount	400.00	10,800.00
43	985	837007	9	EA	Furnish & Install Signal Head Backplate	445.00	4,005.00
44	995	844001	2	EA	Furnish & Install Opticom Emergency Preemption Detector	1525.00	3,050.00
45	1000	837008	3	EA	Furnish & Install 16” LED Countdown Pedestrian Signal	925.00	2,775.00
46	1010	837010	3	EA	Furnish & Install Pedestrian Pushbutton with Sign	350.00	1,050.00
47	1095	844526	1	EA	Relocate Video Detection Device	850.00	850.00
48	1140	823001	2	EA	Installation of Sign on Span Wire or Mast Arm	50.00	100.00
49	1215	838500	2	EA	Removal of Span Wire Attachment	100.00	200.00
50	1235	832035	628	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	314.00
51	1270	838504	13	EA	Removal of Signal Head or Opticom Detector from Span Wire or Mast Arm	136.00	1,768.00
52	1275	839003	2	EA	Removal of Wood Pole	550.00	1,100.00
53	1300	847002	2	EA	Installation or Removal of Base or Pad Mounted Cabinet	2500.00	5,000.00
54					**ULTIMATE**		
55	65	832008	645	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper	2.50	1,612.50
56	90	832027	6500	LF	Furnish & Install 2-Conductor #14 AWG Aluminum Shielded Cable	2.00	13,000.00
57	145	832500	19	EA	Splicing of Electrical Cable Underground	75.00	1,425.00
58	1095	844526	2	EA	Relocate Video Detection Device	850.00	1,700.00
59	1235	832035	750	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	375.00
					TOTAL TRAFFIC CONTRACTOR ITEMS	→	130,776.00

INTERSECTION # 6: **K301, US 13 & Old North Road**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	UNIT COST ROMMEL	TOTAL COST ROMMEL
1					**PHASE 3, STAGE 3**		
2	2076	999999	2	EA	GS-3-CAM Gridsmart Fisheye Video Detection Device (includes camera and CPU)	13750.00	27,500.00
3	2077	999999	2	EA	GS-3-SMC: Gridsmart Quick Connect Junction Box	220.00	440.00
4	2078	999999	2	EA	GS-3-A84: Gridsmart Fisheye 84" Mounting Arm with 90 degree bend	138.00	276.00
5	2079	999999	2	EA	GS-3-CBL: Gridsmart Cable (1000 ft min.) and Astro-Bracket Cable (AB-3009)	688.00	1,376.00
6					**PHASE 3, STAGE 4**		
7							
8					**PHASE 3, STAGE 8**		
9	2180	999490	2	EA	Steel Round Mast Arm Pole, TYPE C (70' - 90' Arm Length)	10885.68	21,771.36
10	2245	999503	1	EA	80' (24.4m) Steel Round Mast Arm	14028.56	14,028.56
11	2250	999504	1	EA	90' (27.4m) Steel Round Mast Arm	19848.40	19,848.40
12	2435	999601	4	EA	Rouleau Sign Brackets (2 per average sign, 3 per longer sign)	115.00	460.00
13					**PHASE 3, STAGE 11**		
14	2020	999421	1	EA	Complete P Cabinet w/12 Channel EPAC Controller (includes Mounting Rack w/Power Supply, 5-4 Ch	13950.00	13,950.00
15	2050	999427	1	EA	Base Extension (split) Aluminum w/Natural Mill Finish	550.00	550.00
16	2095	999458	1	EA	Patch Cables (One Per Cabinet)	240.00	240.00
17	2105	999461	1	EA	Optical Receiver Card (Emergency Preemption)	2751.00	2,751.00
18	2180	999490	2	EA	Steel Round Mast Arm Pole, TYPE C (70' - 90' Arm Length)	10885.68	21,771.36
19	2250	999504	2	EA	90' (27.4m) Steel Round Mast Arm	19848.40	39,696.80
20	2435	999601	4	EA	Rouleau Sign Brackets (2 per average sign, 3 per longer sign)	115.00	460.00
21	2535	999621	1	EA	CDMA	1200.00	1,200.00
22					**ULTIMATE**		
23							
					TOTAL TRAFFIC SUPPLY ITEMS	→	166,319.48

TOTAL PROJECT CONTRACTOR ITEMS	→ →	
TOTAL TRAFFIC CONTRACTOR ITEMS	→ →	130,776.00
TOTAL TRAFFIC SUPPLY ITEMS	→ →	166,319.48
CONTINGENCIES	→ →	29,709.55
TOTAL COST	→ →	326,805.03

					INTERSECTION # 7: **K137, US 13 & POW-MIA Parkway**	UNIT COST	TOTAL COST
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	ROMMEL	ROMMEL
1					**PHASE 4, STAGE 3**		
2	365	831516	215	LF	Furnish & Install 4" Schedule 80 PVC Conduit (Trench)		
3	650	830001	1	EA	Conduit Junction Well, Type 1, 20" x 20" Precast Concrete		
4	655	830002	1	EA	Conduit Junction Well, Type 4, 20" x 42-1/2" Precast Concrete		
5	1225	830010	3	EA	Removal of Existing Junction Well		
6					**PHASE 4, STAGE 4**		
7	305	831545	360	LF	Furnish & Install 4" HDPE SDR-13.5 Conduit (Bore)		
8	365	831516	220	LF	Furnish & Install 4" Schedule 80 PVC Conduit (Trench)		
9	650	830001	1	EA	Conduit Junction Well, Type 1, 20" x 20" Precast Concrete		
10	655	830002	1	EA	Conduit Junction Well, Type 4, 20" x 42-1/2" Precast Concrete		
11	670	830008	2	EA	Adjust or Repair Existing Conduit Junction Well		
12	1225	830010	3	EA	Removal of Existing Junction Well		
13					**PHASE 4, STAGE 9**		
14	305	831545	90	LF	Furnish & Install 4" HDPE SDR-13.5 Conduit (Bore)		
15	355	831514	45	LF	Furnish & Install 2-1/2" Schedule 80 PVC Conduit (Trench)		
16	360	831515	25	LF	Furnish & Install 3" Schedule 80 PVC Conduit (Trench)		
17	365	831516	55	LF	Furnish & Install 4" Schedule 80 PVC Conduit (Trench)		
18	650	830001	2	EA	Conduit Junction Well, Type 1, 20" x 20" Precast Concrete		
19	835	834002	1	EA	Pole Base Type 3A		
20	840	834003	1	EA	Pole Base Type 3B		
21	850	834005	3	EA	Pole Base Type 4A		
22	870	834008	2	EA	Sheeting for Pole Base		
23					**PHASE 4, STAGE 10**		
24	140	846002	20	LF	Furnish & Install a 1 - 1/2" Galvanized Rigid Metal Conduit Detector Sleeve with Loop Wire		
25	305	831545	160	LF	Furnish & Install 4" HDPE SDR-13.5 Conduit (Bore)		
26	355	831514	20	LF	Furnish & Install 2-1/2" Schedule 80 PVC Conduit (Trench)		
27	360	831515	55	LF	Furnish & Install 3" Schedule 80 PVC Conduit (Trench)		
28	365	831516	10	LF	Furnish & Install 4" Schedule 80 PVC Conduit (Trench)		
29	650	830001	2	EA	Conduit Junction Well, Type 1, 20" x 20" Precast Concrete		
30	655	830002	1	EA	Conduit Junction Well, Type 4, 20" x 42-1/2" Precast Concrete		
31	670	830008	1	EA	Adjust or Repair Existing Conduit Junction Well		
32	835	834002	2	EA	Pole Base Type 3A		
33	850	834005	2	EA	Pole Base Type 4A		
34	870	834008	2	EA	Sheeting for Pole Base		
35	1225	830010	3	EA	Removal of Existing Junction Well		
36	1240	834501	3	CY	Partial Removal of Concrete Pole Bases and Cabinet Foundations		
37					**ULTIMATE**		
38	135	846001	1575	LF	Furnish & Install Loop Wire 1-Conductor #14 AWG encased in 1/4" Flexible Tubing in a Loop Sawcut		
39	670	830008	6	EA	Adjust or Repair Existing Conduit Junction Well		
					TOTAL PROJECT CONTRACTOR ITEMS	→	

INTERSECTION # 7: **K137, US 13 & POW-MIA Parkway**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC CONTRACTOR ITEMS)	UNIT COST ROMMEL	TOTAL COST ROMMEL
1					**PHASE 4, STAGE 3**		
2	710	808501	1	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	950.00
3	1070	844521	2	EA	Install Video Detection Device	565.00	1,130.00
4	1235	832035	4120	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	2,060.00
5	NIB003		440	LF	Install CAT-5e Cable	2.10	924.00
6	NIB053		2	LS	MOT Devices and Deployment	7000.00	14,000.00
7					**PHASE 4, STAGE 4**		
8	65	832008	15	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper	2.50	37.50
9	110	832507	270	LF	Furnish & Install 14/5 Traffic Control Cable	4.00	1,080.00
10	710	808501	1	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	950.00
11	990	837011	4	EA	Realign or Slide Existing Signal Head	255.00	1,020.00
12	1235	832035	760	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	380.00
13	1095	844526	2	EA	Relocate Video Detection Device	850.00	1,700.00
14	1270	838504	1	EA	Removal of Signal Head or Opticom Detector from Span Wire or Mast Arm	136.00	136.00
15					**PHASE 4, STAGE 9**		
16	710	808501	2	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	1,900.00
17	885	836502	3	EA	Furnish & Install Pedestal Pole	1510.00	4,530.00
18	890	836504	1	EA	Installation of Steel Mast Arm Pole with Single or Twin Mast arms up to 60’	2200.00	2,200.00
19	895	836500	1	EA	Installation of Steel Mast Arm Pole with Single Mast Arm Greater than 70’	1632.00	1,632.00
20	910	836507	3	EA	Furnish Pedestal Pole Transformer Base	400.00	1,200.00
21	970	837002	25	EA	Furnish & Install 12” LED Signal Head Section Rigid Mount	400.00	10,000.00
22	985	837007	8	EA	Furnish & Install Signal Head Backplate	445.00	3,560.00
23	990	837011	6	EA	Realign or Slide Existing Signal Head	255.00	1,530.00
24	990	837011	8	EA	Realign or Slide Existing Signal Head	255.00	2,040.00
25	995	844001	2	EA	Furnish & Install Opticom Emergency Preemption Detector	1525.00	3,050.00
26	1000	837008	3	EA	Furnish & Install 16” LED Countdown Pedestrian Signal	925.00	2,775.00
27	1010	837010	3	EA	Furnish & Install Pedestrian Pushbutton with Sign	350.00	1,050.00
28	1095	844526	2	EA	Relocate Video Detection Device	850.00	1,700.00
29	1140	823001	2	EA	Installation of Sign on Span Wire or Mast Arm	50.00	100.00
30					**PHASE 4, STAGE 10**		
31	65	832008	630	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper	2.50	1,575.00
32	80	832025	1025	LF	Furnish & Install 4-Conductor #18 AWG Shielded Opticom Cable	2.00	2,050.00
33	105	832032	120	LF	Furnish & Install 14/4 Traffic Control Cable	5.00	600.00
34	110	832507	2415	LF	Furnish & Install 14/5 Traffic Control Cable	4.00	9,660.00
35	115	832033	440	LF	Furnish & Install 14/9 Traffic Control Cable	5.00	2,200.00
36	120	832034	390	LF	Furnish & Install 14/16 Traffic Control Cable	5.00	1,950.00
37	150	832501	2	EA	Splicing of Electrical Cable Above Ground	75.00	150.00
38	710	808501	2	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	1,900.00
39	885	836502	2	EA	Furnish & Install Pedestal Pole	1510.00	3,020.00
40	890	836504	1	EA	Installation of Steel Mast Arm Pole with Single or Twin Mast arms up to 60’	2200.00	2,200.00
41	895	836500	1	EA	Installation of Steel Mast Arm Pole with Single Mast Arm Greater than 70’	1632.00	1,632.00
42	910	836507	2	EA	Furnish Pedestal Pole Transformer Base	400.00	800.00
43	970	837002	25	EA	Furnish & Install 12” LED Signal Head Section Rigid Mount	400.00	10,000.00
44	985	837007	8	EA	Furnish & Install Signal Head Backplate	445.00	3,560.00
45	990	837011	3	EA	Realign or Slide Existing Signal Head	255.00	765.00
46	995	844001	2	EA	Furnish & Install Opticom Emergency Preemption Detector	1525.00	3,050.00
47	1000	837008	3	EA	Furnish & Install 16” LED Countdown Pedestrian Signal	925.00	2,775.00
48	1010	837010	3	EA	Furnish & Install Pedestrian Pushbutton with Sign	350.00	1,050.00
49	1095	844526	2	EA	Relocate Video Detection Device	850.00	1,700.00
50	1140	823001	2	EA	Installation of Sign on Span Wire or Mast Arm	50.00	100.00
51	1215	838500	4	EA	Removal of Span Wire Attachment	100.00	400.00
52	1235	832035	890	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	445.00
53	1250	836006	2	EA	Remove Pedestal Pole	272.00	544.00
54	1255	836503	4	EA	Remove Steel Pole (Equal to or Greater than 15’ and Less than 40’)	550.00	2,200.00
55	1270	838504	11	EA	Removal of Signal Head or Opticom Detector from Span Wire or Mast Arm	136.00	1,496.00
56	NIB003		500	LF	Install CAT-5e Cable	2.10	1,050.00
57					**ULTIMATE**		
58	65	832008	710	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper	2.50	1,775.00
59	90	832027	6965	LF	Furnish & Install 2-Conductor #14 AWG Aluminum Shielded Cable	2.00	13,930.00
60	990	837011	6	EA	Realign or Slide Existing Signal Head	255.00	1,530.00
61	1095	844526	4	EA	Relocate Video Detection Device	850.00	3,400.00
62	1235	832035	450	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	225.00
					TOTAL TRAFFIC CONTRACTOR ITEMS	→	139,366.50

INTERSECTION # 7: **K137, US 13 & POW-MIA Parkway**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	UNIT COST ROMMEL	TOTAL COST ROMMEL
1					**PHASE 4, STAGE 3**		
2		999999	1	LS	Gridsmart Dual Camera Video Detection System	22750.00	22,750.00
3					**PHASE 4, STAGE 4**		
4							
5					**PHASE 4, STAGE 9**		
6	2175	999489	1	EA	Steel Round Mast Arm Pole, TYPE B (45' - 60' Arm Length or 2 - 60' Arms)	8818.16	8,818.16
7	2180	999490	1	EA	Steel Round Mast Arm Pole, TYPE C (70' - 90' Arm Length)	10885.68	10,885.68
8	2235	999501	1	EA	60' (16.8m) Steel Round Mast Arm	9468.16	9,468.16
9	2250	999504	1	EA	90' (27.4m) Steel Round Mast Arm	19848.40	19,848.40
10	2435	999601	4	EA	Rouleau Sign Brackets (2 per average sign, 3 per longer sign)	115.00	460.00
11					**PHASE 4, STAGE 10**		
12	2051	999428	1	EA	M-60 ATC Controller DelDOT SEPAC software (controller conversion only - not full cabinet)	4037.00	4,037.00
13	2175	999489	1	EA	Steel Round Mast Arm Pole, TYPE B (45' - 60' Arm Length or 2 - 60' Arms)	8818.16	8,818.16
14	2180	999490	1	EA	Steel Round Mast Arm Pole, TYPE C (70' - 90' Arm Length)	10885.68	10,885.68
15	2235	999501	1	EA	60' (16.8m) Steel Round Mast Arm	9468.16	9,468.16
16	2250	999504	1	EA	90' (27.4m) Steel Round Mast Arm	19848.40	19,848.40
17	2435	999601	4	EA	Rouleau Sign Brackets (2 per average sign, 3 per longer sign)	115.00	460.00
18					**ULTIMATE**		
19							
					TOTAL TRAFFIC SUPPLY ITEMS	→	125,747.80

TOTAL PROJECT CONTRACTOR ITEMS	→ →	
TOTAL TRAFFIC CONTRACTOR ITEMS	→ →	139,366.50
TOTAL TRAFFIC SUPPLY ITEMS	→ →	125,747.80
CONTINGENCIES	→ →	26,511.43
TOTAL COST	→ →	291,625.73

					INTERSECTION # 8: **K328, US 13 & Governors Avenue**	UNIT COST	TOTAL COST
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	ROMMEL	ROMMEL
1					**PHASE 4, STAGE 3**		
2	305	831545	170	LF	Furnish & Install 4" HDPE SDR-13.5 Conduit (Bore)		
3	355	831514	20	LF	Furnish & Install 2-1/2" Schedule 80 PVC Conduit (Trench)		
4	365	831516	195	LF	Furnish & Install 4" Schedule 80 PVC Conduit (Trench)		
5	650	830001	1	EA	Conduit Junction Well, Type 1, 20" x 20" Precast Concrete		
6	655	830002	1	EA	Conduit Junction Well, Type 4, 20" x 42-1/2" Precast Concrete		
7	855	834511	1	EA	Pole Base Type 4B		
8					**PHASE 4, STAGE 5**		
9	15	835003	1	EA	Cabinet Base Type P		
10	305	831545	185	LF	Furnish & Install 4" HDPE SDR-13.5 Conduit (Bore)		
11	355	831514	15	LF	Furnish & Install 2-1/2" Schedule 80 PVC Conduit (Trench)		
12	360	831515	5	LF	Furnish & Install 3" Schedule 80 PVC Conduit (Trench)		
13	365	831516	220	LF	Furnish & Install 4" Schedule 80 PVC Conduit (Trench)		
14	440	831523	50	LF	Furnish & Install 2" Galvanized Steel Conduit (Trench)		
15	545	831574	10	LF	Furnish & Install Second and Subsequent Additional 4" PVC Conduits in Trench or Open Cut		
16	650	830001	2	EA	Conduit Junction Well, Type 1, 20" x 20" Precast Concrete		
17	655	830002	1	EA	Conduit Junction Well, Type 4, 20" x 42-1/2" Precast Concrete		
18	670	830008	1	EA	Adjust or Repair Existing Conduit Junction Well		
19	840	834003	2	EA	Pole Base Type 3B		
20	850	834005	1	EA	Pole Base Type 4A		
21	870	834008	2	EA	Sheeting for Pole Base		
22					**PHASE 4, STAGE 6**		
23	305	831545	230	LF	Furnish & Install 4" HDPE SDR-13.5 Conduit (Bore)		
24	365	831516	250	LF	Furnish & Install 4" Schedule 80 PVC Conduit (Trench)		
25	650	830001	1	EA	Conduit Junction Well, Type 1, 20" x 20" Precast Concrete		
26	655	830002	1	EA	Conduit Junction Well, Type 4, 20" x 42-1/2" Precast Concrete		
27	670	830008	2	EA	Adjust or Repair Existing Conduit Junction Well		
28					**PHASE 4, STAGE 9**		
29	305	831545	65	LF	Furnish & Install 4" HDPE SDR-13.5 Conduit (Bore)		
30	355	831514	55	LF	Furnish & Install 2-1/2" Schedule 80 PVC Conduit (Trench)		
31	365	831516	10	LF	Furnish & Install 4" Schedule 80 PVC Conduit (Trench)		
32	650	830001	3	EA	Conduit Junction Well, Type 1, 20" x 20" Precast Concrete		
33	840	834003	2	EA	Pole Base Type 3B		
34	850	834005	4	EA	Pole Base Type 4A		
35	870	834008	2	EA	Sheeting for Pole Base		
36					**ULTIMATE**		
37	135	846001	985	LF	Furnish & Install Loop Wire 1-Conductor #14 AWG encased in 1/4" Flexible Tubing in a Loop Sawcut		
38	140	846002	30	LF	Furnish & Install a 1 - 1/2" Galvanized Rigid Metal Conduit Detector Sleeve with Loop Wire		
39	670	830008	7	EA	Adjust or Repair Existing Conduit Junction Well		
					TOTAL PROJECT CONTRACTOR ITEMS	→	

INTERSECTION # 8: **K328, US 13 & Governors Avenue**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC CONTRACTOR ITEMS)	UNIT COST ROMMEL	TOTAL COST ROMMEL
1					**PHASE 4, STAGE 3**		
2	NIB053		2	LS	MOT Devices and Deployment	7000.00	14,000.00
3					**PHASE 4, STAGE 5**		
4	65	832008	630	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper	2.50	1,575.00
5	80	832025	370	LF	Furnish & Install 4-Conductor #18 AWG Shielded Opticom Cable	2.00	740.00
6	95	832029	50	LF	Furnish & Install #8/2 Wire UF W/ground	5.00	250.00
7	105	832032	20	LF	Furnish & Install 14/4 Traffic Control Cable	5.00	100.00
8	110	832507	1035	LF	Furnish & Install 14/5 Traffic Control Cable	4.00	4,140.00
9	120	832034	250	LF	Furnish & Install 14/16 Traffic Control Cable	5.00	1,250.00
10	125	832504	50	LF	Furnish & Install #8 THHN Stranded Copper	1.00	50.00
11	635	842501	1	EA	Furnish & Install Electric Utility Service Equipment (100 AMP)	2525.00	2,525.00
12	710	808501	2	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	1,900.00
13	885	836502	2	EA	Furnish & Install Pedestal Pole	1510.00	3,020.00
14	890	836504	1	EA	Installation of Steel Mast Arm Pole with Single or Twin Mast arms up to 60’	2200.00	2,200.00
15	895	836500	1	EA	Installation of Steel Mast Arm Pole with Single Mast Arm Greater than 70’	1632.00	1,632.00
16	910	836507	2	EA	Furnish Pedestal Pole Transformer Base	400.00	800.00
17	970	837002	33	EA	Furnish & Install 12” LED Signal Head Section Rigid Mount	400.00	13,200.00
18	985	837007	11	EA	Furnish & Install Signal Head Backplate	445.00	4,895.00
19	990	837011	11	EA	Realign or Slide Existing Signal Head	255.00	2,805.00
20	995	844001	2	EA	Furnish & Install Opticom Emergency Preemption Detector	1525.00	3,050.00
21	1000	837008	1	EA	Furnish & Install 16” LED Countdown Pedestrian Signal	925.00	925.00
22	1010	837010	1	EA	Furnish & Install Pedestrian Pushbutton with Sign	350.00	350.00
23	1140	823001	2	EA	Installation of Sign on Span Wire or Mast Arm	50.00	100.00
24	1300	847002	1	EA	Installation or Removal of Base or Pad Mounted Cabinet	2500.00	2,500.00
25					**PHASE 4, STAGE 6**		
26							
27					**PHASE 4, STAGE 9**		
28	65	832008	735	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper	2.50	1,837.50
29	80	832025	590	LF	Furnish & Install 4-Conductor #18 AWG Shielded Opticom Cable	2.00	1,180.00
30	105	832032	80	LF	Furnish & Install 14/4 Traffic Control Cable	5.00	400.00
31	110	832507	2050	LF	Furnish & Install 14/5 Traffic Control Cable	4.00	8,200.00
32	115	832033	480	LF	Furnish & Install 14/9 Traffic Control Cable	5.00	2,400.00
33	710	808501	2	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	1,900.00
34	885	836502	4	EA	Furnish & Install Pedestal Pole	1510.00	6,040.00
35	890	836504	2	EA	Installation of Steel Mast Arm Pole with Single or Twin Mast arms up to 60’	2200.00	4,400.00
36	910	836507	4	EA	Furnish Pedestal Pole Transformer Base	400.00	1,600.00
37	970	837002	16	EA	Furnish & Install 12” LED Signal Head Section Rigid Mount	400.00	6,400.00
38	985	837007	5	EA	Furnish & Install Signal Head Backplate	445.00	2,225.00
39	990	837011	10	EA	Realign or Slide Existing Signal Head	255.00	2,550.00
40	995	844001	2	EA	Furnish & Install Opticom Emergency Preemption Detector	1525.00	3,050.00
41	1000	837008	4	EA	Furnish & Install 16” LED Countdown Pedestrian Signal	925.00	3,700.00
42	1010	837010	4	EA	Furnish & Install Pedestrian Pushbutton with Sign	350.00	1,400.00
43	1070	844521	2	EA	Install Video Detection Device	565.00	1,130.00
44	1140	823001	2	EA	Installation of Sign on Span Wire or Mast Arm	50.00	100.00
45	NIB003		660	LF	Install CAT-5e Cable	2.10	1,386.00
46					**ULTIMATE**		
47	65	832008	350	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper	2.50	875.00
48	90	832027	7050	LF	Furnish & Install 2-Conductor #14 AWG Aluminum Shielded Cable	2.00	14,100.00
49	670	830008	7	EA	Adjust or Repair Existing Conduit Junction Well	400.00	2,800.00
50	710	808501	1	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	950.00
51	990	837011	3	EA	Realign or Slide Existing Signal Head	255.00	765.00
52	1095	844526	4	EA	Relocate Video Detection Device	850.00	3,400.00
53	1235	832035	590	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	295.00
					TOTAL TRAFFIC CONTRACTOR ITEMS	→	135,090.50

INTERSECTION # 8: **K328, US 13 & Governors Avenue**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	UNIT COST ROMMEL	TOTAL COST ROMMEL
1					**PHASE 4, STAGE 3**		
2							
3					**PHASE 4, STAGE 5**		
4	2020	999421	1	EA	Complete P Cabinet w/12 Channel EPAC Controller (includes Mounting Rack w/Power Supply, 5-4 Ch	13950.00	13,950.00
5	2050	999427	1	EA	Base Extension (split) Aluminum w/Natural Mill Finish	550.00	550.00
6	2095	999458	1	EA	Patch Cables (One Per Cabinet)	240.00	240.00
7	2105	999461	1	EA	Optical Receiver Card (Emergency Preemption)	2751.00	2,751.00
8	2175	999489	1	EA	Steel Round Mast Arm Pole, TYPE B (45' - 60' Arm Length or 2 - 60' Arms)	8818.16	8,818.16
9	2180	999490	1	EA	Steel Round Mast Arm Pole, TYPE C (70' - 90' Arm Length)	10885.68	10,885.68
10	2225	999499	2	EA	50' (15.2m) Steel Round Mast Arm	7941.44	15,882.88
11	2240	999502	1	EA	70' (21.3m) Steel Round Mast Arm	12776.40	12,776.40
12	2435	999601	4	EA	Rouleau Sign Brackets (2 per average sign, 3 per longer sign)	115.00	460.00
13					**PHASE 4, STAGE 6**		
14							
15					**PHASE 4, STAGE 9**		
16		999999	1	LS	Gridsmart Dual Camera Video Detection System	23550.00	23,550.00
17	2175	999489	2	EA	Steel Round Mast Arm Pole, TYPE B (45' - 60' Arm Length or 2 - 60' Arms)	8818.16	17,636.32
18	2225	999499	2	EA	50' (15.2m) Steel Round Mast Arm	7941.44	15,882.88
19	2435	999601	4	EA	Rouleau Sign Brackets (2 per average sign, 3 per longer sign)	115.00	460.00
20					**ULTIMATE**		
21							
					TOTAL TRAFFIC SUPPLY ITEMS	→	123,843.32

TOTAL PROJECT CONTRACTOR ITEMS	→ →	
TOTAL TRAFFIC CONTRACTOR ITEMS	→ →	135,090.50
TOTAL TRAFFIC SUPPLY ITEMS	→ →	123,843.32
CONTINGENCIES	→ →	25,893.38
TOTAL COST	→ →	284,827.20

					INTERSECTION # 9: **K118, US 13 & Webbs Lane**	UNIT COST	TOTAL COST
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	ROMMEL	ROMMEL
1					**PHASE 4, STAGE 3**		
2							
3					**PHASE 4, STAGE 7**		
4	15	835003	1	EA	Cabinet Base Type P		
5	305	831545	645	LF	Furnish & Install 4" HDPE SDR-13.5 Conduit (Bore)		
6	360	831515	20	LF	Furnish & Install 3" Schedule 80 PVC Conduit (Trench)		
7	365	831516	470	LF	Furnish & Install 4" Schedule 80 PVC Conduit (Trench)		
8	440	831523	45	LF	Furnish & Install 2" Galvanized Steel Conduit (Trench)		
9	445	831524	30	LF	Furnish & Install 2-1/2" Galvanized Steel Conduit (Trench)		
10	500	831538	30	LF	Furnish & Install 2" Galvanized Steel Conduit (On Structure)		
11	545	831574	10	LF	Furnish & Install Second and Subsequent Additional 4" PVC Conduits in Trench or Open Cut		
12	650	830001	2	EA	Conduit Junction Well, Type 1, 20" x 20" Precast Concrete		
13	655	830002	3	EA	Conduit Junction Well, Type 4, 20" x 42-1/2" Precast Concrete		
14	670	830008	2	EA	Adjust or Repair Existing Conduit Junction Well		
15	835	834002	1	EA	Pole Base Type 3A		
16	870	834008	1	EA	Sheeting for Pole Base		
17	1225	830010	12	EA	Removal of Existing Junction Well		
18	1240	834501	1.5	CY	Partial Removal of Concrete Pole Bases and Cabinet Foundations		
19					**PHASE 4, STAGE 9**		
20	1225	830010	3	EA	Removal of Existing Junction Well		
21	1240	834501	0.5	CY	Partial Removal of Concrete Pole Bases and Cabinet Foundations		
22					**PHASE 4, STAGE 12**		
23	305	831545	150	LF	Furnish & Install 4" HDPE SDR-13.5 Conduit (Bore)		
24	355	831514	30	LF	Furnish & Install 2-1/2" Schedule 80 PVC Conduit (Trench)		
25	360	831515	20	LF	Furnish & Install 3" Schedule 80 PVC Conduit (Trench)		
26	650	830001	3	EA	Conduit Junction Well, Type 1, 20" x 20" Precast Concrete		
27	655	830002	1	EA	Conduit Junction Well, Type 4, 20" x 42-1/2" Precast Concrete		
28	835	834002	2	EA	Pole Base Type 3A		
29	850	834005	2	EA	Pole Base Type 4A		
30	870	834008	2	EA	Sheeting for Pole Base		
31	1225	830010	7	EA	Removal of Existing Junction Well		
32	1240	834501	1	CY	Partial Removal of Concrete Pole Bases and Cabinet Foundations		
33					**PHASE 4, STAGE 13**		
34	305	831545	345	LF	Furnish & Install 4" HDPE SDR-13.5 Conduit (Bore)		
35	355	831514	40	LF	Furnish & Install 2-1/2" Schedule 80 PVC Conduit (Trench)		
36	360	831515	10	LF	Furnish & Install 3" Schedule 80 PVC Conduit (Trench)		
37	650	830001	2	EA	Conduit Junction Well, Type 1, 20" x 20" Precast Concrete		
38	655	830002	1	EA	Conduit Junction Well, Type 4, 20" x 42-1/2" Precast Concrete		
39	670	830008	1	EA	Adjust or Repair Existing Conduit Junction Well		
40	835	834002	1	EA	Pole Base Type 3A		
41	850	834005	3	EA	Pole Base Type 4A		
42	870	834008	1	EA	Sheeting for Pole Base		
43	1225	830010	6	EA	Removal of Existing Junction Well		
44	1240	834501	2.5	CY	Partial Removal of Concrete Pole Bases and Cabinet Foundations		
45					**ULTIMATE**		
46	135	846001	1455	LF	Furnish & Install Loop Wire 1-Conductor #14 AWG encased in 1/4" Flexible Tubing in a Loop Sawcut		
47	140	846002	25	LF	Furnish & Install a 1 - 1/2" Galvanized Rigid Metal Conduit Detector Sleeve with Loop Wire		
48	670	830008	6	EA	Adjust or Repair Existing Conduit Junction Well		
					TOTAL PROJECT CONTRACTOR ITEMS	→	

					INTERSECTION # 9: **K118, US 13 & Webbs Lane**	UNIT COST	TOTAL COST
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC CONTRACTOR ITEMS)	ROMMEL	ROMMEL
1					**PHASE 4, STAGE 3**		
2	710	808501	1	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	950.00
3	1070	844521	2	EA	Install Video Detection Device	565.00	1,130.00
4	1235	832035	3905	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	1,952.50
5	NIB003		350	LF	Install CAT-5e Cable	2.10	735.00
6	NIB053		2	LS	MOT Devices and Deployment	7000.00	14,000.00
7					**PHASE 4, STAGE 7**		
8	65	832008	20	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper	2.50	50.00
9	80	832025	765	LF	Furnish & Install 4-Conductor #18 AWG Shielded Opticom Cable	2.00	1,530.00
10	95	832029	30	LF	Furnish & Install #8/2 Wire UF W/ground	5.00	150.00
11	115	832033	935	LF	Furnish & Install 14/9 Traffic Control Cable	5.00	4,675.00
12	120	832034	485	LF	Furnish & Install 14/16 Traffic Control Cable	5.00	2,425.00
13	125	832504	200	LF	Furnish & Install #8 THHN Stranded Copper	1.00	200.00
14	150	832501	20	EA	Splicing of Electrical Cable Above Ground	75.00	1,500.00
15	630	842005	1	EA	Removal of Electric Service on Wood or Metal Pole	272.00	272.00
16	635	842501	1	EA	Furnish & Install Electric Utility Service Equipment (100 AMP)	2525.00	2,525.00
17	710	808501	1	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	950.00
18	895	836500	1	EA	Installation of Steel Mast Arm Pole with Single Mast Arm Greater than 70’	1632.00	1,632.00
19	990	837011	9	EA	Realign or Slide Existing Signal Head	255.00	2,295.00
20	1095	844526	2	EA	Relocate Video Detection Device	850.00	1,700.00
21	1235	832035	4230	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	2,115.00
22	1250	836006	2	EA	Remove Pedestal Pole	272.00	544.00
23	1300	847002	2	EA	Installation or Removal of Base or Pad Mounted Cabinet	2500.00	5,000.00
24	NIB003		80	LF	Install CAT-5e Cable	2.10	168.00
25					**PHASE 4, STAGE 9**		
26	710	808501	1	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	950.00
27	975	837004	12	EA	Furnish & Install 12” LED Signal Head Section Span Mount	370.00	4,440.00
28	990	837011	2	EA	Realign or Slide Existing Signal Head	255.00	510.00
29	990	837011	5	EA	Realign or Slide Existing Signal Head	255.00	1,275.00
30	1095	844526	2	EA	Relocate Video Detection Device	850.00	1,700.00
31	1270	838504	4	EA	Removal of Signal Head or Opticom Detector from Span Wire or Mast Arm	136.00	544.00
32					**PHASE 4, STAGE 12**		
33	65	832008	440	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper	2.50	1,100.00
34	80	832025	830	LF	Furnish & Install 4-Conductor #18 AWG Shielded Opticom Cable	2.00	1,660.00
35	105	832032	60	LF	Furnish & Install 14/4 Traffic Control Cable	5.00	300.00
36	110	832507	1745	LF	Furnish & Install 14/5 Traffic Control Cable	4.00	6,980.00
37	115	832033	230	LF	Furnish & Install 14/9 Traffic Control Cable	5.00	1,150.00
38	120	832034	410	LF	Furnish & Install 14/16 Traffic Control Cable	5.00	2,050.00
39	710	808501	2	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	1,900.00
40	885	836502	2	EA	Furnish & Install Pedestal Pole	1510.00	3,020.00
41	895	836500	2	EA	Installation of Steel Mast Arm Pole with Single Mast Arm Greater than 70’	1632.00	3,264.00
42	910	836507	2	EA	Furnish Pedestal Pole Transformer Base	400.00	800.00
43	935	839502	1	EA	Furnish & Install Wood Pole, Class II (Heavy) – 50’	2100.00	2,100.00
44	970	837002	25	EA	Furnish & Install 12” LED Signal Head Section Rigid Mount	400.00	10,000.00
45	985	837007	8	EA	Furnish & Install Signal Head Backplate	445.00	3,560.00
46	990	837011	13	EA	Realign or Slide Existing Signal Head	255.00	3,315.00
47	995	844001	2	EA	Furnish & Install Opticom Emergency Preemption Detector	1525.00	3,050.00
48	1000	837008	3	EA	Furnish & Install 16” LED Countdown Pedestrian Signal	925.00	2,775.00
49	1010	837010	3	EA	Furnish & Install Pedestrian Pushbutton with Sign	350.00	1,050.00
50	1095	844526	2	EA	Relocate Video Detection Device	850.00	1,700.00
51	1140	823001	2	EA	Installation of Sign on Span Wire or Mast Arm	50.00	100.00
52	1195	838003	1	EA	Furnish & Install Dead End Messenger Wire Attachment	500.00	500.00
53	1200	838006	1	EA	Adjustment of Span or Messenger Wire	750.00	750.00
54	1205	838008	1	EA	Transfer of Existing Span or Messenger Attachment	1000.00	1,000.00
55	1215	838500	1	EA	Removal of Span Wire Attachment	100.00	100.00
56	1220	840001	3	EA	Furnish & Install Down Guy and Anchor	550.00	1,650.00
57	1235	832035	765	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	382.50
58	1250	836006	2	EA	Remove Pedestal Pole	272.00	544.00
59	1255	836503	1	EA	Remove Steel Pole (Equal to or Greater than 15’ and Less than 40’)	550.00	550.00
60	NIB003		410	LF	Install CAT-5e Cable	2.10	861.00

61					**PHASE 4, STAGE 13**		
62	65	832008	270	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper	2.50	675.00
63	80	832025	435	LF	Furnish & Install 4-Conductor #18 AWG Shielded Opticom Cable	2.00	870.00
64	105	832032	60	LF	Furnish & Install 14/4 Traffic Control Cable	5.00	300.00
65	110	832507	1125	LF	Furnish & Install 14/5 Traffic Control Cable	4.00	4,500.00
66	115	832033	210	LF	Furnish & Install 14/9 Traffic Control Cable	5.00	1,050.00
67	120	832034	240	LF	Furnish & Install 14/16 Traffic Control Cable	5.00	1,200.00
68	710	808501	2	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	1,900.00
69	885	836502	3	EA	Furnish & Install Pedestal Pole	1510.00	4,530.00
70	895	836500	2	EA	Installation of Steel Mast Arm Pole with Single Mast Arm Greater than 70’	1632.00	3,264.00
71	910	836507	3	EA	Furnish Pedestal Pole Transformer Base	400.00	1,200.00
72	970	837002	28	EA	Furnish & Install 12” LED Signal Head Section Rigid Mount	400.00	11,200.00
73	985	837007	8	EA	Furnish & Install Signal Head Backplate	445.00	3,560.00
74	990	837011	6	EA	Realign or Slide Existing Signal Head	255.00	1,530.00
75	995	844001	2	EA	Furnish & Install Opticom Emergency Preemption Detector	1525.00	3,050.00
76	1000	837008	3	EA	Furnish & Install 16” LED Countdown Pedestrian Signal	925.00	2,775.00
77	1010	837010	3	EA	Furnish & Install Pedestrian Pushbutton with Sign	350.00	1,050.00
78	1095	844526	2	EA	Relocate Video Detection Device	850.00	1,700.00
79	1140	823001	2	EA	Installation of Sign on Span Wire or Mast Arm	50.00	100.00
80	1215	838500	4	EA	Removal of Span Wire Attachment	100.00	400.00
81	1235	832035	810	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	405.00
82	1250	836006	1	EA	Remove Pedestal Pole	272.00	272.00
83	1255	836503	3	EA	Remove Steel Pole (Equal to or Greater than 15’ and Less than 40’)	550.00	1,650.00
84	1270	838504	17	EA	Removal of Signal Head or Opticom Detector from Span Wire or Mast Arm	136.00	2,312.00
85	1275	839003	1	EA	Removal of Wood Pole	550.00	550.00
86	1280	840005	3	EA	Removal of Down Guy and Anchor	272.00	816.00
87	NIB003		50	LF	Install CAT-5e Cable	2.10	105.00
88					**ULTIMATE**		
89	65	832008	705	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper	2.50	1,762.50
90	90	832027	7380	LF	Furnish & Install 2-Conductor #14 AWG Aluminum Shielded Cable	2.00	14,760.00
91	710	808501	1	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	950.00
92	990	837011	9	EA	Realign or Slide Existing Signal Head	255.00	2,295.00
93	1095	844526	4	EA	Relocate Video Detection Device	850.00	3,400.00
94	1235	832035	400	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	200.00
					TOTAL TRAFFIC CONTRACTOR ITEMS	→	186,460.50

INTERSECTION # 9: **K118, US 13 & Webbs Lane**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	UNIT COST ROMMEL	TOTAL COST ROMMEL
1					**PHASE 4, STAGE 3**		
2		999999	1	LS	Gridsmart Dual Camera Video Detection System	22750.00	22,750.00
3	2535	999621	1	EA	CDMA	1200.00	1,200.00
4					**PHASE 4, STAGE 7**		
5	2020	999421	1	EA	Complete P Cabinet w/12 Channel EPAC Controller (includes Mounting Rack w/Power Supply, 5-4 Ch	13950.00	13,950.00
6	2050	999427	1	EA	Base Extension (split) Aluminum w/Natural Mill Finish	550.00	550.00
7	2095	999458	1	EA	Patch Cables (One Per Cabinet)	240.00	240.00
8	2105	999461	1	EA	Optical Receiver Card (Emergency Preemption)	2751.00	2,751.00
9					**PHASE 4, STAGE 9**		
10							
11					**PHASE 4, STAGE 12**		
12	2180	999490	2	EA	Steel Round Mast Arm Pole, TYPE C (70' - 90' Arm Length)	10885.68	21,771.36
13	2245	999503	2	EA	80' (24.4m) Steel Round Mast Arm	14028.56	28,057.12
14	2435	999601	4	EA	Rouleau Sign Brackets (2 per average sign, 3 per longer sign)	115.00	460.00
15					**PHASE 4, STAGE 13**		
16	2180	999490	2	EA	Steel Round Mast Arm Pole, TYPE C (70' - 90' Arm Length)	10885.68	21,771.36
17	2245	999503	2	EA	80' (24.4m) Steel Round Mast Arm	14028.56	28,057.12
18	2435	999601	4	EA	Rouleau Sign Brackets (2 per average sign, 3 per longer sign)	115.00	460.00
19					**ULTIMATE**		
20							
					TOTAL TRAFFIC SUPPLY ITEMS	→	142,017.96

TOTAL PROJECT CONTRACTOR ITEMS	→ →	
TOTAL TRAFFIC CONTRACTOR ITEMS	→ →	186,460.50
TOTAL TRAFFIC SUPPLY ITEMS	→ →	142,017.96
CONTINGENCIES	→ →	32,847.85
TOTAL COST	→ →	361,326.31

INTERSECTION # 10: **K241, US 13 & Puncheon Run Connector**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	UNIT COST ROMMEL	TOTAL COST ROMMEL
1					**PHASE 4, STAGE 3**		
2	1225	830010	2	EA	Removal of Existing Junction Well		
3					**PHASE 4, STAGE 8**		
4	305	831545	340	LF	Furnish & Install 4" HDPE SDR-13.5 Conduit (Bore)		
5	365	831516	410	LF	Furnish & Install 4" Schedule 80 PVC Conduit (Trench)		
6	650	830001	2	EA	Conduit Junction Well, Type 1, 20" x 20" Precast Concrete		
7	655	830002	2	EA	Conduit Junction Well, Type 4, 20" x 42-1/2" Precast Concrete		
8	1225	830010	3	EA	Removal of Existing Junction Well		
9					**PHASE 4, STAGE 9**		
10	15	835003	1	EA	Cabinet Base Type P		
11	305	831545	205	LF	Furnish & Install 4" HDPE SDR-13.5 Conduit (Bore)		
12	360	831515	70	LF	Furnish & Install 3" Schedule 80 PVC Conduit (Trench)		
13	365	831516	10	LF	Furnish & Install 4" Schedule 80 PVC Conduit (Trench)		
14	440	831523	30	LF	Furnish & Install 2" Galvanized Steel Conduit (Trench)		
15	545	831574	20	LF	Furnish & Install Second and Subsequent Additional 4" PVC Conduits in Trench or Open Cut		
16	650	830001	1	EA	Conduit Junction Well, Type 1, 20" x 20" Precast Concrete		
17	655	830002	2	EA	Conduit Junction Well, Type 4, 20" x 42-1/2" Precast Concrete		
18	835	834002	1	EA	Pole Base Type 3A		
19	840	834003	1	EA	Pole Base Type 3B		
20	870	834008	2	EA	Sheeting for Pole Base		
21	1225	830010	3	EA	Removal of Existing Junction Well		
22	1240	834501	3	CY	Partial Removal of Concrete Pole Bases and Cabinet Foundations		
23					**ULTIMATE**		
24	140	846002	60	LF	Furnish & Install a 1 - 1/2" Galvanized Rigid Metal Conduit Detector Sleeve with Loop Wire		
25	670	830008	5	EA	Adjust or Repair Existing Conduit Junction Well		
26	135	846001	795	LF	Furnish & Install Loop Wire 1-Conductor #14 AWG encased in 1/4" Flexible Tubing in a Loop Sawcut		
					TOTAL PROJECT CONTRACTOR ITEMS	→	

INTERSECTION # 10: **K241, US 13 & Puncheon Run Connector**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC CONTRACTOR ITEMS)	UNIT COST ROMMEL	TOTAL COST ROMMEL
1					**PHASE 4, STAGE 3**		
2	710	808501	1	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	950.00
3	990	837011	4	EA	Realign or Slide Existing Signal Head	255.00	1,020.00
4	1070	844521	1	EA	Install Video Detection Device	565.00	565.00
5	1235	832035	2735	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	1,367.50
6	NIB003		80	LF	Install CAT-5e Cable	2.10	168.00
7	NIB053		2	LS	MOT Devices and Deployment	7000.00	14,000.00
8					**PHASE 4, STAGE 8**		
9	710	808501	1	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	950.00
10	990	837011	2	EA	Realign or Slide Existing Signal Head	255.00	510.00
11	1095	844526	1	EA	Relocate Video Detection Device	850.00	850.00
12					**PHASE 4, STAGE 9**		
13	65	832008	710	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper	2.50	1,775.00
14	80	832025	1400	LF	Furnish & Install 4-Conductor #18 AWG Shielded Opticom Cable	2.00	2,800.00
15	95	832029	35	LF	Furnish & Install #8/2 Wire UF W/ground	5.00	175.00
16	110	832507	575	LF	Furnish & Install 14/5 Traffic Control Cable	4.00	2,300.00
17	115	832033	670	LF	Furnish & Install 14/9 Traffic Control Cable	5.00	3,350.00
18	120	832034	260	LF	Furnish & Install 14/16 Traffic Control Cable	5.00	1,300.00
19	125	832504	35	LF	Furnish & Install #8 THHN Stranded Copper	1.00	35.00
20	630	842005	1	EA	Removal of Electric Service on Wood or Metal Pole	272.00	272.00
21	635	842501	1	EA	Furnish & Install Electric Utility Service Equipment (100 AMP)	2525.00	2,525.00
22	710	808501	2	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	1,900.00
23	890	836504	1	EA	Installation of Steel Mast Arm Pole with Single or Twin Mast arms up to 60’	2200.00	2,200.00
24	895	836500	1	EA	Installation of Steel Mast Arm Pole with Single Mast Arm Greater than 70’	1632.00	1,632.00
25	970	837002	27	EA	Furnish & Install 12” LED Signal Head Section Rigid Mount	400.00	10,800.00
26	985	837007	2	EA	Furnish & Install Signal Head Backplate	445.00	890.00
27	995	844001	3	EA	Furnish & Install Opticom Emergency Preemption Detector	1525.00	4,575.00
28	1095	844526	1	EA	Relocate Video Detection Device	850.00	850.00
29	1215	838500	4	EA	Removal of Span Wire Attachment	100.00	400.00
30	1235	832035	455	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	227.50
31	1255	836503	3	EA	Remove Steel Pole (Equal to or Greater than 15’ and Less than 40’)	550.00	1,650.00
32	1270	838504	11	EA	Removal of Signal Head or Opticom Detector from Span Wire or Mast Arm	136.00	1,496.00
33	1300	847002	2	EA	Installation or Removal of Base or Pad Mounted Cabinet	2500.00	5,000.00
34	NIB003		285	LF	Install CAT-5e Cable	2.10	598.50
35					**ULTIMATE**		
36	65	832008	450	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper	2.50	1,125.00
37	90	832027	5925	LF	Furnish & Install 2-Conductor #14 AWG Aluminum Shielded Cable	2.00	11,850.00
38	145	832500	13	EA	Splicing of Electrical Cable Underground	75.00	975.00
39	710	808501	1	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)	950.00	950.00
40	1095	844526	2	EA	Relocate Video Detection Device	850.00	1,700.00
41	1235	832035	235	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	117.50
					TOTAL TRAFFIC CONTRACTOR ITEMS	→	83,849.00

INTERSECTION # 10: **K241, US 13 & Puncheon Run Connector**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	UNIT COST ROMMEL	TOTAL COST ROMMEL
1					**PHASE 4, STAGE 3**		
2		999999	1	LS	Gridsmart Camera Video Detection System	19750.00	19,750.00
3	2535	999621	1	EA	CDMA	1200.00	1,200.00
4					**PHASE 4, STAGE 8**		
5							
6					**PHASE 4, STAGE 9**		
7	2020	999421	1	EA	Complete P Cabinet w/12 Channel EPAC Controller (includes Mounting Rack w/Power Supply, 5-4 Ch	13950.00	13,950.00
8	2050	999427	1	EA	Base Extension (split) Aluminum w/Natural Mill Finish	550.00	550.00
9	2095	999458	1	EA	Patch Cables (One Per Cabinet)	240.00	240.00
10	2105	999461	1	EA	Optical Receiver Card (Emergency Preemption)	2751.00	2,751.00
11	2175	999489	1	EA	Steel Round Mast Arm Pole, TYPE B (45' - 60' Arm Length or 2 - 60' Arms)	8818.16	8,818.16
12	2180	999490	1	EA	Steel Round Mast Arm Pole, TYPE C (70' - 90' Arm Length)	10885.68	10,885.68
13	2220	999498	1	EA	45' (13.7m) Steel Round Mast Arm	7770.88	7,770.88
14	2240	999502	1	EA	70' (21.3m) Steel Round Mast Arm	12776.40	12,776.40
15					**ULTIMATE**		
16							
					TOTAL TRAFFIC SUPPLY ITEMS	→	78,692.12

TOTAL PROJECT CONTRACTOR ITEMS	→ →	
TOTAL TRAFFIC CONTRACTOR ITEMS	→ →	83,849.00
TOTAL TRAFFIC SUPPLY ITEMS	→ →	78,692.12
CONTINGENCIES	→ →	16,254.11
TOTAL COST	→ →	178,795.23

MULTIPLE INTERSECTION SUMMARY

Intersection #1:	**K284, US13 & Lochmeath Way**			
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	
	TOTAL TRAFFIC CONTRACTOR ITEMS	→	→	181,653.50
	TOTAL TRAFFIC SUPPLY ITEMS	→	→	138,261.48
	CONTINGENCIES	→	→	31,991.50
Intersection #2:	**K019P, US 13 & Thomas Harmon Drive**			
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	
	TOTAL TRAFFIC CONTRACTOR ITEMS	→	→	175,426.00
	TOTAL TRAFFIC SUPPLY ITEMS	→	→	139,957.72
	CONTINGENCIES	→	→	31,538.37
Intersection #3:	**K151, US 13 & Voshells Mill Road/Voshells Mill Star Hill Road**			
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	
	TOTAL TRAFFIC CONTRACTOR ITEMS	→	→	171,540.00
	TOTAL TRAFFIC SUPPLY ITEMS	→	→	139,513.64
	CONTINGENCIES	→	→	31,105.36
Intersection #4:	**K317, US 13 & King Property**			
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	
	TOTAL TRAFFIC CONTRACTOR ITEMS	→	→	116,321.00
	TOTAL TRAFFIC SUPPLY ITEMS	→	→	148,138.48
	CONTINGENCIES	→	→	26,445.95
Intersection #5:	**K128, US 13 & SR 10**			
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	
	TOTAL TRAFFIC CONTRACTOR ITEMS	→	→	160,155.00
	TOTAL TRAFFIC SUPPLY ITEMS	→	→	160,499.64
	CONTINGENCIES	→	→	32,065.46
Intersection #6:	**K301, US 13 & Old North Road**			
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	
	TOTAL TRAFFIC CONTRACTOR ITEMS	→	→	130,776.00
	TOTAL TRAFFIC SUPPLY ITEMS	→	→	166,319.48
	CONTINGENCIES	→	→	29,709.55
Intersection #7:	**K137, US 13 & POW-MIA Parkway**			
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	
	TOTAL TRAFFIC CONTRACTOR ITEMS	→	→	139,366.50
	TOTAL TRAFFIC SUPPLY ITEMS	→	→	125,747.80
	CONTINGENCIES	→	→	26,511.43
Intersection #8:	**K328, US 13 & Governors Avenue**			
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	
	TOTAL TRAFFIC CONTRACTOR ITEMS	→	→	135,090.50
	TOTAL TRAFFIC SUPPLY ITEMS	→	→	123,843.32
	CONTINGENCIES	→	→	25,893.38
Intersection #9:	**K118, US 13 & Webbs Lane**			
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	
	TOTAL TRAFFIC CONTRACTOR ITEMS	→	→	186,460.50
	TOTAL TRAFFIC SUPPLY ITEMS	→	→	142,017.96
	CONTINGENCIES	→	→	32,847.85
Intersection #10:	**K241, US 13 & Puncheon Run Connector**			
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	
	TOTAL TRAFFIC CONTRACTOR ITEMS	→	→	83,849.00
	TOTAL TRAFFIC SUPPLY ITEMS	→	→	78,692.12
	CONTINGENCIES	→	→	16,254.11
	TOTAL	→	→	**3,127,992.60**

G:\Projects\145013.00 (DelDOT Agrmt 1705 DOTS Open-End)\145013.01 (Task 1,US13 Widening)\PROJECT CONSTRUCTION PHASE\Bidding and Cost Estimates\Traffic\[T201500202_US13_TS.xlsx]Signals

DELAWARE DEPARTMENT OF TRANSPORTATION

TRAFFIC ITMS ESTIMATE

HEP KC, US 13, Lochmeath Way to Puncheon Run Connector

CONTRACT #	T201500202
F.A.P. #	ESTP-K024(16)
PROJECT:	HEP KC, US 13, Lochmeath Way to Puncheon Run Connector

					ITMS	UNIT COST	TOTAL COST
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	ROMMEL	ROMMEL
1	5	835001	1	EA	Cabinet Base Type F		
2	15	835003	4	EA	Cabinet Base Type P		
3	305	831545	13675	LF	Furnish & Install 4” HDPE SDR-13.5 Conduit (Bore)		
4	360	831515	45	LF	Furnish & Install 3” Schedule 80 PVC Conduit (Trench)		
5	365	831516	8140	LF	Furnish & Install 4” Schedule 80 PVC Conduit (Trench)		
6	440	831523	100	LF	Furnish & Install 2” Galvanized Steel Conduit (Trench)		
7	500	831538	30	LF	Furnish & Install 2” Galvanized Steel Conduit (On Structure)		
8	545	831574	75	LF	Furnish & Install Second and Subsequent Additional 4" PVC Conduits in Trench or Open Cut		
9	655	830002	38	EA	Conduit Junction Well, Type 4, 20" x 42-1/2" Precast Concrete		
10	665	830004	13	EA	Conduit Junction Well, Type 7, 36" x 60" Precast Polymer Concrete		
11	670	830008	3	EA	Adjust or Repair Existing Conduit Junction Well		
12	830	834001	3	EA	Pole Base Type 3		
13							
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28							
29							
30							
					TOTAL PROJECT CONTRACTOR ITEMS		0.00

ITMS

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC CONTRACTOR ITEMS)	ROMMEL	ROMMEL
1	95	832029	180	LF	Furnish & Install #8/2 Wire UF W/ground	5.00	900.00
2	125	832504	115	LF	Furnish & Install #8 THHN Stranded Copper	1.00	115.00
3	635	842501	5	EA	Furnish & Install Electric Utility Service Equipment (100 AMP)	2525.00	12,625.00
4							
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					TOTAL TRAFFIC CONTRACTOR ITEMS		13,640.00

ITMS

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	ROMMEL	ROMMEL
1	####	999426	5	EA	Camera Cabinet	2416.00	12,080.00
2	####	999427	5	EA	Base Extension (split) Aluminum w/Natural Mill Finish	550.00	2,750.00
3	####	999458	5	EA	Patch Cables (One Per Cabinet)	240.00	1,200.00
4	####	999534	3	EA	75' (22.9m) CCTV Camera Pole	9972.48	29,917.44
5	####	999612	3	EA	Camera (Includes Lowering Device, Controller, and Video Encoder)	12461.00	37,383.00
6	####	999613	3	EA	Strain Pole Camera Mounting Adapter (Includes Cable Assembly)	741.00	2,223.00
7	####	999620	1	EA	Outside Plant-Fiber Optic Installation, Statewide	348094.40	348,094.40
8	####	999623	5	EA	Camera/RWIS/Bluetooth Comm - AC Power	2000.00	10,000.00
9	####	999625	13	EA	Fiber Modem (Ruggedcom)	2370.25	30,813.25
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					TOTAL TRAFFIC SUPPLY ITEMS		474,461.09

TOTAL PROJECT CONTRACTOR ITEMS	0.00
TOTAL TRAFFIC CONTRACTOR ITEMS	13,640.00
TOTAL TRAFFIC SUPPLY ITEMS	474,461.09
CONTINGENCIES	48,810.11
TOTAL COST	536,911.20

DELAWARE DEPARTMENT OF TRANSPORTATION

HIGHWAY LIGHTING ESTIMATE

HEP KC, US 13, Lochmeath Way to Puncheon Run Connector

CONTRACT #: T201500202
F.A.P. #: ESTP-K024(16)
PROJECT: HEP KC, US 13, Lochmeath Way to Puncheon Run Connector

							TOTAL COST
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	ROMMEL	ROMMEL
1	20	835004	13	EA	Cabinet Base Type R		
2	30	847004	13	EA	Lighting Control and Distribution Enclosure (120/240; 100 AMP)		
3	300	831544	12545	LF	Furnish & Install 3” HDPE SDR-13.5 Conduit (Bore)		
4	305	831545	910	LF	Furnish & Install 4” HDPE SDR-13.5 Conduit (Bore)		
5	360	831515	22670	LF	Furnish & Install 3” Schedule 80 PVC Conduit (Trench)		
6	365	831516	620	LF	Furnish & Install 4” Schedule 80 PVC Conduit (Trench)		
7	440	831523	275	LF	Furnish & Install 2” Galvanized Steel Conduit (Trench)		
8	500	831538	390	LF	Furnish & Install 2” Galvanized Steel Conduit (On Structure)		
9	545	831574	210	LF	Furnish & Install Second and Subsequent Additional 4" PVC Conduits in Trench or Open Cut		
10	650	830001	56	EA	Conduit Junction Well, Type 1, 20" x 20" Precast Concrete		
11	655	830002	13	EA	Conduit Junction Well, Type 4, 20" x 42-1/2" Precast Concrete		
12	860	834006	228	EA	Pole Base Type 6		
13	1320	850517	231	EA	Installation of Luminaire		
14	1330	850521	231	EA	Luminaire (LED), 250 Watts HPS Equivalent		
15	1370	851003	228	EA	Aluminum Lighting Standard with Single Davit Arm, 40’ Pole		
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					TOTAL PROJECT CONTRACTOR ITEMS		

							TOTAL COST
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC CONTRACTOR ITEMS)	ROMMEL	ROMMEL
1	40	832002	1023	LF	Furnish & Install 1-Conductor #3/0 AWG Stranded Copper	8.00	8,184.00
2	65	832008	88418	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper	2.50	221,045.00
3	75	832010	15720	LF	Furnish & Install 1-Conductor #10 AWG Stranded Copper	0.50	7,860.00
4	130	832505	40530	LF	Furnish & Install #6 AWG Solid Copper Wire	2.00	81,060.00
5	145	832500	2	EA	Splicing of Electrical Cable Underground	75.00	150.00
6	150	832501	228	EA	Splicing of Electrical Cable Above Ground	75.00	17,100.00
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					TOTAL TRAFFIC CONTRACTOR ITEMS		335,399.00

							TOTAL COST
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	ROMMEL	ROMMEL
1	2040	999425	13	EA	Cabinet (Lighting - Includes Power Strip and Surestor)	1598.00	20,774.00
2	2050	999427	13	EA	Base Extension (split) Aluminum w/Natural Mill Finish	550.00	7,150.00
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					TOTAL TRAFFIC SUPPLY ITEMS		27,924.00

TOTAL PROJECT CONTRACTOR ITEMS	
TOTAL TRAFFIC CONTRACTOR ITEMS	335,399.00
TOTAL TRAFFIC SUPPLY ITEMS	27,924.00
CONTINGENCIES	36,332.30
TOTAL COST	399,655.30

DELAWARE DEPARTMENT OF TRANSPORTATION

TRAFFIC ROADWAY SIGNING ESTIMATE

HEP KC, US 13, Lochmeath Way to Puncheon Run Connector

CONTRACT #: T201500202
F.A.P. #: ESTP-K024(16)
PROJECT: HEP KC, US 13, Lochmeath Way to Puncheon Run Connector

PROJECT LOCATION: **HEP KC, US 13, Lochmeath Way to Puncheon Run Connector**

LINE	ITEM #	QTY	DESCRIPTION - PROJECT CONTRACTOR ITEMS	UOM		
1	819018	1106	INSTALLATION OR REMOVAL OF TRAFFIC SIGN ON SINGLE SIGN POST	EA		
2	819016	5	INSTALLATION OF 4" DIAMETER HOLE, LESS THAN OR EQUAL TO 6" IN DEPTH	EA		
3	819017	1	INSTALLATION OF 4" DIAMETER HOLE, GREATER THAN 6" IN DEPTH	EA		
4	819019	2098	INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS	SF		

LINE	CODE #	QTY	SIGNING DESCRIPTION	SIZE	UNIT COST	TOTAL COST
5	X13		SALARY, OVER-TIME	EA-HR	40.00	
6	X14		SIGNFIX (FOR ANY SIGN WITH FLASHING BEACONS)	EACH	56.00	
7	X11	475	12' POSTS (W/ BASEPOST) NEEDED FOR PROJECT OR LOCATION	EACH	34.02	16,159.50
7A	X11A	0	15' POSTS (W/ BASEPOST) NEEDED FOR PROJECT OR LOCATION	EACH	50.00	-
7B	X11B	4255	FLAT SHEET ALUMINUM SIGN PANELS	SF	12.50	53,183.59
8	X12		6' DELINEATOR POST (W/ BOLT & ETC.)	EACH	5.00	
	X15		Miscellaneous Roadway Signing Fee	EACH	1000.00	
			TRAFFIC ONLY PROJECT			
9	X1		Installation of Sign Posts, 9', 10', 11', 12' in Unpaved Area or Existing Holes	EACH	26.00	
10	X2		Installation of 4" dia. Hole in Pavement or Concrete	EACH	52.00	
11	X3		Installation of 4" dia. Hole, in Excess of 6" per ea. additional inch drilled in Pavement	EACH	$52.75	
12	X4		Installation of Street Name Signs	EACH	$26.38	
13	X5		Installation of Signs (Two or More Mounting Holes)	S/F	2.75	
14	X6		Sets, Installation of Sign Bands and Buckles	EACH	52.75	
15	X7		Removal of Traffic Signs	EACH	26.38	
16	X8		Removal of Street Name Signs	EACH	26.38	
17	X9		Removal of Sign Posts	EACH	1.00	
18	X10		Straightening of Sign Posts	EACH	17.00	
19						
					TOTAL FOR LABOR	0.00

TOTAL FOR SIGNING MATERIALS	69,343.09
TOTAL FOR LABOR	0.00
CONTINGENCIES	6,934.31
TOTAL ROADSIDE SIGNING COST	**$76,277.40**

PERMANENT SIGN SCHEDULE

#	SHEET NO.	PLAN IDENTIFIER	SIGN DESIGNATION	QTY.	DESCRIPTION	SIGN WIDTH (IN)	SIGN HEIGHT (IN)	SIGN AREA (SF)	ITEM 819018 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE POST (EACH)			ITEM 819019 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS (SF)			POST INSTALLATION TYPE	Code X11 12' Post (W/ Basepost) (EACH)	Code X11A 15' Post (W/ Basepost) (EACH)	ITEM 819016 4" HOLE, 0-6" (EACH)	ITEM 819017 4" HOLE, >6" (EACH)	REMARKS
									SIGN DISPOSITION	REMOVE	INSTALL	SIGN DISPOSITION	REMOVE	INSTALL						
890	SS-1	1	W3-5(48)	2	SPEED REDUCTION (Symbol) - 48x48	48	48	32.0				NEW		32.0	SOIL	4				"45"
67	SS-1	2A	R2-1-55(36)	2	SPEED LIMIT (55 MPH - 36x48)	36	48					REMOVE	24.0							
1447	SS-1	2B	W21-12P-DE	2	STRICTLY ENFORCED (plaque)	36	24					REMOVE	12.0							
1680	SS-1	3A	D3-1-DE1	1	PRIVATE STREET NAME	24	18		REMAIN											"SOUTH SIDE DR"
2	SS-1	3B	R1-1(24)	1	STOP (on stop/slow paddle)	24	24		REMOVE	1										
4	SS-1	3C	R1-1(36)	1	STOP	36	36	7.5	ADD TO ASSEMBLY		1									
67	SS-1	4	R2-1-55(36)	2	SPEED LIMIT (55 MPH - 36x48)	36	48	24.0				NEW		24.0	SOIL	4				
59	SS-1	5	R2-1-45(36)	2	SPEED LIMIT (45 MPH - 36x48)	36	48	24.0				NEW		24.0	SOIL	4				
252	SS-1	6	R3-20-DE	1	TURN LANE	18	18		REMAIN											
8	SS-2	1	R1-2(36)	1	YIELD	36	36		REMOVE	1										
9	SS-2	2	R1-2(48)	1	YIELD	48	48	6.9	NEW		1				SOIL	1				Install on a single post
394	SS-2	3	R6-1 L(36)	1	ONE WAY (ENCLOSED IN LEFT ARROW) - 36x12	36	12		REMOVE	1										
394	SS-2	4	R6-1 L(36)	1	ONE WAY (ENCLOSED IN LEFT ARROW) - 36x12	36	12	3.0	NEW		1				SOIL	1				
8	SS-2	5	R1-2(36)	1	YIELD	36	36		REMOVE	1										
9	SS-2	6	R1-2(48)	1	YIELD	48	48	6.9	NEW		1				SOIL	1				Install on a single post
252	SS-2	7	R3-20-DE	1	TURN LANE	18	18		REMOVE	1										
252	SS-2	8	R3-20-DE	1	TURN LANE	18	18	2.3	NEW		1				SOIL	1				
394	SS-2	9	R6-1 L(36)	1	ONE WAY (ENCLOSED IN LEFT ARROW) - 36x12	36	12		REMOVE	1										
394	SS-2	10	R6-1 L(36)	1	ONE WAY (ENCLOSED IN LEFT ARROW) - 36x12	36	12	3.0	NEW		1				SOIL	1				
1962	SS-2	11	OM3-R(B)	1	TYPE 3 OBJECT MARKER (Bike path)	5	18		REMOVE	1										
1107	SS-3	1	W9-2-DE R(36)	1	LANE ENDS (Right Arrows) - 36x36	36	36	9.0	NEW		1				SOIL	1				
1671	SS-3	2A	D3-1(6)	2	STREET NAME (1 Line)	24	6		REMOVE	2										"WORSHIP LANE"
3	SS-3	2B	R1-1(30)	1	STOP	30	30		REMOVE	1										
1675	SS-3	3A	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	NEW		2				SOIL	2				"Worship Ln" Hwy C, 8"/6"
4	SS-3	3B	R1-1(36)	1	STOP	36	36	7.5	ADD TO ASSEMBLY		1									
424	SS-4	1	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24		REMOVE	1										
424	SS-4	2	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24	3.0	NEW		1				SOIL	1				
909	SS-4	3	W4-2 L(36)	1	LANE ENDS (Left) - 36x36	36	36	9.0	NEW		1				SOIL	1				
424	SS-4	4	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24		REMOVE	1										
424	SS-4	5	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24	3.0	NEW		1				SOIL	1				
252	SS-4	6	R3-20-DE	1	TURN LANE	18	18	2.3	NEW		1				SOIL	1				
59	SS-4	7A	R2-1-45(36)	1	SPEED LIMIT (45 MPH - 36x48)	36	48	12.0				NEW		12.0	SOIL	2				
59	SS-4	7B	R2-1-45(36)	1	SPEED LIMIT (45 MPH - 36x48)	36	48	12.0				NEW		12.0	NEW CONCRETE	2				
424	SS-4	8A	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24	3.0	NEW		1				SOIL	1				
1694	SS-4	8B	D4-3-DE	1	BUS STOP (DART)	12	18		ADD TO ASSEMBLY		1									No current route passing
424	SS-4	9	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24		REMOVE	1										
1671	SS-4	10A	D3-1(6)	2	STREET NAME (1 Line)	24	6		REMOVE	2										"LESLIE DR"
3	SS-4	10B	R1-1(30)	1	STOP	30	30		REMOVE	1										
1675	SS-4	11A	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	36	18	9.0	NEW		2				SOIL	2				"Leslie Dr" Hwy C, 8"/6"
4	SS-4	11B	R1-1(36)	1	STOP	36	36	7.5	ADD TO ASSEMBLY		1									
623	SS-4	12	R12-3-DE	1	NO TRUCKS OVER 2 AXLES EXCEPT LOCAL SERVICES	24	36	6.0	NEW		1				SOIL	1				
623	SS-4	13	R12-3-DE	1	NO TRUCKS OVER 2 AXLES EXCEPT LOCAL SERVICES	24	36		REMOVE	1										
4	SS-4	14	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
3	SS-4	15	R1-1(30)	1	STOP	30	30		REMOVE	1										
878	SS-4	16A	W3-3(48)	1	SIGNAL AHEAD (Symbol) - 48x48	48	48					REMOVE	16.0							
1367	SS-4	16B	W16-8P	1	ADVANCE STREET NAME (1 - line plaque)	36	9		REMOVE	1										"LOCHMEATH WAY"
878	SS-4	17A	W3-3(48)	1	SIGNAL AHEAD (Symbol) - 48x48	48	48	16.0				NEW		16.0	SOIL	2				
1367a	SS-4	17B	W16-8P	1	ADVANCE STREET NAME (1 - line plaque) (Oversized)	48	9	3.0				ADD TO ASSEMBLY		3.0						"Lochmeath Way" Hwy C, 4"
878	SS-4	18	W3-3(48)	1	SIGNAL AHEAD (Symbol) - 48x48	48	48					REMOVE	16.0							
878	SS-4	19A	W3-3(48)	1	SIGNAL AHEAD (Symbol) - 48x48	48	48	16.0				NEW		16.0	NEW CONCRETE	2				
1367a	SS-4	19B	W16-8P	1	ADVANCE STREET NAME (1 - line plaque) (Oversized)	48	9	3.0				ADD TO ASSEMBLY		3.0						"Lochmeath Way" Hwy C, 4"
1966	SS-5	1A	S1-1(36)	1	SCHOOL SIGN (Symbol) - 36x36	36	36	9.0	NEW		1				SOIL	1				
1981	SS-5	1B	S4-3P(24)	1	SCHOOL - 24x8	24	8	1.3	ADD TO ASSEMBLY		1									
1965	SS-5	2A	S1-1(30)	1	SCHOOL SIGN (Symbol) - 30x30	30	30		REMOVE	1										
1981	SS-5	2B	S4-3P(24)	1	SCHOOL - 24x8	24	8		REMOVE	1										
424	SS-5	3A	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24	3.0	ADD TO ASSEMBLY		1									
1872	SS-5	3B	D14-3-DE	1	ADOPT A HIGHWAY	24	18	3.0	NEW		1				SOIL	1				"SOUTHSIDE BAPTIST RAK MINISTRY" Hwy D, 2"
424	SS-5	4A	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24		REMOVE	1										
	SS-5	4B		1	ADOPT A HIGHWAY	18	12		REMOVE	1										
	SS-5	4C		1	ACKNOWLEDGEMENT - 18x12	18	12		REMOVE	1										"SOUTHSIDE BAPTIST RAK MINISTRY"
	PAGE TOTALS							267		24	25		68	142		39	0	0	0	

PERMANENT SIGN SCHEDULE

NO.	SHEET NO.	PLAN IDENTIFIER	CODE	QTY.	DESCRIPTION	SIGN WIDTH (IN)	SIGN HEIGHT (IN)	SIGN AREA (SF)	ITEM 819018 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE POST (EACH)			ITEM 819019 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS (SF)			POST INSTALLATION TYPE	Code X11 12' Post (W/ Basepost) (EACH)	Code X11A 15' Post (W/ Basepost) (EACH)	ITEM 819016 4" HOLE, 0-6" (EACH)	ITEM 819017 4" HOLE, >6" (EACH)	REMARKS
									SIGN DISPOSITION	REMOVE	INSTALL	SIGN DISPOSITION	REMOVE	INSTALL						
3	SS-5	5	R1-1(30)	1	STOP	30	30		REMOVE	1										
4	SS-5	6	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
9	SS-5	7	R1-2(48)	1	YIELD	48	48	6.9	NEW		1				SOIL	1				Install on a single post
7	SS-5	8	R1-2(30)	1	YIELD	30	30		REMOVE	1										Sign is mounted on Signal pole
311	SS-5	9	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30		REMOVE	1										
406	SS-5	10A	R6-3(30)	1	DIVIDED HIGHWAY CROSSING (4 - Legged Intersection) - 30x24	30	24	5.0	ADD TO ASSEMBLY		1									
392	SS-5	10B	R6-1_R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12	3.0	ADD TO ASSEMBLY		1									
394	SS-5	10C	R6-1_L(36)	1	ONE WAY (ENCLOSED IN LEFT ARROW) - 36x12	36	12	3.0	ADD TO ASSEMBLY		1									
311	SS-5	10D	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	NEW		1				NEW CONCRETE	1				
406	SS-5	11A	R6-3(30)	1	DIVIDED HIGHWAY CROSSING (4 - Legged Intersection) - 30x24	30	24		REMOVE	1										
392	SS-5	11B	R6-1_R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12		REMOVE	1										
1673	SS-5	11C	D3-1(9)	2	STREET NAME (1 Line)	48	9		REMOVE	2										"Lochmeath Way"
1673	SS-5	11D	D3-1(9)	2	STREET NAME (1 Line)	42	9		REMOVE	2										"S Dupont Hwy"
394	SS-5	11E	R6-1_L(36)	1	ONE WAY (ENCLOSED IN LEFT ARROW) - 36x12	36	12		REMOVE	1										
311	SS-5	11F	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30		REMOVE	1										
9	SS-5	12	R1-2(48)	1	YIELD	48	48	6.9	NEW		1				SOIL	1				Install on a single post
7	SS-5	13	R1-2(30)	1	YIELD	30	30		REMOVE	1										Sign is mounted on Signal pole
1827	SS-5	14	D10-2a(12)	1	INTERMEDIATE REFERENCE LOCATION (2- Digit) - 12x48	12	48		REMOVE	1										"45.0"
1824	SS-5	15	D10-2(12)	1	REFERENCE LOCATION (2- Digit) - 12x36	12	36	3.0	NEW		1				SOIL	1				"45"
311	SS-5	16	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30		REMOVE	1										
1104	SS-5	17	W9-2_R(36)	1	LANE ENDS MERGE RIGHT - 36x36	36	36	9.0	NEW		1				NEW CONCRETE	1				
311	SS-5	18	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	NEW		1				NEW CONCRETE	1				
4	SS-5	19	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
8	SS-5	20	R1-2(36)	1	YIELD	36	36		REMOVE	1										
9	SS-5	21	R1-2(48)	1	YIELD	48	48	6.9	NEW		1				SOIL	1				Install on a single post
870	SS-5	22	W3-1(18)	1	STOP AHEAD (Symbol) - 18x18	18	18		REMOVE	1										
871	SS-5	23A	W3-1(30)	1	STOP AHEAD (Symbol) - 30x30	30	30	6.3	NEW		1				SOIL	1				
1367	SS-5	23B	W16-8P	1	ADVANCE STREET NAME (1 - line plaque)	36	9	2.3	ADD TO ASSEMBLY		1									"Peachtree Run" Hey C, 4"
1675	SS-5	24A	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									"Lochmeath Way" Hwy B, 8"/6"
1675	SS-5	24B	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									"Peachtree Run" Hwy B, 8"/6"
4	SS-5	24C	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
18	SS-5	24D	R1-3P(18)	1	ALL WAY(plaque)	18	6	0.8	ADD TO ASSEMBLY		1									
1673	SS-5	25A	D3-1(9)	2	STREET NAME (1 Line)	36	9		REMOVE	2										"Lochmeath Way"
1673	SS-5	25B	D3-1(9)	2	STREET NAME (1 Line)	36	9		REMOVE	2										"Peachtree run"
4	SS-5	25C	R1-1(36)	1	STOP	36	36		REMOVE	1										
18	SS-5	25D	R1-3P(18)	1	ALL WAY(plaque)	18	6		REMOVE	1										
54	SS-5	26	R2-1-40(24)	1	SPEED LIMIT (40 MPH - 24x30)	24	30		REMAIN											
1673	SS-5	27A	D3-1(9)	2	STREET NAME (1 Line)	36	9		REMOVE	2										"Peachtree Run"
4	SS-5	27B	R1-1(36)	1	STOP	36	36		REPOSITION	1	1									
18	SS-5	27C	R1-3P(18)	1	ALL WAY(plaque)	18	6		REPOSITION	1	1									
1694	SS-5	27D	D4-3-DE	1	BUS STOP (DART)	12	18		REPOSITION	1	1									"117"
1673	SS-5	28A	D3-1(9)	2	STREET NAME (1 Line)	48	9		REMOVE	2										"Lochmeath Way"
4	SS-5	28B	R1-1(36)	1	STOP	36	36		REMOVE	1										
18	SS-5	28C	R1-3P(18)	1	ALL WAY(plaque)	18	6		REMOVE	1										
1675	SS-5	29A	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									"Lochmeath Way" Hwy B, 8"/6"
1675	SS-5	29B	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									"Peachtree Run" Hwy B, 8"/6"
4	SS-5	29C	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
18	SS-5	29D	R1-3P(18)	1	ALL WAY(plaque)	18	6	0.8	ADD TO ASSEMBLY		1									
4	SS-5	30A	R1-1(36)	1	STOP	36	36		REMOVE	1										
18	SS-5	30B	R1-3P(18)	1	ALL WAY(plaque)	18	6		REMOVE	1										
1694	SS-5	30C	D4-3-DE	1	BUS STOP (DART)	12	18		REMOVE	1										"117"
4	SS-5	31A	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
18	SS-5	31B	R1-3P(18)	1	ALL WAY(plaque)	18	6	0.8	ADD TO ASSEMBLY		1									
1694	SS-5	31C	D4-3-DE	1	BUS STOP (DART)	12	18		ADD TO ASSEMBLY		1									"117"
876	SS-5	32	W3-3(18)	1	SIGNAL AHEAD (Symbol) - 18x18	18	18		REMOVE	1										
877	SS-5	33A	W3-3(30)	1	SIGNAL AHEAD (Symbol) - 30x30	30	30	6.3	NEW		1				SOIL	1				
1367	SS-5	33B	W16-8P	1	ADVANCE STREET NAME (1 - line plaque)	36	9	2.3	ADD TO ASSEMBLY		1									"S Dupont Hwy" Hwy C, 4"
394	SS-5	34A	R6-1_L(36)	1	ONE WAY (ENCLOSED IN LEFT ARROW) - 36x12	36	12	3.0	ADD TO ASSEMBLY		1									
392	SS-5	34B	R6-1_R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12	3.0	ADD TO ASSEMBLY		1									
406	SS-5	34C	R6-3(30)	1	DIVIDED HIGHWAY CROSSING (4 - Legged Intersection) - 30x24	30	24	5.0	NEW		1				SOIL	1				
1673	SS-5	35A	D3-1(9)	2	STREET NAME (1 Line)	48	9		REMOVE	2										"Lochmeath Way"
1673	SS-5	35B	D3-1(9)	2	STREET NAME (1 Line)	48	9		REMOVE	2										"S Dupont Hwy"
392	SS-5	35C	R6-1_R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12		REMOVE	1										
8	SS-5	35D	R1-2(36)	1	YIELD	36	36		REMOVE	1										
311	SS-5	36	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	NEW		1				NEW CONCRETE	1				
1827	SS-5	37	D10-2a(12)	1	INTERMEDIATE REFERENCE LOCATION (2- Digit) - 12x48	12	48		REMOVE	1										"45.0"
1824	SS-5	38	D10-2(12)	1	REFERENCE LOCATION (2- Digit) - 12x36	12	36	3.0	ADD TO ASSEMBLY		1									"45"
1694	SS-5	39	D4-3-DE	1	BUS STOP (DART)	12	18		NEW		1				SOIL	1				No current route passing
392	SS-5	40A	R6-1_R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12		REMOVE	1										
1964	SS-5	40B	OM4-3	1	END OF ROAD OBJECT MARKER	18	18		REMOVE	1										
392	SS-5	41	R6-1_R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12	3.0	NEW		1					1				
					PAGE TOTALS			180		44	41		0	0		18	0	0	0	

PERMANENT SIGN SCHEDULE

NO.	SHEET NO.	PLAN IDENTIFIER	CODE	QTY.	DESCRIPTION	SIGN WIDTH (IN)	SIGN HEIGHT (IN)	SIGN AREA (SF)	ITEM 819018 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE POST (EACH)			ITEM 819019 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS (SF)			POST INSTALLATION TYPE	Code X11 12' Post (W/ Basepost) (EACH)	Code X11A 15' Post (W/ Basepost) (EACH)	ITEM 819016 4" HOLE, 0-6" (EACH)	ITEM 819017 4" HOLE, >6" (EACH)	REMARKS
									SIGN DISPOSITION	REMOVE	INSTALL	SIGN DISPOSITION	REMOVE	INSTALL						
141	SS-6	1A	R3-8a(48)	1	ADVANCE INTERSECTION LANE CONTROL (Left, Left - Ahead, Right) - 48"x30"	48	30					REMOVE	10.0							
110	SS-6	1B	R3-2(24)	1	LEFT TURN PROHIBITION (Symbol) - 24x24	24	24		REMOVE	1										SIGN ROTATED 90 DEGREES FACING LESLIE DR
141	SS-6	2A	R3-8a(48)	1	ADVANCE INTERSECTION LANE CONTROL (Left, Left - Ahead, Right) - 48"x30"	48	30	10.0				NEW		10.0	SOIL	2				
111	SS-6	2B	R3-2(36)	1	LEFT TURN PROHIBITION (Symbol) - 36x36	36	36	9.0	ADD TO ASSEMBLY		1									SIGN ROTATED 90 DEGREES FACING LESLIE DR
3	SS-6	3A	R1-1(30)	1	STOP	30	30		REMOVE	1										
4	SS-6	3B	R1-1(36)	1	STOP	36	36	7.5	ADD TO ASSEMBLY		1									
311	SS-6	4	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	NEW		1				EX. CONCRETE	1		1		
7	SS-6	5	R1-2(30)	1	YIELD	30	30		REMOVE	1										
1675	SS-6	6A	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									"Walmart Dr" Hwy C, 8"/6"
1675	SS-6	6B	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									"Lochmeath Way" Hwy B, 8"/6"
4	SS-6	6C	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
311	SS-6	7A	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30		REMOVE	1										
1673	SS-6	7B	D3-1(9)	2	STREET NAME (1 Line)	36	9		REMOVE	2										"Walmart Dr"
1673	SS-6	7C	D3-1(9)	2	STREET NAME (1 Line)	48	9		REMOVE	2										"Lochmeath Way"
3	SS-6	7D	R1-1(30)	1	STOP	30	30		REMOVE	1										
311	SS-6	8	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	RENEW	1	1				EX. CONCRETE			1		
42	SS-6	9	R2-1-25(24)	1	SPEED LIMIT (25 MPH - 24x30)	24	30		REMAIN											
143	SS-6	10	R3-8b(48)	1	ADVANCE INTERSECTION LANE CONTROL (Left, Ahead, Right) - 48"x30"	48	30	10.0				NEW		10.0	SOIL	2				
143	SS-6	11	R3-8b(48)	1	ADVANCE INTERSECTION LANE CONTROL (Left, Ahead, Right) - 48"x30"	48	30					REMOVE	10.0							
878	SS-7	1	W3-3(48)	1	SIGNAL AHEAD (Symbol) - 48x48	48	48					REMOVE	16.0							
878	SS-7	2A	W3-3(48)	1	SIGNAL AHEAD (Symbol) - 48x48	48	48					REMOVE	16.0							
1367	SS-7	2B	W16-8P	1	ADVANCE STREET NAME (1 - line plaque)	36	9					REMOVE	2.3							"LOCHMEATH WAY"
424	SS-7	2C	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24					REMOVE	3.0							
878	SS-7	3A	W3-3(48)	1	SIGNAL AHEAD (Symbol) - 48x48	48	48	16.0				NEW		16.0	SOIL	2				
1367a	SS-7	3B	W16-8P	1	ADVANCE STREET NAME (1 - line plaque) (Oversized)	48	9	3.0				ADD TO ASSEMBLY		3.0						"Lochmeath Way" Hwy C, 4"
878	SS-7	4A	W3-3(48)	1	SIGNAL AHEAD (Symbol) - 48x48	48	48	16.0				NEW		16.0	SOIL	2				
1367a	SS-7	4B	W16-8P	1	ADVANCE STREET NAME (1 - line plaque) (Oversized)	48	9	3.0				ADD TO ASSEMBLY		3.0						"Lochmeath Way" Hwy C, 4"
424	SS-7	4C	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24	3.0				ADD TO ASSEMBLY		3.0						
4	SS-7	5	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
59	SS-7	6A	R2-1-45(36)	1	SPEED LIMIT (45 MPH - 36x48)	36	48	12.0				NEW		12.0	SOIL	2				
59	SS-7	6B	R2-1-45(36)	1	SPEED LIMIT (45 MPH - 36x48)	36	48	12.0				NEW		12.0	NEW CONCRETE	2				
424	SS-7	7A	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24		REMOVE	1										
	SS-7	7B		1	ADOPT A HIGHWAY	18	12		REMOVE	1										
	SS-7	7C		1	ACKNOWLEDGEMENT - 18x12	18	12		REMOVE	1										"ALPHA PHI OMEGA OF WESLEY COLLEGE"
424	SS-7	8A	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24	3.0	ADD TO ASSEMBLY		1									
1872	SS-7	8B	D14-3-DE	1	ADOPT A HIGHWAY	24	18	3.0	NEW		1				SOIL	1				"ALPHA PHI OMEGA OF WESLEY COLLEGE" Hwy D, 2"
252	SS-7	9	R3-20-DE	1	TURN LANE	18	18	2.3	NEW		1				NEW CONCRETE	1				
392	SS-7	10A	R6-1 R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12		REMOVE	1										
1964	SS-7	10B	OM4-3	1	END OF ROAD OBJECT MARKER	18	18		REMOVE	1										
392	SS-7	11	R6-1 R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12	3.0	NEW		1				SOIL	1				
2	SS-7	12	R1-1(24)	1	STOP (on stop/slow paddle)	24	24		REMOVE	1										
4	SS-7	13	R1-1(36)	1	STOP	36	36	7.5	NEW		1				BITUMINOUS	1			1	
878	SS-7	14	W3-3(48)	2	SIGNAL AHEAD (Symbol) - 48x48	48	48					REMOVE	32.0							
59	SS-8	1A	R2-1-45(36)	1	SPEED LIMIT (45 MPH - 36x48)	36	48	12.0				NEW		12.0	SOIL	2				
59	SS-8	1B	R2-1-45(36)	1	SPEED LIMIT (45 MPH - 36x48)	36	48	12.0				NEW		12.0	NEW CONCRETE	2				
392	SS-8	2	R6-1 R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12	3.0	NEW		1				SOIL	1				
392	SS-8	3A	R6-1 R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12		REMOVE	1										
1964	SS-8	3B	OM4-3	1	END OF ROAD OBJECT MARKER	18	18		REMOVE	1										
2	SS-8	4	R1-1(24)	1	STOP (on stop/slow paddle)	24	24		REMOVE	1										
4	SS-8	5	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
138	SS-9	6A	R3-8(30)	1	ADVANCE INTERSECTION LANE CONTROL (Left, Left - Ahead) - 30"x30"	30	30	6.3	NEW		1				SOIL	1				
121	SS-9	6B	R3-4(36)	1	U - TURN PROHIBITION (Symbol) - 36x36	36	36	9.0	ADD TO ASSEMBLY		1									
138	SS-8	7A	R3-8(30)	1	ADVANCE INTERSECTION LANE CONTROL (Left, Left - Ahead) - 30"x30"	30	30		REMOVE	1										
120	SS-8	7B	R3-4(24)	1	U - TURN PROHIBITION (Symbol) - 24x24	24	24		REMOVE	1										
878	SS-8	8A	W3-3(48)	2	SIGNAL AHEAD (Symbol) - 48x48	48	48	32.0				NEW		32.0	SOIL	4				
1367a	SS-8	8B	W16-8P	2	ADVANCE STREET NAME (1 - line plaque) (Oversized)	48	9	6.0				ADD TO ASSEMBLY		6.0						"Thomas Harmon Dr" Hwy C, 4"
2	SS-8	9	R1-1(24)	1	STOP (on stop/slow paddle)	24	24		REMOVE	1										
4	SS-8	10	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
67	SS-9	1	R2-1-55(36)	2	SPEED LIMIT (55 MPH - 36x48)	36	48					REMOVE	24.0							
1514	SS-9	2A	M3-3(24)	1	CARDINAL DIRECTION - SOUTH - 24x12	24	12	2.0	NEW		1				SOIL	1				
1484	SS-9	2B	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24	4.0	ADD TO ASSEMBLY		1									"13"
1694	SS-9	3	D4-3-DE	1	BUS STOP (DART)	12	18		ADD TO ASSEMBLY		1									No current route passing
1514	SS-9	4A	M3-3(24)	1	CARDINAL DIRECTION - SOUTH - 24x12	24	12		REMOVE	1										
1484	SS-9	4B	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24		REMOVE	1										"13"
	SS-9	5		1					REMOVE	1										
8	SS-9	6	R1-2(36)	1	YIELD	36	36		REMOVE	1										
9	SS-9	7	R1-2(48)	1	YIELD	48	48	6.9	NEW		1				SOIL	1				Install on a single post
394	SS-9	8A	R6-1 L(36)	1	ONE WAY (ENCLOSED IN LEFT ARROW) - 36x12	36	12	3.0	ADD TO ASSEMBLY		1									
392	SS-9	8B	R6-1 R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12	3.0	ADD TO ASSEMBLY		1									
406	SS-9	8C	R6-3(30)	1	DIVIDED HIGHWAY CROSSING (4 - Legged Intersection) - 30x24	30	24	5.0	NEW		1				NEW CONCRETE	1				
394	SS-9	9A	R6-1 L(36)	1	ONE WAY (ENCLOSED IN LEFT ARROW) - 36x12	36	12		REMOVE	1										
392	SS-9	9B	R6-1 R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12		REMOVE	1										
1508	SS-9	10A	M3-1(24)	1	CARDINAL DIRECTION - NORTH - 24x12	24	12		REMOVE	1										
1484	SS-9	10B	M1-4(24)	2	US ROUTE (2 - Digit Sign) - 24x24	24	24		REMOVE	2										"13"
1589	SS-9	10C	M5-1 L	1	ADVANCE TURN ARROW (Left - 90)	21	15		REMOVE	1										
1514	SS-9	10D	M3-3(24)	1	CARDINAL DIRECTION - SOUTH - 24x12	24	12		REMOVE	1										
1604	SS-9	10E	M6-1 R(21)	1	DIRECTIONAL ARROW (Right) - 21x15	21	15		REMOVE	1										
					PAGE TOTALS			288		34	27		113	147		34	0	2	1	

PERMANENT SIGN SCHEDULE

NO.	SHEET NO.	PLAN IDENTIFIER	CODE	QTY.	DESCRIPTION	SIGN WIDTH (IN)	SIGN HEIGHT (IN)	SIGN AREA (SF)	ITEM 819018 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE POST (EACH)			ITEM 819019 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS (SF)			POST INSTALLATION TYPE	Code X11 12' Post (W/ Basepost) (EACH)	Code X11A 15' Post (W/ Basepost) (EACH)	ITEM 819016 4" HOLE, 0-6" (EACH)	ITEM 819017 4" HOLE, >6" (EACH)	REMARKS
									SIGN DISPOSITION	REMOVE	INSTALL	SIGN DISPOSITION	REMOVE	INSTALL						
1508	SS-9	11A	M3-1(24)	1	CARDINAL DIRECTION - NORTH - 24x12	24	12	2.0	NEW		1				SOIL	1				
1484	SS-9	11B	M1-4(24)	2	US ROUTE (2 - Digit Sign) - 24x24	24	24	8.0	ADD TO ASSEMBLY		2									"13"
1589	SS-9	11C	M5-1 L	1	ADVANCE TURN ARROW (Left - 90)	21	15	2.2	ADD TO ASSEMBLY		1									
1514	SS-9	11D	M3-3(24)	1	CARDINAL DIRECTION - SOUTH - 24x12	24	12	2.0	NEW		1				SOIL	1				
1604	SS-9	11E	M6-1 R(21)	1	DIRECTIONAL ARROW (Right) - 21x15	21	15	2.2	ADD TO ASSEMBLY		1									
121	SS-9	12A	R3-4(36)	1	U - TURN PROHIBITION (Symbol) - 36x36	36	36	9.0	NEW		1				NEW CONCRETE	1				
311	SS-9	12B	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	ADD TO ASSEMBLY		1									
120	SS-9	13A	R3-4(24)	1	U - TURN PROHIBITION (Symbol) - 24x24	24	24		REMOVE	1										
1673	SS-9	13B	D3-1(9)	2	STREET NAME (1 Line)	36	9		REMOVE	2										"Thomas Harmon Dr"
1673	SS-9	13C	D3-1(9)	2	STREET NAME (1 Line)	36	9		REMOVE	2										"S Dupont Hwy"
311	SS-9	13D	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30		REMOVE	1										
9	SS-9	14	R1-2(48)	1	YIELD	48	48	6.9	NEW		1				SOIL	1				Install on a single post
8	SS-9	15	R1-2(36)	1	YIELD	36	36		REMOVE	1										
358	SS-9	16	R5-1(30)	2	DO NOT ENTER - 30x30	30	30		REMOVE	2										
359	SS-9	17	R5-1(36)	2	DO NOT ENTER - 36x36	36	36	18.0	NEW		2				SOIL	2				
363	SS-9	18	R5-1a(42)	2	WRONG WAY - 42x30	42	30	17.5	NEW		2				SOIL	2				
362	SS-9	19	R5-1a(36)	2	WRONG WAY - 36x24	36	24		REMOVE	2										
362	SS-9	20	R5-1a(36)	2	WRONG WAY - 36x24	36	24		REMOVE	2										
363	SS-9	21A	R5-1a(42)	1	WRONG WAY - 42x30	42	30	8.8	NEW		1				SOIL	1				
363	SS-9	21B	R5-1a(42)	1	WRONG WAY - 42x30	42	30	8.8	NEW		1				NEW CONCRETE	1				
359	SS-9	22A	R5-1(36)	1	DO NOT ENTER - 36x36	36	36	9.0	NEW		1				SOIL	1				
359	SS-9	22B	R5-1(36)	1	DO NOT ENTER - 36x36	36	36	9.0	NEW		1				NEW CONCRETE	1				
358	SS-9	23	R5-1(30)	2	DO NOT ENTER - 30x30	30	30		REMOVE	2										
121	SS-9	24A	R3-4(36)	1	U - TURN PROHIBITION (Symbol) - 36x36	36	36	9.0	ADD TO ASSEMBLY		1									
311	SS-9	24B	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	NEW		1				NEW CONCRETE	1				
120	SS-9	25A	R3-4(24)	1	U - TURN PROHIBITION (Symbol) - 24x24	24	24		REMOVE	1										
311	SS-9	24B	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30		REMOVE	1										
394	SS-9	26A	R6-1 L(36)	1	ONE WAY (ENCLOSED IN LEFT ARROW) - 36x12	36	12	3.0	NEW		1				SOIL	1				
392	SS-9	26B	R6-1 R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12	3.0	ADD TO ASSEMBLY		1									
406	SS-9	26C	R6-3(30)	1	DIVIDED HIGHWAY CROSSING (4 - Legged Intersection) - 30x24	30	24	5.0	ADD TO ASSEMBLY		1									
394	SS-9	27A	R6-1 L(36)	1	ONE WAY (ENCLOSED IN LEFT ARROW) - 36x12	36	12		REMOVE	1										
392	SS-9	27B	R6-1 R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12		REMOVE	1										
311	SS-9	28	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	NEW		1				NEW CONCRETE	1				
311	SS-9	29	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30		REMOVE	1										
1508	SS-9	30A	M3-1(24)	1	CARDINAL DIRECTION - NORTH - 24x12	24	12	2.0	NEW		1				SOIL	1				
1484	SS-9	30B	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24	4.0	ADD TO ASSEMBLY		1									"13"
1508	SS-9	31A	M3-1(24)	1	CARDINAL DIRECTION - NORTH - 24x12	24	12		REMAIN											
1484	SS-9	31B	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24		REMOVE	1										"13"
1694	SS-9	32	D4-3-DE	1	BUS STOP (DART)	12	18		ADD TO ASSEMBLY		1									
141	SS-10	1	R3-8a(48)	1	ADVANCE INTERSECTION LANE CONTROL (Left, Left - Ahead, Right) - 48"x30"	48	30		REMAIN											
4	SS-10	2	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
1504	SS-10	3A	M2-1(21)	1	JUNCTION - 21x15	21	15		REMAIN											
1484	SS-10	3B	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24		REMAIN											"13"
3	SS-10	4A	R1-1(30)	1	STOP	30	30		REMAIN											
	SS-10	4B		1	3-WAY (plaque)	12	6		REMAIN											
	SS-10	4C		1	THRU TRAFFIC FROM US RT 13 DOES NOT STOP	24	18		REMAIN											
42	SS-10	5A	R2-1-25(24)	1	SPEED LIMIT (25 MPH - 24x30)	24	30		REMAIN											
	SS-10	5B		1	NO THRU TRUCK OR BUS TRAFFIC TO LOCHMEATH WAY	24	30		REMAIN											
3	SS-10	6A	R1-1(30)	1	STOP	30	30		REMAIN											
	SS-10	6B		1	3-WAY (plaque)	12"	6"		REMAIN											
	SS-10	6C		1	THRU TRAFFIC FROM US RT 13 DOES NOT STOP	24"	18"		REMAIN											
3	SS-10	7A	R1-1(30)	1	STOP	30	30		REMAIN											
	SS-10	7B		1	3-WAY (plaque)	12"	6"		REMAIN											
	SS-10	7C		1	THRU TRAFFIC FROM US RT 13 DOES NOT STOP	24"	18"		REMAIN											
42	SS-10	8	R2-1-25(24)	1	SPEED LIMIT (25 MPH - 24x30)	24	30		REMAIN											
252	SS-11	1	R3-20-DE	1	TURN LANE	18	18		REMOVE	1										
252	SS-11	2	R3-20-DE	1	TURN LANE	18	18	2.3	NEW		1				NEW CONCRETE	1				
878	SS-11	3A	W3-3(48)	2	SIGNAL AHEAD (Symbol) - 48x48	48	48	32.0				NEW		32.0	SOIL	4				
1367a	SS-11	3B	W16-8P	2	ADVANCE STREET NAME (1 - line plaque) (Oversized)	48	9	6.0				ADD TO ASSEMBLY		6.0						"Thomas Harmon Dr" Hwy C, 4"
	SS-11	4		1	DO NOT ENTER (PRIVATE)	12	18		REMAIN											
59	SS-11	5	R2-1-45(36)	2	SPEED LIMIT (45 MPH - 36x48)	36	48	24.0				NEW		24.0	SOIL	4				
890	SS-11	6	W3-5(48)	2	SPEED REDUCTION (Symbol) - 48x48	48	48					REMOVE	32.0							"50"
4	SS-11	7	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
67	SS-12	1	R2-1-55(36)	2	SPEED LIMIT (55 MPH - 36x48)	36	48					REMOVE	24.0							
252	SS-12	2	R3-20-DE	1	TURN LANE	18	18	2.3	NEW		1				NEW CONCRETE	1				
63	SS-12	3A	R2-1-50(36)	2	SPEED LIMIT (50 MPH - 36x48)	36	48					REMOVE	24.0							
1447	SS-12	3B	W21-12P-DE	2	STRICTLY ENFORCED (plaque)	36	24					REMOVE	12.0							
876	SS-12	4A	W3-3(18)	1	SIGNAL AHEAD (Symbol) - 18x18	18	18		REMOVE	1										
1368	SS-12	4B	W16-8aP	1	ADVANCE STREET NAME (2 - line plaque)	42	18		REMOVE	1										"<--Voshells Mill Rd Voshells Mill --> Star Hill Rd"
1694	SS-12	4C	D4-3-DE	1	BUS STOP (DART)	12	18		REMOVE	1										"104"
	PAGE TOTALS							226		25	30		92	62		28	0	0	0	

PERMANENT SIGN SCHEDULE

NO.	SHEET NO.	PLAN IDENTIFIER	CODE	QTY.	DESCRIPTION	SIGN WIDTH (IN)	SIGN HEIGHT (IN)	SIGN AREA (SF)	ITEM 819018 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE POST (EACH)			ITEM 819019 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS (SF)			POST INSTALLATION TYPE	Code X11 12' Post (W/ Basepost) (EACH)	Code X11A 15' Post (W/ Basepost) (EACH)	ITEM 819016 4" HOLE, 0-6" (EACH)	ITEM 819017 4" HOLE, >6" (EACH)	REMARKS
									SIGN DISPOSITION	REMOVE	INSTALL	SIGN DISPOSITION	REMOVE	INSTALL						
876	SS-12	5A	W3-3(18)	1	SIGNAL AHEAD (Symbol) - 18x18	18	18		REMOVE	1										
1368	SS-12	5B	W16-8aP	1	ADVANCE STREET NAME (2 - line plaque)	42	18		REMOVE	1										"<--Voshells Mill Rd Voshells Mill --> Star Hill Rd"
59	SS-13	1A	R2-1-45(36)	1	SPEED LIMIT (45 MPH - 36x48)	36	48	12.0				NEW		12.0	SOIL	2				
59	SS-13	1B	R2-1-45(36)	1	SPEED LIMIT (45 MPH - 36x48)	36	48	12.0				NEW		12.0	NEW CONCRETE	2				
4	SS-13	2	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
1514	SS-13	3A	M3-3(24)	1	CARDINAL DIRECTION - SOUTH - 24x12	24	12		REMOVE	1										
1484	SS-13	3B	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24		REMOVE	1										"13"
1514	SS-13	4A	M3-3(24)	1	CARDINAL DIRECTION - SOUTH - 24x12	24	12	2.0	NEW		1				SOIL	1				
1484	SS-13	4B	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24	4.0	ADD TO ASSEMBLY		1									"13"
311	SS-13	5	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	NEW		1				NEW CONCRETE	1				
9	SS-13	6	R1-2(48)	1	YIELD	48	48	6.9	NEW		1				SOIL	1				Install on a single post
394	SS-13	7A	R6-1 L(36)	1	ONE WAY (ENCLOSED IN LEFT ARROW) - 36x12	36	12	3.0	ADD TO ASSEMBLY		1									
392	SS-13	7B	R6-1 R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12	3.0	ADD TO ASSEMBLY		1									
406	SS-13	7C	R6-3(30)	1	DIVIDED HIGHWAY CROSSING (4 - Legged Intersection) - 30x24	30	24	5.0	NEW		1				NEW CONCRETE	1				
1674	SS-13	8A	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	48	12		REMOVE	2										"Voshells Mill Rd"
1674	SS-13	8B	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	48	12		REMOVE	2										"S Dupont Hwy"
	SS-13	8C		1	RIGHT TURN ON RED AFTER STOP	24	30		REMOVE	1										
4	SS-13	9	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
622	SS-13	10	R12-3	1	NO TRUCKS OVER XXXX LBS EMPTY WT	24	36		REMOVE	1										"NO TRUCKS OVER 5000 LBS EXCEPT LOCAL SERVICE"
50	SS-13	11	R2-1-35(24)	1	SPEED LIMIT (35 MPH - 24x30)	24	30		REMOVE	1										
50.5	SS-13	12	R2-1-35(30)	1	SPEED LIMIT (35 MPH - 30x36)	30	36	7.5	NEW		1				NEW CONCRETE	1				
9	SS-13	13	R1-2(48)	1	YIELD	48	48	6.9	NEW		1				SOIL	1				Install on a single post
7	SS-13	14A	R1-2(30)	1	YIELD	30	30		REMOVE	1										Sign is mounted on utility pole
	SS-13	14B		1	TO PEDESTRIANS	24	12		REMOVE	1										Sign is mounted on utility pole
4	SS-13	15	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
	SS-13	16		1	DUI 1 KILLED HERE	24	18		REMOVE	1										
878	SS-13	17A	W3-3(48)	1	SIGNAL AHEAD (Symbol) - 48x48	48	48	16.0				NEW		16.0	NEW CONCRETE	2				
878	SS-13	17B	W3-3(48)	1	SIGNAL AHEAD (Symbol) - 48x48	48	48	16.0				NEW		16.0	SOIL	2				
1368c	SS-13	17C	W16-8aP	2	ADVANCE STREET NAME (3 - line plaque) (Oversized)	48	18	12.0				ADD TO ASSEMBLY		12.0						"(<-- Voshells Mill Rd Voshells Mill --> Star Hill Rd" Hwy C, 4"
4	SS-13	18	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
8	SS-13	19	R1-2(36)	1	YIELD	36	36		REMOVE	1										
9	SS-13	20	R1-2(48)	1	YIELD	48	48	6.9	NEW		1				SOIL	1				Install on a single post
3	SS-13	21	R1-1(30)	1	STOP	30	30		REMAIN											
1685	SS-13	22A	D3-2-DE1	1	WELCOME TO	36	32		REMAIN											
1686	SS-13	22B	D3-2-DE2	1	DEVELOPMENT NAME	36	24		REMOVE	1										"PALMER PARK -->"
1686	SS-13	22C	D3-2-DE2	1	DEVELOPMENT NAME	36	24	6.0	ADD TO ASSEMBLY		1									"Palmer Park -->"
394	SS-13	23A	R6-1 L(36)	1	ONE WAY (ENCLOSED IN LEFT ARROW) - 36x12	36	12	3.0	ADD TO ASSEMBLY		1									
392	SS-13	23B	R6-1 R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12	3.0	ADD TO ASSEMBLY		1									
406	SS-13	23C	R6-3(30)	1	DIVIDED HIGHWAY CROSSING (4 - Legged Intersection) - 30x24	30	24	5.0	ADD TO ASSEMBLY		1									
589	SS-13	23D	R10-17a	1	RIGHT ON RED ARROW AFTER STOP	36	48	12.0	NEW		1				SOIL	1				"RIGHT TURN ON RED AFTER STOP"
1673	SS-13	24A	D3-1(9)	2	STREET NAME (1 Line)	48	9		REMOVE	2										"Voshells Mill Rd"
1673	SS-13	24B	D3-1(9)	2	STREET NAME (1 Line)	36	9		REMOVE	2										"S Dupont Hwy"
	SS-13	24C		1	RIGHT TURN ON RED AFTER STOP	24	36		REMOVE	1										
311	SS-13	25	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	NEW		1				NEW CONCRETE	1				
1508	SS-13	26A	M3-1(24)	1	CARDINAL DIRECTION - NORTH - 24x12	24	12		REMOVE	1										
1484	SS-13	26B	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24		REMOVE	1										"13"
1508	SS-13	27A	M3-1(24)	1	CARDINAL DIRECTION - NORTH - 24x12	24	12	2.0	NEW		1				SOIL	1				
1484	SS-13	27B	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24	4.0	ADD TO ASSEMBLY		1									"13"
1694	SS-13	28	D4-3-DE	1	BUS STOP (DART)	12	18		ADD TO ASSEMBLY		1									"104"
878	SS-14	1A	W3-3(48)	1	SIGNAL AHEAD (Symbol) - 48x48	48	48	16.0				NEW		16.0	SOIL	2				
878	SS-14	1B	W3-3(48)	1	SIGNAL AHEAD (Symbol) - 48x48	48	48	16.0				NEW		16.0	NEW CONCRETE	2				
1368b	SS-14	1C	W16-8aP	2	ADVANCE STREET NAME (3 - line plaque)	42	18	10.5				ADD TO ASSEMBLY		10.5						"<--Voshells Mill Rd Voshells Mill --> Star Hill Rd" Hwy C, 4"
252	SS-14	2	R3-20-DE	1	TURN LANE	18	18	2.3	NEW		1				SOIL	1				
252	SS-14	3	R3-20-DE	1	TURN LANE	18	18		REMOVE	1										
876	SS-14	4	W3-3(18)	2	SIGNAL AHEAD (Symbol) - 18x18	18	18		REMOVE	2										
1966	SS-14	5A	S1-1(36)	1	SCHOOL SIGN (Symbol) - 36x36	36	36	9.0	NEW		1				SOIL	1				
1981	SS-14	5B	S4-3P(24)	1	SCHOOL - 24x8	24	8	1.3	ADD TO ASSEMBLY		1									
1353	SS-14	5C	W16-6P FYG(24)L	1	LEFT ADVANCE TURN ARROW (plaque) - 24x18	24	18	3.0	ADD TO ASSEMBLY		1									
59	SS-14	6A	R2-1-45(36)	1	SPEED LIMIT (45 MPH - 36x48)	36	48	12.0				NEW		12.0	NEW CONCRETE	2				
59	SS-14	6B	R2-1-45(36)	1	SPEED LIMIT (45 MPH - 36x48)	36	48	12.0				NEW		12.0	SOIL	2				
63	SS-14	7	R2-1-50(36)	2	SPEED LIMIT (50 MPH - 36x48)	36	48		REMOVE	2										
1968	SS-14	8	S3-1(30)	1	SCHOOL BUS STOP AHEAD - 30x30	30	30		REMOVE	1										
1969	SS-14	9	S3-1(36)	1	SCHOOL BUS STOP AHEAD - 36x36	36	36	9.0	NEW		1				SOIL	1				
252	SS-14	10	R3-20-DE	1	TURN LANE	18	18		REMOVE	1										
4	SS-14	11	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
1966	SS-14	12A	S1-1(36)	1	SCHOOL SIGN (Symbol) - 36x36	36	36		REMOVE	1										
1981	SS-14	12B	S4-3P(24)	1	SCHOOL - 24x8	24	8		REMOVE	1										
1966	SS-14	13A	S1-1(36)	1	SCHOOL SIGN (Symbol) - 36x36	36	36	9.0	NEW		1				SOIL	1				
1981	SS-14	13B	S4-3P(24)	1	SCHOOL - 24x8	24	8	1.3	ADD TO ASSEMBLY		1									
252	SS-14	14	R3-20-DE	1	TURN LANE	18	18	2.3	NEW		1				NEW CONCRETE	1				
8	SS-15	1	R1-2(36)	1	YIELD	36	36		REMOVE	1										
					PAGE TOTALS			299		33	32		0	135		36	0	0	0	

PERMANENT SIGN SCHEDULE

NO.	SHEET NO.	PLAN IDENTIFIER	CODE	QTY.	DESCRIPTION	SIGN WIDTH (IN)	SIGN HEIGHT (IN)	SIGN AREA (SF)	ITEM 819018 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE POST (EACH)			ITEM 819019 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS (SF)			POST INSTALLATION TYPE	Code X11 12' Post (W/ Basepost) (EACH)	Code X11A 15' Post (W/ Basepost) (EACH)	ITEM 819016 4" HOLE, 0-6" (EACH)	ITEM 819017 4" HOLE, >6" (EACH)	REMARKS
									SIGN DISPOSITION	REMOVE	INSTALL	SIGN DISPOSITION	REMOVE	INSTALL						
394	SS-15	2	R6-1 L(36)	1	ONE WAY (ENCLOSED IN LEFT ARROW) - 36x12	36	12		REMOVE	1										
8	SS-15	3	R1-2(36)	1	YIELD	36	36		REMOVE	1										
1694	SS-15	4	D4-3-DE	1	BUS STOP (DART)	12	18		NEW		1				SOIL	1				No current route passing
252	SS-15	5	R3-20-DE	1	TURN LANE	18	18		REMOVE	1										
1824	SS-15	6	D10-2(12)	1	REFERENCE LOCATION (2- Digit) - 12x36	12	36	3.0	NEW		1				SOIL	1				"46"
9	SS-15	7	R1-2(48)	1	YIELD	48	48	6.9	NEW		1				SOIL	1				Install on a single post
394	SS-15	8A	R6-1 L(36)	1	ONE WAY (ENCLOSED IN LEFT ARROW) - 36x12	36	12	3.0	ADD TO ASSEMBLY		1									
392	SS-15	8B	R6-1 R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12	3.0	ADD TO ASSEMBLY		1									
406	SS-15	8C	R6-3(30)	1	DIVIDED HIGHWAY CROSSING (4 - Legged Intersection) - 30x24	30	24	5.0	NEW		1				NEW CONCRETE	1				
1827	SS-15	9	D10-2a(12)	1	INTERMEDIATE REFERENCE LOCATION (2- Digit) - 12x48	12	48		REMOVE	1										"46.0"
311	SS-15	10	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	NEW		1				EX. CONCRETE	1		1		
9	SS-15	11	R1-2(48)	1	YIELD	48	48	6.9	NEW		1				SOIL	1				Install on a single post
4	SS-15	12	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
1924	SS-15	13A	EM-1-DE	1	EVACUATION ROUTE	24	24	4.0	NEW		1				SOIL	1				
1618	SS-15	13B	M6-3(B)	1	DIRECTIONAL ARROW (Up) - 12x9	12	9	0.8	ADD TO ASSEMBLY		1									
1924	SS-15	14A	EM-1-DE	1	EVACUATION ROUTE	24	24		REMOVE	1										
1618	SS-15	14B	M6-3(B)	1	DIRECTIONAL ARROW (Up) - 12x9	12	9		REMOVE	1										
1694	SS-15	14C	D4-3-DE	1	BUS STOP (DART)	12	18		REMOVE	1										"104"
1824	SS-15	15	D10-2(12)	1	REFERENCE LOCATION (2- Digit) - 12x36	12	36	3.0	NEW		1				SOIL	1				"46"
311	SS-15	16	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	NEW		1				NEW CONCRETE	1				
1827	SS-15	17	D10-2a(12)	1	INTERMEDIATE REFERENCE LOCATION (2- Digit) - 12x48	12	48		REMOVE	1										"46.0"
394	SS-15	18A	R6-1 L(36)	1	ONE WAY (ENCLOSED IN LEFT ARROW) - 36x12	36	12	3.0	ADD TO ASSEMBLY		1									
392	SS-15	18B	R6-1 R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12	3.0	ADD TO ASSEMBLY		1									
406	SS-15	18C	R6-3(30)	1	DIVIDED HIGHWAY CROSSING (4 - Legged Intersection) - 30x24	30	24	5.0	NEW		1				NEW CONCRETE	1				
311	SS-15	19	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	NEW		1				NEW CONCRETE	1				
4	SS-17	1	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
252	SS-17	2	R3-20-DE	1	TURN LANE	18	18	2.3	NEW		1				NEW CONCRETE	1				
1965	SS-17	3A	S1-1(30)	1	SCHOOL SIGN (Symbol) - 30x30	30	30		REMOVE	1										
1981	SS-17	3B	S4-3P(24)	1	SCHOOL - 24x8	24	8		REMOVE	1										
1353	SS-17	3C	W16-6P FYG(24)L	1	LEFT ADVANCE TURN ARROW (plaque) - 24x18	24	18		REMOVE	1										
1694	SS-17	4	D4-3-DE	1	BUS STOP (DART)	12	18		NEW		1				SOIL	1				"104"
878	SS-17	5A	W3-3(48)	2	SIGNAL AHEAD (Symbol) - 48x48	48	48					REMOVE	32.0							
1368	SS-17	5B	W16-8aP	2	ADVANCE STREET NAME (2 - line plaque)	42	18		REMOVE	2										"<-- Camden Wyoming Ave W Lebanon Rd -->"
878	SS-17	6A	W3-3(48)	2	SIGNAL AHEAD (Symbol) - 48x48	48	48	32.0				NEW		32.0	SOIL	4				
1368b	SS-17	6B	W16-8aP	2	ADVANCE STREET NAME (3 - line plaque)	42	18	10.5				ADD TO ASSEMBLY		10.5						"<-- E Camden Wyoming Ave W Lebanon Rd -->" Hwy C, 4"
1504	SS-17	7A	M2-1(21)	1	JUNCTION - 21x15	21	15	2.2	NEW		1				SOIL	1				
1488	SS-17	7B	M1-5(24)	1	STATE ROUTE (2 - Digit Sign) - 24x24	24	24	4.0	ADD TO ASSEMBLY		1									"10"
1504	SS-17	8A	M2-1(21)	1	JUNCTION - 21x15	21	15		REMOVE	1										
1488	SS-17	8B	M1-5(24)	1	STATE ROUTE (2 - Digit Sign) - 24x24	24	24		REMOVE	1										"10"
424	SS-18	1	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24		REMOVE	1										
424	SS-18	2	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24	3.0	NEW		1				SOIL	1				
4	SS-18	3	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
59	SS-18	4	R2-1-45(36)	2	SPEED LIMIT (45 MPH - 36x48)	36	48	24.0				NEW		24.0	SOIL	4				
63	SS-18	5	R2-1-50(36)	2	SPEED LIMIT (50 MPH - 36x48)	36	48		REMOVE	2										
1669	SS-18	6A	D2-2	1	DISTANCE (2 Line)	60	30	12.5				NEW		12.5	SOIL	2				"Felton 8 Harrington 13" Hwy D, 6"
424	SS-18	6B	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24	3.0				ADD TO ASSEMBLY		3.0						
1872	SS-18	6C	D14-3-DE	1	ADOPT A HIGHWAY	24	18	3.0				ADD TO ASSEMBLY		3.0						"ALPHA PHI OMEGA OF WESLEY COLLEGE" Hwy D, 2"
1669	SS-18	7A	D2-2	1	DISTANCE (2 Line)	72	30					REMOVE	15.0							"FELTON 8 HARRINGTON 14"
424	SS-18	7B	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24		REMOVE	1										
	SS-18	7C		1	ADOPT A HIGHWAY				REMOVE	1										
	SS-18	7D		1	ACKNOWLEDGEMENT - 18x12				REMOVE	1										"ALPHA PHI OMEGA OF WESLEY COLLEGE"
	SS-18	8		1	DAIRY QUEEN ENTRANCE SOUTH END OF LOT				REMAIN											
4	SS-18	9	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
	SS-18	10A		1	ENTER (PRIVATE)				REMAIN											
566	SS-18	10B	R10-7	1	DO NOT BLOCK INTERSECTION	24	30		REMAIN											
	SS-18	11A		1	WHATCOAT UNITED METHODIST CHURCH (PRIVATE)				REMAIN											
	SS-18	11B		1	CHRISTIAN PRE-SCHOOL (PRIVATE) - plaque				REMAIN											
252	SS-18	12	R3-20-DE	1	TURN LANE	18	18	2.3	NEW		1				SOIL	1				
1653	SS-18	13	D1-2	1	DESTINATION (2 Line)	60	30					REMOVE	12.5							"<-- Camden <-- Wyoming"
1653	SS-18	14	D1-2	1	DESTINATION (2 Line)	60	30	12.5				NEW		12.5	SOIL	2				"<-- Camden <-- Wyoming" Hwy D, 6"
	PAGE TOTALS							203		21	26		60	98		32	0	1	0	

PERMANENT SIGN SCHEDULE

NO.	SHEET NO.	PLAN IDENTIFIER	CODE	QTY.	DESCRIPTION	SIGN WIDTH (IN)	SIGN HEIGHT (IN)	SIGN AREA (SF)	ITEM 819018 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE POST (EACH)			ITEM 819019 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS (SF)			POST INSTALLATION TYPE	Code X11 12' Post (W/ Basepost) (EACH)	Code X11A 15' Post (W/ Basepost) (EACH)	ITEM 819016 4" HOLE, 0-6" (EACH)	ITEM 819017 4" HOLE, >6" (EACH)	REMARKS
									SIGN DISPOSITION	REMOVE	INSTALL	SIGN DISPOSITION	REMOVE	INSTALL						
	SS-18	15A		1	CIVIL AIR TERMINAL	27	27	5.1	REMOVE	1										
	SS-18	15B		1	INFORMATION ARROW	12	DIA	0.8	REMOVE	1										
	SS-18	16A		1	CIVIL AIR TERMINAL	27	27	5.1	NEW		1				SOIL	1				
	SS-18	16B		1	INFORMATION ARROW	12	DIA	0.8	ADD TO ASSEMBLY		1									
1653	SS-18	17	D1-2	1	DESTINATION (2 Line)	72	30	15.0				NEW		15.0	SOIL	2				"Rising Sun --> Dover A.F.B. -->" Hwy D, 6"
1653	SS-18	18	D1-2	1	DESTINATION (2 Line)	72	30					REMOVE	15.0							"Rising Sun --> Dover A.F.B. -->"
363	SS-18	19	R5-1a(42)	2	WRONG WAY - 42x30	42	30	17.5	NEW		2				SOIL	2				
1514	SS-19	1A	M3-3(24)	1	CARDINAL DIRECTION - SOUTH - 24x12	24	12	2.0	NEW		1				SOIL	1				
1484	SS-19	1B	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24	4.0	ADD TO ASSEMBLY		1									"13"
424	SS-19	1C	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24	3.0	ADD TO ASSEMBLY		1									
1514	SS-19	2A	M3-3(24)	1	CARDINAL DIRECTION - SOUTH - 24x12	24	12		REMOVE	1										
1484	SS-19	2B	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24		REMOVE	1										"13"
424	SS-19	2C	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24		REMOVE	1										
9	SS-19	3	R1-2(48)	1	YIELD	48	48	6.9	NEW		1				SOIL	1				Install on a single post
8	SS-19	4	R1-2(36)	1	YIELD	36	36		REMOVE	1										
1660	SS-19	5	D1-3	1	DESTINATION (3 Line)	84	42					REMOVE	24.5							" DOVER A.F.B. <-- DOVER HARRINGTON -->
1660	SS-19	6	D1-3	1	DESTINATION (3 Line)	66	42	19.3				NEW		19.3	SOIL	2				"(UP arrow) Dover A.F.B. <-- Dover Harrington --> Hwy D, 6"
1508	SS-19	7A	M3-1(24)	1	CARDINAL DIRECTION - NORTH - 24x12	24	12		REMOVE	1										
1484	SS-19	7B	M1-4(24)	2	US ROUTE (2 - Digit Sign) - 24x24	24	24		REMOVE	2										"13"
1589	SS-19	7C	M5-1 L	1	ADVANCE TURN ARROW (Left - 90)	21	15		REMOVE	1										
1514	SS-19	7D	M3-3(24)	1	CARDINAL DIRECTION - SOUTH - 24x12	24	12		REMOVE	1										
1604	SS-19	7E	M6-1 R(21)	1	DIRECTIONAL ARROW (Right) - 21x15	21	15		REMOVE	1										
143	SS-19	7F	R3-8b(48)	1	ADVANCE INTERSECTION LANE CONTROL (Left, Ahead, Right) - 48"x30"	48	30		REMOVE	1										MOD "LEFT-AHEAD-AHEAD-RIGHT"
1508	SS-19	8A	M3-1(24)	1	CARDINAL DIRECTION - NORTH - 24x12	24	12	2.0	NEW		1				SOIL	1				
1484	SS-19	8B	M1-4(24)	2	US ROUTE (2 - Digit Sign) - 24x24	24	24	8.0	ADD TO ASSEMBLY		2									"13"
1589	SS-19	8C	M5-1 L	1	ADVANCE TURN ARROW (Left - 90)	21	15	2.2	ADD TO ASSEMBLY		1									
1514	SS-19	8D	M3-3(24)	1	CARDINAL DIRECTION - SOUTH - 24x12	24	12	2.0	NEW		1				SOIL	1				
1604	SS-19	8E	M6-1 R(21)	1	DIRECTIONAL ARROW (Right) - 21x15	21	15	2.2	ADD TO ASSEMBLY		1									
143	SS-19	8F	R3-8b(48)	1	ADVANCE INTERSECTION LANE CONTROL (Left, Ahead, Right) - 48"x30"	48	30	10.0				ADD TO ASSEMBLY		10.0						MOD "LEFT-AHEAD-AHEAD-RIGHT"
42	SS-19	9	R2-1-25(24)	1	SPEED LIMIT (25 MPH - 24x30)	24	30		REMAIN											
311	SS-19	10	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	NEW		1				NEW CONCRETE	1				
311	SS-19	11	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30		REMOVE	1										
394	SS-19	12A	R6-1 L(36)	1	ONE WAY (ENCLOSED IN LEFT ARROW) - 36x12	36	12	3.0	ADD TO ASSEMBLY		1									
392	SS-19	12B	R6-1 R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12	3.0	ADD TO ASSEMBLY		1									
406	SS-19	12C	R6-3(30)	1	DIVIDED HIGHWAY CROSSING (4 - Legged Intersection) - 30x24	30	24	5.0	NEW		1				NEW CONCRETE	1				
1517	SS-19	13A	M3-4(24)	1	CARDINAL DIRECTION - WEST - 24x12	24	12		REMOVE	1										
1488	SS-19	13B	M1-5(24)	1	STATE ROUTE (2 - Digit Sign) - 24x24	24	24		REMOVE	1										"10"
1604	SS-19	13C	M6-1 R(21)	1	DIRECTIONAL ARROW (Right) - 21x15	21	15		REMOVE	1										
1517	SS-19	14A	M3-4(24)	1	CARDINAL DIRECTION - WEST - 24x12	24	12	2.0	NEW		1				SOIL	1				
1488	SS-19	14B	M1-5(24)	1	STATE ROUTE (2 - Digit Sign) - 24x24	24	24	4.0	ADD TO ASSEMBLY		1									"10"
1604	SS-19	14C	M6-1 R(21)	1	DIRECTIONAL ARROW (Right) - 21x15	21	15	2.2	ADD TO ASSEMBLY		1									
4	SS-19	15	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
1511	SS-19	16A	M3-2(24)	1	CARDINAL DIRECTION - EAST - 24x12	24	12		REMOVE	1										
1488	SS-19	16B	M1-5(24)	1	STATE ROUTE (2 - Digit Sign) - 24x24	24	24		REMOVE	1										"10"
1605	SS-19	16C	M6-1 L(21)	1	DIRECTIONAL ARROW (Left) - 21x15	21	15		REMOVE	1										
1511	SS-19	17A	M3-2(24)	1	CARDINAL DIRECTION - EAST - 24x12	24	12	2.0	NEW		1				NEW CONCRETE	1				
1488	SS-19	17B	M1-5(24)	1	STATE ROUTE (2 - Digit Sign) - 24x24	24	24	4.0	ADD TO ASSEMBLY		1									"10"
1605	SS-19	17C	M6-1 L(21)	1	DIRECTIONAL ARROW (Left) - 21x15	21	15	2.2	ADD TO ASSEMBLY		1									
1653	SS-19	18A	D1-2	1	DESTINATION (2 Line)	60	30	12.5				NEW		12.5	SOIL	2				" Camden --> Wyoming -->" Hwy D, 6"
	SS-19	18B		1	CAMDEN FRIENDS MEETING EST 1805, NEXT RIGHT (PRIVATE)	24	30	5.0	ADD TO ASSEMBLY		1									
	SS-19	18C		1	KENT COUNTY SPCA	24	12	2.0	ADD TO ASSEMBLY		1									
1653	SS-19	19A	D1-2	1	DESTINATION (2 Line)	60	30					REMOVE	12.5							
	SS-19	19B		1	CAMDEN FRIENDS MEETING EST 1805, NEXT RIGHT (PRIVATE)	24"	30"		REMOVE	1										
	SS-19	19C		1	KENT COUNTY SPCA	24"	12"		REMOVE	1										
4	SS-19	20	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
1517	SS-19	21A	M3-4(24)	1	CARDINAL DIRECTION - WEST - 24x12	24	12	2.0	NEW		1				SOIL	1				
1488	SS-19	21B	M1-5(24)	2	STATE ROUTE (2 - Digit Sign) - 24x24	24	24	8.0	ADD TO ASSEMBLY		2									"10"
1605	SS-19	21C	M6-1 L(21)	1	DIRECTIONAL ARROW (Left) - 21x15	21	15	2.2	ADD TO ASSEMBLY		1									
1511	SS-19	21D	M3-2(24)	1	CARDINAL DIRECTION - EAST - 24x12	24	12	2.0	NEW		1				SOIL	1				
1604	SS-19	21E	M6-1 R(21)	1	DIRECTIONAL ARROW (Right) - 21x15	21	15	2.2	ADD TO ASSEMBLY		1									
1517	SS-19	22A	M3-4(24)	1	CARDINAL DIRECTION - WEST - 24x12	24	12		REMOVE	1										
1488	SS-19	22B	M1-5(24)	2	STATE ROUTE (2 - Digit Sign) - 24x24	24	24		REMOVE	2										"10"
1605	SS-19	22C	M6-1 L(21)	1	DIRECTIONAL ARROW (Left) - 21x15	21	15		REMOVE	1										
1511	SS-19	22D	M3-2(24)	1	CARDINAL DIRECTION - EAST - 24x12	24	12		REMOVE	1										
1604	SS-19	22E	M6-1 R(21)	1	DIRECTIONAL ARROW (Right) - 21x15	21	15		REMOVE	1										
1517	SS-19	23A	M3-4(24)	1	CARDINAL DIRECTION - WEST - 24x12	24	12	2.0	NEW		1				NEW CONCRETE	1				
1488	SS-19	23B	M1-5(24)	1	STATE ROUTE (2 - Digit Sign) - 24x24	24	24	4.0	ADD TO ASSEMBLY		1									"10"
1605	SS-19	23C	M6-1 L(21)	1	DIRECTIONAL ARROW (Left) - 21x15	21	15	2.2	ADD TO ASSEMBLY		1									
359	SS-19	24A	R5-1(36)	1	DO NOT ENTER - 36x36	36	36	9.0	NEW		1				NEW CONCRETE	1				
359	SS-19	24B	R5-1(36)	1	DO NOT ENTER - 36x36	36	36	9.0	NEW		1				SOIL	1				
1517	SS-19	25A	M3-4(24)	1	CARDINAL DIRECTION - WEST - 24x12	24	12		REMOVE	1										
1488	SS-19	25B	M1-5(24)	1	STATE ROUTE (2 - Digit Sign) - 24x24	24	24		REMOVE	1										"10"
1605	SS-19	25C	M6-1 L(21)	1	DIRECTIONAL ARROW (Left) - 21x15	21	15		REMOVE	1										
	PAGE TOTALS							215		31	39		52	57		24	0	0	0	

PERMANENT SIGN SCHEDULE

NO.	SHEET NO.	PLAN IDENTIFIER	CODE	QTY.	DESCRIPTION	SIGN WIDTH (IN)	SIGN HEIGHT (IN)	SIGN AREA (SF)	ITEM 819018 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE POST (EACH)			ITEM 819019 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS (SF)			POST INSTALLATION TYPE	Code X11 12' Post (W/ Basepost) (EACH)	Code X11A 15' Post (W/ Basepost) (EACH)	ITEM 819016 4" HOLE, 0-6" (EACH)	ITEM 819017 4" HOLE, >6" (EACH)	REMARKS
									SIGN DISPOSITION	REMOVE	INSTALL	SIGN DISPOSITION	REMOVE	INSTALL						
311	SS-19	26	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	NEW		1				NEW CONCRETE	1				
311	SS-19	27	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	NEW		1				NEW CONCRETE	1				
406	SS-19	28A	R6-3(30)	1	DIVIDED HIGHWAY CROSSING (4 - Legged Intersection) - 30x24	30	24		REMOVE	1										
392	SS-19	28B	R6-1 R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12		REMOVE	1										
1674	SS-19	28C	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	48	12		REMOVE	2										"W Lebanon Rd"
1674	SS-19	28D	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	48	12		REMOVE	2										"S Dupont Hwy"
394	SS-19	28E	R6-1 L(36)	1	ONE WAY (ENCLOSED IN LEFT ARROW) - 36x12	36	12		REMOVE	1										
311	SS-19	28F	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30		REMOVE	1										
406	SS-19	29A	R6-3(30)	1	DIVIDED HIGHWAY CROSSING (4 - Legged Intersection) - 30x24	30	24	5.0	ADD TO ASSEMBLY		1									
392	SS-19	29B	R6-1 R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12	3.0	ADD TO ASSEMBLY		1									
394	SS-19	29C	R6-1 L(36)	1	ONE WAY (ENCLOSED IN LEFT ARROW) - 36x12	36	12	3.0	ADD TO ASSEMBLY		1									
311	SS-19	29D	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	NEW		1				NEW CONCRETE	1				
1511	SS-19	30A	M3-2(24)	1	CARDINAL DIRECTION - EAST - 24x12	24	12	2.0	NEW		1				SOIL	1				
1488	SS-19	30B	M1-5(24)	1	STATE ROUTE (2 - Digit Sign) - 24x24	24	24	4.0	ADD TO ASSEMBLY		1									"10"
1511	SS-19	31A	M3-2(24)	1	CARDINAL DIRECTION - EAST - 24x12	24	12		REMOVE	1										
1488	SS-19	31B	M1-5(24)	1	STATE ROUTE (2 - Digit Sign) - 24x24	24	24		REMOVE	1										"10"
1514	SS-19	32A	M3-3(24)	1	CARDINAL DIRECTION - SOUTH - 24x12	24	12		REMOVE	1										
1484	SS-19	32B	M1-4(24)	2	US ROUTE (2 - Digit Sign) - 24x24	24	24		REMOVE	2										"13"
1589	SS-19	32C	M5-1 L	1	ADVANCE TURN ARROW (Left - 90)	21	15		REMOVE	1										
1508	SS-19	32D	M3-1(24)	1	CARDINAL DIRECTION - NORTH - 24x12	24	12		REMOVE	1										
1604	SS-19	32E	M6-1 R(21)	1	DIRECTIONAL ARROW (Right) - 21x15	21	15		REMOVE	1										
1514	SS-19	33A	M3-3(24)	1	CARDINAL DIRECTION - SOUTH - 24x12	24	12	2.0	NEW		1				SOIL	1				
1484	SS-19	33B	M1-4(24)	2	US ROUTE (2 - Digit Sign) - 24x24	24	24	8.0	ADD TO ASSEMBLY		2									"13"
1589	SS-19	33C	M5-1 L	1	ADVANCE TURN ARROW (Left - 90)	21	15	2.2	ADD TO ASSEMBLY		1									
1508	SS-19	33D	M3-1(24)	1	CARDINAL DIRECTION - NORTH - 24x12	24	12	2.0	NEW		1				SOIL	1				
1604	SS-19	33E	M6-1 R(21)	1	DIRECTIONAL ARROW (Right) - 21x15	21	15	2.2	ADD TO ASSEMBLY		1									
8	SS-19	34	R1-2(36)	1	YIELD	36	36		REMOVE	1										
9	SS-19	35	R1-2(48)	1	YIELD	48	48	6.9	NEW		1				SOIL	1				Install on a single post
252	SS-19	36	R3-20-DE	1	TURN LANE	18	18	2.3	NEW		1				NEW CONCRETE	1				
1924	SS-19	37A	EM-1-DE	1	EVACUATION ROUTE	24	24		REMOVE	1										
1618	SS-19	37B	M6-3(B)	1	DIRECTIONAL ARROW (Up) - 12x9	12	9		REMOVE	1										
1924	SS-19	38A	EM-1-DE	1	EVACUATION ROUTE	24	24	4.0	NEW		1				SOIL	1				
1618	SS-19	38B	M6-3(B)	1	DIRECTIONAL ARROW (Up) - 12x9	12	9	0.8	ADD TO ASSEMBLY		1									
	SS-20	1		1	ENTER (PRIVATE)	18	12		REMAIN											
1504	SS-20	2A	M2-1(21)	1	JUNCTION - 21x15	21	15		REMAIN											
1488	SS-20	2B	M1-5(24)	1	STATE ROUTE (2 - Digit Sign) - 24x24	24	24		REMAIN											"13"
1672	SS-20	3A	D3-1(8)	2	STREET NAME (1 Line) Intersection of two subdivision streets	24	8		REMAIN											"East St"
1672	SS-20	3B	D3-1(8)	2	STREET NAME (1 Line) Intersection of two subdivision streets	48	8		REMAIN											"Camden Wyoming Ave"
4	SS-20	3C	R1-1(36)	1	STOP	36	36		REMAIN											
1517	SS-20	4A	M3-4(24)	1	CARDINAL DIRECTION - WEST - 24x12	24	12		REMAIN											
1488	SS-20	4B	M1-5(24)	1	STATE ROUTE (2 - Digit Sign) - 24x24	24	24		REMAIN											"10"
1955	SS-20	5A	OM1-3	1	TYPE 1 OBJECT MARKER	18	18		REMAIN											
311	SS-20	5B	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30		REMAIN											
1955	SS-20	5C	OM1-3	1	TYPE 1 OBJECT MARKER	18	18		REMAIN											
392	SS-20	6A	R6-1 R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12		REMAIN											
110	SS-20	6B	R3-2(24)	1	LEFT TURN PROHIBITION (Symbol) - 24x24	24	24		REMAIN											
311	SS-20	7	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	NEW		1				NEW CONCRETE	1				
833	SS-21	1A	W2-3 R(36)	1	SIDE ROAD (Oblique - Right) - 36x36	36	36		REMAIN											
1367	SS-21	1B	W16-8P	1	ADVANCE STREET NAME (1 - line plaque)	36	9		REMAIN											"Rising Sun Rd"
1653	SS-21	2	D1-2	1	DESTINATION (2 Line)	66	30					REMOVE	13.8							"(UP arrow) DOVER A.F.B. RISING SUN (45 deg arrow)"
1653	SS-21	3	D1-2	1	DESTINATION (2 Line)	66	30	13.8				NEW		13.8	SOIL	2				"(UP arrow) Dover A.F.B. Rising Sun (45 deg arrow)" Hwy D, 6"
252	SS-21	4	R3-20-DE	1	TURN LANE	18	18		REMAIN											
311	SS-21	5	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30		REMAIN											
8	SS-21	6	R1-2(36)	1	YIELD	36	36		REMAIN											
1673	SS-21	7A	D3-1(9)	2	STREET NAME (1 Line)	36	9		REMOVE	2										"Rising Sun Rd"
1673	SS-21	7B	D3-1(9)	2	STREET NAME (1 Line)	42	9		REMOVE	2										"W Lebanon Rd"
4	SS-21	7C	R1-1(36)	1	STOP	36	36		REMOVE	1										
1675	SS-21	8A	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									"Rising Sun Rd" Hwy B, 8"/6"
1675	SS-21	8B	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									"W Lebanon Rd" Hwy B, 8"/6"
4	SS-21	8C	R1-1(36)	1	STOP	36	36	7.5	NEW		1				EX. CONCRETE	1		1		
8	SS-21	9	R1-2(36)	1	YIELD	36	36		REMAIN											
1872	SS-21	10	D14-3-DE	1	ADOPT A HIGHWAY	24	18		REMAIN											"NDSTRUKTABLE ENT"
8	SS-21	11	R1-2(36)	1	YIELD	36	36		REMAIN											
394	SS-21	12	R6-1 L(36)	1	ONE WAY (ENCLOSED IN LEFT ARROW) - 36x12	36	12		REMAIN											
8	SS-21	13	R1-2(36)	1	YIELD	36	36		REMAIN											
					PAGE TOTALS			113		24	24		14	14		13	0	1	0	

PERMANENT SIGN SCHEDULE

NO.	SHEET NO.	PLAN IDENTIFIER	CODE	QTY.	DESCRIPTION	SIGN WIDTH (IN)	SIGN HEIGHT (IN)	SIGN AREA (SF)	ITEM 819018 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE POST (EACH)			ITEM 819019 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS (SF)			POST INSTALLATION TYPE	Code X11 12' Post (W/ Basepost) (EACH)	Code X11A 15' Post (W/ Basepost) (EACH)	ITEM 819016 4" HOLE, 0-6" (EACH)	ITEM 819017 4" HOLE, >6" (EACH)	REMARKS
									SIGN DISPOSITION	REMOVE	INSTALL	SIGN DISPOSITION	REMOVE	INSTALL						
136	SS-21	14	R3-7 L(30)	1	LEFT LANE MUST TURN LEFT - 30"x30"	30	30		REMAIN											
1517	SS-21	15A	M3-4(24)	1	CARDINAL DIRECTION - WEST - 24x12	24	12		REMAIN											
1488	SS-21	15B	M1-5(24)	1	STATE ROUTE (2 - Digit Sign) - 24x24	24	24		REMAIN											
1653	SS-21	16	D1-2	1	DESTINATION (2 Line)	72	30					REMOVE	15.0							"<-- HARRINGTON <-- SEAFORD "
1653	SS-21	17	D1-2	1	DESTINATION (2 Line)	66	30	13.8				NEW		13.8	SOIL	2				"<-- Harrington <-- Seaford " Hwy D, 6"
	SS-21	18		1	NO SOLICITING (PRIVATE)	18	12		REMOVE	1										
1660	SS-21	19A	D1-3	1	DESTINATION (3 Line)	60	42	17.5				NEW		17.5	SOIL	2				"(Up arrow) Camden (Up arrow) Wyoming Dover --> " Hwy D, 6"
	SS-21	19B		1	CAMDEN FRIENDS MEETING EST 1805, AHEAD (PRIVATE)	30	24	5.0				ADD TO ASSEMBLY		5.0						
1660	SS-21	20A	D1-3	1	DESTINATION (3 Line)	60	42					REMOVE	17.5							"(Up arrow) CAMDEN (Up arrow) WYOMING DOVER -->"
	SS-21	20B		1	CAMDEN FRIENDS MEETING EST 1805, AHEAD (PRIVATE)	30	24	5.0				REMOVE	5.0							
	SS-21	21A		1	NO THRU TRAFFIC (PRIVATE)	18	24		REMOVE	1										
	SS-21	21B		1	NO SOLICITING (PRIVATE)	18	12		REMOVE	1										
	SS-22	1A		1	WHATCOAT UNITED METHODIST CHURCH (PRIVATE)	24	40		REPOSITION	1	1									Relocate private sign
	SS-22	2B		1	CHRISTIAN PRE-SCHOOL (PRIVATE) - plaque	24	14		REPOSITION	1	1									Relocate private sign
1694	SS-22	1C	D4-3-DE	1	BUS STOP (DART)	12	18		REMOVE	1										"104"
878	SS-22	2A	W3-3(48)	2	SIGNAL AHEAD (Symbol) - 48x48	48	48					REMOVE	32.0							
1368b	SS-22	2B	W16-8aP	2	ADVANCE STREET NAME (3 - line plaque)	42	18					REMOVE	10.5							"<-- W Lebanon Rd Camden -->" Wyoming Ave"
1653	SS-22	3	D1-2	1	DESTINATION (2 Line)	72	30	15.0				NEW		15.0	NEW CONCRETE	2				"<-- Rising Sun <-- Dover AFB" Hwy D, 6"
1653	SS-22	4A	D1-2	1	DESTINATION (2 Line)	72	30					REMOVE	15.0							"<-- Rising Sun <-- Dover AFB"
252	SS-22	4B	R3-20-DE	1	TURN LANE	18	18		REMOVE	1										
252	SS-22	5	R3-20-DE	1	TURN LANE	18	18	2.3	NEW		1				NEW CONCRETE	1				
9	SS-22	6	R1-2(48)	1	YIELD	48	48	6.9	NEW		1				SOIL	1				Install on a single post
9	SS-22	7	R1-2(48)	1	YIELD	48	48		REMOVE	1										
1508	SS-22	8A	M3-1(24)	1	CARDINAL DIRECTION - NORTH - 24x12	24	12		REMOVE	1										
1484	SS-22	8B	M1-4(24)	2	US ROUTE (2 - Digit Sign) - 24x24	24	24		REMOVE	2										"13"
1589	SS-22	8C	M5-1 L	1	ADVANCE TURN ARROW (Left - 90)	21	15		REMOVE	1										
1604	SS-22	8D	M6-1 R(21)	1	DIRECTIONAL ARROW (Right) - 21x15	21	15		REMOVE	1										
1508	SS-22	9A	M3-1(24)	1	CARDINAL DIRECTION - NORTH - 24x12	24	12	2.0	NEW		1				SOIL	1				
1484	SS-22	9B	M1-4(24)	2	US ROUTE (2 - Digit Sign) - 24x24	24	24	8.0	ADD TO ASSEMBLY		2									"13"
1589	SS-22	9C	M5-1 L	1	ADVANCE TURN ARROW (Left - 90)	21	15	2.2	ADD TO ASSEMBLY		1									
1514	SS-22	9D	M3-3(24)	1	CARDINAL DIRECTION - SOUTH - 24x12	24	12	2.0	NEW		1				SOIL	1				
1604	SS-22	9E	M6-1 R(21)	1	DIRECTIONAL ARROW (Right) - 21x15	21	15	2.2	ADD TO ASSEMBLY		1									
304	SS-22	10	R4-4	1	BEGIN RIGHT TURN LANE YIELD TO BIKES	36	30		REMOVE	1										
3	SS-22	11	R1-1(30)	1	STOP	30	30		REMAIN											
311	SS-22	12A	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30		REMOVE	1										
1955	SS-22	12B	OM1-3	1	TYPE 1 OBJECT MARKER	18	18		REMOVE	1										
42.5	SS-22	13	R2-1-25(30)	1	SPEED LIMIT (25 MPH - 30x36)	30	36	7.5	NEW		1				SOIL	1				
42	SS-22	14	R2-1-25(24)	1	SPEED LIMIT (25 MPH - 24x30)	24	30		REMOVE	1										
9	SS-22	15	R1-2(48)	1	YIELD	48	48	6.9	NEW		1				SOIL	1				Install on a single post
311	SS-22	16	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	NEW		1				NEW CONCRETE	1				
9	SS-22	17	R1-2(48)	1	YIELD	48	48		REMOVE	1										
311	SS-22	18	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30		REMOVE	1										
358	SS-22	19	R5-1(30)	2	DO NOT ENTER - 30x30	30	30		REMOVE	2										
1504	SS-22	20A	M2-1(21)	1	JUNCTION - 21x15	21	15		REMOVE	1										
1488	SS-22	20B	M1-5(24)	1	STATE ROUTE (2 - Digit Sign) - 24x24	24	24		REMOVE	1										"10"
359	SS-22	21A	R5-1(36)	1	DO NOT ENTER - 36x36	36	36	9.0	ADD TO ASSEMBLY		1									
1504	SS-22	21B	M2-1(21)	1	JUNCTION - 21x15	21	15	2.2	NEW		1				SOIL	1				
1488	SS-22	21C	M1-5(24)	1	STATE ROUTE (2 - Digit Sign) - 24x24	24	24	4.0	ADD TO ASSEMBLY		1									"10"
359	SS-22	22	R5-1(36)	1	DO NOT ENTER - 36x36	36	36	9.0	NEW		1				NEW CONCRETE	1				
362	SS-22	23	R5-1a(36)	2	WRONG WAY - 36x24	36	24		REMOVE	2										
363	SS-22	24	R5-1a(42)	2	WRONG WAY - 42x30	42	30	17.5	NEW		2				SOIL	2				
876	SS-22	25	W3-3(18)	1	SIGNAL AHEAD (Symbol) - 18x18	18	18		REMOVE	1										
1508	SS-22	26A	M3-1(24)	1	CARDINAL DIRECTION - NORTH - 24x12	24	12		REMOVE	1										
1484	SS-22	26B	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24		REMOVE	1										"13"
1508	SS-22	27A	M3-1(24)	1	CARDINAL DIRECTION - NORTH - 24x12	24	12	2.0	NEW		1				SOIL	1				
1484	SS-22	27B	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24	4.0	ADD TO ASSEMBLY		1									"13"
	SS-22	28		1	NO THRU TRAFFIC (PRIVATE)	18	24		REMOVE	1										
1669	SS-22	29	D2-2	1	DISTANCE (2 Line)	54	30	11.3				NEW		11.3	SOIL	2				"Dover 3 Smyrna 15" Hwy D, 6"
1669	SS-22	30A	D2-2	1	DISTANCE (2 Line)	54	30					REMOVE	11.3							"Dover 3 Smyrna 15"
1694	SS-22	30B	D4-3-DE	1	BUS STOP (DART)	12	18		REMOVE	1										"104" & "303"
363	SS-22	31A	R5-1a(42)	1	WRONG WAY - 42x30	42	30	8.8	NEW		1				NEW CONCRETE	1				
363	SS-22	31B	R5-1a(42)	1	WRONG WAY - 42x30	42	30	8.8	NEW		1				SOIL	1				
362	SS-22	32	R5-1a(36)	2	WRONG WAY - 36x24	36	24		REMOVE	2										
					PAGE TOTALS			178		32	23		106	63		22	0	0	0	

PERMANENT SIGN SCHEDULE

NO.	SHEET NO.	PLAN IDENTIFIER	CODE	QTY.	DESCRIPTION	SIGN WIDTH (IN)	SIGN HEIGHT (IN)	SIGN AREA (SF)	ITEM 819018 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE POST (EACH)			ITEM 819019 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS (SF)			POST INSTALLATION TYPE	Code X11 12' Post (W/ Basepost) (EACH)	Code X11A 15' Post (W/ Basepost) (EACH)	ITEM 819016 4" HOLE, 0-6" (EACH)	ITEM 819017 4" HOLE, >6" (EACH)	REMARKS
									SIGN DISPOSITION	REMOVE	INSTALL	SIGN DISPOSITION	REMOVE	INSTALL						
359	SS-22	33A	R5-1(36)	1	DO NOT ENTER - 36x36	36	36	9.0	NEW		1				NEW CONCRETE	1				
359	SS-22	33B	R5-1(36)	1	DO NOT ENTER - 36x36	36	36	9.0	NEW		1				SOIL	1				
311	SS-22	34	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	NEW		1				NEW CONCRETE	1				
358	SS-22	35	R5-1(30)	2	DO NOT ENTER - 30x30	30	30		REMOVE	2										
311	SS-22	36	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	NEW		1				NEW CONCRETE	1				
9	SS-22	37	R1-2(48)	1	YIELD	48	48	6.9	NEW		1				SOIL	1				Install on a single post
63	SS-22	38	R2-1-50(36)	2	SPEED LIMIT (50 MPH - 36x48)	36	48		REMOVE	2										
110	SS-22	39	R3-2(24)	1	LEFT TURN PROHIBITION (Symbol) - 24x24	24	24		REMOVE	1										
311	SS-22	40	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	NEW		1				NEW CONCRETE	1				
362	SS-22	41	R5-1a(36)	2	WRONG WAY - 36x24	36	24		REMOVE	2										
4	SS-22	42	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
304	SS-23	1	R4-4	1	BEGIN RIGHT TURN LANE YIELD TO BIKES	36	30		REMOVE	1										
4	SS-23	2	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
4	SS-23	3	R1-1(36)	1	STOP	36	36		REMOVE	1										
311	SS-23	4A	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30		REMOVE	1										
1955	SS-23	4B	OM1-3	1	TYPE 1 OBJECT MARKER	18	18		REMOVE	1										
394	SS-23	5	R6-1 L(36)	1	ONE WAY (ENCLOSED IN LEFT ARROW) - 36x12	36	12		REMOVE	1										
358	SS-23	6	R5-1(30)	1	DO NOT ENTER - 30x30	30	30		REMOVE	1										
	SS-23	7A		1					REMOVE	1										
121	SS-23	7B	R3-4(36)	1	U - TURN PROHIBITION (Symbol) - 36x36	36	36		REMOVE	1										
693	SS-23	8	SR1-15-DE	1	STATE PROPERTY NO TRESPASSING	24	12		REMOVE	1										
4	SS-23	9	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
4	SS-23	10	R1-1(36)	1	STOP	36	36		REMOVE	1										
1691	SS-23	11A	D4-2(30)	1	PARK & RIDE - 30x36	30	36	7.5	NEW		1				SOIL	1				
1694	SS-23	11B	D4-3-DE	1	BUS STOP (DART)	12	18		ADD TO ASSEMBLY		1									"104" & "303"
1691	SS-23	12A	D4-2(30)	1	PARK & RIDE - 30x36	30	36		REMOVE	1										
1694	SS-23	12B	D4-3-DE	1	BUS STOP (DART)	12	18		REMOVE	1										"104" & "303"
4	SS-23	13	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
252	SS-23	14	R3-20-DE	1	TURN LANE	18	18	2.3	NEW		1				NEW CONCRETE	1				
252	SS-23	15	R3-20-DE	1	TURN LANE	18	18		REMOVE	1										
1660	SS-23	16	D1-3	1	DESTINATION (3 Line)	54	42	15.8				NEW		15.8	SOIL	2				"Rising Sun Dover A.F.B. Keep Left" Hwy D, 6"
1660	SS-23	17	D1-3	1	DESTINATION (3 Line)	54	42		REMOVE	1										"Rising Sun Dover A.F.B. Keep Left"
358	SS-23	18	R5-1(30)	1	DO NOT ENTER - 30x30	30	30		REMOVE	1										
359	SS-23	19A	R5-1(36)	1	DO NOT ENTER - 36x36	36	36		REMOVE	1										
110	SS-23	19B	R3-2(24)	1	LEFT TURN PROHIBITION (Symbol) - 24x24	24	24		REMOVE	1										
394	SS-23	20	R6-1 L(36)	1	ONE WAY (ENCLOSED IN LEFT ARROW) - 36x12	36	12		REMOVE	1										
4	SS-23	21A	R1-1(36)	1	STOP	36	36		REMOVE	1										
105	SS-23	21B	R3-1(24)	1	RIGHT TURN PROHIBITION (Symbol) - 24x24	24	24		REMOVE	1										
4	SS-23	22	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
59	SS-23	23	R2-1-45(36)	2	SPEED LIMIT (45 MPH - 36x48)	36	48	24.0				NEW		24.0	SOIL	4				
252	SS-23	24	R3-20-DE	1	TURN LANE	18	18	2.3	NEW		1				SOIL	1				
252	SS-23	25	R3-20-DE	1	TURN LANE	18	18		REMOVE	1										
447	SS-23	26A	R7-202aP-DE	1	BEGIN (plaque - red)	12	6	0.5	NEW		1				SOIL	1				
424	SS-23	26B	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24	3.0	ADD TO ASSEMBLY		1									
447	SS-23	27A	R7-202aP-DE	1	BEGIN (plaque - red)	12	6		REMOVE	1										
424	SS-23	27B	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24		REMOVE	1										
1694	SS-23	27C	D4-3-DE	1	BUS STOP (DART)	12	18		REMOVE	1										"104" & "303"
4	SS-23	28	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
4	SS-23	29	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
4	SS-24	1	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
63	SS-24	2	R2-1-50(36)	2	SPEED LIMIT (50 MPH - 36x48)	36	48					REMOVE	24.0							
110	SS-24	3	R3-2(24)	1	LEFT TURN PROHIBITION (Symbol) - 24x24	24	24		REMOVE	1										
358	SS-24	4A	R5-1(30)	1	DO NOT ENTER - 30x30	30	30		REMOVE	1										
8	SS-24	4B	R1-2(36)	1	YIELD	36	36		REMOVE	1										
9	SS-24	5	R1-2(48)	1	YIELD	48	48	6.9	NEW		1				SOIL	1				Install on a single post
358	SS-24	6A	R5-1(30)	1	DO NOT ENTER - 30x30	30	30		REMOVE	1										
1514	SS-24	6B	M3-3(24)	1	CARDINAL DIRECTION - SOUTH - 24x12	24	12		REMAIN											
1484	SS-24	6C	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24		REMAIN											"13"
1604	SS-24	6D	M6-1 R(21)	1	DIRECTIONAL ARROW (Right) - 21x15	21	15		REMAIN											
359	SS-24	7	R5-1(36)	1	DO NOT ENTER - 36x36	36	36	9.0	NEW		1				SOIL	1				
392	SS-24	8	R6-1 R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12		REMAIN											
358	SS-24	9A	R5-1(30)	1	DO NOT ENTER - 30x30	30	30		REMOVE	1										
1508	SS-24	9B	M3-1(24)	1	CARDINAL DIRECTION - NORTH - 24x12	24	12		REMOVE	1										
1484	SS-24	9C	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24		REMOVE	1										
1589	SS-24	9D	M5-1 L	1	ADVANCE TURN ARROW (Left - 90)	21	15		REMOVE	1										
					PAGE TOTALS			171		39	22		24	40		26	0	0	0	

PERMANENT SIGN SCHEDULE

NO.	SHEET NO.	PLAN IDENTIFIER	CODE	QTY.	DESCRIPTION	SIGN WIDTH (IN)	SIGN HEIGHT (IN)	SIGN AREA (SF)	ITEM 819018 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE POST (EACH)			ITEM 819019 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS (SF)			POST INSTALLATION TYPE	Code X11 12' Post (W/ Basepost) (EACH)	Code X11A 15' Post (W/ Basepost) (EACH)	ITEM 819016 4" HOLE, 0-6" (EACH)	ITEM 819017 4" HOLE, >6" (EACH)	REMARKS
									SIGN DISPOSITION	REMOVE	INSTALL	SIGN DISPOSITION	REMOVE	INSTALL						
363	SS-24	10	R5-1a(42)	1	WRONG WAY - 42x30	42	30	8.8	NEW		1				SOIL	1				
394	SS-24	11A	R6-1 L(36)	1	ONE WAY (ENCLOSED IN LEFT ARROW) - 36x12	36	12		REMOVE	1										
1673	SS-24	11B	D3-1(9)	2	STREET NAME (1 Line)	36	9		REMOVE	2										"Caboose Rd"
1673	SS-24	11C	D3-1(9)	2	STREET NAME (1 Line)	36	9		REMOVE	2										"S Dupont Hwy"
392	SS-24	11D	R6-1 R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12		REMOVE	1										
4	SS-24	11E	R1-1(36)	1	STOP	36	36		REMOVE	1										
408	SS-24	11F	R6-3a(30)	1	DIVIDED HIGHWAY CROSSING (T - Intersection) - 30x24	30	24		REMOVE	1										
359	SS-24	12	R5-1(36)	1	DO NOT ENTER - 36x36	36	36	9.0	NEW		1				SOIL	1				
358	SS-24	13A	R5-1(30)	1	DO NOT ENTER - 30x30	30	30		REMOVE	1										
105	SS-24	13B	R3-1(24)	1	RIGHT TURN PROHIBITION (Symbol) - 24x24	24	24		REMOVE	1										
106	SS-24	14	R3-1(36)	1	RIGHT TURN PROHIBITION (Symbol) - 36x36	36	36	9.0	NEW		1				SOIL	1				
424	SS-24	15	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24	3.0	NEW		1				SOIL	1				
424	SS-24	16	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24		REMOVE	1										
9	SS-24	17	R1-2(48)	1	YIELD	48	48	6.9	NEW		1				NEW CONCRETE	1				Install on a single post
111	SS-24	18	R3-2(36)	1	LEFT TURN PROHIBITION (Symbol) - 36x36	36	36	9.0	NEW		1				NEW CONCRETE	1				
8	SS-24	19	R1-2(36)	1	YIELD	36	36		REMOVE	1										
392	SS-24	20	R6-1 R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12	3.0	NEW		1				SOIL	1				
4	SS-24	21	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
903	SS-24	22A	W4-1 L(36)	1	MERGE (Left) - 36x36	36	36		REMOVE	1										
110	SS-24	22B	R3-2(24)	1	LEFT TURN PROHIBITION (Symbol) - 24x24	24	24		REMOVE	1										
358	SS-24	23	R5-1(30)	1	DO NOT ENTER - 30x30	30	30		REMOVE	1										
1653	SS-24	24A	D1-2-MOD	1	DESTINATION (2 Line)	36	16		REMOVE	1										"CARTER --> "
424	SS-24	24B	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24		REMOVE	1										
424	SS-24	25	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24	3.0	NEW		1				SOIL	1				
1445	SS-24	26A	W21-11-DE	1	WATCH CHILDREN (Symbol)	30	30		REMAIN											
42	SS-24	26B	R2-1-25(24)	1	SPEED LIMIT (25 MPH - 24x30)	24	30		REMAIN											
1674	SS-24	27A	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	42	12		REMOVE	2										"Shamrock Ave"
1674	SS-24	27B	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	42	12		REMOVE	2										"S Dupont Hwy"
1675	SS-24	27C	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	42	18	10.5	ADD TO ASSEMBLY		2									"Shamrock Ave" Hwy B, 8"/6"
1675	SS-24	27D	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									"S Dupont Hwy" Hwy B, 6"/8"/6"
4	SS-24	27E	R1-1(36)	1	STOP	36	36		REPOSITION	1	1									
440	SS-25	1	R7-107-DE(12)	1	NO PARKING (Blank) - 12"x18"	12	18		REMAIN											"DURING SCHOOL HOURS" "20"
1997	SS-25	2	S5-1-DE(24)	1	SCHOOL SPEED LIMIT XX WHEN CHILDREN ARE PRESENT - 24x54	24	54		REMAIN											
1966	SS-25	3A	S1-1(36)	1	SCHOOL SIGN (Symbol) - 36x36	36	36		REMAIN											
1981	SS-25	3B	S4-3P(24)	1	SCHOOL - 24x8	24	8		REMAIN											
1320	SS-25	4A	W14-2(30)	1	NO OUTLET - 30x30	30	30		REMOVE	1										
	SS-25	4B		1	PLEASE DRIVE SLOWLY! WE LOVE OUR CHILDREN!	18	24		REMOVE	1										
1672	SS-25	4C	D3-1(8)	1	STREET NAME (1 Line) Intersection of two subdivision streets	24	8		REMOVE	1										"CHAPEL DR"
1672	SS-25	4D	D3-1(8)	1	STREET NAME (1 Line) Intersection of two subdivision streets	36	8		REMOVE	1										"OLD CAMDEN RD"
3	SS-25	4E	R1-1(30)	1	STOP	30	30		REMOVE	1										
1674	SS-25	5A	D3-1(12)	1	STREET NAME (1 Line) Posted speed ≤ 40 MPH	36	12	3.0	ADD TO ASSEMBLY		1									"Chapel Dr" Hwy C, 6"/4"
1674	SS-25	5B	D3-1(12)	1	STREET NAME (1 Line) Posted speed ≤ 40 MPH	48	12	4.0	ADD TO ASSEMBLY		1									"Old Camden Dr" Hwy C, 6"/4"
1323	SS-25	5C	W14-2a R	1	NO OUTLET (Arrow right)	36	8	2.0	ADD TO ASSEMBLY		1									
1324	SS-25	5D	W14-2a L	1	NO OUTLET (Arrow left)	36	8	2.0	ADD TO ASSEMBLY		1									
4	SS-25	5E	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				14' POST
1534	SS-25	6A	M4-5(24)	1	TO - 24x12	24	12		REMAIN											
1514	SS-25	6B	M3-3(24)	1	CARDINAL DIRECTION - SOUTH - 24x12	24	12	2.0	ADD TO ASSEMBLY		1									
1484	SS-25	6C	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24		REPOSITION	1	1									"13"
1605	SS-25	6D	M6-1 L(21)	1	DIRECTIONAL ARROW (Left) - 21x15	21	15		REPOSITION	1	1									
822	SS-25	7A	W2-2 R(30)	1	SIDE ROAD (Perpendicular - Right) - 30x30	30	30		REMAIN											
1367	SS-25	7B	W16-8P	1	ADVANCE STREET NAME (1 - line plaque)	30	9	1.9	ADD TO ASSEMBLY		1									"Caboose Rd"
424	SS-25	8	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24		REMAIN											
1999	SS-25	9	S5-2(24)	1	END SCHOOL ZONE - 24x30	24	30		REMAIN											
1674	SS-25	10A	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	36	12		REMOVE	2										"Caboose Ln"
1674	SS-25	10B	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	42	12	7.0	ADD TO ASSEMBLY		2									"Caboose Rd" Hwy C, 6"/4"
1534	SS-25	10C	M4-5(24)	1	TO - 24x12	24	12		REMOVE	1										
1514	SS-25	10D	M3-3(24)	1	CARDINAL DIRECTION - SOUTH - 24x12	24	12	2.0	ADD TO ASSEMBLY		1									
1484	SS-25	10E	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24		REPOSITION	1	1									"13"
1604	SS-25	10F	M6-1 R(21)	1	DIRECTIONAL ARROW (Right) - 21x15	21	15		REPOSITION	1	1									
9	SS-25	11	R1-2(48)	1	YIELD	48	48	6.9	NEW		1				SOIL	1				Install on a single post
870	SS-25	12A	W3-1(18)	1	STOP AHEAD (Symbol) - 18x18	18	18		REMAIN											
1367	SS-25	12B	W16-8P	1	ADVANCE STREET NAME (1 - line plaque)	42	9		REMAIN											"S Dupont Hwy"
363	SS-25	13	R5-1a(42)	1	WRONG WAY - 42x30	42	30	8.8	NEW		1				SOIL	1				
392	SS-25	14	R6-1 R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12		REMAIN											
1694	SS-26	1	D4-3-DE	1	BUS STOP (DART)	12	18		REMOVE	1										"104"
3	SS-26	2	R1-1(30)	1	STOP	30	30		REMOVE	1										
4	SS-26	3	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
3	SS-26	4	R1-1(30)	1	STOP	30	30		REMOVE	1										
4	SS-26	5	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
890	SS-26	6	W3-5(48)	1	SPEED REDUCTION (Symbol) - 48x48	48	48					REMAIN								
	PAGE TOTALS							144		37	32		0	0		14	0	0	0	

PERMANENT SIGN SCHEDULE

NO.	SHEET NO.	PLAN IDENTIFIER	CODE	QTY.	DESCRIPTION	SIGN WIDTH (IN)	SIGN HEIGHT (IN)	SIGN AREA (SF)	ITEM 819018 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE POST (EACH)			ITEM 819019 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS (SF)			POST INSTALLATION TYPE	Code X11 12' Post (W/ Basepost) (EACH)	Code X11A 15' Post (W/ Basepost) (EACH)	ITEM 819016 4" HOLE, 0-6" (EACH)	ITEM 819017 4" HOLE, >6" (EACH)	REMARKS
									SIGN DISPOSITION	REMOVE	INSTALL	SIGN DISPOSITION	REMOVE	INSTALL						
3	SS-26	7	R1-1(30)	1	STOP	30	30		REMAIN											
424	SS-26	8	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24	3.0	NEW		1				SOIL	1				
424	SS-26	9A	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24		REMOVE	1										
1694	SS-26	9B	D4-3-DE	1	BUS STOP (DART)	12	18		REMOVE	1										"104"
42	SS-26	10A	R2-1-25(24)	1	SPEED LIMIT (25 MPH - 24x30)	24	30		REMAIN											
1445	SS-26	10B	W21-11-DE	1	WATCH CHILDREN (Symbol)	30	30		REMAIN											
1674	SS-26	11A	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	24	12		REMOVE	2										"Steven St"
1674	SS-26	11B	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	42	12		REMOVE	2										"S Dupont Hwy"
1675	SS-26	11C	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	42	18	10.5	ADD TO ASSEMBLY		2									"Steven St" Hwy C, 8"/6"
1675	SS-26	11D	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									"S Dupont Hwy" Hwy B, 6"/8"/6"
4	SS-26	11E	R1-1(36)	1	STOP	36	36		REPOSITION	1	1				SOIL	1				
447	SS-26	12A	R7-202aP-DE	1	BEGIN (plaque - red)	12	6	0.5	NEW		1				SOIL	1				
442	SS-26	12B	R7-108	1	XX HR PARKING X:XX AM TO X:XX PM	12	18	1.5	ADD TO ASSEMBLY		1									"1" HR PARKING "ONLY"
447	SS-26	13A	R7-202aP-DE	1	BEGIN (plaque - red)	12	6		REMOVE	1										
442	SS-26	13B	R7-108	1	XX HR PARKING X:XX AM TO X:XX PM	12	18		REMOVE	1										"1" HR PARKING "ONLY"
137	SS-26	14	R3-7 L(36)	1	LEFT LANE MUST TURN LEFT - 36"x36"	36	36		REMOVE	1										
1674	SS-26	15A	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	24	12		REMOVE	2										"Robert St"
1674	SS-26	15B	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	36	12		REMOVE	2										"S Dupont Hwy"
1675	SS-26	15C	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	42	18	10.5	ADD TO ASSEMBLY		2									"Robert St" Hwy C, 8"/6"
1675	SS-26	15D	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									"S Dupont Hwy" Hwy B, 6"/8"/6"
4	SS-26	15E	R1-1(36)	1	STOP	36	36		REPOSITION	1	1				SOIL	1				
442	SS-26	16	R7-108	1	XX HR PARKING X:XX AM TO X:XX PM	12	18	1.5	NEW		1				SOIL	1				"1" HR PARKING "ONLY"
442	SS-26	17	R7-108	1	XX HR PARKING X:XX AM TO X:XX PM	12	18		REMOVE	1										"1" HR PARKING "ONLY"
1872	SS-27	1	D14-3-DE	1	ADOPT A HIGHWAY	24	18	3.0	NEW		1				SOIL	1				"CAMDEN VFW POST 3238" Hwy D, 2"
	SS-27	2A		1	ADOPT A HIGHWAY	18	12		REMOVE	1										
	SS-27	2B		1	ACKNOWLEDGEMENT - 18x12	18	12		REMOVE	1										"CAMDEN VFW POST 3238"
1523	SS-27	3A	M4-1a(24)	1	ALT - 24x12	24	12	2.0	NEW		1				SOIL	1				
1514	SS-27	3B	M3-3(24)	1	CARDINAL DIRECTION - SOUTH - 24x12	24	12	2.0	ADD TO ASSEMBLY		1									
1484	SS-27	3C	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24	4.0	ADD TO ASSEMBLY		1									"13"
50	SS-27	4	R2-1-35(24)	1	SPEED LIMIT (35 MPH - 24x30)	24	30		REMOVE	1										
50	SS-27	5	R2-1-35(24)	1	SPEED LIMIT (35 MPH - 24x30)	24	30	5.0	NEW		1				SOIL	1				
	SS-27	6A		1	ALL TRAFFIC (Right Arrow)	48	36	12.0				REMOVE	12.0							
780	SS-27	6B	W1-8(18)	2	CHEVRON ALIGNMENT - 18x24	18	24		REMOVE	2										
	SS-27	7A		1	ALL TRAFFIC (Right Arrow)	48	36	12.0				NEW		12.0	SOIL	2				
780	SS-27	7B	W1-8(18)	2	CHEVRON ALIGNMENT - 18x24	18	24	6.0	ADD TO ASSEMBLY		2									
4	SS-27	8A	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
111	SS-27	8B	R3-2(36)	1	LEFT TURN PROHIBITION (Symbol) - 36x36	36	36	9.0	ADD TO ASSEMBLY		1									
3	SS-27	9A	R1-1(30)	1	STOP	30	30		REMOVE	1										
110	SS-27	9B	R3-2(24)	1	LEFT TURN PROHIBITION (Symbol) - 24x24	24	24		REMOVE	1										
1523	SS-27	10A	M4-1a(24)	1	ALT - 24x12	24	12		REMOVE	1										
1514	SS-27	10B	M3-3(24)	1	CARDINAL DIRECTION - SOUTH - 24x12	24	12		REMOVE	1										
1484	SS-27	10C	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24		REMOVE	1										"13"
	SS-27	10D		1	TOWN BUSINESS LICENSE REQUIRED FOR ALL CONTRACTORS	12	18		REMOVE	1										
63	SS-27	11A	R2-1-50(36)	2	SPEED LIMIT (50 MPH - 36x48)	36	48					REMOVE	24.0							
1447	SS-27	11B	W21-12P-DE	2	STRICTLY ENFORCED (plaque)	36	24					REMOVE	12.0							
8	SS-27	12	R1-2(36)	1	YIELD	36	36		REMOVE	1										
9	SS-27	13	R1-2(48)	1	YIELD	48	48	6.9	NEW		1				NEW CONCRETE	1				Install on a single post
8	SS-27	14	R1-2(36)	1	YIELD	36	36		REMOVE	1										
1514	SS-27	15A	M3-3(24)	1	CARDINAL DIRECTION - SOUTH - 24x12	24	12		REMOVE	1										
1484	SS-27	15B	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24		REMOVE	1										"13"
1514	SS-27	16A	M3-3(24)	1	CARDINAL DIRECTION - SOUTH - 24x12	24	12	2.0	NEW		1				SOIL	1				
1484	SS-27	16B	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24	4.0	ADD TO ASSEMBLY		1									"13"
1669	SS-27	17	D2-2	1	DISTANCE (2 Line)	60	30	12.5				NEW		12.5	SOIL	2				"Felton 9 Harrington 14" Hwy D, 6"
1669	SS-27	18	D2-2	1	DISTANCE (2 Line)	66	30					REMOVE	13.8							"FELTON 9 HARRINGTON 15"
871	SS-27	19A	W3-1(30)	1	STOP AHEAD (Symbol) - 30x30	30	30		REMAIN											
1367	SS-27	19B	W16-8P	1	ADVANCE STREET NAME (1 - line plaque)	36	9	2.3	ADD TO ASSEMBLY		1									"S Dupont Hwy" Hwy B, 6"/8"/6"
392	SS-27	20	R6-1 R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12		REMOVE	1										
392	SS-27	21	R6-1 R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12	3.0	NEW		1				SOIL	1				
447	SS-27	22A	R7-202aP-DE	1	BEGIN (plaque - red)	12	6		REMOVE	1										
424	SS-27	22B	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24		REMOVE	1										
	SS-27	22C		1	END (plaque - green)	12	4		REMOVE	1										
442	SS-27	22D	R7-108	1	XX HR PARKING X:XX AM TO X:XX PM	12	18		REMOVE	1										"1" HR PARKING "ONLY"
447	SS-27	23A	R7-202aP-DE	1	BEGIN (plaque - red)	12	6	0.5	NEW		1				SOIL	1				
424	SS-27	23B	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24	3.0	ADD TO ASSEMBLY		1									
	SS-27	23C		1	END (plaque - green)	12	4	0.3	ADD TO ASSEMBLY		1									
442	SS-27	23D	R7-108	1	XX HR PARKING X:XX AM TO X:XX PM	12	18	1.5	ADD TO ASSEMBLY		1									"1" HR PARKING "ONLY"
					PAGE TOTALS			150		36	32		62	25		17	0	0	0	

PERMANENT SIGN SCHEDULE

NO.	SHEET NO.	PLAN IDENTIFIER	CODE	QTY.	DESCRIPTION	SIGN WIDTH (IN)	SIGN HEIGHT (IN)	SIGN AREA (SF)	ITEM 819018 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE POST (EACH)			ITEM 819019 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS (SF)			POST INSTALLATION TYPE	Code X11 12' Post (W/ Basepost) (EACH)	Code X11A 15' Post (W/ Basepost) (EACH)	ITEM 819016 4" HOLE, 0-6" (EACH)	ITEM 819017 4" HOLE, >6" (EACH)	REMARKS
									SIGN DISPOSITION	REMOVE	INSTALL	SIGN DISPOSITION	REMOVE	INSTALL						
	SS-27	24		1	NO THRU TRAFFIC (PRIVATE)	24	30		REMOVE	1										
418	SS-27	25A	R7-1	1	NO PARKING ANY TIME	12	18		REMOVE	1										
445	SS-27	25B	R7-201P R	1	TOW AWAY ZONE (plaque - red)	12	6		REMOVE	1										
4	SS-27	26	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
424	SS-27	27	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24		REMOVE	1										
424	SS-27	28	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24	3.0	NEW		1				SOIL	1				
42	SS-27	29	R2-1-25(24)	1	SPEED LIMIT (25 MPH - 24x30)	24	30		REMAIN											
1674	SS-27	30A	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	24	12		REMOVE	2										"Howell St"
1674	SS-27	30B	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	42	12		REMOVE	2										"S Dupont Hwy"
1675	SS-27	30C	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	42	18	10.5	ADD TO ASSEMBLY		2									"Howell St" Hwy C, 8"/6"
1675	SS-27	30D	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									"S Dupont Hwy" Hwy B, 6"/8"/6"
4	SS-27	30E	R1-1(36)	1	STOP	36	36		REPOSITION	1	1				SOIL	1				
448	SS-27	31A	R7-202aP-DE1	1	END (plaque - red)	12	6		REMOVE	1										
424	SS-27	31B	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24		REMOVE	1										
448	SS-27	32A	R7-202aP-DE1	1	END (plaque - red)	12	6	0.5	NEW		1				SOIL	1				
424	SS-27	32B	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24	3.0	ADD TO ASSEMBLY		1									
137	SS-27	33	R3-7 L(36)	1	LEFT LANE MUST TURN LEFT - 36"x36"	36	36		REMOVE	1										
137	SS-27	34	R3-7 L(36)	2	LEFT LANE MUST TURN LEFT - 36"x36"	36	36		REMOVE	2										
42	SS-27	35A	R2-1-25(24)	1	SPEED LIMIT (25 MPH - 24x30)	24	30		REMAIN											
1445	SS-27	35B	W21-11-DE	1	WATCH CHILDREN (Symbol)	30	30		REMAIN											
111	SS-27	36	R3-2(36)	1	LEFT TURN PROHIBITION (Symbol) - 36x36	36	36	9.0	NEW		1				NEW CONCRETE	1				
1674	SS-27	37A	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	36	12		REMOVE	2										"Asbury Ave"
1674	SS-27	37B	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	48	12		REMOVE	2										"S Dupont Hwy"
1675	SS-27	37C	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									"Asbury Ave" Hwy C, 8"/6"
1675	SS-27	37D	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									"S Dupont Hwy" Hwy B, 6"/8"/6"
4	SS-27	37E	R1-1(36)	1	STOP	36	36		REPOSITION	1	1				SOIL	1				
252	SS-28	1	R3-20-DE	1	TURN LANE	18	18	2.3	NEW		1				NEW CONCRETE	1				
392	SS-28	2	R6-1 R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12	3.0	NEW		1				NEW CONCRETE	1				
392	SS-28	3	R6-1 R(36)		ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12		REMOVE											
1514	SS-28	4A	M3-3(24)	1	CARDINAL DIRECTION - SOUTH - 24x12	24	12	2.0	NEW		1				SOIL	1				
1484	SS-28	4B	M1-4(24)	2	US ROUTE (2 - Digit Sign) - 24x24	24	24	8.0	ADD TO ASSEMBLY		2									"13"
1619	SS-28	4C	M6-3(21)	1	DIRECTIONAL ARROW (Up) - 21x15	21	15	2.2	ADD TO ASSEMBLY		1									
1523	SS-28	4D	M4-1a(24)	1	ALT - 24x12	24	12	2.0	NEW		1				SOIL	1				
1610	SS-28	4E	M6-2 R(21)	1	DIRECTIONAL ARROW (Right - upward 45) - 21x15	21	15	2.2	ADD TO ASSEMBLY		1									"13"
1514	SS-28	5A	M3-3(24)	1	CARDINAL DIRECTION - SOUTH - 24x12	24	12		REMOVE	1										
1484	SS-28	5B	M1-4(24)	2	US ROUTE (2 - Digit Sign) - 24x24	24	24		REMOVE	2										"13"
1619	SS-28	5C	M6-3(21)	1	DIRECTIONAL ARROW (Up) - 21x15	21	15		REMOVE	1										
1523	SS-28	5D	M4-1a(24)	1	ALT - 24x12	24	12		REMOVE	1										
1610	SS-28	5E	M6-2 R(21)	1	DIRECTIONAL ARROW (Right - upward 45) - 21x15	21	15		REMOVE	1										
1653	SS-28	6A	D1-2	1	DESTINATION (2 Line)	84	30					REMOVE	17.5							"CAESAR RODNEY HIGH SCHOOL (45 deg arrow)"
	SS-28	6B		1	ENGINE/EXHAUST BRAKE DEVICE PROHIBITED	36	18		REMOVE	1										
	SS-28	6C		1	ENTERING THE CORPORATE LIMITS OF CAMDEN	36	18		REMOVE	1										
1653	SS-28	7A	D1-2	1	DESTINATION (2 Line)	66	30	13.8				NEW		13.8	SOIL	2				"Caesar Rodney High School (45 deg arrow)"
	SS-28	7B	D1-2-MOD	1	DESTINATION (2 Line) - Brown	66	30	13.8				ADD TO ASSEMBLY		13.8						"Brecknock County Park (45 deg arrow)"
	SS-28	8A		1	ENTERING THE CORPORATE LIMITS OF CAMDEN	36	24		REMOVE	1										
1653	SS-28	8B	D1-2-MOD	1	DESTINATION (2 Line)	30	16		REMOVE	1										"CARTER <-- "
252	SS-28	8C	R3-20-DE	1	TURN LANE	18	18		REMOVE	1										
252	SS-28	9	R3-20-DE	1	TURN LANE	18	18	2.3	NEW		1				NEW CONCRETE	1				
59	SS-28	10A	R2-1-45(36)	1	SPEED LIMIT (45 MPH - 36x48)	36	48	12.0				NEW		12.0	SOIL	2				
59	SS-28	10B	R2-1-45(36)	1	SPEED LIMIT (45 MPH - 36x48)	36	48	12.0				NEW		12.0	NEW CONCRETE	2				
	SS-28	11A		1	DESTINATION (2 Line) - Brown	42	18					REMOVE	5.3							"Brecknock County Park (45 deg arrow)"
	SS-28	11B		1	CAMDEN POST 3238 WELCOMES YOU (PRIVATE)	20	30		REMOVE	1										
1610	SS-28	11C	M6-2 R(21)	1	DIRECTIONAL ARROW (Right - upward 45) - 21x15	21	15		REMOVE	1										
1694	SS-28	12	D4-3-DE	1	BUS STOP (DART)	12	18		NEW		1				SOIL	1				"104"
1653	SS-28	13	D1-2	1	DESTINATION (2 Line)	60	30					REMOVE	12.5							"Camden (45 deg arrow) Wyoming (45 deg arrow)"
1653	SS-28	14A	D1-2	1	DESTINATION (2 Line)	60	30	12.5				NEW		12.5	SOIL	2				"Camden (45 deg arrow) Wyoming (45 deg arrow)" Hwy D, 6"
698	SS-28	14B	SR1-19-DE(42)	1	ENGINE COMPRESSION BRAKE PROHIBITION - 42x60	42	60	17.5				ADD TO ASSEMBLY		17.5						
1904	SS-28	14C	I-2-DE1	1	ENTERING CORPORATE LIMITS	36	24	6.0	ADD TO ASSEMBLY		1									"CAMDEN"
1827	SS-28	15	D10-2a(12)	1	INTERMEDIATE REFERENCE LOCATION (2- Digit) - 12x48	12	48		REMOVE	1										"47.0"
1824	SS-28	16	D10-2(12)	2	REFERENCE LOCATION (2- Digit) - 12x36	12	36	6.0	NEW		2				SOIL	2				"47"
4	SS-28	17	R1-1(36)	1	STOP	36	36		REMOVE	1										
4	SS-28	18	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
878	SS-28	19A	W3-3(48)	1	SIGNAL AHEAD (Symbol) - 48x48	48	48					REMOVE	16.0							
1367	SS-28	19B	W16-8P	1	ADVANCE STREET NAME (1 - line plaque)	48	9		REMOVE	1										"Charles Polk Rd"
					PAGE TOTALS			194		35	29		51	82		23	0	0	0	

PERMANENT SIGN SCHEDULE

NO.	SHEET NO.	PLAN IDENTIFIER	CODE	QTY.	DESCRIPTION	SIGN WIDTH (IN)	SIGN HEIGHT (IN)	SIGN AREA (SF)	ITEM 819018 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE POST (EACH)			ITEM 819019 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS (SF)			POST INSTALLATION TYPE	Code X11 12' Post (W/ Basepost) (EACH)	Code X11A 15' Post (W/ Basepost) (EACH)	ITEM 819016 4" HOLE, 0-6" (EACH)	ITEM 819017 4" HOLE, >6" (EACH)	REMARKS
									SIGN DISPOSITION	REMOVE	INSTALL	SIGN DISPOSITION	REMOVE	INSTALL						
878	SS-28	20	W3-3(48)	1	SIGNAL AHEAD (Symbol) - 48x48	48	48					REMOVE	16.0							
4	SS-28	21	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
878	SS-28	22A	W3-3(48)	1	SIGNAL AHEAD (Symbol) - 48x48	48	48	16.0				NEW		16.0	NEW CONCRETE	2				
878	SS-28	22B	W3-3(48)	1	SIGNAL AHEAD (Symbol) - 48x48	48	48	16.0				NEW		16.0	SOIL	2				
1367	SS-28	22C	W16-8P	2	ADVANCE STREET NAME (1 - line plaque)	36	9	4.5				ADD TO ASSEMBLY		4.5						"POW-MIA Pkwy" Hwy C, 4"
1905	SS-28	23	I-2-DE2	1	NOW LEAVING CORPORATE LIMITS	36	24	6.0	NEW		1				SOIL	1				"CAMDEN"
1905	SS-28	24	I-2-DE2	1	NOW LEAVING CORPORATE LIMITS	36	24		REMOVE	1										"CAMDEN"
9	SS-29	1	R1-2(48)	1	YIELD	48	48	6.9	NEW		1				NEW CONCRETE	1				Install on a single post
392	SS-29	2A	R6-1 R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12	3.0	ADD TO ASSEMBLY		1									
394	SS-29	2B	R6-1 L(36)	1	ONE WAY (ENCLOSED IN LEFT ARROW) - 36x12	36	12	3.0	ADD TO ASSEMBLY		1									
408	SS-29	2C	R6-3a(30)	1	DIVIDED HIGHWAY CROSSING (T - Intersection) - 30x24	30	24	5.0	NEW		1				NEW CONCRETE	1				
1508	SS-29	3A	M3-1(24)	1	CARDINAL DIRECTION - NORTH - 24x12	24	12	2.0	NEW		1				SOIL	1				
1484	SS-29	3B	M1-4(24)	2	US ROUTE (2 - Digit Sign) - 24x24	24	24	8.0	ADD TO ASSEMBLY		2									"13"
1589	SS-29	3C	M5-1 L	1	ADVANCE TURN ARROW (Left - 90)	21	15	2.2	ADD TO ASSEMBLY		1									
1514	SS-29	3D	M3-3(24)	1	CARDINAL DIRECTION - SOUTH - 24x12	24	12	2.0	NEW		1				SOIL	1				
1604	SS-29	3E	M6-1 R(21)	1	DIRECTIONAL ARROW (Right) - 21x15	21	15	2.2	ADD TO ASSEMBLY		1									
311	SS-29	4	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	NEW		1				NEW CONCRETE	1				
110	SS-29	5A	R3-2(24)	1	LEFT TURN PROHIBITION (Symbol) - 24x24	24	24		REMOVE	1										
120	SS-29	5B	R3-4(24)	1	U - TURN PROHIBITION (Symbol) - 24x24	24	24		REMOVE	1										
359	SS-29	6A	R5-1(36)	1	DO NOT ENTER - 36x36	36	36	9.0	ADD TO ASSEMBLY		1									
135	SS-29	6B	R3-7 R(36)	1	RIGHT LANE MUST TURN RIGHT - 36"x36"	36	36	9.0	NEW		1				SOIL	1				
359	SS-29	7	R5-1(36)	1	DO NOT ENTER - 36x36	36	36	9.0	NEW		1				NEW CONCRETE	1				
363	SS-29	8A	R5-1a(42)	1	WRONG WAY - 42x30	42	30	8.8	NEW		1				SOIL	1				
363	SS-29	8B	R5-1a(42)	1	WRONG WAY - 42x30	42	30	8.8	NEW		1				NEW CONCRETE	1				
135	SS-29	9	R3-7 R(36)	1	RIGHT LANE MUST TURN RIGHT - 36"x36"	36	36		REMOVE	1										
135	SS-29	10	R3-7 R(36)	1	RIGHT LANE MUST TURN RIGHT - 36"x36"	36	36	9.0	NEW		1				SOIL	1				
311	SS-29	11	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	NEW		1				NEW CONCRETE	1				
311	SS-29	12	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	NEW		1				NEW CONCRETE	1				
311	SS-29	13	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	NEW		1				NEW CONCRETE	1				
63	SS-29	14	R2-1-50(36)	2	SPEED LIMIT (50 MPH - 36x48)	36	48					REMOVE	24.0							
59	SS-29	15A	R2-1-45(36)	1	SPEED LIMIT (45 MPH - 36x48)	36	48	12.0				NEW		12.0	NEW CONCRETE	2				
252	SS-29	15B	R3-20-DE	1	TURN LANE	18	18	2.3	ADD TO ASSEMBLY		1									
59	SS-29	16	R2-1-45(36)	1	SPEED LIMIT (45 MPH - 36x48)	36	48	12.0				NEW		12.0	SOIL	2				
	SS-30	1A		1	TRUCKS PROHIBITED - LOCAL TRAFFIC ONLY	72	42					REMOVE	21.0							"(135 deg arrow) Governors Ave"
252	SS-30	1B	R3-20-DE	1	TURN LANE	18	18		REMOVE	1										
1523	SS-30	2A	M4-1a(24)	1	ALT - 24x12	24	12	2.0	NEW		1				NEW CONCRETE	1				
1484	SS-30	2B	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24	4.0	ADD TO ASSEMBLY		1									"13"
1593	SS-30	2C	M5-2 L	1	ADVANCE TURN ARROW (Left - 45)	21	15	2.2	ADD TO ASSEMBLY		1									
1523	SS-30	3A	M4-1a(24)	1	ALT - 24x12	24	12		REMOVE	1										
1484	SS-30	3B	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24		REMOVE	1										"13"
1593	SS-30	3C	M5-2 L	1	ADVANCE TURN ARROW (Left - 45)	21	15		REMOVE	1										
1653	SS-30	4	D1-2	1	DESTINATION (2 Line)	36	16		REMOVE	1										"RODNEY → VILLAGE"
252	SS-30	5	R3-20-DE	1	TURN LANE	18	18	2.3	NEW		1				SOIL	1				
1687	SS-30	6	D3-2-DE3	1	DEVELOPMENT NAME	42	18	5.3				NEW		5.3	SOIL	2				"Rodney → Village"
	SS-30	7		1	TRUCKS PROHIBITED - LOCAL TRAFFIC ONLY	72	42	21.0				NEW		21.0	SOIL	2				"(135 deg arrow) Governors Ave"
878	SS-30	8A	W3-3(48)	2	SIGNAL AHEAD (Symbol) - 48x48	48	48	32.0				NEW		32.0	SOIL	4				
1367a	SS-30	8B	W16-8P	2	ADVANCE STREET NAME (1 - line plaque) (Oversized)	48	9	6.0				ADD TO ASSEMBLY		6.0						"POW-MIA Pkwy" Hwy C, 4"
878	SS-30	9A	W3-3(48)	1	SIGNAL AHEAD (Symbol) - 48x48	48	48					REMOVE	16.0							
1367a	SS-30	9B	W16-8P	1	ADVANCE STREET NAME (1 - line plaque) (Oversized)	48	9					REMOVE	3.0							"Charles Polk Rd"
135	SS-30	10	R3-7 R(36)	1	RIGHT LANE MUST TURN RIGHT - 36"x36"	36	36	9.0	NEW		1				SOIL	1				
878	SS-30	11	W3-3(48)	1	SIGNAL AHEAD (Symbol) - 48x48	48	48					REMOVE	16.0							
1504	SS-30	12A	M2-1(21)	1	JUNCTION - 21x15	21	15		REMOVE	1										
1523	SS-30	12B	M4-1a(24)	1	ALT - 24x12	24	12		REMOVE	1										
1484	SS-30	12C	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24		REMOVE	1										"13"
1504	SS-30	13A	M2-1(21)	1	JUNCTION - 21x15	21	15	2.2	NEW		1				SOIL	1				
1523	SS-30	13B	M4-1a(24)	1	ALT - 24x12	24	12	2.0	ADD TO ASSEMBLY		1									
1484	SS-30	13C	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24	4.0	ADD TO ASSEMBLY		1									"13"
1671	SS-30	14A	D3-1(6)	1	STREET NAME (1 Line)	48	6		REMOVE	1										"S TAYLOR DR"
1671	SS-30	14B	D3-1(6)	1	STREET NAME (1 Line)	48	6		REMOVE	1										"S Dupont Hwy"
392	SS-30	14C	R6-1 R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12		REMOVE	1										
3	SS-30	14D	R1-1(30)	1	STOP	30	30		REMOVE	1										
1675	SS-30	15A	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									"S Taylor Dr" Hwy C, 6"/8"/6"
1675	SS-30	15B	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									"S Dupont Hwy" Hwy B, 6"/8"/6"
392	SS-30	15C	R6-1 R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12	3.0	ADD TO ASSEMBLY		1									
4	SS-30	15D	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
1924	SS-30	16A	EM-1-DE	1	EVACUATION ROUTE	24	24		REMOVE	1										
1618	SS-30	16B	M6-3(B)	1	DIRECTIONAL ARROW (Up) - 12x9	12	9		REMOVE	1										
1924	SS-30	17A	EM-1-DE	1	EVACUATION ROUTE	24	24	4.0	NEW		1				SOIL	1				
1618	SS-30	17B	M6-3(B)	1	DIRECTIONAL ARROW (Up) - 12x9	12	9	0.8	ADD TO ASSEMBLY		1									
900	SS-31	1	W4-1 R(36)	1	MERGE (Right) - 36x36	36	36		REMOVE	1										
900	SS-31	2	W4-1 R(36)	1	MERGE (Right) - 36x36	36	36	9.0	NEW		1				NEW CONCRETE	1				
					PAGE TOTALS			324		19	40		96	125		38	0	0	0	

PERMANENT SIGN SCHEDULE

NO.	SHEET NO.	PLAN IDENTIFIER	CODE	QTY.	DESCRIPTION	SIGN WIDTH (IN)	SIGN HEIGHT (IN)	SIGN AREA (SF)	ITEM 819018 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE POST (EACH)			ITEM 819019 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS (SF)			POST INSTALLATION TYPE	Code X11 12' Post (W/ Basepost) (EACH)	Code X11A 15' Post (W/ Basepost) (EACH)	ITEM 819016 4" HOLE, 0-6" (EACH)	ITEM 819017 4" HOLE, >6" (EACH)	REMARKS
									SIGN DISPOSITION	REMOVE	INSTALL	SIGN DISPOSITION	REMOVE	INSTALL						
1514	SS-31	3A	M3-3(24)	1	CARDINAL DIRECTION - SOUTH - 24x12	24	12		REMOVE	1										
1484	SS-31	3B	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24		REMOVE	1										"13"
1619	SS-31	3C	M6-3(21)	1	DIRECTIONAL ARROW (Up) - 21x15	21	15		REMOVE	1										
1514	SS-31	4A	M3-3(24)	1	CARDINAL DIRECTION - SOUTH - 24x12	24	12	2.0	NEW		1				SOIL	1				
1484	SS-31	4B	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24	4.0	ADD TO ASSEMBLY		1									"13"
1619	SS-31	4C	M6-3(21)	1	DIRECTIONAL ARROW (Up) - 21x15	21	15	2.2	ADD TO ASSEMBLY		1									
1673	SS-31	5A	D3-1(9)	2	STREET NAME (1 Line)	36	9		REMOVE	2										"S DUPONT HWY"
1673	SS-31	5B	D3-1(9)	2	STREET NAME (1 Line)	48	9		REMOVE	2										"S GOVERNORS AVE"
105	SS-31	5C	R3-1(24)	1	RIGHT TURN PROHIBITION (Symbol) - 24x24	24	24		REMOVE	1										
1653	SS-31	6A	D1-2	1	DESTINATION (2 Line)	48	30					REMOVE	10.0							"SHOPPING CENTER <---"
424	SS-31	6B	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24		REMOVE	1										
106	SS-31	7A	R3-1(36)	1	RIGHT TURN PROHIBITION (Symbol) - 36x36	36	36	9.0	ADD TO ASSEMBLY		1									
359	SS-31	7B	R5-1(36)	1	DO NOT ENTER - 36x36	36	36	9.0	NEW		1				SOIL	1				
1498	SS-31	8A	M1-8(18)	1	BIKE ROUTE - 18x24	18	24	3.0	NEW		1				SOIL	1				
1602	SS-31	8B	M6-1 R(B)	1	DIRECTIONAL ARROW (Right) - 12x9	12	9	0.8	ADD TO ASSEMBLY		1									
1498	SS-31	9A	M1-8(18)	1	BIKE ROUTE - 18x24	18	24	3.0	NEW		1				SOIL	1				
1587	SS-31	9B	M5-1 L(B)	1	ADVANCE TURN ARROW (Left - 90)	12	9	0.8	ADD TO ASSEMBLY		1									
1498	SS-31	10A	M1-8(18)	1	BIKE ROUTE - 18x24	18	24	3.0	NEW		1				SOIL	1				
1618	SS-31	10B	M6-3(B)	1	DIRECTIONAL ARROW (Up) - 12x9	12	9	0.8	ADD TO ASSEMBLY		1									
3	SS-31	11	R1-1(30)	1	STOP	30	30		REMOVE	1										
4	SS-31	12	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
311	SS-31	13	R4-7(24)	2	KEEP RIGHT (Symbol) - 24x30	24	30	10.0	NEW		2				NEW CONCRETE	2				
392	SS-31	14	R6-1 R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12		REMOVE	1										
148	SS-31	15A	R3-9cP	1	BEGIN (plaque)	30	12	2.5	NEW		1				SOIL	1				
146	SS-31	15B	R3-9b(24)	1	TWO-WAY LEFT TURN ONLY (Ground Mounted) - 24"x36"	24	36	6.0	ADD TO ASSEMBLY		1									
8	SS-31	16	R1-2(36)	1	YIELD	36	36		REMOVE	1										
9	SS-31	17	R1-2(48)	1	YIELD	48	48	6.9	NEW		1				SOIL	1				Install on a single post
8	SS-31	18	R1-2(36)	1	YIELD	36	36		REMOVE	1										
359	SS-31	19	R5-1(36)	1	DO NOT ENTER - 36x36	36	36	9.0	NEW		1				SOIL	1				
4	SS-31	20	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
4	SS-31	21	R1-1(36)	2	STOP	36	36		REMOVE	2										
1508	SS-31	22A	M3-1(24)	1	CARDINAL DIRECTION - NORTH - 24x12	24	12	2.0	NEW		1				SOIL	1				
1484	SS-31	22B	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24	4.0	ADD TO ASSEMBLY		1									"13"
1619	SS-31	22C	M6-3(21)	1	DIRECTIONAL ARROW (Up) - 21x15	21	15	2.2	ADD TO ASSEMBLY		1									
1508	SS-31	23A	M3-1(24)	1	CARDINAL DIRECTION - NORTH - 24x12	24	12		REMOVE	1										
1484	SS-31	23B	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24		REMOVE	1										"13"
1619	SS-31	23C	M6-3(21)	1	DIRECTIONAL ARROW (Up) - 21x15	21	15		REMOVE	1										
8	SS-31	24	R1-2(36)	1	YIELD	36	36		REMOVE	1										
110	SS-31	25A	R3-2(24)	1	LEFT TURN PROHIBITION (Symbol) - 24x24	24	24		REMOVE	1										
358	SS-31	25B	R5-1(30)	1	DO NOT ENTER - 30x30	30	30		REMOVE	1										
111	SS-31	26A	R3-2(36)	1	LEFT TURN PROHIBITION (Symbol) - 36x36	36	36	9.0	ADD TO ASSEMBLY		1									
358	SS-31	26B	R5-1(30)	1	DO NOT ENTER - 30x30	30	30	6.3	NEW		1				NEW CONCRETE	1				
111	SS-31	27	R3-2(36)	1	LEFT TURN PROHIBITION (Symbol) - 36x36	36	36	9.0	NEW		1				NEW CONCRETE	1				
110	SS-31	28	R3-2(24)	1	LEFT TURN PROHIBITION (Symbol) - 24x24	24	24		REMOVE	1										
362	SS-31	29	R5-1a(36)	1	WRONG WAY - 36x24	36	24		REMOVE	1										
1445	SS-31	30	W21-11-DE	1	WATCH CHILDREN (Symbol)	30	30		REMOVE	1										
1671	SS-31	31A	D3-1(6)	1	STREET NAME (1 Line)	36	6		REMOVE	1										"LAKEVIEW AVE"
394	SS-31	31B	R6-1 L(36)	1	ONE WAY (ENCLOSED IN LEFT ARROW) - 36x12	36	12		REMOVE	1										
392	SS-31	31C	R6-1 R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12		REMOVE	1										
3	SS-31	31D	R1-1(30)	1	STOP	30	30		REMOVE	1										
406	SS-31	31E	R6-3(30)	1	DIVIDED HIGHWAY CROSSING (4 - Legged Intersection) - 30x24	30	24		REMOVE	1										
394	SS-31	32A	R6-1 L(36)	1	ONE WAY (ENCLOSED IN LEFT ARROW) - 36x12	36	12	3.0	ADD TO ASSEMBLY		1									
392	SS-31	32B	R6-1 R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12	3.0	ADD TO ASSEMBLY		1									
406	SS-31	32C	R6-3(30)	1	DIVIDED HIGHWAY CROSSING (4 - Legged Intersection) - 30x24	30	24	5.0	NEW		1				SOIL	1				
424	SS-32	1	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24		REMAIN											
1504	SS-32	2A	M2-1(21)	1	JUNCTION - 21x15	21	15		REMAIN											
1484	SS-32	2B	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24		REMAIN											"13"
50	SS-32	3	R2-1-35(24)	1	SPEED LIMIT (35 MPH - 24x30)	24	30		REMOVE	1										
50.5	SS-32	4	R2-1-35(30)	1	SPEED LIMIT (35 MPH - 30x36)	30	36	7.5	NEW		1				SOIL	1				
424	SS-32	5A	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24		REMAIN											
1694	SS-32	5B	D4-3-DE	1	BUS STOP (DART)	12	18		REMAIN											"104"
424	SS-32	6	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24		REMAIN											
424	SS-32	7A	R7-4-DE(18)		NO STOPPING, STANDING, OR PARKING - 18x24	18	24		REMAIN											
1653	SS-32	7B	D1-2	1	DESTINATION (2 Line)	30	18		REMAIN											"<--RODNEY VILLAGE"
424	SS-32	8	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24		REMAIN											
					PAGE TOTALS			138		30	29		10	0		17	0	0	0	

PERMANENT SIGN SCHEDULE

NO.	SHEET NO.	PLAN IDENTIFIER	CODE	QTY.	DESCRIPTION	SIGN WIDTH (IN)	SIGN HEIGHT (IN)	SIGN AREA (SF)	ITEM 819018 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE POST (EACH)			ITEM 819019 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS (SF)			POST INSTALLATION TYPE	Code X11 12' Post (W/ Basepost) (EACH)	Code X11A 15' Post (W/ Basepost) (EACH)	ITEM 819016 4" HOLE, 0-6" (EACH)	ITEM 819017 4" HOLE, >6" (EACH)	REMARKS
									SIGN DISPOSITION	REMOVE	INSTALL	SIGN DISPOSITION	REMOVE	INSTALL						
1523	SS-32	9A	M4-1a(24)	1	ALT - 24x12	24	12	2.0	NEW		1				SOIL	1				
1484	SS-32	9B	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24	4.0	ADD TO ASSEMBLY		1									"13"
1588	SS-32	9C	M5-1 R	1	ADVANCE TURN ARROW (Right - 90)	21	15	2.2	ADD TO ASSEMBLY		1									
1523	SS-32	10A	M4-1a(24)	1	ALT - 24x12	24	12		REMOVE	1										
1484	SS-32	10B	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24		REMOVE	1										
1588	SS-32	10C	M5-1 R	1	ADVANCE TURN ARROW (Right - 90)	21	15		REMOVE	1										
1673	SS-32	10D	D3-1(9)	1	STREET NAME (1 Line)	36	9		REMOVE	1										"GOVERNORS AVE"
4	SS-32	11	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
252	SS-32	12	R3-20-DE	1	TURN LANE	18	18		REMOVE	1										
252	SS-32	13	R3-20-DE	1	TURN LANE	18	18	2.3	NEW		1				SOIL	1				
4	SS-32	14	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
3	SS-32	15	R1-1(30)	1	STOP	30	30		REMOVE	1										
4	SS-32	16	R1-1(36)	1	STOP	36	36	7.5	NEW		1				NEW CONCRETE	1				
3	SS-32	17	R1-1(30)	1	STOP	30	30		REMOVE	1										
1694	SS-32	18	D4-3-DE	1	BUS STOP (DART)	12	18		NEW		1				SOIL	1				"303"
4	SS-32	19	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
878	SS-32	20A	W3-3(48)	2	SIGNAL AHEAD (Symbol) - 48x48	48	48		REMOVE	2										
1367a	SS-32	20B	W16-8P	2	ADVANCE STREET NAME (1 - line plaque) (Oversized)	48	9		REMOVE	2										"Webbs Ln" Hwy C, 4"
1653	SS-32	21	D1-2	1	DESTINATION (2 Line)	84	30					REMOVE	17.5							"W. REILY BROWN <-- ELEM. SCHOOL"
1653	SS-32	22	D1-2	1	DESTINATION (2 Line)	66	30	13.8				NEW		13.8	SOIL	2				"W. Reily Brown <-- Elem. School" Hwy D, 6"
1504	SS-33	1A	M2-1(21)	1	JUNCTION - 21x15	21	15		REMOVE	1										
1523	SS-33	1B	M4-1a(24)	1	ALT - 24x12	24	12		REMOVE	1										
1484	SS-33	1C	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24		REMOVE	1										"13"
424	SS-33	1D	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24		REMOVE	1										
1504	SS-33	2A	M2-1(21)	1	JUNCTION - 21x15	21	15	2.2	NEW		1				SOIL	1				
1523	SS-33	2B	M4-1a(24)	1	ALT - 24x12	24	12	2.0	ADD TO ASSEMBLY		1									
1484	SS-33	2C	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24	4.0	ADD TO ASSEMBLY		1									"13"
424	SS-33	2D	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24	3.0	ADD TO ASSEMBLY		1									
4	SS-33	3	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
4	SS-33	4	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
4	SS-33	5	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
4	SS-33	6	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
593	SS-33	7	R10-18a	2	TRAFFIC SIGNAL PHOTO ENFORCED	30	42	17.5	NEW		2				SOIL	2				
593	SS-33	8	R10-18a	2	TRAFFIC SIGNAL PHOTO ENFORCED	30	42		REMOVE	2										
42	SS-33	9	R2-1-25(24)	1	SPEED LIMIT (25 MPH - 24x30)	24	30		REMAIN											
1445	SS-33	10	W21-11-DE	1	WATCH CHILDREN (Symbol)	30	30		REMAIN											
424	SS-33	11	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24		REMAIN											
1675	SS-33	12A	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									"N Taylor Dr" Hwy C, 6"/8"/6"
1675	SS-33	12B	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									"S Dupont Hwy" Hwy B, 6"/8"/6"
392	SS-33	12C	R6-1 R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12	3.0	ADD TO ASSEMBLY		1									
4	SS-33	12D	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
1673	SS-33	13A	D3-1(9)	2	STREET NAME (1 Line)	36	9		REMOVE	2										"N TAYLOR DR"
1673	SS-33	13B	D3-1(9)	2	STREET NAME (1 Line)	42	9		REMOVE	2										"S DUPONT HWY"
392	SS-33	13C	R6-1 R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12		REMOVE	1										
4	SS-33	13D	R1-1(36)	1	STOP	36	36		REMOVE	1										
252	SS-33	14	R3-20-DE	1	TURN LANE	18	18	2.3	NEW		1				SOIL	1				
1694	SS-33	15	D4-3-DE	1	BUS STOP (DART)	12	18		REMOVE	1										"303"
252	SS-33	16	R3-20-DE	1	TURN LANE	18	18		REMOVE	1										
878	SS-33	17A	W3-3(48)	2	SIGNAL AHEAD (Symbol) - 48x48	48	48	32.0	NEW		2				SOIL	2				
1367a	SS-33	17B	W16-8P	2	ADVANCE STREET NAME (1 - line plaque) (Oversized)	48	9	6.0	ADD TO ASSEMBLY		2									"Webbs Ln" Hwy C, 4"
59	SS-34	1	R2-1-45(36)	2	SPEED LIMIT (45 MPH - 36x48)	36	48	24.0				NEW		24.0	SOIL	4				
63	SS-34	2	R2-1-50(36)	2	SPEED LIMIT (50 MPH - 36x48)	36	48		REMOVE	2										
1905	SS-34	3	I-2-DE2	2	NOW LEAVING CORPORATE LIMITS	36	24	12.0	NEW		2				SOIL	2				"DOVER"
1905	SS-34	4	I-2-DE2	1	NOW LEAVING CORPORATE LIMITS	36	24		REMOVE	1										"DOVER"
4	SS-34	5	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
8	SS-34	6	R1-2(36)	1	YIELD	36	36	3.9	NEW		1				SOIL	1				
9	SS-34	7	R1-2(48)	1	YIELD	48	48		REMOVE	1										Sign is mounted on signal pole
					PAGE TOTALS			235		29	34		18	38		28	0	0	0	

PERMANENT SIGN SCHEDULE

NO.	SHEET NO.	PLAN IDENTIFIER	CODE	QTY.	DESCRIPTION	SIGN WIDTH (IN)	SIGN HEIGHT (IN)	SIGN AREA (SF)	ITEM 819018 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE POST (EACH)			ITEM 819019 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS (SF)			POST INSTALLATION TYPE	Code X11 12' Post (W/ Basepost) (EACH)	Code X11A 15' Post (W/ Basepost) (EACH)	ITEM 819016 4" HOLE, 0-6" (EACH)	ITEM 819017 4" HOLE, >6" (EACH)	REMARKS
									SIGN DISPOSITION	REMOVE	INSTALL	SIGN DISPOSITION	REMOVE	INSTALL						
1508	SS-34	8A	M3-1(24)	1	CARDINAL DIRECTION - NORTH - 24x12	24	12		REMOVE	1										
1484	SS-34	8B	M1-4(24)	2	US ROUTE (2 - Digit Sign) - 24x24	24	24		REMOVE	2										"13"
1589	SS-34	8C	M5-1 L	1	ADVANCE TURN ARROW (Left - 90)	21	15		REMOVE	1										
406	SS-34	8D	R6-3(30)	1	DIVIDED HIGHWAY CROSSING (4 - Legged Intersection) - 30x24	30	24		REMOVE	1										
1514	SS-34	8E	M3-3(24)	1	CARDINAL DIRECTION - SOUTH - 24x12	24	12		REMOVE	1										
1604	SS-34	8F	M6-1 R(21)	1	DIRECTIONAL ARROW (Right) - 21x15	21	15		REMOVE	1										
392	SS-34	9A	R6-1 R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12		REMOVE	1										
1673	SS-34	9B	D3-1(9)	2	STREET NAME (1 Line)	24	9		REMOVE	2										"Webbs LN"
1673	SS-34	9C	D3-1(9)	2	STREET NAME (1 Line)	42	9		REMOVE	2										"S Dupont Hwy"
394	SS-34	9D	R6-1 L(36)	1	ONE WAY (ENCLOSED IN LEFT ARROW) - 36x12	36	12		REMOVE	1										
311	SS-34	9E	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30		REMOVE	1										
1955	SS-34	9F	OM1-3	1	TYPE 1 OBJECT MARKER	18	18		REMOVE	1										
406	SS-34	10A	R6-3(30)	1	DIVIDED HIGHWAY CROSSING (4 - Legged Intersection) - 30x24	30	24	5.0	ADD TO ASSEMBLY		1									
392	SS-34	10B	R6-1 R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12	3.0	ADD TO ASSEMBLY		1									
394	SS-34	10C	R6-1 L(36)	1	ONE WAY (ENCLOSED IN LEFT ARROW) - 36x12	36	12	3.0	ADD TO ASSEMBLY		1									
311	SS-34	10D	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	NEW		1				NEW CONCRETE	1				
1508	SS-34	11A	M3-1(24)	1	CARDINAL DIRECTION - NORTH - 24x12	24	12	2.0	NEW		1				SOIL	1				
1484	SS-34	11B	M1-4(24)	2	US ROUTE (2 - Digit Sign) - 24x24	24	24	8.0	ADD TO ASSEMBLY		2									"13"
1589	SS-34	11C	M5-1 L	1	ADVANCE TURN ARROW (Left - 90)	21	15	2.2	ADD TO ASSEMBLY		1									
1514	SS-34	11D	M3-3(24)	1	CARDINAL DIRECTION - SOUTH - 24x12	24	12	2.0	NEW		1				SOIL	1				
1604	SS-34	11E	M6-1 R(21)	1	DIRECTIONAL ARROW (Right) - 21x15	21	15	2.2	ADD TO ASSEMBLY		1									
141	SS-34	12A	R3-8a(48)	1	ADVANCE INTERSECTION LANE CONTROL (Left, Left - Ahead, Right) - 48"x30"	48	30					REMOVE	10.0							
424	SS-34	12B	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24					REMOVE	3.0							
141	SS-34	13A	R3-8a(48)	1	ADVANCE INTERSECTION LANE CONTROL (Left, Left - Ahead, Right) - 48"x30"	48	30	10.0				NEW		10.0	SOIL	2				
424	SS-34	13B	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24	3.0				ADD TO ASSEMBLY		3.0						
4	SS-34	14A	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
110	SS-34	14B	R3-2(24)	1	LEFT TURN PROHIBITION (Symbol) - 24x24	24	24	4.0	ADD TO ASSEMBLY		1									
	SS-34	15		1	NO LEFT TURN	18	24		REMOVE	1										
424	SS-34	16	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24		REMAIN											
4	SS-34	17	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
1	SS-34	18	R1-1(18)	1	STOP	18	18		REMAIN											
877	SS-34	19A	W3-3(30)	1	SIGNAL AHEAD (Symbol) - 30x30	30	30	6.3	NEW		1				SOIL	1				
1367	SS-34	19B	W16-8P	1	ADVANCE STREET NAME (1 - line plaque)	42	9	2.6	ADD TO ASSEMBLY		1									"S Governors Ave" Hwy C, 4"
877	SS-34	20A	W3-3(30)	1	SIGNAL AHEAD (Symbol) - 30x30	30	30		REMOVE	1										
1367	SS-34	20B	W16-8P	1	ADVANCE STREET NAME (1 - line plaque)	42	9		REMOVE	1										"S Governors Ave"
42.5	SS-34	21A	R2-1-25(30)	1	SPEED LIMIT (25 MPH - 30x36)	30	36	7.5	NEW		1				SOIL	1				
424	SS-34	21B	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24	3.0	ADD TO ASSEMBLY		1									
42	SS-34	22A	R2-1-25(24)	1	SPEED LIMIT (25 MPH - 24x30)	24	30		REMOVE	1										
424	SS-34	22B	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24		REMOVE	1										
9	SS-34	23	R1-2(48)	1	YIELD	48	48	6.9	NEW		1				SOIL	1				Install on a single post
8	SS-34	24	R1-2(36)	1	YIELD	36	36		REMOVE	1										
359	SS-34	25A	R5-1(36)	1	DO NOT ENTER - 36x36	36	36	9.0	NEW		1				SOIL	1				
359	SS-34	25B	R5-1(36)	1	DO NOT ENTER - 36x36	36	36	9.0	NEW		1				NEW CONCRETE	1				
363	SS-34	26A	R5-1a(42)	1	WRONG WAY - 42x30	42	30	8.8	NEW		1				SOIL	1				
363	SS-34	26B	R5-1a(42)	1	WRONG WAY - 42x30	42	30	8.8	NEW		1				NEW CONCRETE	1				
311	SS-34	27	R4-7(24)	2	KEEP RIGHT (Symbol) - 24x30	24	30	10.0	NEW		2				NEW CONCRETE	2				
	SS-34	28	R10-17	2	TURN ON FLASHING RED WITH CAUTION AFTER STOP	30	30		REMOVE	2										
1904	SS-34	29A	I-2-DE1	2	ENTERING CORPORATE LIMITS	36	24	12.0	ADD TO ASSEMBLY		2									"DOVER"
363	SS-34	29B	R5-1a(42)	2	WRONG WAY - 42x30	42	30	17.5	NEW		2				SOIL	2				
1905	SS-34	30A	I-2-DE2	1	NOW LEAVING CORPORATE LIMITS	36	24		REMOVE	1										"DOVER"
1904	SS-34	30B	I-2-DE1	1	ENTERING CORPORATE LIMITS	36	24		REMOVE	1										"DOVER"
1904	SS-34	31	I-2-DE1	1	ENTERING CORPORATE LIMITS	36	24		REMOVE	1										"DOVER"
359	SS-34	32A	R5-1(36)	1	DO NOT ENTER - 36x36	36	36	9.0	NEW		1				NEW CONCRETE	1				
359	SS-34	32B	R5-1(36)	1	DO NOT ENTER - 36x36	36	36	9.0	NEW		1				SOIL	1				
8	SS-34	33	R1-2(36)	1	YIELD	36	36		REMOVE	1										
9	SS-34	34	R1-2(48)	1	YIELD	48	48	6.9	NEW		1				SOIL	1				Install on a single post
406	SS-34	35A	R6-3(30)	1	DIVIDED HIGHWAY CROSSING (4 - Legged Intersection) - 30x24	30	24		REMOVE	1										
392	SS-34	35B	R6-1 R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12		REMOVE	1										
1673	SS-34	35C	D3-1(9)	2	STREET NAME (1 Line)	36	9		REMOVE	2										"Webbs Ln"
1673	SS-34	35D	D3-1(9)	2	STREET NAME (1 Line)	42	9		REMOVE	2										"S Dupont Hwy"
394	SS-34	35E	R6-1 L(36)	1	ONE WAY (ENCLOSED IN LEFT ARROW) - 36x12	36	12		REMOVE	1										
311	SS-34	35F	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30		REMOVE	1										
	PAGE TOTALS							191		35	31		13	13		21	0	0	0	

PERMANENT SIGN SCHEDULE

NO.	SHEET NO.	PLAN IDENTIFIER	CODE	QTY.	DESCRIPTION	SIGN WIDTH (IN)	SIGN HEIGHT (IN)	SIGN AREA (SF)	ITEM 819018 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE POST (EACH)			ITEM 819019 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS (SF)			POST INSTALLATION TYPE	Code X11 12' Post (W/ Basepost) (EACH)	Code X11A 15' Post (W/ Basepost) (EACH)	ITEM 819016 4" HOLE, 0-6" (EACH)	ITEM 819017 4" HOLE, >6" (EACH)	REMARKS
									SIGN DISPOSITION	REMOVE	INSTALL	SIGN DISPOSITION	REMOVE	INSTALL						
406	SS-34	36A	R6-3(30)	1	DIVIDED HIGHWAY CROSSING (4 - Legged Intersection) - 30x24	30	24	5.0	ADD TO ASSEMBLY		1									
392	SS-34	36B	R6-1 R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12	3.0	ADD TO ASSEMBLY		1									
394	SS-34	36C	R6-1 L(36)	1	ONE WAY (ENCLOSED IN LEFT ARROW) - 36x12	36	12	3.0	ADD TO ASSEMBLY		1									
311	SS-34	36D	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	NEW		1				NEW CONCRETE	1				
8	SS-34	37	R1-2(36)	1	YIELD	36	36		REMOVE	1										
9	SS-34	38	R1-2(48)	1	YIELD	48	48	6.9	NEW		1				SOIL	1				Install on a single post
1508	SS-34	39A	M3-1(24)	1	CARDINAL DIRECTION - NORTH - 24x12	24	12	2.0	NEW		1				SOIL	1				
1484	SS-34	39B	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24	4.0	ADD TO ASSEMBLY		1									"13"
1508	SS-34	40A	M3-1(24)	1	CARDINAL DIRECTION - NORTH - 24x12	24	12		REMOVE	1										
1484	SS-34	40B	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24		REMOVE	1										"13"
135	SS-34	41	R3-7 R(36)	1	RIGHT LANE MUST TURN RIGHT - 36"x36"	36	36	9.0	NEW		1				SOIL	1				
737	SS-35	1A	W1-3 L(30)	1	REVERSE TURN (Left) - 30x30	30	30		REMAIN											
1288	SS-35	1B	W13-1P-30(18)	1	ADVISORY SPEED (30 MPH) 18x18	18	18		REMAIN											
780	SS-35	1C	W1-8(18)	1	CHEVRON ALIGNMENT - 18x24	18	24		REMAIN											
1685	SS-35	2A	D3-2-DE1	1	WELCOME TO	36	32		REMAIN											
1686	SS-35	2B	D3-2-DE2	1	DEVELOPMENT NAME	36	24		REMAIN											"KENT ACRES -->"
780	SS-35	2C	W1-8(18)	1	CHEVRON ALIGNMENT - 18x24	18	24		REMAIN											
1872	SS-35	3	D14-3-DE	1	ADOPT A HIGHWAY	24	18		REMAIN											"IN MEMORY OF ASHLEY FRAZIER"
780	SS-35	4	W1-8(18)	1	CHEVRON ALIGNMENT - 18x24	18	24		REMAIN											
8	SS-35	5	R1-2(36)	1	YIELD	36	36		REMAIN											
1674	SS-35	6A	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	36	12	6.0	ADD TO ASSEMBLY		2									"Webbs Ln" Hwy C, 6"/4"
1674	SS-35	6B	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	48	12	8.0	ADD TO ASSEMBLY		2									"Woodbrook Rd" Hwy C, 6"/4"
4	SS-35	6C	R1-1(36)	1	STOP	36	36	7.5	NEW		1				EX. CONCRETE	1		1		
1673	SS-35	7A	D3-1(9)	2	STREET NAME (1 Line)	36	9		REMOVE	2										"Webbs Ln"
1673	SS-35	7B	D3-1(9)	2	STREET NAME (1 Line)	36	9		REMOVE	2										"Woodbrook Rd"
4	SS-35	7C	R1-1(36)	1	STOP	36	36		REMOVE	1										
8	SS-35	8	R1-2(36)	1	YIELD	36	36		REMAIN											
447	SS-35	9A	R7-202aP-DE	1	BEGIN (plaque - red)	12	6		REMAIN											
424	SS-35	9B	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24		REMAIN											
780	SS-35	9C	W1-8(18)	1	CHEVRON ALIGNMENT - 18x24	18	24		REMAIN											
1653	SS-35	10	D1-2	1	DESTINATION (2 Line)	54	30	11.3				NEW		11.3	SOIL	2				"<-- Camden Dover --> Hwy D, 6"
1653	SS-35	11A	D1-2	1	DESTINATION (2 Line)	54	30					REMOVE	11.3							"<-- Camden Dover -->"
693	SS-35	11B	SR1-15-DE	1	STATE PROPERTY NO TRESPASSING	24	12					REMOVE	2.0							
1504	SS-35	12A	M2-1(21)	1	JUNCTION - 21x15	21	15		REMAIN											
1484	SS-35	12B	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24		REMAIN											"13"
448	SS-35	13A	R7-202aP-DE1	1	END (plaque - red)	12	6		REMAIN											
424	SS-35	13B	R7-4-DE(18)	1	NO STOPPING, STANDING, OR PARKING - 18x24	18	24		REMAIN											
311	SS-35	14	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30		REMAIN											
877	SS-35	15A	W3-3(30)	1	SIGNAL AHEAD (Symbol) - 30x30	30	30		REMAIN											
693	SS-35	15B	SR1-15-DE	1	STATE PROPERTY NO TRESPASSING	24	12		REMAIN											
1367	SS-35	15C	W16-8P	1	ADVANCE STREET NAME (1 - line plaque)	36	9		REMAIN											"S Dupont Hwy"
4	SS-36	1	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
1694	SS-36	2	D4-3-DE	1	BUS STOP (DART)	12	18		REMOVE	1										"303"
1694	SS-36	3	D4-3-DE	1	BUS STOP (DART)	12	18		NEW		1				SOIL	1				"303"
593	SS-36	4	R10-18a	1	TRAFFIC SIGNAL PHOTO ENFORCED	30	42		REMOVE	1										
593	SS-36	5	R10-18a	2	TRAFFIC SIGNAL PHOTO ENFORCED	30	42	17.5	NEW		2				SOIL	2				
593	SS-36	6A	R10-18a	1	TRAFFIC SIGNAL PHOTO ENFORCED	30	42		REMOVE	1										
252	SS-36	6B	R3-20-DE	1	TURN LANE	18	18		REMOVE	1										
252	SS-36	7	R3-20-DE	1	TURN LANE	18	18	2.3	NEW		1				NEW CONCRETE	1				
878	SS-36	8A	W3-3(48)	2	SIGNAL AHEAD (Symbol) - 48x48	48	48	32.0				NEW		32.0	SOIL	4				
1367a	SS-36	8B	W16-8P	2	ADVANCE STREET NAME (1 - line plaque) (Oversized)	48	9	6.0				ADD TO ASSEMBLY		6.0						"Webbs Ln" Hwy C, 4"
878	SS-36	9A	W3-3(48)	1	SIGNAL AHEAD (Symbol) - 48x48	48	48					REMOVE	16.0							
1367	SS-36	9B	W16-8P	1	ADVANCE STREET NAME (1 - line plaque)	30	9		REMOVE	1										"Webbs Ln"
878	SS-36	10A	W3-3(48)	1	SIGNAL AHEAD (Symbol) - 48x48	48	48					REMOVE	16.0							
1367	SS-36	10B	W16-8P	1	ADVANCE STREET NAME (1 - line plaque)	30	9		REMOVE	1										"Webbs Ln"
1301	SS-36	11	W13-2(36)	1	ADVISORY EXIT SPEED - 36x48	36	48					REMOVE	12.0							"50 M.P.H."
1301	SS-36	12	W13-2(36)	1	ADVISORY EXIT SPEED - 36x48	36	48	12.0				NEW		12.0	SOIL	2				"50 M.P.H."
63	SS-36	13A	R2-1-50(36)	1	SPEED LIMIT (50 MPH - 36x48)	36	48					REMOVE	12.0							
1447	SS-36	13B	W21-12P-DE	1	STRICTLY ENFORCED (plaque)	36	24					REMOVE	6.0							
	SS-36	13C		1	BY CITY ORDINANCE ENGINE/EXHAUST BRAKE DEVICE USE PROHIBITED	30	30		REMOVE	1										"CITY OF DOVER TRUCK ROUTE"
63	SS-36	14	R2-1-50(36)	1	SPEED LIMIT (50 MPH - 36x48)	36	48					REMOVE	12.0							
1514	SS-37	1A	M3-3(24)	1	CARDINAL DIRECTION - SOUTH - 24x12	24	12		REMAIN											
1484	SS-37	1B	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24		REMAIN											"13"
1924	SS-37	2A	EM-1-DE	1	EVACUATION ROUTE	24	24		REMAIN											
1618	SS-37	2B	M6-3(B)	1	DIRECTIONAL ARROW (Up) - 12x9	12	9		REMAIN											
1602	SS-37	2C	M6-1 R(B)	1	DIRECTIONAL ARROW (Right) - 12x9	12	9		REMAIN											
	PAGE TOTALS							148		15	18		87	61		18	0	1	0	

PERMANENT SIGN SCHEDULE

NO.	SHEET NO.	PLAN IDENTIFIER	CODE	QTY.	DESCRIPTION	SIGN WIDTH (IN)	SIGN HEIGHT (IN)	SIGN AREA (SF)	ITEM 819018 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE POST (EACH)			ITEM 819019 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS (SF)			POST INSTALLATION TYPE	Code X11 12' Post (W/ Basepost) (EACH)	Code X11A 15' Post (W/ Basepost) (EACH)	ITEM 819016 4" HOLE, 0-6" (EACH)	ITEM 819017 4" HOLE, >6" (EACH)	REMARKS
									SIGN DISPOSITION	REMOVE	INSTALL	SIGN DISPOSITION	REMOVE	INSTALL						
135	SS-37	3	R3-7 R(36)	1	RIGHT LANE MUST TURN RIGHT - 36"x36"	36	36	9.0	NEW		1				SOIL	1				
1301	SS-37	4	W13-2(36)	1	ADVISORY EXIT SPEED - 36x48	36	48					REMOVE	12.0							"50 M.P.H."
1301	SS-37	5A	W13-2(36)	1	ADVISORY EXIT SPEED - 36x48	36	48	12.0				NEW		12.0	SOIL	2				"50 M.P.H."
135	SS-37	5B	R3-7 R(36)	1	RIGHT LANE MUST TURN RIGHT - 36"x36"	36	36	9.0	ADD TO ASSEMBLY		1									
252	SS-37	6	R3-20-DE	1	TURN LANE	18	18		REMOVE	1										
252	SS-37	7	R3-20-DE	1	TURN LANE	18	18	2.3	NEW		1				SOIL	1				
389	SS-37	8	R5-10b	1	NO PEDESTRIANS OR BICYCLES	30	18		REMOVE	1										
1576	SS-38	1A	M4-14(24)	1	BEGIN - 24x12	24	12		REMOVE	1										
302	SS-38	1B	R4-3-DE	1	TRUCK KEEP RIGHT EXCEPT LEFT TURNS	30	36		REMOVE	1										
1340	SS-38	1C	W16-2aP(18)	1	XX FT (plaque) - 18x9	18	9		REMOVE	1										"1500"
1576	SS-38	2A	M4-14(24)	1	BEGIN - 24x12	24	12	2.0	NEW		1				SOIL	1				
302	SS-38	2B	R4-3-DE	1	TRUCK KEEP RIGHT EXCEPT LEFT TURNS	30	36	7.5	ADD TO ASSEMBLY		1									
1340	SS-38	2C	W16-2aP(18)	1	XX FT (plaque) - 18x9	18	9	1.1	ADD TO ASSEMBLY		1									"1500"
1827	SS-38	3	D10-2a(12)	1	INTERMEDIATE REFERENCE LOCATION (2- Digit) - 12x48	12	48		REMAIN											"48.0"
	SS-38	4A		1	U TURN ONLY	18	24	3.0	ADD TO ASSEMBLY		1									
359	SS-38	4B	R5-1(36)	1	DO NOT ENTER - 36x36	36	36	9.0	NEW		1				NEW CONCRETE	1				
	SS-38	5		1	U TURN ONLY	18	24		REMOVE	1										
394	SS-38	6	R6-1 L(36)	1	ONE WAY (ENCLOSED IN LEFT ARROW) - 36x12	36	12		REMOVE	1										
394	SS-38	7	R6-1 L(36)	1	ONE WAY (ENCLOSED IN LEFT ARROW) - 36x12	36	12	3.0	NEW		1				SOIL	1				
358	SS-38	8	R5-1(30)	2	DO NOT ENTER - 30x30	30	30		REMAIN											
359	SS-38	9	R5-1(36)	1	DO NOT ENTER - 36x36	36	36	9.0	NEW		1				SOIL	1				
359	SS-38	10A	R5-1(36)	1	DO NOT ENTER - 36x36	36	36	9.0	ADD TO ASSEMBLY		1									
110	SS-38	10B	R3-2(24)	1	LEFT TURN PROHIBITION (Symbol) - 24x24	24	24		REMAIN											
120	SS-38	10C	R3-4(24)	1	U - TURN PROHIBITION (Symbol) - 24x24	24	24		REMAIN											
408	SS-38	11A	R6-3a(30)	1	DIVIDED HIGHWAY CROSSING (T - Intersection) - 30x24	30	24		REMAIN											
105	SS-38	11B	R3-1(24)	1	RIGHT TURN PROHIBITION (Symbol) - 24x24	24	24		REMAIN											
358	SS-38	11C	R5-1(30)	1	DO NOT ENTER - 30x30	30	30		REMAIN											
392	SS-38	12	R6-1 R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12	3.0	NEW		1				SOIL	1				
392	SS-38	13	R6-1 R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12		REMOVE	1										
694	SS-38	14	SR1-16-DE	1	STOP (shared-use path only)	24	42	7.0	NEW		1				SOIL	1				
389	SS-38	15	R5-10b	1	NO PEDESTRIANS OR BICYCLES	30	18	3.8	NEW		1				SOIL	1				
1576	SS-38	16A	M4-14(24)	1	BEGIN - 24x12	24	12		REMAIN											
302	SS-38	16B	R4-3-DE	1	TRUCK KEEP RIGHT EXCEPT LEFT TURNS	30	36		REMAIN											
1340	SS-38	16C	W16-2aP(18)	1	XX FT (plaque) - 18x9	18	9		REMAIN											"1500"
1924	SS-38	17A	EM-1-DE	1	EVACUATION ROUTE	24	24		REMOVE	1										
1618	SS-38	17B	M6-3(B)	1	DIRECTIONAL ARROW (Up) - 12x9	12	9		REMOVE	1										
1924	SS-38	18A	EM-1-DE	1	EVACUATION ROUTE	24	24	4.0	NEW		1				SOIL	1				
1618	SS-38	18B	M6-3(B)	1	DIRECTIONAL ARROW (Up) - 12x9	12	9	0.8	ADD TO ASSEMBLY		1									
1827	SS-38	19	D10-2a(12)	1	INTERMEDIATE REFERENCE LOCATION (2- Digit) - 12x48	12	48		REMAIN											"48.0"
363	SS-38	20A	R5-1a(42)	1	WRONG WAY - 42x30	42	30	8.8	NEW		1				NEW CONCRETE	1				
363	SS-38	20B	R5-1a(42)	1	WRONG WAY - 42x30	42	30	8.8	NEW		1				SOIL	1				
359	SS-38	21	R5-1(36)	1	DO NOT ENTER - 36x36	36	36	9.0	NEW		1				SOIL	1				
394	SS-38	22A	R6-1 L(36)	1	ONE WAY (ENCLOSED IN LEFT ARROW) - 36x12	36	12		REMAIN											
105	SS-38	22B	R3-1(24)	1	RIGHT TURN PROHIBITION (Symbol) - 24x24	24	24		REMAIN											
358	SS-38	23	R5-1(30)	1	DO NOT ENTER - 30x30	30	30		REMAIN											
1514	SS-38	24A	M3-3(24)	1	CARDINAL DIRECTION - SOUTH - 24x12	24	12		REMAIN											
1484	SS-38	24B	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24		REMAIN											"13"
1589	SS-38	24C	M5-1 L	1	ADVANCE TURN ARROW (Left - 90)	21	15		REMAIN											
1508	SS-38	25A	M3-1(24)	1	CARDINAL DIRECTION - NORTH - 24x12	24	12		REMAIN											
1484	SS-38	25B	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24		REMAIN											"13"
1604	SS-38	25C	M6-1 R(21)	1	DIRECTIONAL ARROW (Right) - 21x15	21	15		REMAIN											
8	SS-38	26	R1-2(36)	1	YIELD	36	36		REMAIN											
363	SS-39	1A	R5-1a(42)	2	WRONG WAY - 42x30	42	30	17.5				ADD TO ASSEMBLY		17.5						
59	SS-39	1B	R2-1-45(36)	2	SPEED LIMIT (45 MPH - 36x48)	36	48	24.0				NEW		24.0	SOIL	4				
50	SS-39	2	R2-1-35(24)	1	SPEED LIMIT (35 MPH - 24x30)	24	30		REMAIN											
876	SS-39	3	W3-3(18)	2	SIGNAL AHEAD (Symbol) - 18x18	18	18		REMAIN											
3	SS-39	4	R1-1(30)	1	STOP	30	30		REMAIN											
	SS-39	5		1	ALL TRAFFIC (with RIGHT ARROW)	36	48		REMAIN											
1514	SS-39	6A	M3-3(24)	1	CARDINAL DIRECTION - SOUTH - 24x12	24	12		REMAIN											
1484	SS-39	6B	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24		REMAIN											
1611	SS-39	6C	M6-2 L(21)	1	DIRECTIONAL ARROW (Left - upward 45) - 21x15	21	15		REMAIN											
890	SS-39	7	W3-5(48)	2	SPEED REDUCTION (Symbol) - 48x48	48	48	32.0				NEW		32.0	SOIL	4				"45"
63	SS-39	8A	R2-1-50(36)	2	SPEED LIMIT (50 MPH - 36x48)	36	48	24.0				NEW		24.0	SOIL	4				
	SS-39	8B		2	BY CITY ORDINANCE ENGINE/EXHAUST BRAKE DEVICE USE PROHIBITED	30	30	12.5				ADD TO ASSEMBLY		12.5						"CITY OF DOVER TRUCK ROUTE"
1508	SS-39	9A	M3-1(24)	1	CARDINAL DIRECTION - NORTH - 24x12	24	12		REMAIN											
1484	SS-39	9B	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24		REMAIN											"13"
362	SS-39	10	R5-1a(36)	1	WRONG WAY - 36x24	36	24		REMAIN											
1304	SS-39	11	W13-3(36)	1	ADVISORY RAMP SPEED - 36x48	36	48		REMAIN											"20 MPH"
392	SS-39	12	R6-1 R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12		REMAIN											
1924	SS-39	13A	EM-1-DE	1	EVACUATION ROUTE	24	24		REMAIN											
1618	SS-39	13B	M6-3(B)	0	DIRECTIONAL ARROW (Up) - 12x9	12	9		REMAIN											
	PAGE TOTALS							231		10	19		12	122		27	0	0	0	

PERMANENT SIGN SCHEDULE

NO.	SHEET NO.	PLAN IDENTIFIER	CODE	QTY.	DESCRIPTION	SIGN WIDTH (IN)	SIGN HEIGHT (IN)	SIGN AREA (SF)	ITEM 819018 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE POST (EACH)			ITEM 819019 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS (SF)			POST INSTALLATION TYPE	Code X11 12' Post (W/ Basepost) (EACH)	Code X11A 15' Post (W/ Basepost) (EACH)	ITEM 819016 4" HOLE, 0-6" (EACH)	ITEM 819017 4" HOLE, >6" (EACH)	REMARKS
									SIGN DISPOSITION	REMOVE	INSTALL	SIGN DISPOSITION	REMOVE	INSTALL						
1675	SIG-K284	A	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	72	18	18.0												"S Dupont Hwy" (8"/6" Highway D) Install by TC
1675	SIG-K284	B	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	78	18	19.5												"Lochmeath Way" (8"/6" Highway D) Install by TC
1675	SIG-K019P	A	D3-1(18)	1	STREET NAME (1 Line) Posted speed > 40 MPH	72	18	9.0												"S Dupont Hwy" (8"/6" Highway D) Install by TC
1675	SIG-K019P	B	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	114	18	28.5												"<-Thomas Harmon Dr" / "Thomas Harmon Dr->" (8"/6" Highway D) Install by TC
1675	SIG-K151	A	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	72	18	18.0												"S Dupont Hwy" (8"/6" Highway D) Install by TC
1675	SIG-K151	B	D3-1(18)	1	STREET NAME (1 Line) Posted speed > 40 MPH	96	18	12.0												"<-Voshells Mill Rd" / "Voshells Mill Rd->" (8"/6" Highway D) Install by TC
1675	SIG-K151	C	D3-1(18)	1	STREET NAME (1 Line) Posted speed > 40 MPH	120	18	15.0												"<-Voshells Mill Star Hill Rd" / "Voshells Mill Star Hill Rd->" (8"/6" Highway D) Install by TC
1675	SIG-K317	A	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	72	18	18.0												"S Dupont Hwy" (8"/6" Highway D) Install by TC
1675	SIG-K317	B	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	84	18	21.0												"Camden Bypass" (8"/6" Highway D) Install by TC
1675	SIG-K128	A	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	72	18	18.0												"S Dupont Hwy" (8"/6" Highway D) Install by TC
1675	SIG-K128	B	D3-1(18)	1	STREET NAME (1 Line) Posted speed > 40 MPH	120	18	15.0												"<-E Camden Wyoming Ave" / "E Camden Wyoming Ave->" (8"/6" Highway D) Install by TC
1675	SIG-K128	C	D3-1(18)	1	STREET NAME (1 Line) Posted speed > 40 MPH	90	18	11.3												"<-W Lebanon Rd" / "W Lebanon Rd->" (8"/6" Highway D) Install by TC
1675	SIG-K301	A	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	72	18	18.0												"S Dupont Hwy" (8"/6" Highway D) Install by TC
1675	SIG-K301	B	D3-1(18)	1	STREET NAME (1 Line) Posted speed > 40 MPH	102	18	12.8												"<-Camden Bypass" / "Camden Bypass->" (8"/6" Highway D) Install by TC
1675	SIG-K301	C	D3-1(18)	1	STREET NAME (1 Line) Posted speed > 40 MPH	84	18	10.5												"<-Old North Rd" / "Old North Rd->" (8"/6" Highway D) Install by TC
1675	SIG-K137	A	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	72	18	18.0												"S Dupont Hwy" (8"/6" Highway D) Install by TC
1675	SIG-K137	B	D3-1(18)	1	STREET NAME (1 Line) Posted speed > 40 MPH	90	18	11.3												"<-POW-MIA Pkwy" (8"/6" Highway D) Install by TC
1675	SIG-K137	C	D3-1(18)	1	STREET NAME (1 Line) Posted speed > 40 MPH	90	18	11.3												"<-POW-MIA Pkwy" / "POW-MIA Pkwy->" (8"/6" Highway D) Install by TC
1675	SIG-K328	A	D3-1(18)	1	STREET NAME (1 Line) Posted speed > 40 MPH	72	18	9.0												"S Dupont Hwy" (8"/6" Highway D) Install by TC
1675	SIG-K328	B	D3-1(18)	1	STREET NAME (1 Line) Posted speed > 40 MPH	102	18	12.8												"S Governors Ave->" (8"/6" Highway D) Install by TC
1675	SIG-K328	C	D3-1(18)	1	STREET NAME (1 Line) Posted speed > 40 MPH	90	18	11.3												"Lakeview Ave->" / "<-Lakeview Ave" (8"/6" Highway D) Install by TC
1675	SIG-K328	D	D3-1(18)	1	STREET NAME (1 Line) Posted speed > 40 MPH	102	18	12.8												"<-S Governors Ave" (8"/6" Highway D) Install by TC
1675	SIG-K118	A	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	72	18	18.0												"S Dupont Hwy" (8"/6" Highway D) Install by TC
1675	SIG-K118	B	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	54	18	13.5												"Webbs Ln" (8"/6" Highway D) Install by TC

DELAWARE DEPARTMENT OF TRANSPORTATION

TRAFFIC PAVEMENT MARKING ESTIMATE

HEP KC, US 13, Lochmeath Way to Puncheon Run Connector

CONTRACT # T201500202
F.A.P. # ESTP-K024(16)
PROJECT: HEP KC, US 13, Lochmeath Way to Puncheon Run Connector

LINE	CODE #	ITEM #	UOM	STRIPING DESCRIPTION	QTY
1	40	817002	SF	PERMANENT PAVEMENT STRIPING, SYMBOL/LEGEND ALKYD-THERMOPLASTIC	33,748
2	85	817005	LF	PERMANENT PAVEMENT STRIPING, ALKYD-THERMOPLASTIC, 5"	761
3	75	817006	LF	PERMANENT PAVEMENT STRIPING, ALKYD-THERMOPLASTIC, 12"	432
4	315	817013	LF	PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, WHITE/YELLOW, 5"	146,040
5	320	817014	LF	PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, WHITE/YELLOW, 10"	2,095
6	335	817015	EACH	PREFORMED RETROREFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS, BIKE SYMBOL	761
7					
8	105	817027	EACH	RAISED/RECESSED PAVEMENT MARKER	1,000
9		817030	EACH	REMOVAL OF RAISED/RECESSED PAVEMENT MARKER HOUSING	500
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DELAWARE DEPARTMENT OF TRANSPORTATION

TRAFFIC SIGNAL ESTIMATE

FEDERAL INTERSECTION IMPROVEMENTS - SR 41 (Newport Gap Pike) at McKennans Chruch Rd/Loveville Rd

CONTRACT #: T201904001
F.A.P. #: ESTP-2018(10)
PROJECT: Signal Reconstruction - SR 41 (Newport Gap Pike) at Loveville Road/McKennans Church Road

INTERSECTION # 1: **N262 - SR 41 (Newport Gap Pike) at Loveville Road/McKennans Church Road**

						UNIT COST			TOTAL COST		
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC CONTRACTOR ITEMS)	BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
1	15	835003	1	EA	Cabinet Base Type P	1200.00	1200.00	3400.00	1,200.00	1,200.00	3,400.00
2	135	846001	980	LF	Furnish & Install Loop Wire 1-conductor #14 AWG encased in ¼" Flexible Tubing in a Loop Sawcut	15.00	14.15	30.00	14,700.00	13,867.00	29,400.00
3	305	831545	245	LF	Furnish and Install 4" HDPE SDR-13.5 Conduit (Bore)	29.00	34.00	24.00	7,105.00	8,330.00	5,880.00
4	360	831515	235	LF	Furnish and Install 3" Schedule 80 PVC Conduit (Trench)	12.00	13.00	15.00	2,820.00	3,055.00	3,525.00
5	365	831516	665	LF	Furnish and Install 4" Schedule 80 PVC Conduit (Trench)	13.50	13.00	15.00	8,977.50	8,645.00	9,975.00
6	440	831523	30	LF	Furnish and Install 2" Galvanized Steel Conduit (Trench)	18.50	20.20	22.50	555.00	606.00	675.00
7	545	831574	15	LF	Furnish and Install Second and Subsequent Additional 4" PVC Conduits in Trench or Open Cut	5.50	5.30	3.50	82.50	79.50	52.50
8	650	830001	4	EA	Conduit Junction Well, Type 1, 20"x20" Precast Concrete	1100.00	1100.00	1300.00	4,400.00	4,400.00	5,200.00
9	655	830002	1	EA	Conduit Junction Well, Type 4, 20"x42.5" Precast Concrete	1400.00	1300.00	1825.00	1,400.00	1,300.00	1,825.00
10	670	830008	5	EA	Adjust or Repair Existing Conduit Junction Well	500.00	375.00	400.00	2,500.00	1,875.00	2,000.00
11	1225	830010	2	EA	Removal of Existing Junction Well	300.00	210.00	545.00	600.00	420.00	1,090.00
12	680	830011	1	EA	Furnish & Install Frame and Lid, for Junction Well, Type 1	800.00	760.00	400.00	800.00	760.00	400.00
13	700	833001	5	EA	Bonding & Grounding Existing Junction Well	400.00	415.00	200.00	2,000.00	2,075.00	1,000.00
14	835	834002	4	EA	Pole Base Type 3A	3700.00	4325.00	6500.00	14,800.00	17,300.00	26,000.00
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					TOTAL PROJECT CONTRACTOR ITEMS	→		→	61,940.00	63,912.50	90,422.50

INTERSECTION # 1: **N262 - SR 41 (Newport Gap Pike) at Loveville Road/McKennans Church Road**

						UNIT COST			TOTAL COST		
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC CONTRACTOR ITEMS)	BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
1	65	832008	1150	LF	Furnish & Install 1-conductor #6 AWG Stranded Copper	2.30	2.30	2.50	2,645.00	2,645.00	2,875.00
2	80	832025	900	LF	Furnish & Install 4-conductor #18 AWG Shielded Opticom Cable	2.50	2.85	2.00	2,250.00	2,565.00	1,800.00
3	90	832027	2200	LF	Furnish & Install 2-Conductor #14 AWG Aluminum Shielded Cable	2.50	2.20	2.00	5,500.00	4,840.00	4,400.00
4	95	832029	50	LF	Furnish & Install #8/2 wire UF W/ground	4.55	4.95	5.00	227.50	247.50	250.00
5	115	832033	1250	LF	Furnish & Install 14/9 Traffic Control Cable	3.20	3.20	5.00	4,000.00	4,000.00	6,250.00
6	635	842501	1	EA	Furnish & Install Electrical Utility Service Equipment (100 AMP)	1800.00	3180.00	2525.00	1,800.00	3,180.00	2,525.00
7	890	836504	4	EA	Installation of Steel Mast Arm Pole with Single or Twin Mast arms up to 60’	2000.00	1580.00	2200.00	8,000.00	6,320.00	8,800.00
8	995	844001	4	EA	Furnish & Install Opticom Emergency Preemption Detector	950.00	735.00	1525.00	3,800.00	2,940.00	6,100.00
9	970	837002	32	EA	Furnish & Install 12” LED Signal Head Section Rigid Mount	340.00	345.00	400.00	10,880.00	11,040.00	12,800.00
10	1235	832035	1600	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	1.50	1.10	0.50	2,400.00	1,760.00	800.00
11	1240	834501	3.5	CY	Removal of Concrete Pole Bases and Cabinet Foundations	900.00	900.00	500.00	3,150.00	3,150.00	1,750.00
12	1255	836503	4	EA	Remove Steel Pole (Equal to or Greater than 15’ and Less than 40’	275.00	390.00	550.00	1,100.00	1,560.00	2,200.00
13	1265	838503	150	LF	Removal of Cable from Messenger Wire	5.00	1.80	0.20	750.00	270.00	30.00
14	1270	838504	8	EA	Removal of Signal Head or Opticom Detector from Span Wire or Mast Arm	225.00	41.00	136.00	1,800.00	328.00	1,088.00
15	1300	847002	2	EA	Installation or Removal of Base or Pad Mounted Cabinet	300.00	400.00	2500.00	600.00	800.00	5,000.00
16	1415	817002	60	SF	Permanent Pavement Striping, Symbol/Legend Alkyd-Thermoplastic	12.00	12.00	11.50	720.00	720.00	690.00
17	1140	823001	8	EA	Installation of Sign on Span Wire or Mast Arm	275.00	22.00	50.00	2,200.00	176.00	400.00
18	1560	825001	6	EA	Tubular Markers	75.00	250.00	150.00	450.00	1,500.00	900.00
19	710	802003	20	EA-DY	Arrow Panels, Type C	45.00	41.00	40.00	900.00	820.00	800.00
20	715	803001	24	EA-DY	Furnish & Maintain Portable Changeable Message Board	145.00	165.00	125.00	3,480.00	3,960.00	3,000.00
21	720	804001	8	EA-DY	Furnish & Maintain Portable Light Assembly (Flood Lights)	225.00	390.00	100.00	1,800.00	3,120.00	800.00
22	725	805001	600	EA-DY	Plastic Drums	4.00	2.87	4.00	2,400.00	1,722.00	2,400.00
23	730	806001	40	HR	Traffic Officers	75.00	75.00	75.00	3,000.00	3,000.00	3,000.00
24	735	808002	16	EA-DY	Furnish & Maintain Truck Mounted Attenuator, Type II	220.00	250.00	500.00	3,520.00	4,000.00	8,000.00
25	745	810001	160	EA-DY	Temporary Warning Signs and Plaques	18.00	18.00	25.00	2,880.00	2,880.00	4,000.00
26	750	811001	160	HR	Flagger, New Castle County, State	84.00	74.85	67.00	13,440.00	11,976.00	10,720.00
27	765	811013	40	HR	Flagger, New Castle County, State, Overtime	122.00	112.30	100.00	4,880.00	4,492.00	4,000.00
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					TOTAL TRAFFIC CONTRACTOR ITEMS	→		→	88,572.50	84,011.50	95,378.00

INTERSECTION # 1: **N262 - SR 41 (Newport Gap Pike) at Loveville Road/McKennans Church Road**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	UNIT COST			TOTAL COST		
						BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
1	2020	999421	1	EA	Complete P Cabinet w/12 Channel EPAC Controller(includes Mounting Rack w/Power Supply, 5-4 Channel Loop Amplifiers, Load Switches, Conflict Monitor)	13450.00	13450.00	13450.00	13,450.00	13,450.00	13,450.00
2	2105	999461	1	EA	Optical Receiver Card (Emergency Preemption)	2751.00	2751.00	2751.00	2,751.00	2,751.00	2,751.00
3	2175	999489	4	EA	Steel Round Mast Arm Pole, TYPE B (45' - 60' Arm Length or 2-60' Arms)	8818.16	8818.16	8818.16	35,272.64	35,272.64	35,272.64
4	2225	999499	4	EA	50' (15.2m) Steel Round Mast Arm	7941.44	7941.44	7941.44	31,765.76	31,765.76	31,765.76
5	2355	999527	4	EA	Set of Four, 2' x 90" (51mm x 2286mm) Anchor Bolts with Two Hex Nuts and Two Flat Washers Per Bolt	978.00	978.00	978.00	3,912.00	3,912.00	3,912.00
6	2435	999601	24	EA	Rouleau Sign Brackets (2 per average sign, 3 per longer sign)	115.00	115.00	115.00	2,760.00	2,760.00	2,760.00
7	2535	999621	1	EA	CDMA	1200.00	1200.00	1200.00	1,200.00	1,200.00	1,200.00
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					TOTAL TRAFFIC SUPPLY ITEMS	→		→	91,111.40	91,111.40	91,111.40
					TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	61,940.00	63,912.50	90,422.50
					TOTAL TRAFFIC CONTRACTOR ITEMS	→	→	→	88,572.50	84,011.50	95,378.00
					TOTAL TRAFFIC SUPPLY ITEMS	→	→	→	91,111.40	91,111.40	91,111.40
					CONTINGENCIES	→	→	→	12,081.20	11,951.77	13,845.60
					TOTAL COST	→	→	→	253,705.10	250,987.17	290,757.50

MULTIPLE INTERSECTION SUMMARY

Intersection #1: **N262 - SR 41 (Newport Gap Pike) at Loveville Road/McKennans Church Road**

TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→	61,940.00	63,912.50	90,422.50
TOTAL TRAFFIC CONTRACTOR ITEMS	→	→	→	→	88,572.50	84,011.50	95,378.00
TOTAL TRAFFIC SUPPLY ITEMS	→	→	→	→	91,111.40	91,111.40	91,111.40
CONTINGENCIES	→	→	→	→	12,081.20	11,951.77	13,845.60
TOTAL	→	→	→	→	**253,705.10**	**250,987.17**	**290,757.50**

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DELAWARE DEPARTMENT OF TRANSPORTATION

TRAFFIC SIGNAL ESTIMATE

Savannah Road Sidewalk Improvements

CONTRACT #: T201801302
F.A.P. #: ESTP-S018(19)
PROJECT: Savannah Road Sidewalk Improvements

INTERSECTION # 1: **S319, US9 (Savannah Rd) & Vikings Way (Cape Henlopen HS)**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	UNIT COST ROMMEL	TOTAL COST ROMMEL
1	135	846001	400	LF	Furnish & Install Loop Wire 1-Conductor #14 AWG encased in 1/4" Flexible Tubing in a Loop Sawcut		
2	140	846002	20	LF	Furnish & Install a 1 - 1/2" Galvanized Rigid Metal Conduit Detector Sleeve with Loop Wire		
3	305	831545	220	LF	Furnish & Install 4" HDPE SDR-13.5 Conduit (Bore)		
4	355	831514	30	LF	Furnish & Install 2-1/2" Schedule 80 PVC Conduit (Trench)		
5	365	831516	320	LF	Furnish & Install 4" Schedule 80 PVC Conduit (Trench)		
6	440	831523	70	LF	Furnish & Install 2" Galvanized Steel Conduit (Trench)		
7	500	831538	40	LF	Furnish & Install 2" Galvanized Steel Conduit (On Structure)		
8	650	830001	6	EA	Conduit Junction Well, Type 1, 20" x 20" Precast Concrete		
9	670	830008	2	EA	Adjust or Repair Existing Conduit Junction Well		
10	850	834005	3	EA	Pole Base Type 4A		
11	1225	830010	4	EA	Removal of Existing Junction Well		
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					TOTAL PROJECT CONTRACTOR ITEMS	→	

INTERSECTION # 1: **S319, US9 (Savannah Rd) & Vikings Way (Cape Henlopen HS)**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC CONTRACTOR ITEMS)	UNIT COST ROMMEL	TOTAL COST ROMMEL
1	65	832008	550	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper	2.50	1,375.00
2	90	832027	730	LF	Furnish & Install 2-Conductor #14 AWG Aluminum Shielded Cable	2.00	1,460.00
3	95	832029	160	LF	Furnish & Install #8/2 Wire UF W/ground	5.00	800.00
4	105	832032	100	LF	Furnish & Install 14/4 Traffic Control Cable	5.00	500.00
5	110	832507	350	LF	Furnish & Install 14/5 Traffic Control Cable	4.00	1,400.00
6	125	832504	150	LF	Furnish & Install #8 THHN Stranded Copper	1.00	150.00
7	500	831538	45	LF	Furnish & Install 2” Galvanized Steel Conduit (On Structure)	29.00	1,305.00
8	630	842005	2	EA	Removal of Electric Service on Wood or Metal Pole	272.00	544.00
9	635	842501	1	EA	Furnish & Install Electric Utility Service Equipment (100 AMP)	2525.00	2,525.00
10	645	835500	1	EA	Furnish & Install Additional Disconnect Switch	1300.00	1,300.00
11	700	833001	2	EA	Bonding & Grounding Existing Junction Well	200.00	400.00
12	715	802003	6	EA-DY	Arrow Panels, Type C	40.00	240.00
13	720	803001	9	EA-DY	Furnish & Maintain Portable Changeable Message Board	125.00	1,125.00
14	730	805001	210	EA-DY	Plastic Drums	4.00	840.00
15	745	810001	36	EA-DY	Temporary Warning Signs and Plaques	25.00	900.00
16	760	811003	48	HR	Flagger, Sussex County, State	67.00	3,216.00
17	885	836502	3	EA	Furnish & Install Pedestal Pole	1510.00	4,530.00
18	985	837007	6	EA	Furnish & Install Signal Head Backplate	445.00	2,670.00
19	990	837011	1	EA	Realign or Slide Existing Signal Head	255.00	255.00
20	990	837011	1	EA	Realign or Slide Existing Signal Head	255.00	255.00
21	1000	837008	4	EA	Furnish & Install 16” LED Countdown Pedestrian Signal	925.00	3,700.00
22	1010	837010	4	EA	Furnish & Install Pedestrian Pushbutton with Sign	350.00	1,400.00
23	1070	844521	1	EA	Install Video Detection Device	565.00	565.00
24	1095	844526	1	EA	Relocate Video Detection Device	850.00	850.00
25	1140	823001	3	EA	Installation of Sign on Span Wire or Mast Arm	50.00	150.00
26	1145	823003	29.3	SF	Removal of Sign on Span Wire or Mast Arm	20.00	586.00
27	1230	831011	40	LF	Removal of Conduit from Wood Pole	2.00	80.00
28	1235	832035	1300	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	650.00
29	1295	847001	2	EA	Installation or Removal of Pole or Post Mounted Cabinet	2000.00	4,000.00
30	NIB003		50	LF	Install CAT-5e Cable	2.10	105.00
					TOTAL TRAFFIC CONTRACTOR ITEMS	→	37,876.00

INTERSECTION # 1: **S319, US9 (Savannah Rd) & Vikings Way (Cape Henlopen HS)**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	UNIT COST ROMMEL	TOTAL COST ROMMEL
1	2435	999601	4	EA	Rouleau Sign Brackets (2 per average sign, 3 per longer sign)	115.00	460.00
2		999999	1	LS	Gridsmart Video Detection System	19200.00	19,200.00
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					TOTAL TRAFFIC SUPPLY ITEMS	→	19,660.00

TOTAL PROJECT CONTRACTOR ITEMS	→	→	
TOTAL TRAFFIC CONTRACTOR ITEMS	→	→	37,876.00
TOTAL TRAFFIC SUPPLY ITEMS	→	→	19,660.00
CONTINGENCIES	→	→	5,753.60
TOTAL COST	→	→	63,289.60

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TRAFFIC STATEMENT

Date : NOT YET SENT

DelDOT Traffic
169 Brick Store Landing Rd
Smyrna, Delaware 19977

To : Daniel Macchione
PS&E Project Coordinator

From :
Traffic Systems Design Engineer

Ref : Contract Number : T202004001 F.A.P. # : ESTP-2019(16)
Project Title : Signal Rebuild - US 113 & DE 54

	No Involvement by Traffic
XX	PS&E Attached, Signal Involvement
	PS&E Attached, ITMS Involvement
	PS&E Attached, Highway Lighting Involvement
XX	PS&E Attached, Signing Involvement
XX	Traffic ONLY, Pavement Markings

cc: Eddie Toulson, Traffic Operations Manager
Amanda Davis, Support Services Administrator
Charlanne A. Thornton, Director of Finance
XXXX XXXX, Project Engineer/Designer
Traffic Project File Copy

TRAFFIC PROJECT COST SUMMARY

Signal Rebuild - US 113 & DE 54

T202004001

DESCRIPTION	ENGINEER'S ESTIMATE
TOTAL SIGNAL ESTIMATE	$387,940.39
TOTAL ITMS ESTIMATE	$0.00
TOTAL HIGHWAY LIGHTING ESTIMATE	$0.00
TOTAL ROADWAY SIGNING ESTIMATE	$789.31

TOTAL ESTIMATE FOR PROJECT ---->	**$388,729.69**

DELAWARE DEPARTMENT OF TRANSPORTATION

TRAFFIC SIGNAL ESTIMATE

Signal Rebuild - US 113 & DE 54

CONTRACT #: T202004001
F.A.P. #: ESTP-2019(16)
PROJECT: Signal Rebuild - US 113 & DE 54

INTERSECTION # 1: **S160 - US 113 & DE 54**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	UNIT COST ROMMEL	TOTAL COST ROMMEL
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					TOTAL PROJECT CONTRACTOR ITEMS	→	

					INTERSECTION # 1: **S160 - US 113 & DE 54**	UNIT COST	TOTAL COST
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC CONTRACTOR ITEMS)	ROMMEL	ROMMEL
1	15	835003	1	EA	Cabinet Base Type P	3400.00	3,400.00
2	65	832008	1390	LF	Furnish & Install 1-conductor #6 AWG Stranded Copper	2.50	3,475.00
3	80	832025	1015	LF	Furnish & Install 4-conductor #18 AWG Shielded Opticom Cable	2.00	2,030.00
4	90	832027	5070	LF	Furnish & Install 2-Conductor #14 AWG Aluminum Shielded Cable	2.00	10,140.00
5	95	832029	60	LF	Furnish & Install #8/2 wire UF W/ground	5.00	300.00
6	105	832032	70	LF	Furnish & Install 14/4 Traffic Control Cable	5.00	350.00
7	110	832507	1320	LF	Furnish & Install 14/5 Traffic Control Cable	4.00	5,280.00
8	115	832033	150	LF	Furnish & Install 14/9 Traffic Control Cable	5.00	750.00
9	120	832034	730	LF	Furnish & Install 14/16 Traffic Control Cable	5.00	3,650.00
10	125	832504	150	LF	Furnish and Install #8 THHN Stranded Copper	1.00	150.00
11	135	846001	1070	LF	Furnish & Install Loop Wire 1-conductor #14 AWG encased in ¼" Flexible Tubing in a Loop Sawcut	30.00	32,100.00
12	140	846002	65	LF	Furnish & Install a 1-1/2 inch Galvanized Rigid Metal Conduit Detector Sleeve with Loop Wire	38.00	2,470.00
13		202000	20	CY	Excavation & Embankment	45.00	900.00
14	165	301001	8	CY	Graded Aggregate Base Course, Type B	175.00	1,400.00
15	170	301002	5	CY	Graded Aggregate Base Course, Type B, Patching	345.00	1,725.00
16	175	401026	3	TON	WMA, Superpave, Type C, 160 Gyrations, PG 64-22, Patching	287.00	861.00
17	180	401027	4	TON	WMA, Superpave, Type B, 160 Gyrations, PG 64-22, Pathcing	287.00	1,148.00
18	185	401028	7	TON	WMA, Superpave, Bituminous Concrete Base Course, 160 Gyrations, PG 64-22, Patching	587.00	4,109.00
19	215	701014	50	LF	Portland Cement Concrete Curb, Type 2	69.00	3,450.00
20	220	701018	35	LF	Integral Portland Cement Concrete Curb and Gutter, Type 1 - 8	80.00	2,800.00
21	245	705001	100	SF	Portland Cement Concrete Sidewalk, 4”	14.00	1,400.00
22	250	705002	160	SF	Portland Cement Concrete Sidewalk, 6”	21.00	3,360.00
23	255	705007	70	SF	Sidewalk Surface Detectable Warning System	57.00	3,990.00
24	270	705010	295	SF	Curb Ramp, Type 5	92.00	27,140.00
25	275	211001	22	SY	Removal of Existing Portland Cement Concrete Pavement, Curb, Sidewalk, Etc.	115.00	2,530.00
26	280	762000	140	LF	Saw Cutting, Bituminous Concrete	3.00	420.00
27	285	762001	30	LF	Saw Cutting, Concrete, Full Depth	6.00	180.00
28	305	831545	480	LF	Furnish and Install 4” HDPE SDR-13.5 Conduit (Bore)	24.00	11,520.00
29	360	831515	50	LF	Furnish and Install 3” Schedule 80 PVC Conduit (Trench)	15.00	750.00
30	365	831516	720	LF	Furnish and Install 4” Schedule 80 PVC Conduit (Trench)	15.00	10,800.00
31	440	831523	50	LF	Furnish and Install 2” Galvanized Steel Conduit (Trench)	22.50	1,125.00
32	500	831538	30	LF	Furnish and Install 2” Galvanized Steel Conduit (On Structure)	29.00	870.00
33	545	831574	30	LF	Furnish and Install Second and Subsequent Additional 4" PVC Conduits in Trench or Open Cut	3.50	105.00
34	635	842501	1	EA	Furnish & Install Electrical Utility Service Equipment (100 AMP)	2525.00	2,525.00
35	650	830001	6	EA	Conduit Junction Well, Type 1, 20"x20" Precast Concrete	1300.00	7,800.00

36	655	830002	2	EA	Conduit Junction Well, Type 4, 20"x42.5" Precast Concrete	1825.00	3,650.00
37	715	802003	15	EA-DY	Arrow Panels, Type C	40.00	600.00
38	720	803001	20	EA-DY	Furnish & Maintain Portable Changeable Message Board	125.00	2,500.00
39	730	805001	320	EA-DY	Plastic Drums	4.00	1,280.00
40	740	808002	15	EA-DY	Furnish & Maintain Truck Mounted Attenuator, Type II	500.00	7,500.00
41	745	810001	80	EA-DY	Temporary Warning Signs and Plaques	25.00	2,000.00
42	760	811003	80	HR	Flagger, Sussex County, State	67.00	5,360.00
43	835	834002	2	EA	Pole Base Type 3A	6500.00	13,000.00
44	850	834005	4	EA	Pole Base Type 4A	950.00	3,800.00
45	870	834008	2	EA	Sheeting for Pole Base	2500.00	5,000.00
46	885	836502	4	EA	Furnish and Install Pedestal Pole	1510.00	6,040.00
47	890	836504	2	EA	Installation of Steel Mast Arm Pole with Single or Twin Mast arms up to 60’	2200.00	4,400.00
48	910	836507	4	EA	Furnish Pedestal Pole Transformer Base	400.00	1,600.00
49	970	837002	42	EA	Furnish & Install 12” LED Signal Head Section Rigid Mount	400.00	16,800.00
50	985	837007	14	EA	Furnish & Install Signal Head Backplate	445.00	6,230.00
51	995	844001	4	EA	Furnish & Install Opticom Emergency Preemption Detector	1525.00	6,100.00
52	1000	837008	4	EA	Furnish & Install 16” LED Countdown Pedestrian Signal	925.00	3,700.00
53	1055	837509	4	EA	Furnish Pedestrian Pushbutton with Sign	160.00	640.00
54	1140	823001	4	EA	Installation of Sign on Span Wire or Mast Arm	50.00	200.00
55	1165	908001	7	TON	Topsoil	75.00	525.00
56	1170	908514	33	SY	Sodding	60.00	1,980.00
57	1215	838500	2	EA	Removal of Span Wire Attachment	100.00	200.00
58	1225	830010	11	EA	Removal of Existing Junction Well	545.00	5,995.00
59	1230	831011	30	LF	Removal of Conduit from Wood Pole	2.00	60.00
60	1235	832035	4700	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	0.50	2,350.00
61	1240	834501	1	CY	Removal of Concrete Pole Bases and Cabinet Foundations	500.00	500.00
62	1255	836503	2	EA	Remove Steel Pole (Equal to or Greater than 15’ and Less than 40’	550.00	1,100.00
63	1270	838504	16	EA	Removal of Signal Head or Opticom Detector from Span Wire or Mast Arm	136.00	2,176.00
64	1290	842500	4	EA	Installation or Removal of Pedestrian Button on Wood or Metal Pole	440.00	1,760.00
65	1300	847002	2	EA	Installation or Removal of Base or Pad Mounted Cabinet	2500.00	5,000.00
66	1415	817002	840	SF	Permanent Pavement Striping, Symbol/Legend Alkyd-Thermoplastic	11.50	9,660.00
67	1470	817013	580	LF	Epoxy Resin Paint Pavement Striping, 5” White or Yellow	1.15	667.00
68		817015	2	EA	Preformed Retroreflective Thermoplastic Pavement Markings, Bike Symbol	400.00	800.00
69	1535	817031	360	SF	Removal of Pavement Striping	7.00	2,520.00
					TOTAL TRAFFIC CONTRACTOR ITEMS	→	280,696.00

INTERSECTION # 1: **S160 - US 113 & DE 54**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	UNIT COST ROMMEL	TOTAL COST ROMMEL
1	2020	999421	1	EA	Complete P Cabinet w/12 Channel EPAC Controller(includes Mounting Rack w/Power Supply, 5-4 Channel	13950.00	13,950.00
2	2050	999427	1	EA	Base Extension (split) Aluminum w/Natural Mill Finish	550.00	550.00
3	2095	999458	1	EA	Patch Cables (One Per Cabinet)	240.00	240.00
4	2105	999461	1	EA	Optical Receiver Card (Emergency Preemption)	2751.00	2,751.00
5	2175	999489	2	EA	Steel Round Mast Arm Pole, TYPE B (45' - 60' Arm Length or 2-60' Arms)	8818.16	17,636.32
6	2225	999499	4	EA	50' (15.2m) Steel Round Mast Arm	7941.44	31,765.76
7	2305	999515	4	EA	10' (3.0M) 4" Round Aluminum Pedestal Pole	130.00	520.00
8	2350	999526	4	EA	17" Cast Aluminum Transformer Base	351.00	1,404.00
9	2425	999554	4	EA	12" Louver	135.00	540.00
10	2435	999601	8	EA	Rouleau Sign Brackets (2 per average sign, 3 per longer sign)	115.00	920.00
11	2535	999621	1	EA	CDMA	1200.00	1,200.00
12		999999	1	EA	Relocate Bluetooth Device	500.00	500.00
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
					TOTAL TRAFFIC SUPPLY ITEMS	→	71,977.08

TOTAL PROJECT CONTRACTOR ITEMS	→	→	
TOTAL TRAFFIC CONTRACTOR ITEMS	→	→	280,696.00
TOTAL TRAFFIC SUPPLY ITEMS	→	→	71,977.08
CONTINGENCIES	→	→	35,267.31
TOTAL COST	→	→	387,940.39

G:\Projects\185033.00 TRAFFIC - 1883 - 2\185033.02 Traffic Signal Designs\DESIGN PROJECT INFO\Comments and Submissions\DelDOT\20-08-14 (S) S160 Handoff to Construction\[S160- US113 & SR54 2020 Traffic Statement 1.2.xlsx]Signals

DELAWARE DEPARTMENT OF TRANSPORTATION

TRAFFIC ROADWAY SIGNING ESTIMATE

Signal Rebuild - US 113 & DE 54

CONTRACT #: T202004001
F.A.P. #: ESTP-2019(16)
PROJECT: Signal Rebuild - US 113 & DE 54

PROJECT LOCATION: **Signal Rebuild - US 113 & DE 54**

LINE	ITEM #	QTY	DESCRIPTION - PROJECT CONTRACTOR ITEMS	UOM		
1	819018	0	INSTALLATION OR REMOVAL OF TRAFFIC SIGN ON SINGLE SIGN POST	EA		
2	819016	0	INSTALLATION OF 4" DIAMETER HOLE, LESS THAN OR EQUAL TO 6" IN DEPTH	EA		
3	819017	0	INSTALLATION OF 4" DIAMETER HOLE, GREATER THAN 6" IN DEPTH	EA		
4	819019	0	INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS	SF		

LINE	CODE #	QTY	SIGNING DESCRIPTION	SIZE	UNIT COST	TOTAL COST
5	X13		SALARY, OVER-TIME	EA-HR	40.00	
6	X14		SIGNFIX (FOR ANY SIGN WITH FLASHING BEACONS)	EACH	56.00	
7	X11	0	12' POSTS (W/ BASEPOST) NEEDED FOR PROJECT OR LOCATION	EACH	34.02	-
7A	X11A	0	15' POSTS (W/ BASEPOST) NEEDED FOR PROJECT OR LOCATION	EACH	50.00	-
8	X12		6' DELINEATOR POST (W/ BOLT & ETC.)	EACH	5.00	
	X15		**Miscellaneous Roadway Signing Fee**	**EACH**	**1000.00**	
			TRAFFIC ONLY PROJECT			
9	X1	0	Installation of Sign Posts, 9', 10', 11', 12' in Unpaved Area or Existing Holes	EACH	26.00	-
10	X2		Installation of 4" dia. Hole in Pavement or Concrete	EACH	52.00	
11	X3		Installation of 4" dia. Hole, in Excess of 6" per ea. additional inch drilled in Pavement	EACH	$52.75	
12	X4		Installation of Street Name Signs	EACH	$26.38	
13	X5	1	Installation of Signs (Two or More Mounting Holes)	S/F	2.75	2.75
14	X6		Sets, Installation of Sign Bands and Buckles	EACH	52.75	
15	X7	10	Removal of Traffic Signs	EACH	26.38	263.80
16	X8		Removal of Street Name Signs	EACH	26.38	
17	X9	1	Removal of Sign Posts	EACH	1.00	1.00
18	X10		Straightening of Sign Posts	EACH	17.00	
19						
					TOTAL FOR LABOR	267.55

TOTAL FOR SIGNING MATERIALS	450.00
TOTAL FOR LABOR	267.55
CONTINGENCIES	71.76
TOTAL ROADSIDE SIGNING COST	**$789.31**

PERMANENT SIGN SCHEDULE

SHEET NO.	PLAN IDENTIFIER	SIGN DESIGNATION	QTY.	DESCRIPTION	SIGN WIDTH (IN)	SIGN HEIGHT (IN)	SIGN AREA (SF)	ITEM 819018 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE POST (EACH)			ITEM 819019 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS (SF)			POST INSTALLATION TYPE	Code X11 12' Post (W/ Basepost) (EACH)	Code X11A 15' Post (W/ Basepost) (EACH)	ITEM 819016 4" HOLE, 0-6" (EACH)	ITEM 819017 4" HOLE, >6" (EACH)	REMARKS
								SIGN DISPOSITION	REMOVE	INSTALL	SIGN DISPOSITION	REMOVE	INSTALL						
SG-1	A	D3-1a(18)	2	STREET NAME + ROUTE SHIELD (1 Line)	72	18	18.0												"113", "Dupont Blvd" U8"/L6", Hwy C - Install by TC
SG-1	B	D3-1a(18)	2	STREET NAME + ROUTE SHIELD (1 Line)	72	18	18.0												"54", "Cemetery Rd" U8"/L6", Hwy C - Install by TC
SS-1	1A	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	36	12		REMOVE	2										"Dupont Blvd"
SS-1	1B	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	48	12		REMOVE	2										"Cemetery Rd"
SS-1	1C	R1-2(48)	1	YIELD	48	48		REMOVE	1										
SS-1	2A	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	36	12		REMOVE	2										"Dupont Blvd"
SS-1	2B	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	48	12		REMOVE	2										"Cemetery Rd"
SS-1	2C	R1-2(48)	1	YIELD	48	48		REPOSITION	1	1									
JOB TOTALS							36		10	1		0	0						

TRAFFIC STATEMENT

Date : August 23, 2021

DelDOT Traffic
169 Brick Store Landing Rd
Smyrna, Delaware 19977

To : Daniel Macchione
PS&E Project Coordinator

From : Bret A. Martine, PE, PTOE (Century Engineering)
Traffic Systems Design Engineer

Ref : Contract Number : T201606112 F.A.P. # :
Project Title : PAVEMENT AND REHABILITATION, NORTH XII, 2016

	No Involvement by Traffic
XX	PS&E Attached, Signal Involvement
	PS&E Attached, ITMS Involvement
	PS&E Attached, Highway Lighting Involvement
XX	PS&E Attached, Signing Involvement
XX	PS&E Attached, Pavement Markings Involvement
	Traffic ONLY, Pavement Markings

cc: Mike Havel, Traffic Operations Manager
Sandra DiOrrio, Support Services Administrator
Charlanne A. Thornton, Director of Finance
Andy Waslyn, Project Engineer/Designer
Traffic Project File Copy

TRAFFIC PROJECT COST SUMMARY

PAVEMENT AND REHABILITATION, NORTH XII, 2016

T201606112

DESCRIPTION	ENGINEER'S ESTIMATE
TOTAL SIGNAL ADVANCE WORK ONLY ESTIMATE	$209,220.00
TOTAL SIGNAL ESTIMATE	$20,560.10
TOTAL ITMS ESTIMATE	$0.00
TOTAL HIGHWAY LIGHTING ESTIMATE	$0.00
TOTAL OVERHEAD SIGNING ESTIMATE	$0.00
TOTAL ROADWAY SIGNING ESTIMATE	$0.00
MAINTENANCE FEE (5%)	$0.00

TOTAL ESTIMATE FOR PROJECT ---->	**$229,780.10**

DELAWARE DEPARTMENT OF TRANSPORTATION

TRAFFIC SIGNAL ESTIMATE

PAVEMENT AND REHABILITATION, NORTH XII, 2016

Pilot Project Where General Contractor Will Be Responsible for Underground & Aboveground Signal Work

CONTRACT #: T201606112
F.A.P. #:
PROJECT: PAVEMENT AND REHABILITATION, NORTH XII, 2016

					INTERSECTION # 1: N232 - DE 7 (Main Street) & Old Baltimore Pike - Advance Work ONLY	UNIT COST			TOTAL COST		
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
					TOTAL PROJECT CONTRACTOR ITEMS	→		→			

					INTERSECTION # 1: N232 - DE 7 (Main Street) & Old Baltimore Pike - Advance Work ONLY	UNIT COST			TOTAL COST		
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
1	710	808501	1	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)						
2	715	802003	1	EA-DY	Arrow Panels, Type C						
3	730	805001	60	EA-DY	Plastic Drums						
4	740	808002	1	EA-DY	Furnish & Maintain Truck Mounted Attenuator, Type II						
5	745	810001	16	EA-DY	Temporary Warning Signs and Plaques						
6	750	811001	8	HR	Flagger, New Castle County, State						
7	1070	844521	1	EA	Install Video Detection Device						
8	2556	832509	50	LF	Install CAT-5e Cable						
					TOTAL PROJECT CONTRACTOR ITEMS	→		→			

					INTERSECTION # 1: N232 - DE 7 (Main Street) & Old Baltimore Pike - Advance Work ONLY	UNIT COST			TOTAL COST		
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
1		999999	1	LS	Gridsmart Video Detection System	19200.00	19200.00	19200.00	19,200.00	19,200.00	19,200.00
2											
3											
4											
5											
6											
7											
8											
9											
10											
					TOTAL TRAFFIC SUPPLY ITEMS	→		→	19,200.00	19,200.00	19,200.00

TOTAL PROJECT CONTRACTOR ITEMS	→ →	→ →	
TOTAL PROJECT CONTRACTOR ITEMS	→ →	→ →	
TOTAL TRAFFIC SUPPLY ITEMS	→ →	→ →	19,200.00 19,200.00 19,200.00
CONTINGENCIES	→ →	→ →	1,920.00 1,920.00 1,920.00
TOTAL COST	→ →	→ →	21,120.00 21,120.00 21,120.00

					INTERSECTION # 2: N192 - DE 273 & DE 7 (Main Street) - Advance Work ONLY	UNIT COST			TOTAL COST		
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
					TOTAL PROJECT CONTRACTOR ITEMS	→		→			

					INTERSECTION # 2: N192 - DE 273 & DE 7 (Main Street) - Advance Work ONLY	UNIT COST			TOTAL COST		
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
1	710	808501	1	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)						
2	715	802003	4	EA-DY	Arrow Panels, Type C						
3	730	805001	60	EA-DY	Plastic Drums						
4	740	808002	4	EA-DY	Furnish & Maintain Truck Mounted Attenuator, Type II						
5	745	810001	16	EA-DY	Temporary Warning Signs and Plaques						
6	1070	844521	1	EA	Install Video Detection Device						
7	2556	832509	270	LF	Install CAT-5e Cable						
8											
9											
10											
					TOTAL PROJECT CONTRACTOR ITEMS	→		→			

					INTERSECTION # 2: N192 - DE 273 & DE 7 (Main Street) - Advance Work ONLY	UNIT COST			TOTAL COST		
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
1		999999	1	LS	Gridsmart Video Detection System	19200.00	19200.00	19200.00	19,200.00	19,200.00	19,200.00
2											
3											
4											
5											
6											
7											
8											
9											
10											
					TOTAL TRAFFIC SUPPLY ITEMS	→		→	19,200.00	19,200.00	19,200.00

TOTAL PROJECT CONTRACTOR ITEMS	→ →		→ →				
TOTAL PROJECT CONTRACTOR ITEMS	→ →		→ →				
TOTAL TRAFFIC SUPPLY ITEMS	→ →		→ →	19,200.00	19,200.00	19,200.00	
CONTINGENCIES	→ →		→ →	1,920.00	1,920.00	1,920.00	
TOTAL COST	→ →		→ →	21,120.00	21,120.00	21,120.00	

MULTIPLE INTERSECTION SUMMARY

Intersection #1:	**N232 - DE 7 (Main Street) & Old Baltimore Pike - Advance Work ONLY**							
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→			
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→			
	TOTAL TRAFFIC SUPPLY ITEMS	→	→	→	→	19,200.00	19,200.00	19,200.00
	CONTINGENCIES	→	→	→	→	1,920.00	1,920.00	1,920.00
Intersection #2:	**N192 - DE 273 & DE 7 (Main Street) - Advance Work ONLY**							
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→			
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→			
	TOTAL TRAFFIC SUPPLY ITEMS	→	→	→	→	19,200.00	19,200.00	19,200.00
	CONTINGENCIES	→	→	→	→	1,920.00	1,920.00	1,920.00
	TOTAL	→	→	→	→	**42,240.00**	**42,240.00**	**42,240.00**

G:\Projects\145002.00 (DelDOT Agmt 1679)\T51 (T201606112) - Traffic-ADA Pleasant Valley Rd\PROJECT CONSTRUCTION PHASE\Bidding and Cost Estimates\[T201606112_North XII.xlsx]Signals Loc 1 - Advance

DELAWARE DEPARTMENT OF TRANSPORTATION

TRAFFIC SIGNAL ESTIMATE

PAVEMENT AND REHABILITATION, NORTH XII, 2016

Pilot Project Where General Contractor Will Be Responsible for Underground & Aboveground Signal Work

CONTRACT #: T201606112
F.A.P. #:
PROJECT: PAVEMENT AND REHABILITATION, NORTH XII, 2016

					INTERSECTION # 3: N238 - Old Baltimore Pike & Otts Chapel Road - Advance Work ONLY	UNIT COST			TOTAL COST		
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
					TOTAL PROJECT CONTRACTOR ITEMS	→		→			

					INTERSECTION # 3: N238 - Old Baltimore Pike & Otts Chapel Road - Advance Work ONLY	UNIT COST			TOTAL COST		
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
1	710	808501	1	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)						
2	715	802003	4	EA-DY	Arrow Panels, Type C						
3	730	805001	120	EA-DY	Plastic Drums						
4	740	808002	4	EA-DY	Furnish & Maintain Truck Mounted Attenuator, Type II						
5	745	810001	16	EA-DY	Temporary Warning Signs and Plaques						
6	1070	844521	2	EA	Install Video Detection Device						
7	2556	832509	400	LF	Install CAT-5e Cable						
8											
9											
10											
					TOTAL PROJECT CONTRACTOR ITEMS	→		→			

					INTERSECTION # 3: N238 - Old Baltimore Pike & Otts Chapel Road - Advance Work ONLY	UNIT COST			TOTAL COST		
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
1		999999	1	LS	Gridsmart Video Detection System	23550.00	23550.00	23550.00	23,550.00	23,550.00	23,550.00
2											
3											
4											
5											
6											
7											
8											
9											
10											
					TOTAL TRAFFIC SUPPLY ITEMS	→		→	23,550.00	23,550.00	23,550.00

TOTAL PROJECT CONTRACTOR ITEMS	→ →	→ →			
TOTAL PROJECT CONTRACTOR ITEMS	→ →	→ →			
TOTAL TRAFFIC SUPPLY ITEMS	→ →	→ →	23,550.00	23,550.00	23,550.00
CONTINGENCIES	→ →	→ →	2,355.00	2,355.00	2,355.00
TOTAL COST	→ →	→ →	25,905.00	25,905.00	25,905.00

					INTERSECTION # 4: N188 - DE 896 (South College Avenue) & Old Baltimore Pike - Advance Work ONLY	UNIT COST			TOTAL COST		
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
					TOTAL PROJECT CONTRACTOR ITEMS	→		→			

					INTERSECTION # 4: N188 - DE 896 (South College Avenue) & Old Baltimore Pike - Advance Work ONLY	UNIT COST			TOTAL COST		
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
1	710	808501	1	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)						
2	715	802003	2	EA-DY	Arrow Panels, Type C						
	730	805001	120	EA-DY	Plastic Drums						
	740	808002	2	EA-DY	Furnish & Maintain Truck Mounted Attenuator, Type II						
	745	810001	16	EA-DY	Temporary Warning Signs and Plaques						
3	1070	844521	2	EA	Install Video Detection Device						
7	2556	832509	580	LF	Install CAT-5e Cable						
8											
9											
10											
					TOTAL PROJECT CONTRACTOR ITEMS	→		→			

					INTERSECTION # 4: N188 - DE 896 (South College Avenue) & Old Baltimore Pike - Advance Work ONLY	UNIT COST			TOTAL COST		
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
1		999999	1	LS	Gridsmart Video Detection System	23550.00	23550.00	23550.00	23,550.00	23,550.00	23,550.00
2											
3											
4											
5											
6											
7											
8											
9											
10											
					TOTAL TRAFFIC SUPPLY ITEMS	→		→	23,550.00	23,550.00	23,550.00

TOTAL PROJECT CONTRACTOR ITEMS	→ →	→ →	
TOTAL PROJECT CONTRACTOR ITEMS	→ →	→ →	
TOTAL TRAFFIC SUPPLY ITEMS	→ →	→ →	23,550.00 / 23,550.00 / 23,550.00
CONTINGENCIES	→ →	→ →	2,355.00 / 2,355.00 / 2,355.00
TOTAL COST	→ →	→ →	25,905.00 / 25,905.00 / 25,905.00

MULTIPLE INTERSECTION SUMMARY

Intersection #3:	**N238 - Old Baltimore Pike & Otts Chapel Road - Advance Work ONLY**							
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→			
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→			
	TOTAL TRAFFIC SUPPLY ITEMS	→	→	→	→	23,550.00	23,550.00	23,550.00
	CONTINGENCIES	→	→	→	→	2,355.00	2,355.00	2,355.00
Intersection #4:	**N188 - DE 896 (South College Avenue) & Old Baltimore Pike - Advance Work ONLY**							
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→			
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→			
	TOTAL TRAFFIC SUPPLY ITEMS	→	→	→	→	23,550.00	23,550.00	23,550.00
	CONTINGENCIES	→	→	→	→	2,355.00	2,355.00	2,355.00
	TOTAL	→	→	→	→	**51,810.00**	**51,810.00**	**51,810.00**

G:\Projects\145002.00 (DelDOT Agmt 1679)\T51 (T201606112) - Traffic-ADA Pleasant Valley Rd\PROJECT CONSTRUCTION PHASE\Bidding and Cost Estimates\[T201606112_North XII.xlsx]Signals Loc 2 (Sec 1) - Advance

DELAWARE DEPARTMENT OF TRANSPORTATION

TRAFFIC SIGNAL ESTIMATE

PAVEMENT AND REHABILITATION, NORTH XII, 2016

Pilot Project Where General Contractor Will Be Responsible for Underground & Aboveground Signal Work

CONTRACT #: T201606112
F.A.P. #:
PROJECT: PAVEMENT AND REHABILITATION, NORTH XII, 2016

					INTERSECTION # 5: N527 - Old Baltimore Pike & Walther Rd - Advance Work ONLY	UNIT COST			TOTAL COST		
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
					TOTAL PROJECT CONTRACTOR ITEMS	→		→			

					INTERSECTION # 5: N527 - Old Baltimore Pike & Walther Rd - Advance Work ONLY	UNIT COST			TOTAL COST		
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
1	710	808501	1	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)						
2	715	802003	1	EA-DY	Arrow Panels, Type C						
3	730	805001	60	EA-DY	Plastic Drums						
4	740	808002	1	EA-DY	Furnish & Maintain Truck Mounted Attenuator, Type II						
5	745	810001	16	EA-DY	Temporary Warning Signs and Plaques						
6	750	811001	8	HR	Flagger, New Castle County, State						
7	1070	844521	1	EA	Install Video Detection Device						
8	2556	832509	200	LF	Install CAT-5e Cable						
9											
10											
					TOTAL PROJECT CONTRACTOR ITEMS	→		→			

					INTERSECTION # 5: N527 - Old Baltimore Pike & Walther Rd - Advance Work ONLY	UNIT COST			TOTAL COST		
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
1		999999	1	LS	Gridsmart Video Detection System	19200.00	19200.00	19200.00	19,200.00	19,200.00	19,200.00
2											
3											
4											
5											
6											
7											
8											
9											
10											
					TOTAL TRAFFIC SUPPLY ITEMS	→		→	19,200.00	19,200.00	19,200.00

TOTAL PROJECT CONTRACTOR ITEMS	→ →	→ →			
TOTAL PROJECT CONTRACTOR ITEMS	→ →	→ →			
TOTAL TRAFFIC SUPPLY ITEMS	→ →	→ →	19,200.00	19,200.00	19,200.00
CONTINGENCIES	→ →	→ →	1,920.00	1,920.00	1,920.00
TOTAL COST	→ →	→ →	21,120.00	21,120.00	21,120.00

					INTERSECTION # 6: N632 - Old Baltimore Pike & Martha Washington Avenue - Advance Work ONLY	UNIT COST			TOTAL COST		
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
					TOTAL PROJECT CONTRACTOR ITEMS	→		→			

					INTERSECTION # 6: N632 - Old Baltimore Pike & Martha Washington Avenue - Advance Work ONLY	UNIT COST			TOTAL COST		
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
1	710	808501	1	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)						
2	715	802003	4	EA-DY	Arrow Panels, Type C						
3	730	805001	60	EA-DY	Plastic Drums						
4	740	808002	4	EA-DY	Furnish & Maintain Truck Mounted Attenuator, Type II						
5	745	810001	16	EA-DY	Temporary Warning Signs and Plaques						
6	1070	844521	2	EA	Install Video Detection Device						
7	2556	832509	560	LF	Install CAT-5e Cable						
8											
9											
10											
					TOTAL PROJECT CONTRACTOR ITEMS	→		→			

					INTERSECTION # 6: N632 - Old Baltimore Pike & Martha Washington Avenue - Advance Work ONLY	UNIT COST			TOTAL COST		
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
1		999999	1	LS	Gridsmart Video Detection System	23550.00	23550.00	23550.00	23,550.00	23,550.00	23,550.00
2											
3											
4											
5											
6											
7											
8											
9											
10											
					TOTAL TRAFFIC SUPPLY ITEMS	→		→	23,550.00	23,550.00	23,550.00

					TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→			
					TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→			
					TOTAL TRAFFIC SUPPLY ITEMS	→	→	→	→	23,550.00	23,550.00	23,550.00
					CONTINGENCIES	→	→	→	→	2,355.00	2,355.00	2,355.00
					TOTAL COST	→	→	→	→	25,905.00	25,905.00	25,905.00

					INTERSECTION # 7: N698 - Old Baltimore Pike & Woodshade Drive - Advance Work ONLY	UNIT COST			TOTAL COST		
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
					TOTAL PROJECT CONTRACTOR ITEMS	→		→			

					INTERSECTION # 7: N698 - Old Baltimore Pike & Woodshade Drive - Advance Work ONLY	UNIT COST			TOTAL COST		
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
1	710	808501	1	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)						
2	715	802003	2	EA-DY	Arrow Panels, Type C						
3	730	805001	60	EA-DY	Plastic Drums						
4	740	808002	2	EA-DY	Furnish & Maintain Truck Mounted Attenuator, Type II						
5	745	810001	16	EA-DY	Temporary Warning Signs and Plaques						
6	1070	844521	1	EA	Install Video Detection Device						
7	2556	832509	220	LF	Install CAT-5e Cable						
8											
9											
10											
					TOTAL PROJECT CONTRACTOR ITEMS	→		→			

					INTERSECTION # 7: N698 - Old Baltimore Pike & Woodshade Drive - Advance Work ONLY	UNIT COST			TOTAL COST		
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
1		999999	1	LS	Gridsmart Video Detection System	19200.00	19200.00	19200.00	19,200.00	19,200.00	19,200.00
2											
3											
4											
5											
6											
7											
8											
9											
10											
					TOTAL TRAFFIC SUPPLY ITEMS	→		→	19,200.00	19,200.00	19,200.00

					TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→			
					TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→			
					TOTAL TRAFFIC SUPPLY ITEMS	→	→	→	→	19,200.00	19,200.00	19,200.00
					CONTINGENCIES	→	→	→	→	1,920.00	1,920.00	1,920.00
					TOTAL COST	→	→	→	→	21,120.00	21,120.00	21,120.00

					INTERSECTION # 8: N528 - Old Baltimore Pike & Trevett Boulevard - Advance Work ONLY	UNIT COST			TOTAL COST		
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
					TOTAL PROJECT CONTRACTOR ITEMS	→		→			

					INTERSECTION # 8: N528 - Old Baltimore Pike & Trevett Boulevard - Advance Work ONLY	UNIT COST			TOTAL COST		
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
1	710	808501	1	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)						
2	715	802003	4	EA-DY	Arrow Panels, Type C						
3	730	805001	60	EA-DY	Plastic Drums						
4	740	808002	4	EA-DY	Furnish & Maintain Truck Mounted Attenuator, Type II						
5	745	810001	16	EA-DY	Temporary Warning Signs and Plaques						
6	750	811001	8	HR	Flagger, New Castle County, State						
7	1070	844521	1	EA	Install Video Detection Device						
8	2556	832509	320	LF	Install CAT-5e Cable						
9											
10											
					TOTAL PROJECT CONTRACTOR ITEMS	→		→			

					INTERSECTION # 8: N528 - Old Baltimore Pike & Trevett Boulevard - Advance Work ONLY	UNIT COST			TOTAL COST		
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
1		999999	1	LS	Gridsmart Video Detection System	19200.00	19200.00	19200.00	19,200.00	19,200.00	19,200.00
2											
3											
4											
5											
6											
7											
8											
9											
10											
					TOTAL TRAFFIC SUPPLY ITEMS	→		→	19,200.00	19,200.00	19,200.00

TOTAL PROJECT CONTRACTOR ITEMS	→ →	→ →					
TOTAL PROJECT CONTRACTOR ITEMS	→ →	→ →					
TOTAL TRAFFIC SUPPLY ITEMS	→ →	→ →	19,200.00	19,200.00	19,200.00		
CONTINGENCIES	→ →	→ →	1,920.00	1,920.00	1,920.00		
TOTAL COST	→ →	→ →	21,120.00	21,120.00	21,120.00		

					INTERSECTION # 9: N351 - DE 273 & Old Baltimore Pike - Advance Work ONLY	UNIT COST			TOTAL COST		
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
					TOTAL PROJECT CONTRACTOR ITEMS	→		→			

					INTERSECTION # 9: N351 - DE 273 & Old Baltimore Pike - Advance Work ONLY	UNIT COST			TOTAL COST		
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
1	710	808501	1	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)						
2	715	802003	3	EA-DY	Arrow Panels, Type C						
3	730	805001	60	EA-DY	Plastic Drums						
4	740	808002	3	EA-DY	Furnish & Maintain Truck Mounted Attenuator, Type II						
5	745	810001	16	EA-DY	Temporary Warning Signs and Plaques						
6	1070	844521	2	EA	Install Video Detection Device						
7	2556	832509	430	LF	Install CAT-5e Cable						
8											
9											
10											
					TOTAL PROJECT CONTRACTOR ITEMS	→		→			

					INTERSECTION # 9: N351 - DE 273 & Old Baltimore Pike - Advance Work ONLY	UNIT COST			TOTAL COST		
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
1		999999	1	LS	Gridsmart Video Detection System	23550.00	23550.00	23550.00	23,550.00	23,550.00	23,550.00
2											
3											
4											
5											
6											
7											
8											
9											
10											
					TOTAL TRAFFIC SUPPLY ITEMS	→		→	23,550.00	23,550.00	23,550.00

TOTAL PROJECT CONTRACTOR ITEMS	→ →	→ →	
TOTAL PROJECT CONTRACTOR ITEMS	→ →	→ →	
TOTAL TRAFFIC SUPPLY ITEMS	→ →	→ →	23,550.00 23,550.00 23,550.00
CONTINGENCIES	→ →	→ →	2,355.00 2,355.00 2,355.00
TOTAL COST	→ →	→ →	25,905.00 25,905.00 25,905.00

MULTIPLE INTERSECTION SUMMARY

Intersection #5:	**N527 - Old Baltimore Pike & Walther Rd - Advance Work ONLY**								
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→				
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→				
	TOTAL TRAFFIC SUPPLY ITEMS	→	→	→	→	19,200.00	19,200.00	19,200.00
	CONTINGENCIES	→	→	→	→	1,920.00	1,920.00	1,920.00
Intersection #6:	**N632 - Old Baltimore Pike & Martha Washington Avenue - Advance Work ONLY**								
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→				
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→				
	TOTAL TRAFFIC SUPPLY ITEMS	→	→	→	→	23,550.00	23,550.00	23,550.00
	CONTINGENCIES	→	→	→	→	2,355.00	2,355.00	2,355.00
Intersection #7:	**N698 - Old Baltimore Pike & Woodshade Drive - Advance Work ONLY**								
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→				
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→				
	TOTAL TRAFFIC SUPPLY ITEMS	→	→	→	→	19,200.00	19,200.00	19,200.00
	CONTINGENCIES	→	→	→	→	1,920.00	1,920.00	1,920.00
Intersection #8:	**N528 - Old Baltimore Pike & Trevett Boulevard - Advance Work ONLY**								
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→				
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→				
	TOTAL TRAFFIC SUPPLY ITEMS	→	→	→	→	19,200.00	19,200.00	19,200.00
	CONTINGENCIES	→	→	→	→	1,920.00	1,920.00	1,920.00
Intersection #9:	**N351 - DE 273 & Old Baltimore Pike - Advance Work ONLY**								
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→				
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→				
	TOTAL TRAFFIC SUPPLY ITEMS	→	→	→	→	23,550.00	23,550.00	23,550.00
	CONTINGENCIES	→	→	→	→	2,355.00	2,355.00	2,355.00
	TOTAL	→	→	→	→	**115,170.00**	**115,170.00**	**115,170.00**

DELAWARE DEPARTMENT OF TRANSPORTATION

TRAFFIC SIGNAL ESTIMATE

PAVEMENT AND REHABILITATION, NORTH XII, 2016

Pilot Project Where General Contractor Will Be Responsible for Underground & Aboveground Signal Work

CONTRACT #: T201606112
F.A.P. #:
PROJECT: PAVEMENT AND REHABILITATION, NORTH XII, 2016

INTERSECTION # 1: **N232 - DE 7 (Main Street) & Old Baltimore Pike**

						UNIT COST			TOTAL COST		
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
1	15	835003	1	EA	Cabinet Base Type P						
2	135	846001	960	LF	Furnish & Install Loop Wire 1-Conductor #14 AWG encased in 1/4" Flexible Tubing in a Loop Sawcut						
3	140	846002	10	LF	Furnish & Install a 1 - 1/2" Galvanized Rigid Metal Conduit Detector Sleeve with Loop Wire						
4	305	831545	130	LF	Furnish & Install 4” HDPE SDR-13.5 Conduit (Bore)						
5	355	831514	40	LF	Furnish & Install 2-1/2” Schedule 80 PVC Conduit (Trench)						
6	360	831515	20	LF	Furnish & Install 3” Schedule 80 PVC Conduit (Trench)						
7	365	831516	40	LF	Furnish & Install 4” Schedule 80 PVC Conduit (Trench)						
8	440	831523	70	LF	Furnish & Install 2” Galvanized Steel Conduit (Trench)						
9	500	831538	30	LF	Furnish & Install 2” Galvanized Steel Conduit (On Structure)						
10	545	831574	20	LF	Furnish & Install Second and Subsequent Additional 4" PVC Conduits in Trench or Open Cut						
11	650	830001	5	EA	Conduit Junction Well, Type 1, 20" x 20" Precast Concrete						
12	655	830002	1	EA	Conduit Junction Well, Type 4, 20" x 42-1/2" Precast Concrete						
13	850	834005	3	EA	Pole Base Type 4A						
14	1225	830010	2	EA	Removal of Existing Junction Well						
15	1240	834501	1.5	CY	Partial Removal of Concrete Pole Bases and Cabinet Foundations						
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											
					TOTAL PROJECT CONTRACTOR ITEMS	→		→			

INTERSECTION # 1: **N232 - DE 7 (Main Street) & Old Baltimore Pike**

						UNIT COST			TOTAL COST		
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
1	65	832008	260	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper						
2	80	832025	300	LF	Furnish & Install 4-Conductor #18 AWG Shielded Opticom Cable						
3	90	832027	560	LF	Furnish & Install 2-Conductor #14 AWG Aluminum Shielded Cable						
4	95	832029	20	LF	Furnish & Install #8/2 Wire UF W/ground						
5	105	832032	75	LF	Furnish & Install 14/4 Traffic Control Cable						
6	110	832507	690	LF	Furnish & Install 14/5 Traffic Control Cable						
7	115	832033	120	LF	Furnish & Install 14/9 Traffic Control Cable						
8	120	832034	160	LF	Furnish & Install 14/16 Traffic Control Cable						
9	125	832504	300	LF	Furnish & Install #8 THHN Stranded Copper						
10	630	842005	1	EA	Removal of Electric Service on Wood or Metal Pole						
11	635	842501	1	EA	Furnish & Install Electric Utility Service Equipment (100 AMP)						
12	700	833001	1	EA	Bonding & Grounding Existing Junction Well						
13	710	808501	1	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)						
14	715	802003	20	EA-DY	Arrow Panels, Type C						
15	720	803001	60	EA-DY	Furnish & Maintain Portable Changeable Message Board						
16	730	805001	350	EA-DY	Plastic Drums						
17	740	808002	12	EA-DY	Furnish & Maintain Truck Mounted Attenuator, Type II						
18	745	810001	70	EA-DY	Temporary Warning Signs and Plaques						
19	750	811001	96	HR	Flagger, New Castle County, State						
20	780	813001	180	LF-DY	Temporary Barricades, Type III						
21	800	813503	8	SY	Temporary Pedestrian Pathway						
22	885	836502	3	EA	Furnish & Install Pedestal Pole						
23	910	836507	3	EA	Furnish Pedestal Pole Transformer Base						
24	970	837002	8	EA	Furnish & Install 12” LED Signal Head Section Rigid Mount						
25	990	837011	3	EA	Realign or Slide Existing Signal Head						
26	1000	837008	4	EA	Furnish & Install 16” LED Countdown Pedestrian Signal						
27	1010	837010	4	EA	Furnish & Install Pedestrian Pushbutton with Sign						
28	1095	844526	1	EA	Relocate Video Detection Device						
29	1210	838009	60	LF	Removal of Messenger Wire, Cable and Hardware						
30	1235	832035	1375	LF	Removal of Cable from Conduit or Traffic/Lighting Pole						
31	1250	836006	1	EA	Remove Pedestal Pole						
32	1260	837500	2	EA	Removal of Signal Head or Pedestrian Head from Pole or Pedestal						
33	1270	838504	2	EA	Removal of Signal Head or Opticom Detector from Span Wire or Mast Arm						
34	1290	842500	2	EA	Installation or Removal of Pedestrian Button on Wood or Metal Pole						
					TOTAL PROJECT CONTRACTOR ITEMS →			→			

INTERSECTION # 1: **N232 - DE 7 (Main Street) & Old Baltimore Pike**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	UNIT COST			TOTAL COST		
						BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
1	2020	999421	1	EA	Complete P Cabinet w/12 Channel EPAC Controller (includes Mounting Rack w/Power Supply, 5-4 Ch	13950.00	13950.00	13950.00	13,950.00	13,950.00	13,950.00
2	2050	999427	1	EA	Base Extension (split) Aluminum w/Natural Mill Finish	550.00	550.00	550.00	550.00	550.00	550.00
3	2095	999458	1	EA	Patch Cables (One Per Cabinet)	240.00	240.00	240.00	240.00	240.00	240.00
4	2105	999461	1	EA	Optical Receiver Card (Emergency Preemption)	2751.00	2751.00	2751.00	2,751.00	2,751.00	2,751.00
5	2535	999621	1	EA	CDMA	1200.00	1200.00	1200.00	1,200.00	1,200.00	1,200.00
6											
7											
8											
9											
10											
					TOTAL TRAFFIC SUPPLY ITEMS	→		→	18,691.00	18,691.00	18,691.00
					TOTAL PROJECT CONTRACTOR ITEMS	→ →		→ →			
					TOTAL PROJECT CONTRACTOR ITEMS	→ →		→ →			
					TOTAL TRAFFIC SUPPLY ITEMS	→ →		→ →	18,691.00	18,691.00	18,691.00
					CONTINGENCIES	→ →		→ →	1,869.10	1,869.10	1,869.10
					TOTAL COST	→ →		→ →	20,560.10	20,560.10	20,560.10

INTERSECTION # 2: **N192 - DE 273 & DE 7 (Main Street)**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	UNIT COST BYERS	UNIT COST KRISS	UNIT COST ROMMEL	TOTAL COST BYERS	TOTAL COST KRISS	TOTAL COST ROMMEL
1	135	846001	340	LF	Furnish & Install Loop Wire 1-Conductor #14 AWG encased in 1/4" Flexible Tubing in a Loop Sawcut						
2											
3											
4											
5											
6											
7											
8											
9											
10											
					TOTAL PROJECT CONTRACTOR ITEMS	→		→			

INTERSECTION # 2: **N192 - DE 273 & DE 7 (Main Street)**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	UNIT COST BYERS	UNIT COST KRISS	UNIT COST ROMMEL	TOTAL COST BYERS	TOTAL COST KRISS	TOTAL COST ROMMEL
1	65	832008	270	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper						
2	90	832027	820	LF	Furnish & Install 2-Conductor #14 AWG Aluminum Shielded Cable						
3	1095	844526	1	EA	Relocate Video Detection Device						
4	1235	832035	770	LF	Removal of Cable from Conduit or Traffic/Lighting Pole						
5		801500	1	LS	Maintenance of Traffic, All Inclusive						
6											
7											
8											
9											
10											
					TOTAL PROJECT CONTRACTOR ITEMS	→		→			

INTERSECTION # 2: **N192 - DE 273 & DE 7 (Main Street)**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	UNIT COST BYERS	UNIT COST KRISS	UNIT COST ROMMEL	TOTAL COST BYERS	TOTAL COST KRISS	TOTAL COST ROMMEL
					TOTAL TRAFFIC SUPPLY ITEMS	→		→			

TOTAL PROJECT CONTRACTOR ITEMS	→ →	→ →			
TOTAL PROJECT CONTRACTOR ITEMS	→ →	→ →			
TOTAL TRAFFIC SUPPLY ITEMS	→ →	→ →			
CONTINGENCIES	→ →	→ →			
TOTAL COST	→ →	→ →			

MULTIPLE INTERSECTION SUMMARY

Intersection #1:	**N232 - DE 7 (Main Street) & Old Baltimore Pike**							
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→			
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→			
	TOTAL TRAFFIC SUPPLY ITEMS	→	→	→	→	18,691.00	18,691.00	18,691.00
	CONTINGENCIES	→	→	→	→	1,869.10	1,869.10	1,869.10
Intersection #2:	**N192 - DE 273 & DE 7 (Main Street)**							
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→			
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→			
	TOTAL TRAFFIC SUPPLY ITEMS	→	→	→	→			
	CONTINGENCIES	→	→	→	→			
	TOTAL	→	→	→	→	**20,560.10**	**20,560.10**	**20,560.10**

G:\Projects\145002.00 (DelDOT Agmt 1679)\T51 (T201606112) - Traffic-ADA Pleasant Valley Rd\PROJECT CONSTRUCTION PHASE\Bidding and Cost Estimates\[T201606112_North XII.xlsx]Signals Loc 1

DELAWARE DEPARTMENT OF TRANSPORTATION

TRAFFIC SIGNAL ESTIMATE

PAVEMENT AND REHABILITATION, NORTH XII, 2016

Pilot Project Where General Contractor Will Be Responsible for Underground & Aboveground Signal Work

CONTRACT #: T201606112
F.A.P. #:
PROJECT: PAVEMENT AND REHABILITATION, NORTH XII, 2016

INTERSECTION # 3: **N238 - Old Baltimore Pike & Otts Chapel Road**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	UNIT COST BYERS	UNIT COST KRISS	UNIT COST ROMMEL	TOTAL COST BYERS	TOTAL COST KRISS	TOTAL COST ROMMEL
1	135	846001	500	LF	Furnish & Install Loop Wire 1-Conductor #14 AWG encased in 1/4" Flexible Tubing in a Loop Sawcut						
2											
3											
4											
5											
6											
7											
8											
9											
10											
					TOTAL PROJECT CONTRACTOR ITEMS	→		→			

INTERSECTION # 3: **N238 - Old Baltimore Pike & Otts Chapel Road**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	UNIT COST BYERS	UNIT COST KRISS	UNIT COST ROMMEL	TOTAL COST BYERS	TOTAL COST KRISS	TOTAL COST ROMMEL
1	85	832026	300	LF	Furnish & Install 1-Conductor #14 AWG Stranded Copper						
2	1095	844526	2	EA	Relocate Video Detection Device						
3	1235	832035	400	LF	Removal of Cable from Conduit or Traffic/Lighting Pole						
4		801500	1	LS	Maintenance of Traffic, All Inclusive						
5											
6											
7											
8											
9											
10											
					TOTAL PROJECT CONTRACTOR ITEMS	→		→			

INTERSECTION # 3: **N238 - Old Baltimore Pike & Otts Chapel Road**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	UNIT COST BYERS	UNIT COST KRISS	UNIT COST ROMMEL	TOTAL COST BYERS	TOTAL COST KRISS	TOTAL COST ROMMEL
					TOTAL TRAFFIC SUPPLY ITEMS	→		→			

TOTAL PROJECT CONTRACTOR ITEMS	→ →	→ →			
TOTAL PROJECT CONTRACTOR ITEMS	→ →	→ →			
TOTAL TRAFFIC SUPPLY ITEMS	→ →	→ →			
CONTINGENCIES	→ →	→ →			
TOTAL COST	→ →	→ →			

INTERSECTION # 4: **N188 - DE 896 (South College Avenue) & Old Baltimore Pike**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	UNIT COST BYERS	UNIT COST KRISS	UNIT COST ROMMEL	TOTAL COST BYERS	TOTAL COST KRISS	TOTAL COST ROMMEL
1	135	846001	820	LF	Furnish & Install Loop Wire 1-Conductor #14 AWG encased in 1/4" Flexible Tubing in a Loop Sawcut						
2											
3											
4											
5											
6											
7											
8											
9											
10											
					TOTAL PROJECT CONTRACTOR ITEMS	→		→			

INTERSECTION # 4: **N188 - DE 896 (South College Avenue) & Old Baltimore Pike**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	UNIT COST BYERS	UNIT COST KRISS	UNIT COST ROMMEL	TOTAL COST BYERS	TOTAL COST KRISS	TOTAL COST ROMMEL
1	85	832026	100	LF	Furnish & Install 1-Conductor #14 AWG Stranded Copper						
2	90	832027	1100	LF	Furnish & Install 2-Conductor #14 AWG Aluminum Shielded Cable						
3	1095	844526	2	EA	Relocate Video Detection Device						
4	1235	832035	1230	LF	Removal of Cable from Conduit or Traffic/Lighting Pole						
5		801500	1	LS	Maintenance of Traffic, All Inclusive						
6											
7											
8											
9											
10											
					TOTAL PROJECT CONTRACTOR ITEMS	→		→			

INTERSECTION # 4: **N188 - DE 896 (South College Avenue) & Old Baltimore Pike**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	UNIT COST BYERS	UNIT COST KRISS	UNIT COST ROMMEL	TOTAL COST BYERS	TOTAL COST KRISS	TOTAL COST ROMMEL
					TOTAL TRAFFIC SUPPLY ITEMS	→		→			

TOTAL PROJECT CONTRACTOR ITEMS	→ →	→ →			
TOTAL PROJECT CONTRACTOR ITEMS	→ →	→ →			
TOTAL TRAFFIC SUPPLY ITEMS	→ →	→ →			
CONTINGENCIES	→ →	→ →			
TOTAL COST	→ →	→ →			

MULTIPLE INTERSECTION SUMMARY

Intersection #3:	**N238 - Old Baltimore Pike & Otts Chapel Road**								
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→				
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→				
	TOTAL TRAFFIC SUPPLY ITEMS	→	→	→	→				
	CONTINGENCIES	→	→	→	→				
Intersection #4:	**N188 - DE 896 (South College Avenue) & Old Baltimore Pike**								
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→				
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→				
	TOTAL TRAFFIC SUPPLY ITEMS	→	→	→	→				
	CONTINGENCIES	→	→	→	→				
	TOTAL	→	→	→	→				

DELAWARE DEPARTMENT OF TRANSPORTATION

TRAFFIC SIGNAL ESTIMATE

PAVEMENT AND REHABILITATION, NORTH XII, 2016

Pilot Project Where General Contractor Will Be Responsible for Underground & Aboveground Signal Work

CONTRACT #: T201606112
F.A.P. #:
PROJECT: PAVEMENT AND REHABILITATION, NORTH XII, 2016

INTERSECTION # 5: **N527 - Old Baltimore Pike & Walther Rd**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	UNIT COST BYERS	UNIT COST KRISS	UNIT COST ROMMEL	TOTAL COST BYERS	TOTAL COST KRISS	TOTAL COST ROMMEL
1	135	846001	500	LF	Furnish & Install Loop Wire 1-Conductor #14 AWG encased in 1/4" Flexible Tubing in a Loop Sawcut						
2											
3											
4											
5											
6											
7											
8											
9											
10											
					TOTAL PROJECT CONTRACTOR ITEMS	→		→			

INTERSECTION # 5: **N527 - Old Baltimore Pike & Walther Rd**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	UNIT COST BYERS	UNIT COST KRISS	UNIT COST ROMMEL	TOTAL COST BYERS	TOTAL COST KRISS	TOTAL COST ROMMEL
1	65	832008	1070	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper						
2	90	832027	1850	LF	Furnish & Install 2-Conductor #14 AWG Aluminum Shielded Cable						
3	1095	844526	1	EA	Relocate Video Detection Device						
4	1235	832035	1850	LF	Removal of Cable from Conduit or Traffic/Lighting Pole						
5		801500	1	LS	Maintenance of Traffic, All Inclusive						
6											
7											
8											
9											
10											
					TOTAL PROJECT CONTRACTOR ITEMS	→		→			

INTERSECTION # 5: **N527 - Old Baltimore Pike & Walther Rd**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	UNIT COST BYERS	UNIT COST KRISS	UNIT COST ROMMEL	TOTAL COST BYERS	TOTAL COST KRISS	TOTAL COST ROMMEL
					TOTAL TRAFFIC SUPPLY ITEMS	→		→			

TOTAL PROJECT CONTRACTOR ITEMS	→ →	→ →			
TOTAL PROJECT CONTRACTOR ITEMS	→ →	→ →			
TOTAL TRAFFIC SUPPLY ITEMS	→ →	→ →			
CONTINGENCIES	→ →	→ →			
TOTAL COST	→ →	→ →			

INTERSECTION # 6: **N632 - Old Baltimore Pike & Martha Washington Avenue**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	UNIT COST			TOTAL COST		
						BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
1	135	846001	760	LF	Furnish & Install Loop Wire 1-Conductor #14 AWG encased in 1/4" Flexible Tubing in a Loop Sawcut						
2	140	846002	30	LF	Furnish & Install a 1 - 1/2" Galvanized Rigid Metal Conduit Detector Sleeve with Loop Wire						
3	305	831545	260	LF	Furnish & Install 4” HDPE SDR-13.5 Conduit (Bore)						
4	355	831514	70	LF	Furnish & Install 2-1/2” Schedule 80 PVC Conduit (Trench)						
5	365	831516	30	LF	Furnish & Install 4” Schedule 80 PVC Conduit (Trench)						
6	440	831523	50	LF	Furnish & Install 2” Galvanized Steel Conduit (Trench)						
7	500	831538	30	LF	Furnish & Install 2” Galvanized Steel Conduit (On Structure)						
8	650	830001	5	EA	Conduit Junction Well, Type 1, 20" x 20" Precast Concrete						
9	670	830008	4	EA	Adjust or Repair Existing Conduit Junction Well						
10	850	834005	4	EA	Pole Base Type 4A						
11	1225	830010	1	EA	Removal of Existing Junction Well						
12	1240	834501	0.4	CY	Partial Removal of Concrete Pole Bases and Cabinet Foundations						
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											
					TOTAL PROJECT CONTRACTOR ITEMS	→		→			

INTERSECTION # 6: **N632 - Old Baltimore Pike & Martha Washington Avenue**

						UNIT COST			TOTAL COST		
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
1	65	832008	1070	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper						
2	85	832026	60	LF	Furnish & Install 1-Conductor #14 AWG Stranded Copper						
3	90	832027	1870	LF	Furnish & Install 2-Conductor #14 AWG Aluminum Shielded Cable						
4	95	832029	55	LF	Furnish & Install #8/2 Wire UF W/ground						
5	105	832032	110	LF	Furnish & Install 14/4 Traffic Control Cable						
6	110	832507	760	LF	Furnish & Install 14/5 Traffic Control Cable						
7	125	832504	130	LF	Furnish & Install #8 THHN Stranded Copper						
8	630	842005	1	EA	Removal of Electric Service on Wood or Metal Pole						
9	635	842501	1	EA	Furnish & Install Electric Utility Service Equipment (100 AMP)						
10	700	833001	4	EA	Bonding & Grounding Existing Junction Well						
11	710	808501	1	EA-DY	Furnish & Maintain Straight Boom Lift, Up to 80', 4WD (Daily)						
12	715	802003	20	EA-DY	Arrow Panels, Type C						
13	720	803001	60	EA-DY	Furnish & Maintain Portable Changeable Message Board						
14	730	805001	350	EA-DY	Plastic Drums						
15	740	808002	12	EA-DY	Furnish & Maintain Truck Mounted Attenuator, Type II						
16	745	810001	70	EA-DY	Temporary Warning Signs and Plaques						
17	750	811001	96	HR	Flagger, New Castle County, State						
18	780	813001	200	LF-DY	Temporary Barricades, Type III						
19	800	813503	10	SY	Temporary Pedestrian Pathway						
20	885	836502	4	EA	Furnish & Install Pedestal Pole						
21	910	836507	4	EA	Furnish Pedestal Pole Transformer Base						
22	975	837004	8	EA	Furnish & Install 12” LED Signal Head Section Span Mount						
23	1000	837008	6	EA	Furnish & Install 16” LED Countdown Pedestrian Signal						
24	1010	837010	6	EA	Furnish & Install Pedestrian Pushbutton with Sign						
25	1095	844526	2	EA	Relocate Video Detection Device						
26	1230	831011	30	LF	Removal of Conduit from Wood Pole						
27	1235	832035	2425	LF	Removal of Cable from Conduit or Traffic/Lighting Pole						
28	1250	836006	2	EA	Remove Pedestal Pole						
29	1270	838504	2	EA	Removal of Signal Head or Opticom Detector from Span Wire or Mast Arm						
30											
					TOTAL PROJECT CONTRACTOR ITEMS →			→			

INTERSECTION # 6: **N632 - Old Baltimore Pike & Martha Washington Avenue**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	UNIT COST BYERS	UNIT COST KRISS	UNIT COST ROMMEL	TOTAL COST BYERS	TOTAL COST KRISS	TOTAL COST ROMMEL
					TOTAL TRAFFIC SUPPLY ITEMS	→		→			
					TOTAL PROJECT CONTRACTOR ITEMS	→ →		→ →			
					TOTAL PROJECT CONTRACTOR ITEMS	→ →		→ →			
					TOTAL TRAFFIC SUPPLY ITEMS	→ →		→ →			
					CONTINGENCIES	→ →		→ →			
					TOTAL COST	→ →		→ →			

INTERSECTION # 7: **N698 - Old Baltimore Pike & Woodshade Drive**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	UNIT COST BYERS	UNIT COST KRISS	UNIT COST ROMMEL	TOTAL COST BYERS	TOTAL COST KRISS	TOTAL COST ROMMEL
1	135	846001	450	LF	Furnish & Install Loop Wire 1-Conductor #14 AWG encased in 1/4" Flexible Tubing in a Loop Sawcut						
2											
3											
4											
5											
6											
7											
8											
9											
10											
					TOTAL PROJECT CONTRACTOR ITEMS	→		→			

INTERSECTION # 7: **N698 - Old Baltimore Pike & Woodshade Drive**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	UNIT COST BYERS	UNIT COST KRISS	UNIT COST ROMMEL	TOTAL COST BYERS	TOTAL COST KRISS	TOTAL COST ROMMEL
1	65	832008	970	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper						
2	85	832026	100	LF	Furnish & Install 1-Conductor #14 AWG Stranded Copper						
3	90	832027	1700	LF	Furnish & Install 2-Conductor #14 AWG Aluminum Shielded Cable						
4	1095	844526	1	EA	Relocate Video Detection Device						
5	1235	832035	1370	LF	Removal of Cable from Conduit or Traffic/Lighting Pole						
6		801500	1	LS	Maintenance of Traffic, All Inclusive						
7											
8											
9											
10											
					TOTAL PROJECT CONTRACTOR ITEMS	→		→			

INTERSECTION # 7: **N698 - Old Baltimore Pike & Woodshade Drive**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	UNIT COST BYERS	UNIT COST KRISS	UNIT COST ROMMEL	TOTAL COST BYERS	TOTAL COST KRISS	TOTAL COST ROMMEL
					TOTAL TRAFFIC SUPPLY ITEMS	→		→			

TOTAL PROJECT CONTRACTOR ITEMS	→ →	→ →			
TOTAL PROJECT CONTRACTOR ITEMS	→ →	→ →			
TOTAL TRAFFIC SUPPLY ITEMS	→ →	→ →			
CONTINGENCIES	→ →	→ →			
TOTAL COST	→ →	→ →			

INTERSECTION # 8: **N528 - Old Baltimore Pike & Trevett Boulevard**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	UNIT COST BYERS	UNIT COST KRISS	UNIT COST ROMMEL	TOTAL COST BYERS	TOTAL COST KRISS	TOTAL COST ROMMEL
1	135	846001	500	LF	Furnish & Install Loop Wire 1-Conductor #14 AWG encased in 1/4" Flexible Tubing in a Loop Sawcut						
2											
3											
4											
5											
6											
7											
8											
9											
10											
					TOTAL PROJECT CONTRACTOR ITEMS	→		→			

INTERSECTION # 8: **N528 - Old Baltimore Pike & Trevett Boulevard**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	UNIT COST BYERS	UNIT COST KRISS	UNIT COST ROMMEL	TOTAL COST BYERS	TOTAL COST KRISS	TOTAL COST ROMMEL
1	65	832008	1200	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper						
2	85	832026	100	LF	Furnish & Install 1-Conductor #14 AWG Stranded Copper						
3	90	832027	1750	LF	Furnish & Install 2-Conductor #14 AWG Aluminum Shielded Cable						
4	1095	844526	1	EA	Relocate Video Detection Device						
5	1235	832035	1720	LF	Removal of Cable from Conduit or Traffic/Lighting Pole						
6		801500	1	LS	Maintenance of Traffic, All Inclusive						
7											
8											
9											
10											
					TOTAL PROJECT CONTRACTOR ITEMS	→		→			

INTERSECTION # 8: **N528 - Old Baltimore Pike & Trevett Boulevard**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	UNIT COST BYERS	UNIT COST KRISS	UNIT COST ROMMEL	TOTAL COST BYERS	TOTAL COST KRISS	TOTAL COST ROMMEL
					TOTAL TRAFFIC SUPPLY ITEMS	→		→			

TOTAL PROJECT CONTRACTOR ITEMS	→ →	→ →			
TOTAL PROJECT CONTRACTOR ITEMS	→ →	→ →			
TOTAL TRAFFIC SUPPLY ITEMS	→ →	→ →			
CONTINGENCIES	→ →	→ →			
TOTAL COST	→ →	→ →			

INTERSECTION # 9: **N351 - DE 273 & Old Baltimore Pike**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	UNIT COST BYERS	UNIT COST KRISS	UNIT COST ROMMEL	TOTAL COST BYERS	TOTAL COST KRISS	TOTAL COST ROMMEL
1	135	846001	250	LF	Furnish & Install Loop Wire 1-Conductor #14 AWG encased in 1/4" Flexible Tubing in a Loop Sawcut						
2											
3											
4											
5											
6											
7											
8											
9											
10											
					TOTAL PROJECT CONTRACTOR ITEMS	→		→			

INTERSECTION # 9: **N351 - DE 273 & Old Baltimore Pike**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	UNIT COST BYERS	UNIT COST KRISS	UNIT COST ROMMEL	TOTAL COST BYERS	TOTAL COST KRISS	TOTAL COST ROMMEL
1	65	832008	300	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper						
2	90	832027	750	LF	Furnish & Install 2-Conductor #14 AWG Aluminum Shielded Cable						
4	1095	844526	2	EA	Relocate Video Detection Device						
5	1235	832035	680	LF	Removal of Cable from Conduit or Traffic/Lighting Pole						
6		801500	1	LS	Maintenance of Traffic, All Inclusive						
7											
8											
9											
10											
					TOTAL PROJECT CONTRACTOR ITEMS	→		→			

INTERSECTION # 9: **N351 - DE 273 & Old Baltimore Pike**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	UNIT COST BYERS	UNIT COST KRISS	UNIT COST ROMMEL	TOTAL COST BYERS	TOTAL COST KRISS	TOTAL COST ROMMEL
					TOTAL TRAFFIC SUPPLY ITEMS	→		→			

TOTAL PROJECT CONTRACTOR ITEMS	→ →	→ →			
TOTAL PROJECT CONTRACTOR ITEMS	→ →	→ →			
TOTAL TRAFFIC SUPPLY ITEMS	→ →	→ →			
CONTINGENCIES	→ →	→ →			
TOTAL COST	→ →	→ →			

MULTIPLE INTERSECTION SUMMARY

Intersection #5:	**N527 - Old Baltimore Pike & Walther Rd**									
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→					
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→					
	TOTAL TRAFFIC SUPPLY ITEMS	→	→	→	→					
	CONTINGENCIES	→	→	→	→					
Intersection #6:	**N632 - Old Baltimore Pike & Martha Washington Avenue**									
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→					
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→					
	TOTAL TRAFFIC SUPPLY ITEMS	→	→	→	→					
	CONTINGENCIES	→	→	→	→					
Intersection #7:	**N698 - Old Baltimore Pike & Woodshade Drive**									
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→					
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→					
	TOTAL TRAFFIC SUPPLY ITEMS	→	→	→	→					
	CONTINGENCIES	→	→	→	→					
Intersection #8:	**N528 - Old Baltimore Pike & Trevett Boulevard**									
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→					
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→					
	TOTAL TRAFFIC SUPPLY ITEMS	→	→	→	→					
	CONTINGENCIES	→	→	→	→					
Intersection #9:	**N351 - DE 273 & Old Baltimore Pike**									
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→					
	TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→					
	TOTAL TRAFFIC SUPPLY ITEMS	→	→	→	→					
	CONTINGENCIES	→	→	→	→					
	TOTAL	→	→	→	→					

DELAWARE DEPARTMENT OF TRANSPORTATION

TRAFFIC SIGNAL ESTIMATE

PAVEMENT AND REHABILITATION, NORTH XII, 2016

Pilot Project Where General Contractor Will Be Responsible for Underground & Aboveground Signal Work

CONTRACT #: T201606112
F.A.P. #:
PROJECT: PAVEMENT AND REHABILITATION, NORTH XII, 2016

LOCATION # 1: **W Main St**

						UNIT COST			TOTAL COST		
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
1	1145	823003	22.5	SF	Removal of Sign on Span Wire or Mast Arm						
2	1210	838009	100	LF	Removal of Messenger Wire, Cable and Hardware						
3											
4											
5											
6											
7											
8											
9											
10											
					TOTAL PROJECT CONTRACTOR ITEMS	→		→			
					TOTAL PROJECT CONTRACTOR ITEMS	→ →		→ →			
					CONTINGENCIES	→ →		→ →			
					TOTAL COST	→ →		→ →			

G:\Projects\145002.00 (DelDOT Agmt 1679)\T51 (T201606112) - Traffic-ADA Pleasant Valley Rd\PROJECT CONSTRUCTION PHASE\Bidding and Cost Estimates\[T201606112_North XII.xlsx]Overhead Signing

DELAWARE DEPARTMENT OF TRANSPORTATION

TRAFFIC ROADWAY SIGNING ESTIMATE

PAVEMENT AND REHABILITATION, NORTH XII, 2016

General Contractor Will Be Responsible for Supply and Installation of all Signs

CONTRACT #: T201606112
F.A.P. #: 0
PROJECT: PAVEMENT AND REHABILITATION, NORTH XII, 2016

PROJECT LOCATION: **PAVEMENT AND REHABILITATION, NORTH XII, 2016**

LINE	ITEM #	QTY	DESCRIPTION - PROJECT CONTRACTOR ITEMS	UOM	
1	819018	563	INSTALLATION OR REMOVAL OF TRAFFIC SIGN ON SINGLE SIGN POST	EA	
2	819016	9	INSTALLATION OF 4" DIAMETER HOLE, LESS THAN OR EQUAL TO 6" IN DEPTH	EA	
3	819017	0	INSTALLATION OF 4" DIAMETER HOLE, GREATER THAN 6" IN DEPTH	EA	
4	819019	99	INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS	SF	
7	819011	126	GALVANIZED TELESCOPING STEEL SIGN POSTS, 12'X2", COMPLETE W/BASEPOSTS & HARDWARE	EA	
7A	819023	5	GALVANIZED TELESCOPING STEEL SIGNPOSTS, 15'X2", COMPLETE W/BASEPOSTS & HARDWARE	EA	
7B	818002	1565	SUPPLY OF FLAT SHEET ALUMINUM SIGN PANEL, TYPE IX RETROREFLECTIVE SHEETING	SF	

LINE	CODE #	QTY	SIGNING DESCRIPTION	SIZE	UNIT COST	TOTAL COST
5	X13		SALARY, OVER-TIME	EA-HR	40.00	
6	X14		SIGNFIX (FOR ANY SIGN WITH FLASHING BEACONS)	EACH	56.00	
7	X11		12' POSTS (W/ BASEPOST) NEEDED FOR PROJECT OR LOCATION	EACH	34.02	
7A	X11A		15' POSTS (W/ BASEPOST) NEEDED FOR PROJECT OR LOCATION	EACH	50.00	
7B	X11B		FLAT SHEET ALUMINUM SIGN PANELS	SF	12.50	
8	X12		6' DELINEATOR POST (W/ BOLT & ETC.)	EACH	5.00	
	X15		Miscellaneous Roadway Signing Fee	EACH	1000.00	
			TRAFFIC ONLY PROJECT			
9	X1		Installation of Sign Posts, 9', 10', 11', 12', 15' in Unpaved Area or Existing Holes	EACH	26.00	
10	X2		Installation of 4" dia. Hole in Pavement or Concrete	EACH	52.00	
11	X3		Installation of 4" dia. Hole, in Excess of 6" per ea. additional inch drilled in Pavement	EACH	$52.75	
12	X4		Installation of Street Name Signs	EACH	$26.38	
13	X5		Installation of Signs (Two or More Mounting Holes)	S/F	2.75	
14	X6		Sets, Installation of Sign Bands and Buckles	EACH	52.75	
15	X7		Removal of Traffic Signs	EACH	26.38	
16	X8		Removal of Street Name Signs	EACH	26.38	
17	X9		Removal of Sign Posts	EACH	1.00	
18	X10		Straightening of Sign Posts	EACH	17.00	
19						
					TOTAL FOR LABOR	0.00

TOTAL FOR SIGNING MATERIALS	0.00
TOTAL FOR LABOR	0.00
CONTINGENCIES	0.00
TOTAL ROADSIDE SIGNING COST	**$0.00**

PERMANENT SIGN SCHEDULE

SHEET NO.	PLAN IDENTIFIER	SIGN DESIGNATION	QTY.	DESCRIPTION	SIGN WIDTH (IN)	SIGN HEIGHT (IN)	SIGN AREA (SF)	ITEM 819018 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE POST (EACH)			ITEM 819019 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS (SF)			POST INSTALLATION TYPE	Code X11 12' Post (W/ Basepost) (EACH)	Code X11A 15' Post (W/ Basepost) (EACH)	ITEM 819016 4" HOLE, 0-6" (EACH)	ITEM 819017 4" HOLE, >6" (EACH)	REMARKS
								SIGN DISPOSITION	REMOVE	INSTALL	SIGN DISPOSITION	REMOVE	INSTALL						
SS-1	1A	S1-1(36)	1	SCHOOL SIGN (Symbol) - 36x36	36	36	9.0	NEW		1				SOIL	1				
SS-1	1B	W16-6P_FYG(24)L	1	LEFT ADVANCE TURN ARROW (plaque) - 24x18	24	18	3.0	ADD TO ASSEMBLY		1									
SS-1	2A	D3-1(6)	1	STREET NAME (1 Line)	24	6		REMOVE	1										W Main St
SS-1	2B	R1-1(30)	1	STOP	30	30		REMOVE	1										
SS-1	3A	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	30	12	5.0	ADD TO ASSEMBLY		2									W Main St Hwy C, 6"/4"
SS-1	3B	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	36	12	6.0	ADD TO ASSEMBLY		2									Browns Ln Hwy C, 6"/4"
SS-1	3C	R1-1(36)	1	STOP	36	36	7.5	ADD TO ASSEMBLY		1									
SS-1	3D	S5-2(24)	1	END SCHOOL ZONE - 24x30	24	30	5.0	NEW		1				SOIL	1				
SS-1	4A	R3-8 (MOD)	1	ADVANCE INTERSECTION LANE CONTROL (Left, Right) - 30"x30"	30	30					REMAIN								
SS-1	4B	MOD	1	TOURIST SIGN	24	36					REMAIN								
SS-1	5A	W3-1(36)	1	STOP AHEAD (Symbol) - 36x36	36	36	9.0	NEW		1				SOIL	1				
SS-1	5B	W16-8aP	1	ADVANCE STREET NAME (2 - line plaque)	36	18	4.5	ADD TO ASSEMBLY		1									(Left Arrow) W Main St Browns Ln (Right Arrow) Hwy C, 4"
SS-1	6A	W11-2(30)	1	PEDESTRIAN (Symbol) - 30x30	30	30		REMOVE	1										
SS-1	6B	D4-3-DE	1	BUS STOP (DART)	12	18		REMOVE	1										ID 2188 STOP 10-34
SS-1	7A	W16-7P_FYG(24)R	1	RIGHT DOWNWARD DIAGONAL ARROW (plaque) - 24x12	24	12	2.0	ADD TO ASSEMBLY		1									Install Back to Back with 7D
SS-1	7B	S1-1(36)	1	SCHOOL SIGN (Symbol) - 36x36	36	36	9.0	ADD TO ASSEMBLY		1									Install Back to Back with 7C
SS-1	7C	S1-1(36)	1	SCHOOL SIGN (Symbol) - 36x36	36	36	9.0	NEW		1				SOIL	1				
SS-1	7D	W16-7P_FYG(24)L	1	LEFT DOWNWARD DIAGONAL ARROW (plaque) - 24x12	24	12	2.0	ADD TO ASSEMBLY		1									
SS-1	8	D4-3-DE	1	BUS STOP (DART)	12	18		NEW		1				SOIL	1				Sign will be furnished by DART Install on new 12' post ID 2188 STOP 10-34
SS-1	9	R5-1(30)	1	DO NOT ENTER - 30x30	30	30		REMOVE	1										
SS-1	10	R5-1(36)	2	DO NOT ENTER - 36x36	36	36	18.0	NEW		2				SOIL	2				
SS-1	11	R7-4-DE(12)	1	NO STOPPING, STANDING, OR PARKING - 12x18	12	18		REMAIN											
SS-1	12A	W1-7(48)	1	TWO DIRECTIONAL LARGE ARROW - 48x24	48	24	8.0				NEW		8.0	SOIL	2				
SS-1	12B	OM4-3	2	END OF ROAD OBJECT MARKER	18	18	4.5				ADD TO ASSEMBLY		4.5						
SS-1	13A	S1-1(30)	1	SCHOOL SIGN (Symbol) - 30x30	30	30		REMOVE	1										
SS-1	13B	D4-3-DE	1	BUS STOP (DART)	12	18		REMOVE	1										ID 3318 STOP 10-34
SS-1	14A	S1-1(36)	1	SCHOOL SIGN (Symbol) - 36x36	36	36	9.0	NEW		1				SOIL	1				
SS-1	14B	W16-6P_FYG(24)R	1	RIGHT ADVANCE TURN ARROW (plaque) - 24x18	24	18	3.0	ADD TO ASSEMBLY		1									
SS-1	14C	D4-3-DE	1	BUS STOP (DART)	12	18		ADD TO ASSEMBLY		1									Sign will be furnished by DART ID 3318 STOP 10-34
SS-1	15A	S5-1-DE(24)	1	SCHOOL SPEED LIMIT XX WHEN CHILDREN ARE PRESENT - 24x5	24	54	9.0	NEW		1				SOIL	1				"20"
SS-1	15B	R2-1-35(24)	1	SPEED LIMIT (35 MPH - 24x30)	24	30	5.0	ADD TO ASSEMBLY		1									
SS-1	16A	S1-1(36)	1	SCHOOL SIGN (Symbol) - 36x36	36	36	9.0	NEW		1				SOIL	1				
SS-1	16B	W16-9P_FYG(24)	1	AHEAD (plaque) - 24x12	24	12	2.0	ADD TO ASSEMBLY		1									
SS-1	17A	W11-2(30)	1	PEDESTRIAN (Symbol) - 30x30	30	30		REMOVE	1										
SS-1	17B	R2-1-35(24)	1	SPEED LIMIT (35 MPH - 24x30)	24	30		REMOVE	1										
SS-1	18A	W16-7P_FYG(24)R	1	RIGHT DOWNWARD DIAGONAL ARROW (plaque) - 24x12	24	12	2.0	ADD TO ASSEMBLY		1									Install Back to Back with 18D
SS-1	18B	S1-1(36)	1	SCHOOL SIGN (Symbol) - 36x36	36	36	9.0	ADD TO ASSEMBLY		1									Install Back to Back with 18C
SS-1	18C	S1-1(36)	1	SCHOOL SIGN (Symbol) - 36x36	36	36	9.0	NEW		1				SOIL	1				
SS-1	18D	W16-7P_FYG(24)L	1	LEFT DOWNWARD DIAGONAL ARROW (plaque) - 24x12	24	12	2.0	ADD TO ASSEMBLY		1									
SS-1	19	D4-3-DE	1	BUS STOP (DART)	12	18	1.5	RENEW	1	1				SOIL	1				Sign will be furnished by DART Install on new 12' post ID 2196 STOP 10-34
SS-1	20	S5-1-DE(24)		SCHOOL SPEED LIMIT XX WHEN CHILDREN ARE PRESENT - 24x5	24	54		REMOVE											20
SS-1	21	D3-2-DE3	1	DEVELOPMENT NAME	36	16		REMAIN											CHRISTIANA VILLAGE -->
SS-1	22A	R4-17(24)	1	DO NOT DRIVE ON SHOULDER - 24x30	24	30	5.0	ADD TO ASSEMBLY		1									
SS-1	22B	MOD	1	NO TRAFFIC ON SHOULDER	24	30		REMOVE	1										
SS-1	22C	R7-4-DE(12)	1	NO STOPPING, STANDING, OR PARKING - 12x18	12	18		REMAIN											
SS-1	23	S1-1(36)	1	SCHOOL SIGN (Symbol) - 36x36	36	36		REMOVE	1										
SS-2	1	S1-1(30)	1	SCHOOL SIGN (Symbol) - 30x30	30	30		REMOVE	1										
SS-2	2A	W16-7P_FYG(24)R	1	RIGHT DOWNWARD DIAGONAL ARROW (plaque) - 24x12	24	12	2.0	ADD TO ASSEMBLY		1									Install Back to Back with 2D
SS-2	2B	S1-1(36)	1	SCHOOL SIGN (Symbol) - 36x36	36	36	9.0	ADD TO ASSEMBLY		1									Install Back to Back with 2C
SS-2	2C	S1-1(36)	1	SCHOOL SIGN (Symbol) - 36x36	36	36	9.0	NEW		1				SOIL	1				
SS-2	2D	W16-7P_FYG(24)L	1	LEFT DOWNWARD DIAGONAL ARROW (plaque) - 24x12	24	12	2.0	ADD TO ASSEMBLY		1									
SS-2	3	S5-1-DE(24)	1	SCHOOL SPEED LIMIT XX WHEN CHILDREN ARE PRESENT - 24x5	24	54		REMOVE	1										20
SS-2	4A	S1-1(36)	1	SCHOOL SIGN (Symbol) - 36x36	36	36	9.0	NEW		1				SOIL	1				
SS-2	4B	W16-7P_FYG(24)L	1	LEFT DOWNWARD DIAGONAL ARROW (plaque) - 24x12	24	12	2.0	ADD TO ASSEMBLY		1									
SS-2	4C	D4-3-DE	1	BUS STOP (DART)	12	18		ADD TO ASSEMBLY		1									Sign will be furnished by DART ID 2410 STOP 10-34
SS-2	5A	S5-3-DE-MOD	1	SCHOOL	60	30													Remove overhead sign
SS-2	5B	R3-8-MOD	1	DVANCE INTERSECTION LANE CONTROL (Left, Left - Ahead) - 48"x	48	30													Remove overhead sign
SS-2	6A	W11-2(30)	1	PEDESTRIAN (Symbol) - 30x30	30	30		REMOVE	1										
SS-2	6B	D4-3-DE	1	BUS STOP (DART)	12	18		REMOVE	1										ID 2410 STOP 10-34
SS-2	7	S5-1-DE(24)	1	SCHOOL SPEED LIMIT XX WHEN CHILDREN ARE PRESENT - 24x5	24	54	9.0	NEW		1				SOIL	1				"20"
SS-2	8A	R7-202aP-DE1	1	END (plaque - red)	12	6		REMAIN											
SS-2	8B	R7-4-DE(12)	1	NO STOPPING, STANDING, OR PARKING - 12x18	12	18		REMAIN											
SS-2	9A	W16-7P_FYG(24)R	1	RIGHT DOWNWARD DIAGONAL ARROW (plaque) - 24x12	24	12	2.0	ADD TO ASSEMBLY		1									Install Back to Back with 9D
SS-2	9B	S1-1(36)	1	SCHOOL SIGN (Symbol) - 36x36	36	36	9.0	ADD TO ASSEMBLY		1									Install Back to Back with 9C
SS-2	9C	S1-1(36)	1	SCHOOL SIGN (Symbol) - 36x36	36	36	9.0	NEW		1				SOIL	1				
SS-2	9D	W16-7P_FYG(24)L	1	LEFT DOWNWARD DIAGONAL ARROW (plaque) - 24x12	24	12	2.0	ADD TO ASSEMBLY		1									
SS-2	10A	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30		REMAIN											
SS-2	10B	OM1-3	1	TYPE 1 OBJECT MARKER	18	18		REMOVE	1										
SS-2	11A	D3-1(8)	1	STREET NAME (1 Line) Intersection of two subdivision streets	18	8		REMOVE	1										MAIN ST
SS-2	11B	D3-1(8)	1	STREET NAME (1 Line) Intersection of two subdivision streets	36	8		REMOVE	1										BIRCHBROOK DR
SS-2	11C	R1-1(30)	1	STOP	30	30		REMOVE	1										
PAGE TOTALS							231		20	42		0	13		18	0	0	0	

PERMANENT SIGN SCHEDULE

SHEET NO.	PLAN IDENTIFIER	CODE	QTY.	DESCRIPTION	SIGN WIDTH (IN)	SIGN HEIGHT (IN)	SIGN AREA (SF)	ITEM 819018 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE POST (EACH)			ITEM 819019 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS (SF)			POST INSTALLATION TYPE	Code X11 12' Post (W/ Basepost) (EACH)	Code X11A 15' Post (W/ Basepost) (EACH)	ITEM 819016 4" HOLE, 0-6" (EACH)	ITEM 819017 4" HOLE, >6" (EACH)	REMARKS
								SIGN DISPOSITION	REMOVE	INSTALL	SIGN DISPOSITION	REMOVE	INSTALL						
SS-2	12A	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	42	12	7.0	ADD TO ASSEMBLY		2									Birchbrook Dr Hwy C, 6"/4"
SS-2	12B	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	36	12	6.0	ADD TO ASSEMBLY		2									W Main St Hwy C, 6"/4"
SS-2	12C	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
SS-2	13A	M2-1(21)	1	JUNCTION - 21x15	21	15	2.2	ADD TO ASSEMBLY		1									
SS-2	13B	M1-5(24)	1	STATE ROUTE (2 - Digit Sign) - 24x24	24	24	4.0	NEW		1				SOIL	1				"7"
SS-2	14	W11-2(30)	1	PEDESTRIAN (Symbol) - 30x30	30	30		REMOVE	1										
SS-2	15	W3-3(30)	1	SIGNAL AHEAD (Symbol) - 30x30	30	30		REMOVE	1										
SS-2	16A	W3-3(36)	1	SIGNAL AHEAD (Symbol) - 36x36	36	36	9.0	NEW		1				SOIL	1				
SS-2	16B	W16-8P	1	ADVANCE STREET NAME (1 - line plaque)	42	9	2.6	ADD TO ASSEMBLY		1									Old Baltimore Pike Hwy C, 4"
SS-2	17	R3-7_L(30)	1	LEFT LANE MUST TURN LEFT - 30"x30"	30	30	6.3	NEW		1				SOIL	1				
SS-2	18	D4-3-DE	1	BUS STOP (DART)	12	18		NEW		1				SOIL	1				Sign will be furnished by DART ID 2197 STOP 10-34
SS-2	19A	W11-2(30)	1	PEDESTRIAN (Symbol) - 30x30	30	30		REMOVE	1										
SS-2	19B	D4-3-DE	1	BUS STOP (DART)	12	18		REMOVE	1										ID 2197 STOP 10-34
SS-2	20A	S1-1(36)	1	SCHOOL SIGN (Symbol) - 36x36	36	36	9.0	NEW		1				SOIL	1				
SS-2	20B	W16-7P_FYG(24)I	1	LEFT DOWNWARD DIAGONAL ARROW (plaque) - 24x12	24	12	2.0	ADD TO ASSEMBLY		1									
SS-2	21A	M3-1(24)	1	CARDINAL DIRECTION - NORTH - 24x12	24	12	2.0	ADD TO ASSEMBLY		1									
SS-2	21B	M1-5(24)	1	STATE ROUTE (2 - Digit Sign) - 24x24	24	24	4.0	NEW		1				SOIL	1				"7"
SS-2	21C	M6-1_L(21)	1	DIRECTIONAL ARROW (Left) - 21x15	21	15	2.2	ADD TO ASSEMBLY		1									
SS-2	22A	M4-5(24)	1	TO - 24x12	24	12		REMOVE	1										
SS-2	22B	M3-4(24)	1	CARDINAL DIRECTION - WEST - 24x12	24	12		REMOVE	1										
SS-2	22C	M1-5(30)	1	STATE ROUTE (3 - Digit Sign) - 30x24	30	24		REMOVE	1										273
SS-2	22D	M6-1_R(21)	1	DIRECTIONAL ARROW (Right) - 21x15	21	15		REMOVE	1										
SS-2	23A	R3-7_L(30)	1	LEFT LANE MUST TURN LEFT - 30"x30"	30	30	6.3	NEW		1				SOIL	1				
SS-2	23B	S5-2(24)	1	END SCHOOL ZONE - 24x30	24	30	5.0	ADD TO ASSEMBLY		1									
SS-3	1A	W11-2(30)	1	PEDESTRIAN (Symbol) - 30x30	30	30		REMOVE	1										
SS-3	1B	R2-1-35(24)	1	SPEED LIMIT (35 MPH - 24x30)	24	30	5.0	RENEW	1	1				SOIL	1				Install on new post
SS-3	2A	S1-1(36)	1	SCHOOL SIGN (Symbol) - 36x36	36	36	9.0	NEW		1				SOIL	1				
SS-3	2B	W16-9P_FYG(24)	1	AHEAD (plaque) - 24x12	24	12	2.0	ADD TO ASSEMBLY		1									
SS-3	3A	M3-3(24)	1	CARDINAL DIRECTION - SOUTH - 24x12	24	12	2.0	ADD TO ASSEMBLY		1									
SS-3	3B	M1-5(24)	1	STATE ROUTE (2 - Digit Sign) - 24x24	24	24	4.0	NEW		1				SOIL	1				"7"
SS-3	3C	M6-1_L(21)	1	DIRECTIONAL ARROW (Left) - 21x15	21	15	2.2	ADD TO ASSEMBLY		1									
SS-3	4	R3-7_R(30)	2	RIGHT LANE MUST TURN RIGHT - 30"x30"	30	30	12.5	NEW		2				SOIL	2				
SS-3	5	R3-7_R(36)	1	RIGHT LANE MUST TURN RIGHT - 36"x36"	36	36		REMOVE	1										
SS-3	6A	W3-3(36)	1	SIGNAL AHEAD (Symbol) - 36x36	36	36		REMAIN											
SS-3	6B	W16-8P	1	ADVANCE STREET NAME (1 - line plaque)	42	9	2.6	ADD TO ASSEMBLY		1									Old Baltimore Pike Hwy C, 4"
SS-3	6C	D4-3-DE	1	BUS STOP (DART)	12	18		REPOSITION	1	1									ID 2187 STOP 10-40-54
SS-3	7A	W11-8(30)	1	EMERGENCY VEHICLE (Symbol) - 30x30	30	30	6.3	NEW		1				SOIL	1				
SS-3	7B	R3-7_R(30)	1	RIGHT LANE MUST TURN RIGHT - 30"x30"	30	30	6.3	ADD TO ASSEMBLY		1									
SS-3	8A	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	48	12	8.0	ADD TO ASSEMBLY		2									Old Kings Hwy Hwy C, 6"/4"
SS-3	8B	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	30	12	5.0	ADD TO ASSEMBLY		2									E Main St Hwy C, 6"/4"
SS-3	8C	W14-2a_R	1	NO OUTLET (Arrow right)	36	8	2.0	ADD TO ASSEMBLY		1									
SS-3	8D	W14-2a_L	1	NO OUTLET (Arrow left)	36	8	2.0	ADD TO ASSEMBLY		1									
SS-3	8E	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
SS-3	9	W14-2(30)	1	NO OUTLET - 30x30	30	30		REMOVE	1										
SS-3	10	W1-6_L(48)	1	ONE DIRECTIONAL LARGE ARROW (Left) - 48x24	48	24					REMAIN								
SS-3	11A	M4-5(24)	1	TO - 24x12	24	12		REMOVE	1										
SS-3	11B	M3-3(24)	1	CARDINAL DIRECTION - SOUTH - 24x12	24	12	2.0	RENEW	1	1									
SS-3	11C	M1-5(24)	1	STATE ROUTE (2 - Digit Sign) - 24x24	24	24	4.0	RENEW	1	1									"7"
SS-3	11D	M6-3(21)	1	DIRECTIONAL ARROW (Up) - 21x15	21	15		REMAIN											
SS-3	11E	MOD	1	TOURIST SIGN	24	30		REMAIN											
SS-3	12	R3-7_L(30)	1	LEFT LANE MUST TURN LEFT - 30"x30"	30	30	6.3	NEW		1				SOIL	1				
SS-3	13A	D3-1(9)	2	STREET NAME (1 Line)	48	9		REMOVE	2										OLD BALTIMORE PIKE
SS-3	13B	D3-1(9)	2	STREET NAME (1 Line)	24	9		REMOVE	2										MAIN ST
SS-3	13C	M3-1(24)	1	CARDINAL DIRECTION - NORTH - 24x12	24	12		REMOVE	1										
SS-3	13D	M1-5(24)	1	STATE ROUTE (2 - Digit Sign) - 24x24	24	24		REMOVE	1										7
SS-3	13E	M6-1_L(21)	1	DIRECTIONAL ARROW (Left) - 21x15	21	15		REMOVE	1										
SS-3	14A	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	30	12	5.0	NEW		2				SOIL	1				Main St Hwy C, 6"/4"
SS-3	14B	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	48	12	8.0	ADD TO ASSEMBLY		2									Old Baltimore Pike Hwy B, 6"/4"
SS-3	15	W11-8(30)	1	EMERGENCY VEHICLE (Symbol) - 30x30	30	30		REMOVE	1										
SS-3	16A	M3-3(24)	1	CARDINAL DIRECTION - SOUTH - 24x12	24	12		REMOVE	1										
SS-3	16B	M1-5(24)	1	STATE ROUTE (2 - Digit Sign) - 24x24	24	24		REMOVE	1										"7"
SS-3	16C	M6-1_L(21)	1	DIRECTIONAL ARROW (Left) - 21x15	21	15		REMOVE	1										
SS-3	17	W11-8(30)	1	EMERGENCY VEHICLE (Symbol) - 30x30	30	30	6.3	NEW		1				SOIL	1				
SS-3	18	R2-1-35(24)	1	SPEED LIMIT (35 MPH - 24x30)	24	30		REMAIN											
SS-3	19A	M3-3(24)	1	CARDINAL DIRECTION - SOUTH - 24x12	24	12	2.0	ADD TO ASSEMBLY		1									
SS-3	19B	M1-5(24)	1	STATE ROUTE (2 - Digit Sign) - 24x24	24	24	4.0	NEW		1				SOIL	1				"7"
SS-3	20A	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	30	12	5.0	ADD TO ASSEMBLY		2									Water St Hwy C, 6"/4"
SS-3	20B	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	30	12	5.0	ADD TO ASSEMBLY		2									E Main St Hwy C, 6"/4"
SS-3	20C	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
SS-3	21A	D3-1(8)	1	STREET NAME (1 Line) Intersection of two subdivision streets	24	8		REMOVE	1										Water St
SS-3	21B	R1-1(30)	1	STOP	30	30		REMOVE	1										
SS-3	22	R2-1-35(24)	1	SPEED LIMIT (35 MPH - 24x30)	24	30		REMAIN											
PAGE TOTALS							206		29	52		0	0		20	0	0	0	

PERMANENT SIGN SCHEDULE

SHEET NO.	PLAN IDENTIFIER	CODE	QTY.	DESCRIPTION	SIGN WIDTH (IN)	SIGN HEIGHT (IN)	SIGN AREA (SF)	ITEM 819018 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE POST (EACH)			ITEM 819019 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS (SF)			POST INSTALLATION TYPE	Code X11 12' Post (W/ Basepost) (EACH)	Code X11A 15' Post (W/ Basepost) (EACH)	ITEM 819016 4" HOLE, 0-6" (EACH)	ITEM 819017 4" HOLE, >6" (EACH)	REMARKS
								SIGN DISPOSITION	REMOVE	INSTALL	SIGN DISPOSITION	REMOVE	INSTALL						
SS-4	1	W11-1-DE(30)	1	BICYCLE (Symbol) IN LANE - 30x30	30	30	6.3	NEW		1				SOIL	1				
SS-4	2	R7-4-DE(12)	1	NO STOPPING, STANDING, OR PARKING - 12x18	12	18		REMAIN											
SS-4	3	W3-3(30)	1	SIGNAL AHEAD (Symbol) - 30x30	30	30		REMOVE	1										
SS-4	4	R7-4-DE(12)	1	NO STOPPING, STANDING, OR PARKING - 12x18	12	18		REMAIN											
SS-4	5	W11-1-DE(30)	1	BICYCLE (Symbol) IN LANE - 30x30	36	30	6.3	NEW		1				SOIL	1				
SS-4	6	R7-4-DE(12)	2	NO STOPPING, STANDING, OR PARKING - 12x18	12	18		REMAIN											
SS-5	1A	M3-1(24)	1	CARDINAL DIRECTION - NORTH - 24x12	24	12	2.0	ADD TO ASSEMBLY		1									
SS-5	1B	M1-5(24)	1	STATE ROUTE (2 - Digit Sign) - 24x24	24	24	4.0	NEW		1				SOIL	1				"7"
SS-5	2A	W11-2(36)	1	PEDESTRIAN (Symbol) - 36x36	36	36	9.0	RENEW	1	1				SOIL	1				Install on new 12' post
SS-5	2B	W16-7P_L(24)	1	LEFT DOWNWARD DIAGONAL ARROW (plaque) - 24x12	24	12	2.0	ADD TO ASSEMBLY		1									
SS-5	3	R1-1(30)	1	STOP	30	30		REMOVE	1										
SS-5	4	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
SS-5	5A	R1-1(30)	1	STOP	30	30		REMOVE	1										
SS-5	5B	R1-1(36)	1	STOP	36	36	7.5	ADD TO ASSEMBLY		1									
SS-5	6	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30		REMAIN											
SS-5	7	R3-7_R(36)	1	RIGHT LANE MUST TURN RIGHT - 36"x36"	36	36	9.0	NEW		1				SOIL	1				
SS-5	8A	W11-2(36)	1	PEDESTRIAN (Symbol) - 36x36	36	36	9.0	RENEW	1	1				SOIL	1				Install on new 12' post
SS-5	8B	W16-9P(24)	1	AHEAD (plaque) - 24x12	24	12	2.0	ADD TO ASSEMBLY		1									
SS-5	9	R3-7_R(36)	1	RIGHT LANE MUST TURN RIGHT - 36"x36"	36	36	9.0	NEW		1				SOIL	1				
SS-5	10	W11-1(30)	1	BICYCLE (Symbol) - 30x30	30	30		REMOVE	1										
SS-5	11	R1-2(48)	1	YIELD	48	48		REMAIN											
SS-5	12A	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	36	18	9.0	ADD TO ASSEMBLY		2									E Main St Hwy C, 6"/4"
SS-5	12B	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	24	18		REMOVE	2										EAST MAIN ST
SS-5	12C	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	42	12		REMOVE	2										Christiana Rd
SS-5	12D	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									Christiana Rd Hwy B, 6"/4"
SS-5	12E	M3-2(24)	1	CARDINAL DIRECTION - EAST - 24x12	24	12	2.0	RENEW	1	1				EX. CONCRETE		1			Install on new 15' post
SS-5	12F	M1-5(30)	1	STATE ROUTE (3 - Digit Sign) - 30x24	30	24	5.0	RENEW	1	1									273
SS-5	12G	M5-1_L	1	ADVANCE TURN ARROW (Left - 90)	21	15	2.2	RENEW	1	1									
SS-5	13	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	RENEW	1	1									
SS-5	14A	W11-2(36)	1	PEDESTRIAN (Symbol) - 36x36	36	36	9.0	RENEW	1	1				SOIL	1				Install on new 12' post
SS-5	14B	W16-9P(24)	1	AHEAD (plaque) - 24x12	24	12	2.0	ADD TO ASSEMBLY		1									
SS-5	15	R10-18a	1	TRAFFIC SIGNAL PHOTO ENFORCED	30	42		REMAIN											
SS-5	16A	M4-5(24)	1	TO - 24x12	24	12		REMOVE	1										
SS-5	16B	M1-5(24)	1	STATE ROUTE (2 - Digit Sign) - 24x24	24	24		REMOVE	1										1
SS-5	16C	M1-4(24)	1	US ROUTE (2 - Digit Sign) - 24x24	24	24		REMOVE	1										13
SS-5	16D	M6-1_L(21)	1	DIRECTIONAL ARROW (Left) - 21x15	21	15		REMOVE	1										
SS-5	17A	M2-1(21)	1	JUNCTION - 21x15	21	15		REMAIN											
SS-5	17B	M1-5(30)	1	STATE ROUTE (3 - Digit Sign) - 30x24	30	24		REMAIN											273
SS-5	18A	W11-2(36)	1	PEDESTRIAN (Symbol) - 36x36	36	36	9.0	RENEW	1	1				SOIL	1				Install on new 12' post
SS-5	18B	W16-7P_L(24)	1	LEFT DOWNWARD DIAGONAL ARROW (plaque) - 24x12	24	12	2.0	ADD TO ASSEMBLY		1									
SS-5	19A	W3-3(48)	1	SIGNAL AHEAD (Symbol) - 48x48	48	48	16.0				NEW		16.0	SOIL	2				
SS-5	19B	W16-8P	1	ADVANCE STREET NAME (1 - line plaque) (Oversized)	48	9	3.0				ADD TO ASSEMBLY		3.0						Christiana Rd Hwy C, 4"
SS-5	20	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	NEW		1				EX. CONCRETE	1		1		
SS-5	21	R3-8a MOD	2	ADVANCE INTERSECTION LANE CONTROL (Left, Left - Ahead, Ahead, Right) - 54"x30"	54	30					REMAIN								
SS-5	22A	M4-5(24)	1	TO - 24x12	24	12	2.0	ADD TO ASSEMBLY		1									
SS-5	22B	M1-5(24)	1	STATE ROUTE (2 - Digit Sign) - 24x24	24	24	4.0	NEW		1				EX. CONCRETE	1		1		"1"
SS-5	22C	M5-1_L	1	ADVANCE TURN ARROW (Left - 90)	21	15	2.2	ADD TO ASSEMBLY		1									
SS-5	23	D1-3	1	DESTINATION (3 Line)	60	42		REMAIN											
SS-5	24A	M3-3(24)	1	CARDINAL DIRECTION - SOUTH - 24x12	24	12		REMAIN											
SS-5	24B	M1-5(24)	1	STATE ROUTE (2 - Digit Sign) - 24x24	24	24		REMAIN											7
SS-5	24C	M6-3(21)	1	DIRECTIONAL ARROW (Up) - 21x15	21	15		REMAIN											
SS-5	25A	M3-4(24)	1	CARDINAL DIRECTION - WEST - 24x12	24	12		REMAIN											
SS-5	25B	M1-5(30)	1	STATE ROUTE (3 - Digit Sign) - 30x24	30	24		REMAIN											273
SS-5	25C	M6-1_R(21)	1	DIRECTIONAL ARROW (Right) - 21x15	21	15		REMAIN											
SS-5	26A	R6-1_L(36)	1	ONE WAY (ENCLOSED IN LEFT ARROW) - 36x12	36	12		REMAIN											
SS-5	26B	R6-1_R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12		REMAIN											
SS-5	26C	R6-3(30)	1	DIVIDED HIGHWAY CROSSING (4 - Legged Intersection) - 30x24	30	24		REMAIN											
SS-5	27	R1-2(48)	1	YIELD	48	48		REMAIN											
PAGE TOTALS							163		20	28		0	19		14	1	2	0	

PERMANENT SIGN SCHEDULE

SHEET NO.	PLAN IDENTIFIER	CODE	QTY.	DESCRIPTION	SIGN WIDTH (IN)	SIGN HEIGHT (IN)	SIGN AREA (SF)	ITEM 819018 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE POST (EACH)			ITEM 819019 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS (SF)			POST INSTALLATION TYPE	Code X11 12' Post (W/ Basepost) (EACH)	Code X11A 15' Post (W/ Basepost) (EACH)	ITEM 819016 4" HOLE, 0-6" (EACH)	ITEM 819017 4" HOLE, >6" (EACH)	REMARKS
								SIGN DISPOSITION	REMOVE	INSTALL	SIGN DISPOSITION	REMOVE	INSTALL						
SS-6	1A	W2-2_L(30)	1	SIDE ROAD (Perpendicular - Left) - 30x30	30	30		REMAIN											
SS-6	1B	D14-3-DE	1	ADOPT A HIGHWAY	24	18		REMOVE	1										NEWARK MORNING ROTARY CLUB
SS-6	1C	W16-8P	1	ADVANCE STREET NAME (1 - line plaque)	36	9	2.3	ADD TO ASSEMBLY		1									Dixie Line Rd Hwy C, 4"
SS-6	2A	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									Dixie Line Rd Hwy C, 8"/6"
SS-6	2B	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									Old Baltimore Pike Hwy B, 6"/4"
SS-6	2C	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
SS-6	3A	D3-1(9)	2	STREET NAME (1 Line)	30	9		REMOVE	2										DIXIE LINE RD
SS-6	3B	D3-1(9)	2	STREET NAME (1 Line)	30	9		REMOVE	2										OLD BALTIMORE PK
SS-6	3C	R1-1(30)	1	STOP	30	30		REMOVE	1										
SS-6	4	D14-3-DE	1	ADOPT A HIGHWAY	24	18	3.0	NEW		1				SOIL	1				NEWARK MORNING ROTARY CLUB
SS-6	5A	W1-7(48)	1	TWO DIRECTIONAL LARGE ARROW - 48x24	48	24		REMAIN											
SS-6	5B	OM4-3	2	END OF ROAD OBJECT MARKER	18	18		REMAIN											
SS-6	6A	W2-2_R(30)	1	SIDE ROAD (Perpendicular - Right) - 30x30	30	30		REMAIN											
SS-6	6B	W16-8aP	1	ADVANCE STREET NAME (2 - line plaque)	24	18		REMAIN											Dixie Line Rd
SS-7	1A	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	48	12		REMOVE	2										Preakness Run
SS-7	1B	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	48	12		REMOVE	2										Old Baltimore Pike
SS-7	1C	R1-1(36)	1	STOP	36	36		REMOVE	1										
SS-7	2A	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									Preakness Run Hwy B,8"/6"
SS-7	2B	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									Old Baltimore Pike Hwy B, 6"/4"
SS-7	2C	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
SS-7	3A	D3-2-DE1	1	WELCOME TO	36	32		REMAIN											
SS-7	3B	D3-2-DE2	1	DEVELOPMENT NAME	36	32		REMAIN											OLD POST FARM
SS-7	3C	D3-2-DE2	1	DEVELOPMENT NAME	36	32		REMAIN											DEERBORNE WOODS
SS-7	4A	D3-2-DE1	1	WELCOME TO	36	32		REMAIN											
SS-7	4B	D3-2-DE2	1	DEVELOPMENT NAME	36	36		REMAIN											Old Post Farm Deerborne Woods
SS-7	5A	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	48	12		REMOVE	2										Old Baltimore Pike
SS-7	5B	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	48	12		REMOVE	2										Deerbourne Trail
SS-7	5C	R1-1(36)	1	STOP	36	36		REMOVE	1										
SS-7	6A	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									Deerbourne Trail Hwy B, 7"/5"
SS-7	6B	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									Old Baltimore Pike Hwy B, 6"/4"
SS-7	6C	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
SS-7	7	W11-3(30)	1	DEER (Symbol) - 30x30	30	30		REMOVE	1										
SS-7	8	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	NEW		1				EX. CONCRETE	1		1		
SS-7	9	R2-1-45(24)	1	SPEED LIMIT (45 MPH - 24x30)	24	30		REMAIN											
SS-7	10A	W3-3(30)	1	SIGNAL AHEAD (Symbol) - 30x30	30	30		REMOVE	1										
SS-7	10B	W16-8aP	1	ADVANCE STREET NAME (4 - line plaque)	30	24		REMOVE	1										Pleasant Valley Rd Otts Chapel Rd
SS-7	11A	W3-3(36)	1	SIGNAL AHEAD (Symbol) - 36x36	36	36	9.0	NEW		1				SOIL	1				
SS-7	11B	W16-8aP	1	ADVANCE STREET NAME (4 - line plaque)	30	24	5.0	ADD TO ASSEMBLY		1									(Left Arrow) Otts Chapel Rd Pleasant (Right Arrow) Valley Rd Hwy C, 4"
SS-8	1	W9-2_L(30)	1	LANE ENDS MERGE LEFT - 30x30	30	30		REMOVE	1										
SS-8	2	R1-2(36)	1	YIELD	36	36		REMAIN											
SS-8	3A	D3-1(18)	2	STREET NAME (2 Line) Posted speed > 40 MPH	24	18	6.0	ADD TO ASSEMBLY		2									Otts Chapel Rd Hwy C, 5"/3"
SS-8	3B	D3-1(18)	2	STREET NAME (2 Line) Posted speed > 40 MPH	30	18	7.5	ADD TO ASSEMBLY		2									Old Baltimore Pike Hwy C, 5"/3"
SS-8	3C	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	RENEW	1	1				EX. CONCRETE	1				Install on new 12' post
SS-8	4	R1-2(36)	2	YIELD	36	36		REMAIN											
SS-8	5	R6-3(30)	1	DIVIDED HIGHWAY CROSSING (4 - Legged Intersection) - 30x24	30	24		REMAIN											
SS-8	6	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30		REMAIN											
SS-8	7	R3-20-DE	1	TURN LANE	18	18		REMAIN											
SS-8	8A	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30		REMAIN											
SS-8	8B	OM1-3	1	TYPE 1 OBJECT MARKER	18	18		REMOVE	1										
SS-8	9	R6-3(30)	1	DIVIDED HIGHWAY CROSSING (4 - Legged Intersection) - 30x24	30	24		REMAIN											
SS-8	10	R1-2(36)	1	YIELD	36	36		REMAIN											
SS-8	11A	D3-1(18)	2	STREET NAME (2 Line) Posted speed > 40 MPH	24	18	6.0	RENEW	2	2									Pleasant Valley Rd Hwy C, 5"/3"
SS-8	11B	D3-1(18)	2	STREET NAME (2 Line) Posted speed > 40 MPH	30	18	7.5	RENEW	2	2									Old Baltimore Pike Hwy C, 5"/3"
SS-8	11C	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	RENEW	1	1				EX. CONCRETE	1				Install on new 12' post
SS-8	12A	R12-3-DE	1	NO TRUCKS OVER 2 AXLES EXCEPT LOCAL SERVICES	24	36		REMAIN											
SS-8	12B	M6-3(21)	1	DIRECTIONAL ARROW (Up) - 21x15	21	15		REMAIN											
SS-8	12C	M5-1_R	1	ADVANCE TURN ARROW (Right - 90)	21	15		REMAIN											
SS-8	13A	R12-3-DE	1	NO TRUCKS OVER 2 AXLES EXCEPT LOCAL SERVICES	24	36		REMAIN											
SS-8	13B	M5-1_R	1	ADVANCE TURN ARROW (Right - 90)	21	15		REMAIN											
PAGE TOTALS							156		27	30		0	0		8	0	1	0	

PERMANENT SIGN SCHEDULE

SHEET NO.	PLAN IDENTIFIER	CODE	QTY.	DESCRIPTION	SIGN WIDTH (IN)	SIGN HEIGHT (IN)	SIGN AREA (SF)	ITEM 819018 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE POST (EACH)			ITEM 819019 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS (SF)			POST INSTALLATION TYPE	Code X11 12' Post (W/ Basepost) (EACH)	Code X11A 15' Post (W/ Basepost) (EACH)	ITEM 819016 4" HOLE, 0-6" (EACH)	ITEM 819017 4" HOLE, >6" (EACH)	REMARKS
								SIGN DISPOSITION	REMOVE	INSTALL	SIGN DISPOSITION	REMOVE	INSTALL						
SS-8	14	R12-3-DE	1	NO TRUCKS OVER 2 AXLES EXCEPT LOCAL SERVICES	24	36		REMAIN											
SS-8	15	R3-8b(48)	1	)VANCE INTERSECTION LANE CONTROL (Left, Ahead, Right) - 48"x	48	30					REMAIN								
SS-8	16	R4-4	1	BEGIN RIGHT TURN LANE YIELD TO BIKES	36	30		REMOVE	1										
SS-8	17	R3-20-DE	1	TURN LANE	18	18	2.3	NEW		1				EX. CONCRETE	1		1		
SS-8	18A	R3-9dP	1	END (plaque)	24	12		REMAIN											
SS-8	18B	R7-4-DE(12)	1	NO STOPPING, STANDING, OR PARKING - 12x18	6	12		REMAIN											
SS-8	19	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	NEW		1				EX. CONCRETE	1		1		
SS-8	20A	W3-3(36)	1	SIGNAL AHEAD (Symbol) - 36x36	36	36	9.0	NEW		1				SOIL	1				
SS-8	20B	W16-8aP	1	ADVANCE STREET NAME (4 - line plaque)	30	24	5.0	ADD TO ASSEMBLY		1									(Left Arrow) Pleasant Valley Rd Otts (Right Arrow) Chapel Rd Hwy C, 4"
SS-8	21A	W3-3(30)	1	SIGNAL AHEAD (Symbol) - 30x30	30	30		REMOVE	1										
SS-8	21B	W16-8aP	1	ADVANCE STREET NAME (4 - line plaque)	30	24		REMOVE	1										Otts Chapel Rd Pleasant Valley Rd
SS-8	22	R2-1-45(24)	1	SPEED LIMIT (45 MPH - 24x30)	24	30		REMAIN											
SS-9	1	W11-1(30)	1	BICYCLE (Symbol) - 30x30	30	30		REMOVE	1										
SS-9	2A	D3-2-DE1	1	WELCOME TO	36	32		REMAIN											
SS-9	2B	D3-2-DE2	1	DEVELOPMENT NAME	36	24		REMAIN											Charlan
SS-9	3A	W2-2_L(30)	1	SIDE ROAD (Perpendicular - Left) - 30x30	30	30		REMAIN											
SS-9	3B	W16-8P	1	ADVANCE STREET NAME (1 - line plaque)	30	9		REMAIN											Ironside Rd
SS-9	4	W14-2(30)	1	NO OUTLET - 30x30	30	30		REMOVE	1										
SS-9	5A	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	36	12		REMOVE	2										Stoddard Rd
SS-9	5B	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	48	12		REMOVE	2										Old Baltimore Pike
SS-9	5C	R1-1(36)	1	STOP	36	36		REMOVE	1										
SS-9	6A	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									Stoddard Rd Hwy C, 8"/6"
SS-9	6B	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									Old Baltimore Pike Hwy B, 6"/4"
SS-9	6C	W14-2a_R	1	NO OUTLET (Arrow right)	36	8	2.0	ADD TO ASSEMBLY		1									
SS-9	6D	W14-2a_L	1	NO OUTLET (Arrow left)	36	8	2.0	ADD TO ASSEMBLY		1									
SS-9	6E	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
SS-9	7	W21-9-DE(36)	1	WATCH FOR TURNING TRAFFIC - 36x36	36	36		REMAIN											
SS-9	8A	D3-2-DE1	1	WELCOME TO	36	32		REMAIN											
SS-9	8B	D3-2-DE2	1	DEVELOPMENT NAME	36	24		REMAIN											CHARLAN
SS-9	9	W11-1-DE(30)	1	BICYCLE (Symbol) IN LANE - 30x30	30	30	6.3	NEW		1				SOIL	1				
SS-9	10A	D3-1(9)	2	STREET NAME (1 Line)	30	9		REMOVE	2										Ironside Rd
SS-9	10B	D3-1(9)	2	STREET NAME (1 Line)	48	9		REMOVE	2										Old Baltimore Pike
SS-9	10C	R1-1(36)	1	STOP	36	36		REMOVE	1										
SS-9	11A	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									Ironside Rd Hwy C,8"/6"
SS-9	11B	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									Old Baltimore Pike Hwy B, 6"/4"
SS-9	11C	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
SS-9	12A	W1-7(48)	1	TWO DIRECTIONAL LARGE ARROW - 48x24	48	24					REMAIN								
SS-9	12B	OM4-3	2	END OF ROAD OBJECT MARKER	18	18					REMAIN								
SS-9	13A	W2-2_R(30)	1	SIDE ROAD (Perpendicular - Right) - 30x30	30	30		REMAIN											
SS-9	13B	W16-8P	1	ADVANCE STREET NAME (1 - line plaque)	30	9		REMAIN											Ironside Rd
SS-9	14A	D3-2-DE1	1	WELCOME TO	36	32		REMAIN											
SS-9	14B	D3-2-DE2	1	DEVELOPMENT NAME	36	24		REMAIN											
SS-9	15A	R12-3-DE	1	NO TRUCKS OVER 2 AXLES EXCEPT LOCAL SERVICES	24	36		REMAIN											
SS-9	15B	M6-1_R(21)	1	DIRECTIONAL ARROW (Right) - 21x15	21	15		REMAIN											
SS-9	16	W21-9-DE(48)	1	WATCH FOR TURNING TRAFFIC - 48x48	48	48		REMAIN											
SS-10	1A	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	48	12		REMOVE	2										Old Baltimore Pike
SS-10	1B	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	48	12		REMOVE	2										Four Seasons Pkwy
SS-10	1C	R1-1(36)	1	STOP	36	36		REMOVE	1										
SS-10	2A	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									Four Seasons Pkwy Hwy B, 6"/4"
SS-10	2B	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									Old Baltimore Pike Hwy B, 6"/4"
SS-10	2C	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
SS-10	3	R1-2(36)	1	YIELD	36	36		REMAIN											
SS-10	4A	D3-2-DE1	1	WELCOME TO	36	32		REMAIN											
SS-10	4B	D3-2-DE2	1	DEVELOPMENT NAME	36	24		REMAIN											THORNWOOD
SS-10	5A	R12-3-DE	1	NO TRUCKS OVER 2 AXLES EXCEPT LOCAL SERVICES	24	36		REMAIN											
SS-10	5B	M5-1_L	1	ADVANCE TURN ARROW (Left - 90)	21	15		REMAIN											
SS-10	6	D1-3	1	DESTINATION (3 Line)	36	24		REMAIN											BRADER ELEMENTARY SCHOOL
SS-10	7	D14-3-DE	1	ADOPT A HIGHWAY	24	18		REMAIN											THE NEWARK MORNING ROTARY CLUB
SS-10	8A	W1-7(48)	1	TWO DIRECTIONAL LARGE ARROW - 48x24	48	24	8.0				NEW		8.0	SOIL	2				
SS-10	8B	OM4-3	2	END OF ROAD OBJECT MARKER	18	18	4.5				ADD TO ASSEMBLY		4.5						
SS-10	9A	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	48	12		REMOVE	2										Old Baltimore Pike
SS-10	9B	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	48	12		REMOVE	2										Whittaker Rd
SS-10	9C	R1-1(36)	1	STOP	36	36		REMOVE	1										
PAGE TOTALS							138		25	22		0	13		9	0	2	0	

PERMANENT SIGN SCHEDULE

SHEET NO.	PLAN IDENTIFIER	CODE	QTY.	DESCRIPTION	SIGN WIDTH (IN)	SIGN HEIGHT (IN)	SIGN AREA (SF)	ITEM 819018 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE POST (EACH)			ITEM 819019 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS (SF)			POST INSTALLATION TYPE	Code X11 12' Post (W/ Basepost) (EACH)	Code X11A 15' Post (W/ Basepost) (EACH)	ITEM 819016 4" HOLE, 0-6" (EACH)	ITEM 819017 4" HOLE, >6" (EACH)	REMARKS
								SIGN DISPOSITION	REMOVE	INSTALL	SIGN DISPOSITION	REMOVE	INSTALL						
SS-10	10A	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									Whittaker Rd Hwy B, 8"/6"
SS-10	10B	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									Old Baltimore Pike Hwy B, 6"/4"
SS-10	10C	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
SS-10	11	R2-1-45(24)	1	SPEED LIMIT (45 MPH - 24x30)	24	30		REMAIN											
SS-11	1A	D3-1(8)	1	STREET NAME (1 Line) Intersection of two subdivision streets	30	8		REMAIN											ROBERT L. MELSON LA
SS-11	1B	D3-1(8)	1	STREET NAME (1 Line) Intersection of two subdivision streets	30	8		REMAIN											OLD BALTIMORE PIKE
SS-11	1C	R1-1(36)	1	STOP	36	36		REMAIN											
SS-11	2	R4-4-DE	1	RIGHT TURNS YIELD TO BIKE	36	30		REMOVE	1										
SS-11	3A	D3-2-DE1	1	WELCOME TO	36	32		REMAIN											
SS-11	3B	D3-2-DE2	1	DEVELOPMENT NAME	36	36		REMAIN											The Preserve at Lafayette Hill
SS-11	4	W11-1-DE(30)	1	BICYCLE (Symbol) IN LANE - 30x30	30	30	6.3	NEW		1				SOIL	1				
SS-11	5A	W2-2_L(30)	1	SIDE ROAD (Perpendicular - Left) - 30x30	30	30		REMAIN											
SS-11	5B	W16-8P	1	ADVANCE STREET NAME (1 - line plaque)	30	9		REMAIN											Iron Hill Rd
SS-11	6A	W1-7(48)	1	TWO DIRECTIONAL LARGE ARROW - 48x24	48	24	8.0				NEW		8.0	SOIL	2				
SS-11	6B	OM4-3	2	END OF ROAD OBJECT MARKER	18	18	4.5				ADD TO ASSEMBLY		4.5						
SS-11	7A	W1-7(48)	1	TWO DIRECTIONAL LARGE ARROW - 48x24	48	24		REMOVE	1										
SS-11	7B	OM4-3	1	END OF ROAD OBJECT MARKER	18	18		REMOVE	1										
SS-11	8A	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	48	12		REMOVE	2										Old Baltimore Pike
SS-11	8B	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	48	12		REMOVE	2										Iron Hill Rd
SS-11	8C	W14-2a_R	1	NO OUTLET (Arrow right)	36	8		REMOVE	1										
SS-11	8D	W14-2a_L	1	NO OUTLET (Arrow left)	36	8		REMOVE	1										
SS-11	8E	R1-1(36)	1	STOP	36	36		REMOVE	1										
SS-11	9A	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	42	18	10.5	ADD TO ASSEMBLY		2									Iron Hill Rd Hwy C, 8"/6"
SS-11	9B	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									Old Baltimore Pike Hwy B, 6"/4"
SS-11	9C	W14-2a_R	1	NO OUTLET (Arrow right)	36	8	2.0	ADD TO ASSEMBLY		1									
SS-11	9D	W14-2a_L	1	NO OUTLET (Arrow left)	36	8	2.0	ADD TO ASSEMBLY		1									
SS-11	9E	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL		1			
SS-11	10A	W2-2_R(30)	1	SIDE ROAD (Perpendicular - Right) - 30x30	30	30		REMAIN											
SS-11	10B	W16-8aP	1	ADVANCE STREET NAME (2 - line plaque)	24	18		REMAIN											Iron Hill Rd
SS-11	11A	D3-2-DE1	1	WELCOME TO	36	32		REMAIN											
SS-11	11B	D3-2-DE2	1	DEVELOPMENT NAME	36	32		REMAIN											The Preserve at Lafayette Hill
SS-11	12	W3-5(36)	1	SPEED REDUCTION (Symbol) - 36x36	36	36		REMAIN											SPEED LIMIT 35
SS-12	1	R2-1-45(24)	1	SPEED LIMIT (45 MPH - 24x30)	24	30		REMAIN											
SS-12	2	D1-2	1	DESTINATION (2 Line)	30	18		REMAIN											IRON HILL PARK
SS-12	3	R2-1-35(24)	1	SPEED LIMIT (35 MPH - 24x30)	24	30		REMAIN											
SS-12	4A	W3-3(36)	1	SIGNAL AHEAD (Symbol) - 36x36	36	36		REMOVE	1										
SS-12	4B	W16-8P	1	ADVANCE STREET NAME (1 - line plaque)	30	9		REMOVE	1										S College Ave
SS-13	1	R2-1-35(24)	1	SPEED LIMIT (35 MPH - 24x30)	24	30		REMOVE	1										
SS-13	2A	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	48	12	8.0	ADD TO ASSEMBLY		2									Winterview Way Hwy C, 6"/4"
SS-13	2B	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	48	12	8.0	ADD TO ASSEMBLY		2									Old Baltimore Pike Hwy B, 6"/4"
SS-13	2C	W14-2a_R	1	NO OUTLET (Arrow right)	36	8	2.0	ADD TO ASSEMBLY		1									
SS-13	2D	W14-2a_L	1	NO OUTLET (Arrow left)	36	8	2.0	ADD TO ASSEMBLY		1									
SS-13	2E	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL		1			
SS-13	3A	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	48	12		REMOVE	2										Old Baltimore Pike
SS-13	3B	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	48	12		REMOVE	2										Iron Hill Rd
SS-13	3C	R1-1(36)	1	STOP	36	36		REMOVE	1										
SS-13	4	W14-2(30)	1	NO OUTLET - 30x30	30	30		REMOVE	1										
SS-13	5A	D3-2-DE1	1	WELCOME TO	36	32		REMAIN											
SS-13	5B	D3-2-DE2	1	DEVELOPMENT NAME	36	24		REMAIN											TERRACES ON IRON HILL
SS-13	5C	D3-2-DE2	1	DEVELOPMENT NAME	36	24		REMAIN											ELWIN MANOR
SS-13	6	R10-7	1	DO NOT BLOCK INTERSECTION	24	30		REMAIN											
SS-13	7A	D3-2-DE1	1	WELCOME TO	36	32		REMAIN											
SS-13	7B	D3-2-DE2	1	DEVELOPMENT NAME	36	24		REMAIN											TERRACES ON IRON HILL
SS-13	7C	D3-2-DE2	1	DEVELOPMENT NAME	36	24		REMAIN											ELWIN MANOR
SS-13	8A	D3-1(12)	1	STREET NAME (1 Line) Posted speed ≤ 40 MPH	36	12		REMAIN											Godwin Dr
SS-13	8B	D3-1(12)	1	STREET NAME (1 Line) Posted speed ≤ 40 MPH	36	12		REMAIN											Old Baltimore Pike
SS-13	8C	R1-1(36)	1	STOP	36	36		REMAIN											
SS-13	9	R4-18(24)	1	DO NOT PASS ON SHOULDER - 24x30	24	30		REMOVE	1										
SS-13	10	R4-17(24)	1	DO NOT DRIVE ON SHOULDER - 24x30	24	30	5.0	NEW		1				SOIL	1				
SS-13	11A	W3-3(36)	1	SIGNAL AHEAD (Symbol) - 36x36	36	36	9.0	NEW		1				SOIL	1				
SS-13	11B	W16-8P	1	ADVANCE STREET NAME (1 - line plaque)	30	9	1.9	ADD TO ASSEMBLY		1									S College Ave Hwy C, 4"
SS-13	12	W11-1-DE(30)	1	BICYCLE (Symbol) IN LANE - 30x30	30	30	6.3	NEW		1				SOIL	1				
SS-13	13A	M2-1(21)	1	JUNCTION - 21x15	21	15		REMAIN											
SS-13	13B	M1-5(30)	1	STATE ROUTE (3 - Digit Sign) - 30x24	30	24		REMAIN											896
SS-13	14	W11-1-DE(30)	1	BICYCLE (Symbol) IN LANE - 30x30	30	30	6.3	NEW		1				SOIL	1				
SS-13	15A	R3-8b MOD	1	ADVANCE INTERSECTION LANE CONTROL (Left, Left, Ahead-Right	42	30					REMAIN								Left, Left, Ahead-Right
SS-13	15B	MOD	1	SEPTA	24	24					REMAIN								SEPTA
SS-13	15C	MOD	1	Amtrak	24	24					REMAIN								Amtrak
SS-13	15D	M6-1_R(21)	1	DIRECTIONAL ARROW (Right) - 21x15	21	15					REMAIN								
PAGE TOTALS							140		20	25		0	13		8	2	0	0	

PERMANENT SIGN SCHEDULE

SHEET NO.	PLAN IDENTIFIER	CODE	QTY.	DESCRIPTION	SIGN WIDTH (IN)	SIGN HEIGHT (IN)	SIGN AREA (SF)	ITEM 819018 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE POST (EACH)			ITEM 819019 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS (SF)			POST INSTALLATION TYPE	Code X11 12' Post (W/ Basepost) (EACH)	Code X11A 15' Post (W/ Basepost) (EACH)	ITEM 819016 4" HOLE, 0-6" (EACH)	ITEM 819017 4" HOLE, >6" (EACH)	REMARKS
								SIGN DISPOSITION	REMOVE	INSTALL	SIGN DISPOSITION	REMOVE	INSTALL						
SS-13	16	R2-1-35(24)	1	SPEED LIMIT (35 MPH - 24x30)	24	30		REMAIN											
SS-13	17	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30		REMAIN											
SS-13	18	D1-3	1	DESTINATION (3 Line)	66	42					REMAIN								
SS-13	19A	M3-1(24)	1	CARDINAL DIRECTION - NORTH - 24x12	24	12		REMAIN											
SS-13	19B	M1-5(30)	1	STATE ROUTE (3 - Digit Sign) - 30x24	30	24		REMAIN											896
SS-13	19C	M5-1_L	1	ADVANCE TURN ARROW (Left - 90)	21	15		REMAIN											
SS-13	20A	M3-3(24)	1	CARDINAL DIRECTION - SOUTH - 24x12	24	12		REMAIN											
SS-13	20B	M1-5(30)	1	STATE ROUTE (3 - Digit Sign) - 30x24	30	24		REMAIN											896
SS-13	20C	M6-1_R(21)	1	DIRECTIONAL ARROW (Right) - 21x15	21	15		REMAIN											
SS-13	21A	M4-5(36)	1	TO - 36x18	36	18		REMAIN											White on Blue
SS-13	21B	M1-1(24)	1	INTERSTATE ROUTE (2 - Digit Sign) - 24x24	24	24		REMAIN											95
SS-13	21C	M5-1_L	1	ADVANCE TURN ARROW (Left - 90)	21	15		REMAIN											White on Blue
SS-13	22	R12-3-DE	1	NO TRUCKS OVER 2 AXLES EXCEPT LOCAL SERVICES	24	36		REMAIN											
SS-13	23	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	NEW		1				EX. CONCRETE	1		1		
SS-13	24	R1-2(48)	1	YIELD	48	48		REMAIN											
SS-13	25A	D3-1(9)	2	STREET NAME (1 Line)	36	9		REMOVE	2										S College Ave
SS-13	25B	D3-1(9)	2	STREET NAME (1 Line)	48	9		REMOVE	2										Old Baltimore Pike
SS-13	25C	R6-1_L(36)	1	ONE WAY (ENCLOSED IN LEFT ARROW) - 36x12	36	12	3.0	RENEW	1	1									Move assembly to top of post
SS-13	25D	R6-1_R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12	3.0	RENEW	1	1									Move assembly to top of post
SS-13	25E	R6-3(30)	1	DIVIDED HIGHWAY CROSSING (4 - Legged Intersection) - 30x24	30	24	5.0	RENEW	1	1									Move assembly to top of post
SS-14	1A	R6-1_L(36)	1	ONE WAY (ENCLOSED IN LEFT ARROW) - 36x12	36	12		REMAIN											
SS-14	1B	R6-1_R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12		REMAIN											
SS-14	1C	R6-3(30)	1	DIVIDED HIGHWAY CROSSING (4 - Legged Intersection) - 30x24	30	24		REMAIN											
SS-14	2A	M3-3(24)	1	CARDINAL DIRECTION - SOUTH - 24x12	24	12		REMAIN											
SS-14	2B	M1-5(30)	1	STATE ROUTE (3 - Digit Sign) - 30x24	30	24		REMAIN											896
SS-14	2C	M5-1_L	1	ADVANCE TURN ARROW (Left - 90)	21	15		REMAIN											
SS-14	3A	M3-1(24)	1	CARDINAL DIRECTION - NORTH - 24x12	24	12		REMAIN											
SS-14	3B	M1-5(30)	1	STATE ROUTE (3 - Digit Sign) - 30x24	30	24		REMAIN											896
SS-14	3C	M6-1_R(21)	1	DIRECTIONAL ARROW (Right) - 21x15	21	15		REMAIN											
SS-14	4A	M4-5(36)	1	TO - 36x18	36	18		REMAIN											White on Blue
SS-14	4B	M1-1(24)	1	INTERSTATE ROUTE (2 - Digit Sign) - 24x24	24	24		REMAIN											95
SS-14	4C	M6-1_R(21)	1	DIRECTIONAL ARROW (Right) - 21x15	21	15		REMAIN											White on Blue
SS-14	5A	D1-3	1	DESTINATION (3 Line)	66	42					REMAIN								(Up Arrow) Elkton (Left Arrow) Glasgow Newark (Right Arrow)
SS-14	5B	MOD	1	SEPTA	24	24					REMAIN								SEPTA
SS-14	5C	MOD	1	Amtrak	24	24					REMAIN								Amtrak
SS-14	5D	M6-1_R(21)	1	DIRECTIONAL ARROW (Right) - 21x15	21	15					REMAIN								
SS-14	6	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	NEW		1				EX. CONCRETE	1		1		
SS-14	7	R3-8a(48)	1	ANCE INTERSECTION LANE CONTROL (Left, Left - Ahead, Right) - 4	48	30					REMAIN								
SS-14	8A	M2-1(21)	1	JUNCTION - 21x15	21	15		REMAIN											
SS-14	8B	M1-5(30)	1	STATE ROUTE (3 - Digit Sign) - 30x24	30	24		REMAIN											896
SS-14	9	R1-2(48)	1	YIELD	48	48		REMAIN											
SS-14	10	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30		REMAIN											
SS-14	11	R12-3-DE	1	NO TRUCKS OVER 2 AXLES EXCEPT LOCAL SERVICES	24	36		REMAIN											
SS-14	12	R2-1-35(24)	1	SPEED LIMIT (35 MPH - 24x30)	24	30		REMAIN											
SS-14	13A	W3-3(36)	1	SIGNAL AHEAD (Symbol) - 36x36	30	36		REMAIN											
SS-14	13B	W16-8P	1	ADVANCE STREET NAME (1 - line plaque)	30	9		REMAIN											S College Ave
SS-14	14A	D3-2-DE1	1	WELCOME TO	36	32		REMAIN											
SS-14	14B	D3-2-DE2	1	DEVELOPMENT NAME	36	24		REMAIN											CANNONSHIRE (Left Arrow)
SS-14	15A	D3-2-DE1	1	WELCOME TO	36	32		REMAIN											
SS-14	15B	D3-2-DE2	1	DEVELOPMENT NAME	36	24		REMAIN											Cannonshire (Right Arrow)
PAGE TOTALS							21		7	5		0	0		2	0	2	0	

PERMANENT SIGN SCHEDULE

SHEET NO.	PLAN IDENTIFIER	CODE	QTY.	DESCRIPTION	SIGN WIDTH (IN)	SIGN HEIGHT (IN)	SIGN AREA (SF)	ITEM 819018 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE POST (EACH)			ITEM 819019 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS (SF)			POST INSTALLATION TYPE	Code X11 12' Post (W/ Basepost) (EACH)	Code X11A 15' Post (W/ Basepost) (EACH)	ITEM 819016 4" HOLE, 0-6" (EACH)	ITEM 819017 4" HOLE, >6" (EACH)	REMARKS
								SIGN DISPOSITION	REMOVE	INSTALL	SIGN DISPOSITION	REMOVE	INSTALL						
SS-14	16A	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	30	12		REMAIN											Battle Dr
SS-14	16B	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	48	12		REMAIN											Old Baltimore Pike
SS-14	16C	W14-2a_R	1	NO OUTLET (Arrow right)	36	8		REMAIN											
SS-14	16D	W14-2a_L	1	NO OUTLET (Arrow left)	36	8		REMAIN											
SS-14	16E	R1-1(36)	1	STOP	36	36		REMAIN											
SS-14	17	W11-1-DE(30)	1	BICYCLE (Symbol) IN LANE - 30x30	30	30	6.3	NEW		1				SOIL	1				
SS-15	1A	W2-2_R(30)	1	SIDE ROAD (Perpendicular - Right) - 30x30	30	30		REMAIN											
SS-15	1B	W16-8aP	1	ADVANCE STREET NAME (2 - line plaque)	24	18		REMAIN											Old Coochs Bridge Rd
SS-15	2A	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	48	12		REMAIN											Old Baltimore Pike
SS-15	2B	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	48	12		REMAIN											Old Coochs Bridge Rd
SS-15	3	R1-1(36)	1	STOP	36	36		REMAIN											
SS-15	4A	W1-7(48)	1	TWO DIRECTIONAL LARGE ARROW - 48x24	48	24					REMAIN								
SS-15	4B	OM4-3	2	END OF ROAD OBJECT MARKER	18	18					REMAIN								
SS-15	5A	W2-2_L(30)	1	SIDE ROAD (Perpendicular - Left) - 30x30	30	30		REMAIN											
SS-15	5B	W16-8aP	1	ADVANCE STREET NAME (2 - line plaque)	24	18		REMAIN											Old Coochs Bridge Rd
SS-15	6A	W2-2_R(30)	1	SIDE ROAD (Perpendicular - Right) - 30x30	30	30	6.3	NEW		1				SOIL	1				
SS-15	6B	W16-8P	1	ADVANCE STREET NAME (1 - line plaque)	36	9	2.3	ADD TO ASSEMBLY		1									Dayett Mills Rd Hwy C, 4"
SS-16	1A	W1-7(48)	1	TWO DIRECTIONAL LARGE ARROW - 48x24	48	24					REMAIN								
SS-16	1B	OM4-3	2	END OF ROAD OBJECT MARKER	18	18					REMAIN								
SS-16	2	D1-3	1	DESTINATION (3 Line)	36	42		REMAIN											Coochs Bridge (Right Arrow) Battlefield
SS-16	3A	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	42	12		REMAIN											Dayett Mills Rd
SS-16	3B	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	48	12		REMAIN											Old Baltimore Pike
SS-16	3C	R1-1(36)	1	STOP	36	36		REMAIN											
SS-17	1	D4-3-DE	1	BUS STOP (DART)	12	18		RENEW	1	1				SOIL	1				Sign will be furnished by DART Install on new 12' sign post ID 3245 STOP 055
SS-17	2A	D3-2-DE1	1	WELCOME TO	36	32		REMAIN											
SS-17	2B	D3-2-DE2	1	DEVELOPMENT NAME	36	36		REMAIN											ASPEN WOODS SUMMER HILL
SS-17	3	R3-7_R(30)	1	RIGHT LANE MUST TURN RIGHT - 30"x30"	30	30		REMOVE	1										
SS-17	4A	D3-2-DE1	1	WELCOME TO	36	32		REMAIN											
SS-17	4B	D3-2-DE2	1	DEVELOPMENT NAME	36	36		REMAIN											ASPEN WOODS SUMMER HILL
SS-17	5	R1-2(30)	1	YIELD	30	30		REMOVE	1										
SS-17	6	R1-2(36)	1	YIELD	36	36	3.9	NEW		1				SOIL	1				
SS-17	7	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
SS-17	8A	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	36	18	9.0	ADD TO ASSEMBLY		2									Aspen Dr Hwy C, 8"/6"
SS-17	8B	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									Old Baltimore Pike Hwy B, 6"/4"
SS-17	8C	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
SS-17	9A	D3-1(8)	1	STREET NAME (1 Line) Intersection of two subdivision streets	16	8		REMOVE	1										ASPEN DR
SS-17	9B	R1-1(30)	1	STOP	30	30		REMOVE	1										
SS-17	10	R4-4	1	BEGIN RIGHT TURN LANE YIELD TO BIKES	36	30		REMOVE	1										
SS-17	11A	R3-7_R(30)	1	RIGHT LANE MUST TURN RIGHT - 30"x30"	30	30		REMOVE	1										
SS-17	11B	D4-3-DE	1	BUS STOP (DART)	12	18		RENEW	1	1				SOIL	1				Sign will be furnished by DART Install on new 12' sign post ID 3246 STOP 055
SS-18	1	R8-4(30)	1	EMERGENCY PARKING ONLY - 30x24	30	24		REMAIN											
SS-18	2	D11-1	1	BIKE ROUTE	24	18		REMOVE	1										
SS-18	3A	D3-1(8)	2	STREET NAME (1 Line) Intersection of two subdivision streets	20	8		REMOVE	2										SPLIT RAIL LN
SS-18	3B	D3-1(8)	2	STREET NAME (1 Line) Intersection of two subdivision streets	30	8		REMOVE	2										OLD BALTIMORE PK
SS-18	3C	R1-1(30)	1	STOP	30	30		REMOVE	1										
SS-18	4A	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									Split Rail Ln Hwy C, 8"/6"
SS-18	4B	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									Old Baltimore Pike Hwy B, 6"/4"
SS-18	4C	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
SS-18	5A	R3-9b(24)	1	TWO-WAY LEFT TURN ONLY (Ground Mounted) - 24"x36"	24	36		REMOVE	1										
SS-18	5B	R3-7_R(30)	1	RIGHT LANE MUST TURN RIGHT - 30"x30"	30	30		REMOVE	1										
SS-18	6	R4-4	1	BEGIN RIGHT TURN LANE YIELD TO BIKES	36	30		REMOVE	1										
SS-18	7A	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30		REMAIN											
SS-18	7B	OM1-3	1	TYPE 1 OBJECT MARKER	18	18		REMOVE	1										
SS-18	8A	R3-9b(24)	1	TWO-WAY LEFT TURN ONLY (Ground Mounted) - 24"x36"	24	36		REMOVE	1										
SS-18	8B	R8-4(30)	1	EMERGENCY PARKING ONLY - 30x24	30	24		REPOSITION	1	1									Move to top of post
SS-18	9	D11-1	1	BIKE ROUTE	24	18		REMOVE	1										
SS-18	10A	D3-2-DE1	1	WELCOME TO	36	32		REMAIN											
SS-18	10B	D3-2-DE2	1	DEVELOPMENT NAME	36	32		REMAIN											THE OAKS
SS-18	11A	W3-3(36)	1	SIGNAL AHEAD (Symbol) - 36x36	36	36	9.0	ADD TO ASSEMBLY		1									
SS-18	11B	W3-3(30)	1	SIGNAL AHEAD (Symbol) - 30x30	30	30		REMOVE	1										
SS-18	11C	W16-8aP	1	ADVANCE STREET NAME (4 - line plaque)	30	24		REPOSITION	1	1									(Left Arrow) Timber Woods Dr Walther Rd (Right Arrow)
SS-18	12	W11-24aP-DE	1	HIDDEN ENTRANCE (plaque)	24	12		REMAIN											
SS-18	13	R4-4	1	BEGIN RIGHT TURN LANE YIELD TO BIKES	36	30		REMOVE	1										
PAGE TOTALS							95		24	20		0	0		8	0	0	0	

PERMANENT SIGN SCHEDULE

SHEET NO.	PLAN IDENTIFIER	CODE	QTY.	DESCRIPTION	SIGN WIDTH (IN)	SIGN HEIGHT (IN)	SIGN AREA (SF)	ITEM 819018 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE POST (EACH)			ITEM 819019 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS (SF)			POST INSTALLATION TYPE	Code X11 12' Post (W/ Basepost) (EACH)	Code X11A 15' Post (W/ Basepost) (EACH)	ITEM 819016 4" HOLE, 0-6" (EACH)	ITEM 819017 4" HOLE, >6" (EACH)	REMARKS
								SIGN DISPOSITION	REMOVE	INSTALL	SIGN DISPOSITION	REMOVE	INSTALL						
SS-18	14A	D3-2-DE1	1	WELCOME TO	36	32		REMAIN											
SS-18	14B	D3-2-DE2	1	DEVELOPMENT NAME	36	32		REMAIN											TIMBER FARMS (Left Arrow)
SS-18	15	R3-7_R(30)	1	RIGHT LANE MUST TURN RIGHT - 30"x30"	30	30		REMOVE	1										
SS-18	16	D11-1	1	BIKE ROUTE	24	18		REMOVE	1										
SS-18	17	R1-2(36)	1	YIELD	36	36	3.9	RENEW	1	1				SOIL	1				Install on new 12' sign post
SS-18	18A	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30		REMAIN											
SS-18	18B	R3-4(24)	1	U - TURN PROHIBITION (Symbol) - 24x24	24	24		REMAIN											
SS-18	19	R1-2(36)	1	YIELD	36	36	3.9	RENEW	1	1				SOIL	1				Install on new 12' sign post
SS-18	20	D4-3-DE	1	BUS STOP (DART)	12	18		REMAIN											
SS-18	21A	D3-2-DE1	1	WELCOME TO	36	32		REMAIN											
SS-18	21B	D3-2-DE2	1	DEVELOPMENT NAME	36	32		REMAIN											TIMBER FARMS (Right Arrow)
SS-18	22	R3-7_R(30)	1	RIGHT LANE MUST TURN RIGHT - 30"x30"	30	30		REMOVE	1										
SS-18	23	R4-4	1	BEGIN RIGHT TURN LANE YIELD TO BIKES	36	30		REMOVE	1										
SS-18	24	R8-4(30)	1	EMERGENCY PARKING ONLY - 30x24	30	24		REMAIN											
SS-18	25A	R10-5(30)	1	LEFT ON GREEN ARROW ONLY - 30x36	30	36		REMAIN											
SS-18	25B	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30		REMAIN											
SS-18	26	R1-2(36)	1	YIELD	36	36		REMAIN											
SS-18	27	R4-7(24)	2	KEEP RIGHT (Symbol) - 24x30	24	30		REMAIN											
SS-18	28	R1-2(36)	1	YIELD	36	36	3.9	RENEW	1	1				SOIL	1				Install on new 12' sign post
SS-18	29	D4-3-DE	1	BUS STOP (DART)	12	18		REMAIN											
SS-18	30A	R2-1-45(24)	1	SPEED LIMIT (45 MPH - 24x30)	24	30		REMAIN											
SS-18	30B	R8-4(30)	1	EMERGENCY PARKING ONLY - 30x24	30	24		REMAIN											
SS-19	1A	W3-3(36)	1	SIGNAL AHEAD (Symbol) - 36x36	36	36	9.0	ADD TO ASSEMBLY		1									
SS-19	1B	W3-3(30)	1	SIGNAL AHEAD (Symbol) - 30x30	30	30		REMOVE	1										
SS-19	1C	W16-8aP	1	ADVANCE STREET NAME (4 - line plaque)	30	24		REMAIN											(Left Arrow) Walther Rd Timber (Right Arrow) Woods Dr
SS-19	2	R3-9b(24)	1	TWO-WAY LEFT TURN ONLY (Ground Mounted) - 24"x36"	24	36		REMAIN											
SS-19	3A	R3-9b(24)	1	TWO-WAY LEFT TURN ONLY (Ground Mounted) - 24"x36"	24	36		REMAIN											
SS-19	3B	R8-4(30)	1	EMERGENCY PARKING ONLY - 30x24	30	24		REMAIN											
SS-19	4A	W3-3(36)	1	SIGNAL AHEAD (Symbol) - 36x36	36	36	9.0	NEW		1				SOIL	1				
SS-19	4B	W16-8aP	1	ADVANCE STREET NAME (4 - line plaque)	30	24	5.0	ADD TO ASSEMBLY		1									Norwegian Woods Dr Martha Washington Ave
SS-19	5	W3-3(30)	1	SIGNAL AHEAD (Symbol) - 30x30	30	30		REMOVE	1										
SS-19	6A	R2-1-45(24)	1	SPEED LIMIT (45 MPH - 24x30)	24	30		REMAIN											
SS-19	6B	R8-4(30)	1	EMERGENCY PARKING ONLY - 30x24	30	24		REMAIN											
SS-19	7	D4-3-DE	1	BUS STOP (DART)	12	18		RENEW	1	1				SOIL	1				Sign will be furnished by DART Install on new 12' sign post ID 3506 STOP 55
SS-19	8	D11-1	1	BIKE ROUTE	24	18		REMOVE	1										
SS-19	9A	D3-1(18)	2	STREET NAME (2 Line) Posted speed > 40 MPH	30	18	7.5	RENEW	2	2									Norwegian Woods Dr Hwy C, 5"/3"
SS-19	9B	D3-1(18)	2	STREET NAME (2 Line) Posted speed > 40 MPH	48	18	12.0	RENEW	2	2									Old Baltimore Pike Hwy B, 6"/4"
SS-19	9C	W14-2a_L	1	NO OUTLET (Arrow left)	36	8		REMOVE	1										
SS-19	9D	W14-2a_R	1	NO OUTLET (Arrow right)	36	8		REMOVE	1										
SS-19	9E	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	RENEW	1	1				SOIL	1				Install on new 12' sign post
SS-19	10	R4-4	1	BEGIN RIGHT TURN LANE YIELD TO BIKES	36	30		REMOVE	1										
SS-19	11A	D3-2-DE1	1	WELCOME TO	36	32		REMAIN											
SS-19	11B	D3-2-DE2	1	DEVELOPMENT NAME	36	36		REMAIN											Norwegian Woods Christiana Green
SS-19	12	R3-7_R(30)	1	RIGHT LANE MUST TURN RIGHT - 30"x30"	30	30		REMOVE	1										
SS-19	13	D4-3-DE	1	BUS STOP (DART)	12	18		REMOVE	1										ID 3507 STOP 55
SS-19	14A	D3-1(18)	2	STREET NAME (2 Line) Posted speed > 40 MPH	36	18	9.0	RENEW	2	2									Martha Washington Ave Hwy C, 5"/3"
SS-19	14B	D3-1(18)	2	STREET NAME (2 Line) Posted speed > 40 MPH	48	18	12.0	RENEW	2	2									Old Baltimore Pike Hwy B, 6"/4"
SS-19	14C	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	RENEW	1	1				SOIL	1				Install on new 12' sign post
SS-19	15	R1-2(36)	1	YIELD	36	36	3.9	RENEW	1	1				SOIL	1				Install on new 12' sign post
SS-19	16	D4-3-DE	1	BUS STOP (DART)	12	18		NEW		1				SOIL	1				Sign will be furnished by DART Install on new 12' sign post ID 3507 STOP 55
SS-20	1A	D3-2-DE1	1	WELCOME TO	36	32		REMAIN											
SS-20	1B	D3-2-DE2	1	DEVELOPMENT NAME	36	36		REMAIN											Christiana Green (Left Arrow) Norwegian Woods (Right Arrow)
SS-20	2	R3-7_R(30)	1	RIGHT LANE MUST TURN RIGHT - 30"x30"	30	30		REMOVE	1										
PAGE TOTALS							89		28	19		0	0		9	0	0	0	

PERMANENT SIGN SCHEDULE

SHEET NO.	PLAN IDENTIFIER	CODE	QTY.	DESCRIPTION	SIGN WIDTH (IN)	SIGN HEIGHT (IN)	SIGN AREA (SF)	ITEM 819018 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE POST (EACH)			ITEM 819019 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS (SF)			POST INSTALLATION TYPE	Code X11 12' Post (W/ Basepost) (EACH)	Code X11A 15' Post (W/ Basepost) (EACH)	ITEM 819016 4" HOLE, 0-6" (EACH)	ITEM 819017 4" HOLE, >6" (EACH)	REMARKS
								SIGN DISPOSITION	REMOVE	INSTALL	SIGN DISPOSITION	REMOVE	INSTALL						
SS-20	3	R4-4	1	BEGIN RIGHT TURN LANE YIELD TO BIKES	36	30		REMOVE	1										
SS-20	4A	W3-3(36)	1	SIGNAL AHEAD (Symbol) - 36x36	36	36	9.0	NEW		1				SOIL	1				
SS-20	4B	W16-8aP	1	ADVANCE STREET NAME (4 - line plaque)	30	24	5.0	ADD TO ASSEMBLY		1									(Left Arrow) Martha Washington Ave Norwegian (Right Arrow) Woods Dr Hwy C, 4"
SS-20	5A	W3-3(30)	1	SIGNAL AHEAD (Symbol) - 30x30	30	30		REMOVE	1										
SS-20	5B	D11-1	1	BIKE ROUTE	24	18		REMOVE	1										
SS-20	6	R1-2(36)	1	YIELD	36	36	3.9	RENEW	1	1				SOIL	1				Install on new 12' sign post
SS-20	7A	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	RENEW	2	2									Woodshade Dr Hwy B, 8"/6"
SS-20	7B	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	RENEW	2	2									Old Baltimore Pike Hwy B, 6"/4"
SS-20	7C	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	RENEW	1	1				SOIL	1				Install on new 12' sign post
SS-20	7D	OM1-3	1	TYPE 1 OBJECT MARKER	18	18	2.3	RENEW	1	1									
SS-20	8	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	NEW		1				EX. CONCRETE	1		1		
SS-20	9	D4-3-DE	1	BUS STOP (DART)	12	18		REMAIN											ID 2601 STOP 55
SS-20	10	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30		REMAIN											
SS-20	11	R3-7_R(30)	1	RIGHT LANE MUST TURN RIGHT - 30"x30"	30	30		REMOVE	1										
SS-20	12	D11-1	1	BIKE ROUTE	24	18		REMOVE	1										
SS-20	13A	W3-3(36)	1	SIGNAL AHEAD (Symbol) - 36x36	36	36	9.0	RENEW	1	1				SOIL	1				Install on new 12' sign post
SS-20	13B	W16-8P	1	ADVANCE STREET NAME (1 - line plaque)	36	9	2.3	ADD TO ASSEMBLY		1									Woodshade Dr Hwy C, 4"
SS-20	14A	D3-2-DE1	1	WELCOME TO	36	32		REMAIN											
SS-20	14B	D3-2-DE2	1	DEVELOPMENT NAME	36	36		REMAIN											Woodshade (Left Arrow) Buckingham Place (Left Arrow)
SS-20	15	D4-3-DE	1	BUS STOP (DART)	12	18		REMAIN											ID 2618 STOP 55
SS-20	16A	R3-9b(24)	1	TWO-WAY LEFT TURN ONLY (Ground Mounted) - 24"x36"	24	36		REMAIN											
SS-20	16B	R8-4(30)	1	EMERGENCY PARKING ONLY - 30x24	30	24		REMAIN											
SS-20	17A	D3-2-DE1	1	WELCOME TO	36	32		REMAIN											
SS-20	17B	D3-2-DE2	1	DEVELOPMENT NAME	36	36		REMAIN											Woodshade (Right Arrow) Buckingham Place (Right Arrow)
SS-20	18A	R4-4	1	BEGIN RIGHT TURN LANE YIELD TO BIKES	36	30		REMOVE	1										
SS-20	18B	R8-4(30)	1	EMERGENCY PARKING ONLY - 30x24	30	24		REPOSITION	1	1									Move to top of sign post
SS-20	19A	W3-3(36)	1	SIGNAL AHEAD (Symbol) - 36x36	36	36	9.0	RENEW	1	1				SOIL	1				Install on new 12' sign post
SS-20	19B	W16-8P	1	ADVANCE STREET NAME (1 - line plaque)	36	9	2.3	ADD TO ASSEMBLY		1									Woodshade Dr Hwy C, 4"
SS-20	20	R1-1(36)	1	STOP	36	36		REMAIN											
SS-21	1	D11-1	1	BIKE ROUTE	24	18		REMOVE	1										
SS-21	2A	W3-3(36)	1	SIGNAL AHEAD (Symbol) - 36x36	36	36	9.0	RENEW	1	1				SOIL	1				Install on new 12' sign post
SS-21	2B	W16-8aP	1	ADVANCE STREET NAME (2 - line plaque)	30	18		REPOSITION	1	1									(Left Arrow) Trevett Blvd Trefoil Dr (Right Arrow)
SS-21	3A	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	RENEW	1	1				EX. CONCRETE	1				Install on new 12' sign post
SS-21	3B	OM1-3	1	TYPE 1 OBJECT MARKER	18	18		REMOVE	1										
SS-21	4A	R2-1-45(24)	1	SPEED LIMIT (45 MPH - 24x30)	24	30		REMAIN											
SS-21	4B	R8-4(30)	1	EMERGENCY PARKING ONLY - 30x24	30	24		REMAIN											
SS-21	5A	R8-4(30)	1	EMERGENCY PARKING ONLY - 30x24	30	24		REMAIN											
SS-21	5B	R4-4	1	BEGIN RIGHT TURN LANE YIELD TO BIKES	36	30		REMOVE	1										
SS-21	6A	D3-2-DE1	1	WELCOME TO	36	32		REMAIN											
SS-21	6B	D3-2-DE2	1	DEVELOPMENT NAME	36	36		REMAIN											RAINTREE VILLAGE (Right Arrow) VARLAND (Left Arrow)
SS-21	7A	W11-2(30)	1	PEDESTRIAN (Symbol) - 30x30	30	30		REMAIN											
SS-21	7B	W16-9P(24)	1	AHEAD (plaque) - 24x12	24	12		REMAIN											
SS-21	7C	W11-15P(24)	1	TRAIL X-ING (plaque) - 24x18	24	18		REMAIN											BLIND PED X-ING
SS-22	1	R1-2(36)	1	YIELD	36	36	3.9	NEW		1				SOIL	1				
SS-22	2A	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									Trevett Blvd Hwy C, 8"/6"
SS-22	2B	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									Old Baltimore Pike Hwy B, 6"/4"
SS-22	2C	W14-2a_L	1	NO OUTLET (Arrow left)	36	8	2.0	RENEW	1	1									
SS-22	2D	W14-2a_R	1	NO OUTLET (Arrow right)	36	8	2.0	RENEW	1	1									
SS-22	2E	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	RENEW	1	1				EX. CONCRETE	1				
SS-22	2F	OM1-3	1	TYPE 1 OBJECT MARKER	18	18		REMOVE	1										
SS-22	3A	W11-2(30)	1	PEDESTRIAN (Symbol) - 30x30	30	30		REMAIN											
SS-22	3B	W16-7P-MOD	1	DUEL DOWNWARD DIAGONAL ARROW (plaque) - 24x12	24	12		REMAIN											Dual Downward Diagonal Arrows
SS-22	3C	W11-15P-MOD	1	BLIND PED X-ING (plaque) - 24x18	24	18		REMAIN											BLIND PED X-ING
SS-22	4	R1-2(36)	1	YIELD	36	36	3.9	RENEW	1	1				SOIL	1				Install on new 12' sign post
SS-22	5A	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	RENEW	1	1				EX. CONCRETE	1				Install on new 12' sign post
SS-22	5B	OM1-3	1	TYPE 1 OBJECT MARKER	18	18		REMOVE	1										
SS-22	6	D4-3-DE	1	BUS STOP (DART)	12	18		RENEW	1	1				SOIL	1				Sign will be furnished by DART Install on new 12' sign post ID 2600 STOP 055
PAGE TOTALS							136		30	29		0	0		13	0	1	0	

PERMANENT SIGN SCHEDULE

SHEET NO.	PLAN IDENTIFIER	CODE	QTY.	DESCRIPTION	SIGN WIDTH (IN)	SIGN HEIGHT (IN)	SIGN AREA (SF)	ITEM 819018 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE POST (EACH)			ITEM 819019 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS (SF)			POST INSTALLATION TYPE	Code X11 12' Post (W/ Basepost) (EACH)	Code X11A 15' Post (W/ Basepost) (EACH)	ITEM 819016 4" HOLE, 0-6" (EACH)	ITEM 819017 4" HOLE, >6" (EACH)	REMARKS
								SIGN DISPOSITION	REMOVE	INSTALL	SIGN DISPOSITION	REMOVE	INSTALL						
SS-22	7A	W11-2(30)	1	PEDESTRIAN (Symbol) - 30x30	30	30		REMAIN											
SS-22	7B	W16-9P(24)	1	AHEAD (plaque) - 24x12	24	12		REMAIN											
SS-22	7C	MOD	1	BLIND PED X-ING (plaque) - 24x18	24	18		REMAIN											BLIND PED X-ING
SS-22	8A	D3-2-DE1	1	WELCOME TO	36	32		REMAIN											
SS-22	8B	D3-2-DE2	1	DEVELOPMENT NAME	36	36		REMAIN											RAINTREE VILLAGE (Left Arrow) VARLAND (Right Arrow)
SS-22	9	R4-4	1	BEGIN RIGHT TURN LANE YIELD TO BIKES	36	30		REMOVE	1										
SS-22	10A	W3-3(36)	1	SIGNAL AHEAD (Symbol) - 36x36	36	36	9.0	RENEW	1	1				SOIL	1				Install on new 12' sign post
SS-22	10B	W16-8aP	1	ADVANCE STREET NAME (2 - line plaque)	30	18		REPOSITION	1	1									(Left Arrow) Trefoil Dr Trevett Blvd (Right Arrow)
SS-22	11	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	RENEW	1	1				EX. CONCRETE	1				Install on new 12' sign post
SS-22	12	R1-2(36)	1	YIELD	36	36	3.9	RENEW	1	1				SOIL	1				Existing is mounted to signal pole Install on new 12' sign post
SS-22	13A	W11-2(30)	1	PEDESTRIAN (Symbol) - 30x30	30	30		REMAIN											
SS-22	13B	W16-7P_L(24)	1	LEFT DOWNWARD DIAGONAL ARROW (plaque) - 24x12	24	12		REMAIN											
SS-22	13C	W11-15P-MOD	1	BLIND PED X-ING (plaque) - 24x18	24	18		REMAIN											BLIND PED X-ING
SS-22	14	R1-2(36)	1	YIELD	36	36	3.9	RENEW	1	1				SOIL	1				Install on new 12' sign post
SS-22	15A	D4-3-DE	1	BUS STOP (DART)	12	18		RENEW	1	1				SOIL	1				Sign will be furnished by DART Install on new 12' sign post ID 2619 STOP 055
SS-22	15B	D11-1	1	BIKE ROUTE	24	18		REMOVE	1										
SS-22	16	S1-1(30)	1	SCHOOL SIGN (Symbol) - 30x30	30	30		REMAIN											
SS-22	17	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30	5.0	NEW		1				EX. CONCRETE	1		1		
SS-22	18	S1-1(30)	1	SCHOOL SIGN (Symbol) - 30x30	30	30		REMAIN											
SS-22	19A	M2-1(21)	1	JUNCTION - 21x15	21	15		REMAIN											
SS-22	19B	M1-5(30)	1	STATE ROUTE (3 - Digit Sign) - 30x24	30	24		REMAIN											273
SS-22	19C	R8-4(30)	1	EMERGENCY PARKING ONLY - 30x24	30	24		REMAIN											
SS-23	1	W9-2_L(36)	1	LANE ENDS MERGE LEFT - 36x36	36	36		REMOVE	1										
SS-23	2	W4-2_L(36)	1	LANE ENDS (Left) - 36x36	36	36	9.0	NEW		1				SOIL	1				
SS-23	3	W9-2_L(36)	1	LANE ENDS MERGE LEFT - 36x36	36	36	9.0	NEW		1				SOIL	1				
SS-23	4A	R1-2(48)	1	YIELD	48	48	6.9	RENEW	1	1				SOIL	1				Install on new 12' sign post
SS-23	4B	R1-2aP-DE(24)	1	TO U-TURNING TRAFFIC (plaque)	24	18	3.0	RENEW	1	1									
SS-23	5	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30		REMAIN											
SS-23	6A	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30		REMAIN											
SS-23	6B	R3-20-DE	1	TURN LANE	18	18		REMAIN											
SS-23	7	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30		REMAIN											
SS-23	8	R1-2(48)	1	YIELD	48	48	6.9	RENEW	1	1				SOIL	1				Install on new 12' sign post
SS-23	9A	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									Christiana Rd Hwy B, 8"/6"
SS-23	9B	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									Old Baltimore Pike Hwy B, 6"/4"
SS-23	9C	R6-1_L(36)	1	ONE WAY (ENCLOSED IN LEFT ARROW) - 36x12	36	12	3.0	ADD TO ASSEMBLY		1									
SS-23	9D	R6-1_R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12	3.0	ADD TO ASSEMBLY		1									
SS-23	9E	R6-3(30)	1	DIVIDED HIGHWAY CROSSING (4 - Legged Intersection) - 30x24	30	24	5.0	RENEW	1	1				EX. CONCRETE		1			Install on new 15' sign post
SS-23	10A	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	48	12		REMOVE	2										Christiana Rd
SS-23	10B	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	48	12		REMOVE	2										Old Baltimore Pike
SS-23	10C	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30		REPOSITION	1	1									Move to top of post
SS-23	11	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30		REMAIN											
SS-23	12A	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									Christiana Rd Hwy B, 8"/6"
SS-23	12B	D3-1(18)	2	STREET NAME (1 Line) Posted speed > 40 MPH	48	18	12.0	ADD TO ASSEMBLY		2									Old Baltimore Pike Hwy B, 6"/4"
SS-23	12C	R6-1_L(36)	1	ONE WAY (ENCLOSED IN LEFT ARROW) - 36x12	36	12	3.0	ADD TO ASSEMBLY		1									
SS-23	12D	R6-1_R(36)	1	ONE WAY (ENCLOSED IN RIGHT ARROW) - 36x12	36	12	3.0	ADD TO ASSEMBLY		1									
SS-23	12E	R6-3(30)	1	DIVIDED HIGHWAY CROSSING (4 - Legged Intersection) - 30x24	30	24	5.0	RENEW	1	1				EX. CONCRETE		1			Install on new 15' sign post
SS-23	13	R1-2(48)	1	YIELD	48	48	6.9	RENEW	1	1				SOIL	1				Install on new 12' sign post
SS-23	14	D1-3	1	DESTINATION (3 Line)	72	42	21.0				RENEW	21.0	21.0	SOIL	2				(Up Arrow) Coochs Bridge (Left Arrow) New Castle Newark (Right Arrow)
SS-23	15	D4-3-DE	1	BUS STOP (DART)	12	18	0.0	NEW		1				SOIL	1				ID 2599 STOP 055 (DART SUPPLIED)
SS-23	16A	M3-2(24)	1	CARDINAL DIRECTION - EAST - 24x12	24	12		REMAIN											
SS-23	16B	M1-5(24)	1	STATE ROUTE (2 - Digit Sign) - 24x24	24	24		REMAIN											273
SS-23	16C	M5-1_L	1	ADVANCE TURN ARROW (Left - 90)	21	15		REMAIN											
SS-23	17A	M3-4(24)	1	CARDINAL DIRECTION - WEST - 24x12	24	12		REMAIN											
SS-23	17B	M1-5(24)	1	STATE ROUTE (2 - Digit Sign) - 24x24	24	24		REMAIN											273
SS-23	17C	M6-1_R(21)	1	DIRECTIONAL ARROW (Right) - 21x15	21	15		REMAIN											
SS-23	18	W11-1(30)	1	BICYCLE (Symbol) - 30x30	30	30		REMOVE	1										
SS-23	19	D14-3-DE	1	ADOPT A HIGHWAY	24	18		REMAIN											FULLY CHARGED SBC
SS-23	20	W11-1-DE(30)	1	BICYCLE (Symbol) IN LANE - 30x30	30	30	6.3	RENEW	1	1				SOIL	1				Install on new 12' sign post
SS-23	21	R2-1-25(24)	1	SPEED LIMIT (25 MPH - 24x30)	24	30		REMAIN											
PAGE TOTALS							166		22	30		21	21		15	2	1	0	

PERMANENT SIGN SCHEDULE

SHEET NO.	PLAN IDENTIFIER	CODE	QTY.	DESCRIPTION	SIGN WIDTH (IN)	SIGN HEIGHT (IN)	SIGN AREA (SF)	ITEM 819018 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE POST (EACH)			ITEM 819019 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS (SF)			POST INSTALLATION TYPE	Code X11 12' Post (W/ Basepost) (EACH)	Code X11A 15' Post (W/ Basepost) (EACH)	ITEM 819016 4" HOLE, 0-6" (EACH)	ITEM 819017 4" HOLE, >6" (EACH)	REMARKS
								SIGN DISPOSITION	REMOVE	INSTALL	SIGN DISPOSITION	REMOVE	INSTALL						
SS-23	22	D4-3-DE	1	BUS STOP (DART)	12	18	0.0	NEW		1				SOIL	1				ID 2620 STOP 055 (DART SUPPLIED)
SS-23	23	R1-1(36)	1	STOP	36	36		REMAIN											
SS-23	24A	W11-2(30)	1	PEDESTRIAN (Symbol) - 30x30	30	30		REMOVE	1										
SS-23	24B	D1-2(B)	1	DESTINATION (2 Line)	24	12		REPOSITION											FIELDSTREAM DR (Move to top of post)
SS-23	25A	D3-2-DE1	1	WELCOME TO	36	32		REMAIN											
SS-23	25B	D3-2-DE2	1	DEVELOPMENT NAME	36	32		REMAIN											CHRISTIANA VILLAGE
SS-23	26	D4-3-DE	1	BUS STOP (DART)	12	18		REMOVE											ID 2620 STOP 055
SS-24	1	R1-1(36)	1	STOP	36	36		REMAIN											
SS-24	2A	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	48	12		REMAIN											
SS-24	2B	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	48	12		REMAIN											
SS-24	2C	R4-7(24)	1	KEEP RIGHT (Symbol) - 24x30	24	30		REMAIN											
SS-24	3	D4-3-DE	1	BUS STOP (DART)	12	18		REMOVE	1										ID 2599 STOP 55
SS-24	4A	D3-2-DE1	1	WELCOME TO	36	32		REMAIN											
SS-24	4B	D3-2-DE2	1	DEVELOPMENT NAME	36	24		REMAIN											CHRISTIANA VILLAGE
SS-24	5	R2-1-25(24)	1	SPEED LIMIT (25 MPH - 24x30)	24	30		REMAIN											
SS-24	6A	D3-1(9)	2	STREET NAME (1 Line)	42	9		REMAIN											OLD BALTIMORE PIKE
SS-24	6B	D3-1(9)	2	STREET NAME (1 Line)	36	9		REMAIN											FIELDSTREAM DR
SS-24	6C	R1-1(36)	1	STOP	36	36		REMAIN											
SS-24	7	R2-1-25(24)	1	SPEED LIMIT (25 MPH - 24x30)	24	30		REMAIN											
SS-24	8A	W3-3(36)	1	SIGNAL AHEAD (Symbol) - 36x36	36	36		REMAIN											
SS-24	8B	W16-8P	1	ADVANCE STREET NAME (1 - line plaque)	18	9	1.1	ADD TO ASSEMBLY		1									Main St Hwy C, 4"
SS-24	9	D1-3	1	DESTINATION (3 Line)	72	42					REMAIN								(Up Arrow) STANTON (Left Arrow) NEWARK NEW CASTLE (Right Arrow)
SS-24	10A	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	42	12	7.0	ADD TO ASSEMBLY		2									Maguire St Hwy C, 6"/4"
SS-24	10B	D3-1(12)	2	STREET NAME (1 Line) Posted speed ≤ 40 MPH	48	12	8.0	ADD TO ASSEMBLY		2									Old Baltimore Pike Hwy B, 6"/4"
SS-24	10C	R1-1(36)	1	STOP	36	36	7.5	NEW		1				SOIL	1				
SS-24	11A	M3-1(24)	1	CARDINAL DIRECTION - NORTH - 24x12	24	12		REMAIN											
SS-24	11B	M1-5(24)	1	STATE ROUTE (2 - Digit Sign) - 24x24	24	24		REMAIN											7
SS-24	11C	M6-3(21)	1	DIRECTIONAL ARROW (Up) - 21x15	21	15		REMAIN											
SS-24	11D	D4-3-DE	1	BUS STOP (DART)	12	18		REMAIN											ID 328 STOP 55
SS-24	11E	MOD	1	W3R	24	36		REMAIN											W3R
PAGE TOTALS							24		2	7		0	0		2	0	0	0	
JOB TOTALS							1565		254	309		21	78		126	5	9	0	

DELAWARE DEPARTMENT OF TRANSPORTATION

TRAFFIC PAVEMENT MARKING ESTIMATE

PAVEMENT AND REHABILITATION, NORTH XII, 2016

CONTRACT # T201606112
F.A.P. # 0
PROJECT: PAVEMENT AND REHABILITATION, NORTH XII, 2016

LINE	CODE #	ITEM #	UOM	STRIPING DESCRIPTION	QTY
1	55	817002	SF	PERMANENT PAVEMENT STRIPING, SYMBOL/LEGEND, ALKYD-THERMOPLASTIC	10,774
2	70	817005	LF	PERMANENT PAVEMENT STRIPING, ALKYD-THERMOPLASTIC, 5"	14
3	75	817006	LF	PERMANENT PAVEMENT STRIPING, ALKYD-THERMOPLASTIC, 12"	47
4	105	817013	LF	PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, WHITE/YELLOW, 5"	146,119
5	110	817014	LF	PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, WHITE/YELLOW, 10"	694
6	115	817015	EACH	PREFORMED RETROREFLECTIVE THERMOPLASTIC MARKINGS, BIKE SYMBOL	91
7	175	817027	EACH	RAISED/RECESSED PAVEMENT MARKER	595
8	195	817031	SF	REMOVAL OF PAVEMENT STRIPING	200
9	720	824003	EACH	FLEXIBLE DELINEATOR, PERMANENT	43
10					
11					
12					
13					
14					
30					

TRAFFIC STATEMENT

Date : NOT YET SENT

DelDOT Traffic
169 Brick Store Landing Rd
Smyrna, Delaware 19977

To : Daniel Macchione
PS&E Project Coordinator

From : Bret A. Martine, PE, PTOE (Century Engineering)
Traffic Systems Design Engineer

Ref : Contract Number : T202109816 F.A.P. # :
Project Title : Signalized Intersection Developer Improvements (Martin Honda)

[ ] No Involvement by Traffic

[XX] PS&E Attached, Signal Involvement

[ ] PS&E Attached, ITMS Involvement

[XX] PS&E Attached, Highway Lighting Involvement

[ ] PS&E Attached, Signing Involvement

[ ] PS&E Attached, Pavement Markings Involvement

[ ] Traffic ONLY, Pavement Markings

cc: Nick Mogle, Traffic Operations Manager (Interim)
Amanda Davis, Support Services Administrator
Charlanne A. Thornton, Director of Finance
William Conway, Project Engineer/Designer
Traffic Project File Copy

TRAFFIC PROJECT COST SUMMARY

Signalized Intersection Developer Improvements (Martin Honda)

T202109816

DESCRIPTION	ENGINEER'S ESTIMATE
TOTAL SIGNAL ESTIMATE	$79,636.41
TOTAL ITMS ESTIMATE	$0.00
TOTAL HIGHWAY LIGHTING ESTIMATE	$2,365.00
TOTAL ROADWAY SIGNING ESTIMATE	$0.00
MAINTENANCE FEE (5%)	$4,100.07

TOTAL ESTIMATE FOR PROJECT ---->	**$86,101.48**

DELAWARE DEPARTMENT OF TRANSPORTATION

TRAFFIC SIGNAL ESTIMATE

Signalized Intersection Developer Improvements (Martin Honda)

CONTRACT #: T202109816
F.A.P. #:
PROJECT: Signalized Intersection Developer Improvements (Martin Honda)

Project contractor items estimated for traffic equipment construction ONLY

INTERSECTION # 1: **N247, DE273 & Marrows Road**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	UNIT COST BYERS	TOTAL COST BYERS
1	355	831514	30	LF	Furnish & Install 2-1/2” Schedule 80 PVC Conduit (Trench)		
2	360	831515	20	LF	Furnish & Install 3” Schedule 80 PVC Conduit (Trench)		
3	445	831524	15	LF	Furnish & Install 2-1/2” Galvanized Steel Conduit (Trench)		
4	650	830001	1	EA	Conduit Junction Well, Type 1, 20" x 20" Precast Concrete		
5	835	834002	1	EA	Pole Base Type 3A		
6	850	834005	2	EA	Pole Base Type 4A		
7							
8							
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					TOTAL PROJECT CONTRACTOR ITEMS	→	

					INTERSECTION # 1: **N247, DE273 & Marrows Road**	UNIT COST	TOTAL COST
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC CONTRACTOR ITEMS)	BYERS	BYERS
1	65	832008	110	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper	2.30	253.00
2	80	832025	660	LF	Furnish & Install 4-Conductor #18 AWG Shielded Opticom Cable	2.50	1,650.00
3	105	832032	150	LF	Furnish & Install 14/4 Traffic Control Cable	2.50	375.00
4	110	832507	600	LF	Furnish & Install 14/5 Traffic Control Cable	2.65	1,590.00
5	120	832034	500	LF	Furnish & Install 14/16 Traffic Control Cable	4.25	2,125.00
6	715	802003	6	EA-DY	Arrow Panels, Type C	45.00	270.00
7	720	803001	45	EA-DY	Furnish & Maintain Portable Changeable Message Board	145.00	6,525.00
7	725	804001	6	EA-DY	Furnish & Maintain Portable Light Assembly (Flood Lights)	225.00	1,350.00
8	730	805001	225	EA-DY	Plastic Drums	4.00	900.00
9	735	806001	36	HR	Traffic Officers	75.00	2,700.00
10	740	808002	6	EA-DY	Furnish & Maintain Truck Mounted Attenuator, Type II	220.00	1,320.00
11	745	810001	36	EA-DY	Temporary Warning Signs and Plaques	18.00	648.00
12	750	811001	36	HR	Flagger, New Castle County, State	84.00	3,024.00
13	780	813001	36	LF-DY	Temporary Barricades, Type III	6.00	216.00
14	875	836001	1	EA	Installation of Steel Pole (17' to 40')	450.00	450.00
15	885	836502	2	EA	Furnish & Install Pedestal Pole	1350.00	2,700.00
16	910	836507	2	EA	Furnish Pedestal Pole Transformer Base	175.00	350.00
17	970	837002	3	EA	Furnish & Install 12" LED Signal Head Section Rigid Mount	340.00	1,020.00
18	975	837004	39	EA	Furnish & Install 12" LED Signal Head Section Span Mount	340.00	13,260.00
19	995	844001	4	EA	Furnish & Install Opticom Emergency Preemption Detector	950.00	3,800.00
20	1000	837008	2	EA	Furnish & Install 16" LED Countdown Pedestrian Signal	650.00	1,300.00
21	1010	837010	4	EA	Furnish & Install Pedestrian Pushbutton with Sign	250.00	1,000.00
22	1185	838001	515	LF	Furnish & Install Span Wires, 7/16"	8.50	4,377.50
23	1210	838009	335	LF	Removal of Messenger Wire, Cable and Hardware	5.00	1,675.00
24	1225	830010	1	EA	Removal of Existing Junction Well	300.00	300.00
25	1235	832035	780	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	1.50	1,170.00
26	1240	834501	0.4	CY	Partial Removal of Concrete Pole Bases and Cabinet Foundations	900.00	360.00
27	1250	836006	2	EA	Remove Pedestal Pole	1500.00	3,000.00
28	1255	836503	1	EA	Remove Steel Pole (Equal to or Greater than 15' and Less than 40')	275.00	275.00
29	1260	837500	2	EA	Removal of Signal Head or Pedestrian Head from Pole or Pedestal	150.00	300.00
30	1270	838504	17	EA	Removal of Signal Head or Opticom Detector from Span Wire or Mast Arm	225.00	3,825.00
					TOTAL TRAFFIC CONTRACTOR ITEMS	→	62,108.50

INTERSECTION # 1: **N247, DE273 & Marrows Road**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	UNIT COST BYERS	TOTAL COST BYERS
1	2015	999417	2	EA	Hardware & Brackets (Misc. Nuts, Bolts, Brackets for Signal and Signing Items)(1 or 2 depending on i	1000.00	2,000.00
2	2125	999479	1	EA	28' (8.5m) Steel Round Strain Pole	8629.50	8,629.50
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4							
5							
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29							
30							

TOTAL TRAFFIC SUPPLY ITEMS	→		10,629.50
TOTAL PROJECT CONTRACTOR ITEMS	→	→	
TOTAL TRAFFIC CONTRACTOR ITEMS	→	→	62,108.50
TOTAL TRAFFIC SUPPLY ITEMS	→	→	10,629.50
CONTINGENCIES	→	→	6,898.41
TOTAL COST	→	→	**79,636.41**

DELAWARE DEPARTMENT OF TRANSPORTATION

HIGHWAY LIGHTING ESTIMATE

Signalized Intersection Developer Improvements (Martin Honda)

CONTRACT #: T202109816
F.A.P. #:
PROJECT: Signalized Intersection Developer Improvements (Martin Honda)

						UNIT COST			TOTAL COST
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	BYERS	KRISS	ROMMEL	BYERS
1									
2									
3									
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					TOTAL PROJECT CONTRACTOR ITEMS	→	→		

						UNIT COST			TOTAL COST
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC CONTRACTOR ITEMS)	BYERS	KRISS	ROMMEL	BYERS
1	1190	838002	125	LF	Furnish & Install Span Wires, 1/4"	6.00	4.75	5.00	750.00
2	1195	838003	2	EA	Furnish & Install Dead End Messenger Wire Attachment	250.00	330.00	500.00	500.00
3	1210	838009	110	LF	Removal of Messenger Wire, Cable and Hardware	5.00	2.10	1.00	550.00
4	1315	850011	1	EA	Removal of Luminaire	150.00	44.00	136.00	150.00
5	1320	850517	1	EA	Installation of Luminaire	200.00	51.00	272.00	200.00
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					TOTAL TRAFFIC CONTRACTOR ITEMS	→	→		2,150.00

						UNIT COST			TOTAL COST
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	BYERS	KRISS	ROMMEL	BYERS
1									
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30									
					TOTAL TRAFFIC SUPPLY ITEMS	→	→		

TOTAL PROJECT CONTRACTOR ITEMS	→	→	→	→	
TOTAL TRAFFIC CONTRACTOR ITEMS	→	→	→	→	2,150.00
TOTAL TRAFFIC SUPPLY ITEMS	→	→	→	→	
CONTINGENCIES	→	→	→	→	215.00
TOTAL COST	→	→	→	→	2,365.00

DELAWARE DEPARTMENT OF TRANSPORTATION

TRAFFIC SIGNAL ESTIMATE

ERLSP ("J account") SR 41 @ Graves Rd RSA|WF upgrades

CONTRACT #: T200308302
F.A.P. #: n/a
PROJECT: ERLSP ("J account") SR 41 @ Graves Rd RSA|WF upgrades

INTERSECTION # 1: **(N491) SR 41 @ Graves Rd**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	UNIT COST BYERS	UNIT COST KRISS	TOTAL COST BYERS	TOTAL COST KRISS
					TOTAL PROJECT CONTRACTOR ITEMS →				

INTERSECTION # 1: **(N491) SR 41 @ Graves Rd**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC CONTRACTOR ITEMS)	UNIT COST BYERS	UNIT COST KRISS	TOTAL COST BYERS	TOTAL COST KRISS
1	65	832008	900	LF	Furnish & Install 1-conductor #6 AWG Stranded Copper	2.30	2.30	2,070.00	2,070.00
2	80	832025	400	LF	Furnish & Install 4-conductor #18 AWG Shielded Opticom Cable	2.50	2.85	1,000.00	1,140.00
3	90	832027	250	LF	Furnish & Install 2-Conductor #14 AWG Aluminum Shielded Cable	2.50	2.20	625.00	550.00
4	95	832029	30	LF	Furnish & Install #8/2 wire UF W/ground	4.55	4.95	136.50	148.50
5	105	832032	1400	LF	Furnish & Install 14/4 Traffic Control Cable	2.50	2.60	3,500.00	3,640.00
6	120	832034	250	LF	Furnish & Install 14/16 Traffic Control Cable	4.25	4.10	1,062.50	1,025.00
7	125	832504	20	LF	Furnish and Install #8 THHN Stranded Copper	1.55	2.00	31.00	40.00
8	135	846001	100	LF	Furnish & Install Loop Wire 1-conductor #14 AWG encased in ¼" Flexible Tubing in a Loop Sawcut	15.00	14.15	1,500.00	1,415.00
9	305	831545	200	LF	Furnish and Install 4" HDPE SDR-13.5 Conduit (Bore)	29.00	34.00	5,800.00	6,800.00
10	360	831515	25	LF	Furnish and Install 3" Schedule 80 PVC Conduit (Trench)	12.00	13.00	300.00	325.00
11	365	831516	500	LF	Furnish and Install 4" Schedule 80 PVC Conduit (Trench)	13.50	13.00	6,750.00	6,500.00
12	440	831523	35	LF	Furnish and Install 2" Galvanized Steel Conduit (Trench)	18.50	20.20	647.50	707.00
13	630	842005	1	EA	Removal of Electric Service on Wood or Metal Pole	350.00	270.00	350.00	270.00
14	635	842501	1	EA	Furnish & Install Electrical Utility Service Equipment (100 AMP)	1800.00	3180.00	1,800.00	3,180.00
15	650	830001	5	EA	Conduit Junction Well, Type 1, 20"x20" Precast Concrete	1100.00	1100.00	5,500.00	5,500.00
16	670	830008	2	EA	Adjust or Repair Existing Conduit Junction Well	500.00	375.00	1,000.00	750.00
17	700	833001	4	EA	Bonding & Grounding Existing Junction Well	400.00	415.00	1,600.00	1,660.00
18	715	802003	10	EA-DY	Arrow Panels, Type C	45.00	41.00	450.00	410.00
19	725	804001	4	EA-DY	Furnish & Maintain Portable Light Assembly (Flood Lights)	225.00	390.00	900.00	1,560.00
20	730	805001	300	EA-DY	Plastic Drums	4.00	2.87	1,200.00	861.00
21	735	806001	16	HR	Traffic Officers	75.00	75.00	1,200.00	1,200.00
22	740	808002	10	EA-DY	Furnish & Maintain Truck Mounted Attenuator, Type II	220.00	250.00	2,200.00	2,500.00
23	745	810001	80	EA-DY	Temporary Warning Signs and Plaques	18.00	18.00	1,440.00	1,440.00
24	750	811001	50	HR	Flagger, New Castle County, State	84.00	74.85	4,200.00	3,742.50
25	765	811013	10	HR	Flagger, New Castle County, State, Overtime	122.00	112.30	1,220.00	1,123.00
26	860	834006	2	EA	Pole Base Type 6	1000.00	900.00	2,000.00	1,800.00
27	885	836502	2	EA	Furnish and Install Pedestal Pole	1350.00	930.00	2,700.00	1,860.00
28	970	837002	4	EA	Furnish & Install 12" LED Signal Head Section Rigid Mount	340.00	345.00	1,360.00	1,380.00
29	975	837004	30	EA	Furnish & Install 12" LED Signal Head Section Span Mount	340.00	335.00	10,200.00	10,050.00
30	995	844001	4	EA	Furnish & Install Opticom Emergency Preemption Detector	950.00	735.00	3,800.00	2,940.00
31	1135	822500	4	EA	Install Overhead Sign	300.00	22.00	1,200.00	88.00
32	1200	838006	1	EA	Adjustment of Span or Messenger Wire	700.00	600.00	700.00	600.00
33	1235	832035	80	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	1.50	1.10	120.00	88.00
34	1240	834501	1	CY	Removal of Concrete Pole Bases and Cabinet Foundations	900.00	900.00	900.00	900.00
35	1250	836006	1	EA	Remove Pedestal Pole	1500.00	47.00	1,500.00	47.00
36	1270	838504	8	EA	Removal of Signal Head or Opticom Detector from Span Wire or Mast Arm	225.00	41.00	1,800.00	328.00
					TOTAL TRAFFIC CONTRACTOR ITEMS →			72,762.50	68,638.00

INTERSECTION # 1: **(N491) SR 41 @ Graves Rd**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	UNIT COST BYERS	UNIT COST KRISS	TOTAL COST BYERS	TOTAL COST KRISS
1	2020	999421	1	EA	Complete P Cabinet w/12 Channel EPAC Controller(includes Mounting Rack w/Power Supply, 5-4 Ch	13950.00	13950.00	13,950.00	13,950.00
2	2050	999427	1	EA	Base Extension (split) Aluminum w/Natural Mill Finish	550.00	550.00	550.00	550.00
3	2105	999461	1	EA	Optical Receiver Card (Emergency Preemption)	2751.00	2751.00	2,751.00	2,751.00
					TOTAL TRAFFIC SUPPLY ITEMS →			17,251.00	17,251.00

TOTAL PROJECT CONTRACTOR ITEMS	→ →		
TOTAL TRAFFIC CONTRACTOR ITEMS	→ →	72,762.50	68,638.00
TOTAL TRAFFIC SUPPLY ITEMS	→ →	17,251.00	17,251.00
CONTINGENCIES	→ →	4,500.68	4,294.45
TOTAL COST	→ →	94,514.18	90,183.45

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DELAWARE DEPARTMENT OF TRANSPORTATION

TRAFFIC ITMS ESTIMATE

ERLSP ("J account") SR 41 @ Graves Rd RSA|WF upgrades

CONTRACT # T200308302
F.A.P. # n/a
PROJECT: ERLSP ("J account") SR 41 @ Graves Rd RSA|WF upgrades

ITMS						UNIT COST		TOTAL COST	
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	BYERS	KRISS	BYERS	KRISS
					TOTAL PROJECT CONTRACTOR ITEMS	→		0.00	0.00

ITMS						UNIT COST		TOTAL COST	
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC CONTRACTOR ITEMS)	BYERS	KRISS	BYERS	KRISS
					TOTAL TRAFFIC CONTRACTOR ITEMS	→		0.00	0.00

ITMS						UNIT COST		TOTAL COST	
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	BYERS	KRISS	BYERS	KRISS
1	2535	999621	1	EA	CDMA	1200.00	1200.00	1,200.00	1,200.00
					TOTAL TRAFFIC SUPPLY ITEMS	→		1,200.00	1,200.00

TOTAL PROJECT CONTRACTOR ITEMS	→	→	0.00	0.00
TOTAL TRAFFIC CONTRACTOR ITEMS	→	→	0.00	0.00
TOTAL TRAFFIC SUPPLY ITEMS	→	→	1,200.00	1,200.00
CONTINGENCIES	→	→	60.00	60.00
TOTAL COST	→	→	1,260.00	1,260.00

DELAWARE DEPARTMENT OF TRANSPORTATION

TRAFFIC SIGNAL ESTIMATE

Sweetbriar Rd @ Georgetown-Lewes Trail RRFB

CONTRACT #: T202204001
F.A.P. #: ESTP-2022(06)
PROJECT: Sweetbriar Rd @ Georgetown-Lewes Trail RRFB

INTERSECTION # 1: **(S401) Sweetbriar Rd @ GLT**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	UNIT COST BYERS	UNIT COST KRISS	TOTAL COST BYERS	TOTAL COST KRISS
					TOTAL PROJECT CONTRACTOR ITEMS	→			

INTERSECTION # 1: **(S401) Sweetbriar Rd @ GLT**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC CONTRACTOR ITEMS)	UNIT COST BYERS	UNIT COST KRISS	TOTAL COST BYERS	TOTAL COST KRISS
1	65	832008	110	LF	Furnish & Install 1-conductor #6 AWG Stranded Copper	2.30	2.30	253.00	253.00
2	95	832029	85	LF	Furnish & Install #8/2 wire UF W/ground	4.55	4.95	386.75	420.75
3	105	832032	110	LF	Furnish & Install 14/4 Traffic Control Cable	2.50	2.60	275.00	286.00
4	115	832033	110	LF	Furnish & Install 14/9 Traffic Control Cable	3.20	3.20	352.00	352.00
5	125	832504	20	LF	Furnish and Install #8 THHN Stranded Copper	1.55	2.00	31.00	40.00
6	360	831515	30	LF	Furnish and Install 3" Schedule 80 PVC Conduit (Trench)	12.00	13.00	360.00	390.00
7	440	831523	60	LF	Furnish and Install 2" Galvanized Steel Conduit (Trench)	18.50	20.20	1,110.00	1,212.00
8	635	842501	1	EA	Furnish & Install Electrical Utility Service Equipment (100 AMP)	1800.00	3180.00	1,800.00	3,180.00
9	670	830008	3	EA	Adjust or Repair Existing Conduit Junction Well	500.00	375.00	1,500.00	1,125.00
10	715	802003	4	EA-DY	Arrow Panels, Type C	45.00	41.00	180.00	164.00
11	730	805001	150	EA-DY	Plastic Drums	4.00	2.87	600.00	430.50
12	735	806001	16	HR	Traffic Officers	75.00	75.00	1,200.00	1,200.00
13	740	808002	4	EA-DY	Furnish & Maintain Truck Mounted Attenuator, Type II	220.00	250.00	880.00	1,000.00
14	745	810001	80	EA-DY	Temporary Warning Signs and Plaques	18.00	18.00	1,440.00	1,440.00
15	760	811003	50	HR	Flagger, Sussex County, State	78.00	70.00	3,900.00	3,500.00
16	775	811015	10	HR	Flagger, Sussex County, State, Overtime	113.00	104.50	1,130.00	1,045.00
17	780	813001	100	LF-DY	Temporary Barricades, Type III	6.00	8.00	600.00	800.00
18	840	834003	1	EA	Pole Base Type 3B	4900.00	4740.00	4,900.00	4,740.00
19	860	834006	4	EA	Pole Base Type 6	1000.00	900.00	4,000.00	3,600.00
20	885	836502	4	EA	Furnish and Install Pedestal Pole	1350.00	930.00	5,400.00	3,720.00
21	890	836504	1	EA	Installation of Steel Mast Arm Pole with Single or Twin Mast arms up to 60'	2000.00	1580.00	2,000.00	1,580.00
22	970	837002	4	EA	Furnish & Install 12" LED Signal Head Section Rigid Mount	340.00	345.00	1,360.00	1,380.00
23	970	837002	4	EA	~~Furnish &~~ Install ~~12" LED~~ RRFB Signal Head Section Rigid Mount	340.00	345.00	1,360.00	1,380.00
24	1010	837010	2	EA	~~Furnish &~~ Install Pedestrian Pushbutton with Sign	250.00	240.00	500.00	480.00
25	1070	844521	1	EA	Install Video Detection Device	500.00	900.00	500.00	900.00
26	1135	822500	14	EA	Install Overhead Sign	300.00	22.00	4,200.00	308.00
27	1295	847001	1	EA	Installation or Removal of Pole or Post Mounted Cabinet	225.00	390.00	225.00	390.00
28		N.I.B.	5	EA	Dual RRFB units w/ Dual Confirmation light (back to back mounting) AC powered	2891.10	2891.10	14,455.50	14,455.50
29		N.I.B.	2	EA	Control Cabinet with ventilation and thermostatic controlled fan DT-26	4582.75	4582.75	9,165.50	9,165.50
30		N.I.B.	3	EA	Pushbutton Assembly	236.90	236.90	710.70	710.70
31		N.I.B.	1	EA	Flasher Control System	419.75	419.75	419.75	419.75
32		N.I.B.	1	EA	Gridsmart Detection System (includes camera and processor)	21275.00	21275.00	21,275.00	21,275.00
33		N.I.B.	1	EA	Gridsmart Processor GS-3-GS2 with Performance S/W	16100.00	16100.00	16,100.00	16,100.00
					TOTAL TRAFFIC CONTRACTOR ITEMS	→		102,569.20	97,442.70

INTERSECTION # 1: **(S401) Sweetbriar Rd @ GLT**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	UNIT COST BYERS	UNIT COST KRISS	TOTAL COST BYERS	TOTAL COST KRISS
1	2175	999489	1	EA	Steel Round Mast Arm Pole, TYPE B (45' - 60' Arm Length or 2-60' Arms)	9784.60	9784.60	9,784.60	9,784.60
2	2220	999498	1	EA	45' (13.7m) Steel Round Mast Arm	11774.00	11774.00	11,774.00	11,774.00
					TOTAL TRAFFIC SUPPLY ITEMS	→		21,558.60	21,558.60

TOTAL PROJECT CONTRACTOR ITEMS	→	→		
TOTAL TRAFFIC CONTRACTOR ITEMS	→	→	102,569.20	97,442.70
TOTAL TRAFFIC SUPPLY ITEMS	→	→	21,558.60	21,558.60
CONTINGENCIES	→	→	6,206.39	5,950.07
TOTAL COST	→	→	130,334.19	124,951.37

DELAWARE DEPARTMENT OF TRANSPORTATION

TRAFFIC SIGNAL ESTIMATE

CTF (Sen. Lopez): Sweetbriar Rd @ Sussex Consortium school flasher installation

CONTRACT #: T202204304
F.A.P. #: n/a
PROJECT: CTF (Sen. Lopez): Sweetbriar Rd @ Sussex Consortium school flasher installation

INTERSECTION # 1: **(S412) Sweetbriar Rd @ Sussex Consortium**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	UNIT COST KRISS	TOTAL COST KRISS
					TOTAL PROJECT CONTRACTOR ITEMS		

INTERSECTION # 1: **(S412) Sweetbriar Rd @ Sussex Consortium**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC CONTRACTOR ITEMS)	UNIT COST KRISS	TOTAL COST KRISS
1	65	832008	1560	LF	Furnish & Install 1-conductor #6 AWG Stranded Copper	2.30	3,588.00
2	95	832029	950	LF	Furnish & Install #8/2 wire UF W/ground	4.95	4,702.50
3	105	832032	1560	LF	Furnish & Install 14/4 Traffic Control Cable	2.60	4,056.00
4	125	832504	50	LF	Furnish and Install #8 THHN Stranded Copper	2.00	100.00
5	305	831545	720	LF	Furnish and Install 4” HDPE SDR-13.5 Conduit (Bore)	34.00	24,480.00
6	360	831515	55	LF	Furnish and Install 3” Schedule 80 PVC Conduit (Trench)	13.00	715.00
7	365	831516	790	LF	Furnish and Install 4” Schedule 80 PVC Conduit (Trench)	13.00	10,270.00
8	440	831523	40	LF	Furnish and Install 2” Galvanized Steel Conduit (Trench)	20.20	808.00
9	545	831574	600	LF	Furnish and Install Second and Subsequent Additional 4" PVC Conduits in Trench or Open Cut	5.30	3,180.00
10	565	831578	330	LF	Furnish and Install Second and Subsequent Additional 4" HDPE 13.5 SDR Conduit Conduits in Directi	18.50	6,105.00
11	580	831581	5	LF	Furnish and Install Second and Subsequent Additional 2" Galvanized Steel Conduit in Trench or Oper	16.00	80.00
12	635	842501	1	EA	Furnish & Install Electrical Utility Service Equipment (100 AMP)	3180.00	3,180.00
13	645	835500	1	EA	Furnish & Install Additional Disconnect Switch	3800.00	3,800.00
14	650	830001	9	EA	Conduit Junction Well, Type 1, 20"x20" Precast Concrete	1100.00	9,900.00
15	715	802003	10	EA-DY	Arrow Panels, Type C	41.00	410.00
16	730	805001	300	EA-DY	Plastic Drums	2.87	861.00
17	740	808002	10	EA-DY	Furnish & Maintain Truck Mounted Attenuator, Type II	250.00	2,500.00
18	745	810001	80	EA-DY	Temporary Warning Signs and Plaques	18.00	1,440.00
19	760	811003	50	HR	Flagger, Sussex County, State	70.00	3,500.00
20	775	811015	10	HR	Flagger, Sussex County, State, Overtime	104.50	1,045.00
21	860	834006	2	EA	Pole Base Type 6	900.00	1,800.00
22	885	836502	2	EA	Furnish and Install Pedestal Pole	930.00	1,860.00
23	970	837002	4	EA	Furnish & Install 12” LED Signal Head Section Rigid Mount	345.00	1,380.00
24	1135	822500	2	EA	Install Overhead Sign	22.00	44.00
25	1415	817002	60	SF	Permanent Pavement Striping, Symbol/Legend Alkyd-Thermoplastic	12.00	720.00
					TOTAL TRAFFIC CONTRACTOR ITEMS		90,524.50

INTERSECTION # 1: **(S412) Sweetbriar Rd @ Sussex Consortium**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	UNIT COST KRISS	TOTAL COST KRISS
1	2035	999424	1	EA	Pole Mounted Cabinet	1200.00	1,200.00
					TOTAL TRAFFIC SUPPLY ITEMS		1,200.00

TOTAL PROJECT CONTRACTOR ITEMS	
TOTAL TRAFFIC CONTRACTOR ITEMS	90,524.50
TOTAL TRAFFIC SUPPLY ITEMS	1,200.00
CONTINGENCIES	9,172.45
TOTAL COST	100,896.95

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DELAWARE DEPARTMENT OF TRANSPORTATION

TRAFFIC SIGNAL ESTIMATE

Mill Creek Fire Company, Station 21 Fire Signal

CONTRACT #: T201909906
F.A.P. #: N/A
PROJECT: Mill Creek Fire Company, Station 21 Fire Signal

INTERSECTION # 1: **N-837 Mill Creek Fire Company, Sta. 21**

						UNIT COST			TOTAL COST		
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
1											
2											
3											
4											
5											
					TOTAL PROJECT CONTRACTOR ITEMS →			→			

INTERSECTION # 1: **N-837 Mill Creek Fire Company, Sta. 21**

						UNIT COST			TOTAL COST		
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC CONTRACTOR ITEMS)	BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
1	15	835003	1	EA	Cabinet Base Type P	1200.00	1200.00	3400.00	1,200.00	1,200.00	3,400.00
2	65	832008	486	LF	Furnish & Install 1-conductor #6 AWG Stranded Copper	2.30	2.30	2.50	1,117.80	1,117.80	1,215.00
3	80	832025	615	LF	Furnish & Install 4-conductor #18 AWG Shielded Opticom Cable	2.50	2.85	2.00	1,537.50	1,752.75	1,230.00
4	95	832029	85	LF	Furnish & Install #8/2 wire UF W/ground	4.55	4.95	5.00	386.75	420.75	425.00
5	105	832032	440	LF	Furnish & Install 14/4 Traffic Control Cable	2.50	2.60	5.00	1,100.00	1,144.00	2,200.00
6	115	832033	350	LF	Furnish & Install 14/9 Traffic Control Cable	3.20	3.20	5.00	1,120.00	1,120.00	1,750.00
7	305	831545	403	LF	Furnish and Install 4” HDPE SDR-13.5 Conduit (Bore)	29.00	34.00	24.00	11,687.00	13,702.00	9,672.00
8	360	831515	30	LF	Furnish and Install 3” Schedule 80 PVC Conduit (Trench)	12.00	13.00	15.00	360.00	390.00	450.00
9	365	831516	12	LF	Furnish and Install 4” Schedule 80 PVC Conduit (Trench)	13.50	13.00	15.00	162.00	156.00	180.00
10	440	831523	9	LF	Furnish and Install 2” Galvanized Steel Conduit (Trench)	18.50	20.20	22.50	166.50	181.80	202.50
11	470	831528	55	LF	Furnish and Install 2” Galvanized Steel Conduit (Bore)	35.00	35.00	46.00	1,925.00	1,925.00	2,530.00
32	545	831574	12	LF	Furnish and Install Second and Subsequent Additional 4" PVC Conduits in Trench or Open Cut	5.50	5.30	3.50	66.00	63.60	42.00
12	635	842501	1	EA	Furnish & Install Electrical Utility Service Equipment (100 AMP)	1800.00	3180.00	2525.00	1,800.00	3,180.00	2,525.00
13	650	830001	3	EA	Conduit Junction Well, Type 1, 20"x20" Precast Concrete	1100.00	1100.00	1300.00	3,300.00	3,300.00	3,900.00
14	655	830002	1	EA	Conduit Junction Well, Type 4, 20"x42.5" Precast Concrete	1400.00	1300.00	1825.00	1,400.00	1,300.00	1,825.00
15	710	802003	25	EA-DY	Arrow Panels, Type C	45.00	41.00	40.00	1,125.00	1,025.00	1,000.00
31	715	803001	40	EA-DY	Furnish & Maintain Portable Changeable Message Board	145.00	165.00	125.00	5,800.00	6,600.00	5,000.00
16	720	804001	6	EA-DY	Furnish & Maintain Portable Light Assembly (Flood Lights)	225.00	390.00	100.00	1,350.00	2,340.00	600.00
17	725	805001	540	EA-DY	Plastic Drums	4.00	2.87	4.00	2,160.00	1,549.80	2,160.00
20	730	806001	32	HR	Traffic Officers	75.00	75.00	75.00	2,400.00	2,400.00	2,400.00
18	735	808002	23	EA-DY	Furnish & Maintain Truck Mounted Attenuator, Type II	220.00	250.00	500.00	5,060.00	5,750.00	11,500.00
19	745	810001	100	EA-DY	Temporary Warning Signs and Plaques	18.00	18.00	25.00	1,800.00	1,800.00	2,500.00
21	750	811001	64	HR	Flagger, New Castle County, State	84.00	74.85	67.00	5,376.00	4,790.40	4,288.00
22	840	834003	2	EA	Pole Base Type 3B	4900.00	4740.00	7600.00	9,800.00	9,480.00	15,200.00
23	850	834005	2	EA	Pole Base Type 4	900.00	700.00	950.00	1,800.00	1,400.00	1,900.00
24	885	836502	2	EA	Furnish and Install Pedestal Pole	1350.00	930.00	1510.00	2,700.00	1,860.00	3,020.00
25	890	836504	1	EA	Installation of Steel Mast Arm Pole with Single or Twin Mast arms up to 60’	2000.00	1580.00	2200.00	2,000.00	1,580.00	2,200.00
26	895	836500	1	EA	Installation of Steel Mast Arm Pole with Single Mast Arm Greater than 70’	4500.00	3100.00	1632.00	4,500.00	3,100.00	1,632.00
27	970	837002	18	EA	Furnish & Install 12” LED Signal Head Section Rigid Mount	340.00	345.00	400.00	6,120.00	6,210.00	7,200.00
29	985	837007	6	EA	Furnish & Install Signal Head Backplate	325.00	300.00	445.00	1,950.00	1,800.00	2,670.00
28	995	844001	4	EA	Furnish & Install Opticom Emergency Preemption Detector	950.00	735.00	1525.00	3,800.00	2,940.00	6,100.00
30	1135	822500	2	EA	Install Overhead Sign	300.00	22.00	50.00	600.00	44.00	100.00
33	1415	817002	150	SF	Permanent Pavement Striping, Symbol/Legend Alkyd-Thermoplastic	12.00	12.00	11.50	1,800.00	1,800.00	1,725.00
					TOTAL TRAFFIC CONTRACTOR ITEMS	→		→	87,469.55	87,422.90	102,741.50

INTERSECTION # 1: **N-837 Mill Creek Fire Company, Sta. 21**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	UNIT COST			TOTAL COST		
						BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
1	2020	999421	1	EA	Complete P Cabinet w/12 Channel EPAC Controller(includes Mounting Rack w/Power Supply, 5-4 C	13450.00	13450.00	13450.00	13,450.00	13,450.00	13,450.00
2	2050	999427	1	EA	Base Extension (split) Aluminum w/Natural Mill Finish	550.00	550.00	550.00	550.00	550.00	550.00
3	2175	999489	1	EA	Steel Round Mast Arm Pole, TYPE B (45' - 60' Arm Length or 2-60' Arms)	8818.16	8818.16	8818.16	8,818.16	8,818.16	8,818.16
4	2180	999490	1	EA	Steel Round Mast Arm Pole, TYPE C (70' - 90' Arm Length)	10885.68	10885.68	10885.68	10,885.68	10,885.68	10,885.68
5	2230	999500	1	EA	55' (16.8m) Steel Round Mast Arm	8641.36	8641.36	8641.36	8,641.36	8,641.36	8,641.36
6	2240	999502	1	EA	70' (21.3m) Steel Round Mast Arm	12776.40	12776.40	12776.40	12,776.40	12,776.40	12,776.40
7	2535	999621	1	EA	CDMA	1200.00	1200.00	1200.00	1,200.00	1,200.00	1,200.00
8	2435	999601	4	EA	Rouleau Sign Brackets (2 per average sign, 3 per longer sign)	115.00	115.00	115.00	460.00	460.00	460.00
9											
10											
					TOTAL TRAFFIC SUPPLY ITEMS	→		→	56,781.60	56,781.60	56,781.60
					TOTAL PROJECT CONTRACTOR ITEMS	→ →		→ →			
					TOTAL TRAFFIC CONTRACTOR ITEMS	→ →		→ →	87,469.55	87,422.90	102,741.50
					TOTAL TRAFFIC SUPPLY ITEMS	→ →		→ →	56,781.60	56,781.60	56,781.60
					CONTINGENCIES	→ →		→ →	14,425.12	14,420.45	15,952.31
					TOTAL COST	→ →		→ →	158,676.27	158,624.95	175,475.41

MULTIPLE INTERSECTION SUMMARY

Intersection #1: **N-837 Mill Creek Fire Company, Sta. 21**

TOTAL PROJECT CONTRACTOR ITEMS	→ →	→ →	
TOTAL TRAFFIC CONTRACTOR ITEMS	→ →	→ →	87,469.55	87,422.90	102,741.50
TOTAL TRAFFIC SUPPLY ITEMS	→ →	→ →	56,781.60	56,781.60	56,781.60
CONTINGENCIES	→ →	→ →	14,425.12	14,420.45	15,952.31
TOTAL	→ →	→ →	**158,676.27**	**158,624.95**	**175,475.41**

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DELAWARE DEPARTMENT OF TRANSPORTATION

TRAFFIC SIGNAL ESTIMATE

E. 4th Street @ N. Church Street (2016 HEP, Site N)

CONTRACT #: T201800402
F.A.P. #: ESTP-2018(10)
PROJECT: E. 4th Street @ N. Church Street (2016 HEP, Site N)

INTERSECTION # 1: **W771 - E. 4th Street @ N. Church Street**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	UNIT COST			TOTAL COST		
						BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
					TOTAL PROJECT CONTRACTOR ITEMS →			→			

INTERSECTION # 1: **W771 - E. 4th Street @ N. Church Street**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC CONTRACTOR ITEMS)	UNIT COST			TOTAL COST		
						BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
1	15	835003	1	EA	Cabinet Base Type P	1200.00	1200.00	3400.00	1,200.00	1,200.00	3,400.00
2	65	832008	845	LF	Furnish & Install 1-Conductor #6 AWG Stranded Copper	2.30	2.30	2.50	1,943.50	1,943.50	2,112.50
3	95	832029	140	LF	Furnish & Install #8/2 Wire UF W/ground	4.55	4.95	5.00	637.00	693.00	700.00
4	105	832032	1310	LF	Furnish & Install 14/4 Traffic Control Cable	2.50	2.60	5.00	3,275.00	3,406.00	6,550.00
5	110	832507	765	LF	Furnish & Install 14/5 Traffic Control Cable	2.65	2.75	4.00	2,027.25	2,103.75	3,060.00
6	115	832033	365	LF	Furnish & Install 14/9 Traffic Control Cable	3.20	3.20	5.00	1,168.00	1,168.00	1,825.00
7	125	832504	100	LF	Furnish & Install #8 THHN Stranded Copper	1.55	2.00	1.00	155.00	200.00	100.00
8	250	705002	900	SF	Portland Cement Concrete Sidewalk, 6”	28.00	38.00	21.00	25,200.00	34,200.00	18,900.00
9	255	705007	36	SF	Sidewalk Surface Detectable Warning System	57.00	65.00	57.00	2,052.00	2,340.00	2,052.00
10	265	705009	750	SF	Curb Ramp, Type 2, 3 and/or 4	33.00	45.00	92.00	24,750.00	33,750.00	69,000.00
11	275	211001	95	SY	Removal of Existing Portland Cement Concrete Pavement, Curb, Sidewalk, Etc.	110.00	185.00	115.00	10,450.00	17,575.00	10,925.00
12	285	762001	225	LF	Saw Cutting, Concrete, Full Depth	10.00	13.80	6.00	2,250.00	3,105.00	1,350.00
13	305	831545	660	LF	Furnish & Install 4” HDPE SDR-13.5 Conduit (Bore)	29.00	34.00	24.00	19,140.00	22,440.00	15,840.00
14	325	831503	45	LF	Furnish & Install 2-1/2” Schedule 80 PVC Conduit (Open Cut)	105.00	97.00	57.50	4,725.00	4,365.00	2,587.50
15	335	831501	10	LF	Furnish & Install 4” Schedule 80 PVC Conduit (Open Cut)	105.00	97.00	57.50	1,050.00	970.00	575.00
16	355	831514	50	LF	Furnish & Install 2-1/2” Schedule 80 PVC Conduit (Trench)	11.50	13.00	14.00	575.00	650.00	700.00
17	360	831515	75	LF	Furnish & Install 3” Schedule 80 PVC Conduit (Trench)	12.00	13.00	15.00	900.00	975.00	1,125.00
18	365	831516	10	LF	Furnish & Install 4” Schedule 80 PVC Conduit (Trench)	13.50	13.00	15.00	135.00	130.00	150.00
19	440	831523	65	LF	Furnish & Install 2” Galvanized Steel Conduit (Trench)	18.50	20.20	22.50	1,202.50	1,313.00	1,462.50
20	290	831542	120	LF	Furnish & Install 2” HDPE SDR-13.5 Conduit (Bore)	26.50	33.00	24.00	3,180.00	3,960.00	2,880.00
21	500	831538	30	LF	Furnish & Install 2” Galvanized Steel Conduit (On Structure)	21.50	38.35	29.00	645.00	1,150.50	870.00
22	545	831574	20	LF	Furnish & Install Second and Subsequent Additional 4" PVC Conduits in Trench or Open Cut	5.50	5.30	3.50	110.00	106.00	70.00
23	580	831581	10	LF	Furnish & Install Second and Subsequent Additional 2" Galvanized Steel Conduit in Trench or Open C	12.65	16.00	10.00	126.50	160.00	100.00
24	635	842501	1	EA	Furnish & Install Electric Utility Service Equipment (100 AMP)	1800.00	3180.00	2525.00	1,800.00	3,180.00	2,525.00
25	650	830001	8	EA	Conduit Junction Well, Type 1, 20" x 20" Precast Concrete	1100.00	1100.00	1300.00	8,800.00	8,800.00	10,400.00
26	655	830002	1	EA	Conduit Junction Well, Type 4, 20" x 42-1/2" Precast Concrete	1400.00	1300.00	1825.00	1,400.00	1,300.00	1,825.00
27	835	834002	3	EA	Pole Base Type 3A	3700.00	4325.00	6500.00	11,100.00	12,975.00	19,500.00
28	850	834005	7	EA	Pole Base Type 4A	900.00	700.00	950.00	6,300.00	4,900.00	6,650.00
29	860	834006	2	EA	Pole Base Type 6	1000.00	900.00	1545.00	2,000.00	1,800.00	3,090.00
30	885	836502	9	EA	Furnish & Install Pedestal Pole	1350.00	930.00	1510.00	12,150.00	8,370.00	13,590.00
31	890	836504	3	EA	Installation of Steel Mast Arm Pole with Single or Twin Mast arms up to 60’	2000.00	1580.00	2200.00	6,000.00	4,740.00	6,600.00
32	970	837002	39	EA	Furnish & Install 12” LED Signal Head Section Rigid Mount	340.00	345.00	400.00	13,260.00	13,455.00	15,600.00
33	985	837007	6	EA	Furnish & Install Signal Head Backplate	325.00	300.00	445.00	1,950.00	1,800.00	2,670.00
34	1000	837008	6	EA	Furnish & Install 16” LED Countdown Pedestrian Signal	650.00	650.00	925.00	3,900.00	3,900.00	5,550.00
35	1010	837010	1	EA	Furnish & Install Pedestrian Pushbutton with Sign	250.00	240.00	350.00	250.00	240.00	350.00
36	1070	844521	1	EA	Install Video Detection Device	500.00	900.00	565.00	500.00	900.00	565.00
37	1135	822500	5	EA	Install Overhead Sign	300.00	22.00	50.00	1,500.00	110.00	250.00
38	1210	838009	220	LF	Removal of Messenger Wire, Cable and Hardware	5.00	2.10	1.00	1,100.00	462.00	220.00
39	1225	830010	3	EA	Removal of Existing Junction Well	300.00	210.00	545.00	900.00	630.00	1,635.00
40	1235	832035	350	LF	Removal of Cable from Conduit or Traffic/Lighting Pole	1.50	1.10	0.50	525.00	385.00	175.00
41	1240	834501	5	CY	Partial Removal of Concrete Pole Bases and Cabinet Foundations	900.00	900.00	500.00	4,500.00	4,500.00	2,500.00
42	1250	836006	5	EA	Remove Pedestal Pole	1500.00	47.00	272.00	7,500.00	235.00	1,360.00
43	1255	836503	3	EA	Remove Steel Pole (Equal to or Greater than 15’ and Less than 40’)	275.00	390.00	550.00	825.00	1,170.00	1,650.00
44	1260	837500	6	EA	Removal of Signal Head or Pedestrian Head from Pole or Pedestal	150.00	47.00	135.00	900.00	282.00	810.00
45	1270	838504	7	EA	Removal of Signal Head or Opticom Detector from Span Wire or Mast Arm	225.00	41.00	136.00	1,575.00	287.00	952.00
46	1295	847001	1	EA	Installation or Removal of Pole or Post Mounted Cabinet	225.00	390.00	2000.00	225.00	390.00	2,000.00
47	1300	847002	1	EA	Installation or Removal of Base or Pad Mounted Cabinet	300.00	400.00	2500.00	300.00	400.00	2,500.00
48	1415	817002	810	SF	Permanent Pavement Striping, Symbol/Legend Alkyd - Thermoplastic	12.00	12.00	11.50	9,720.00	9,720.00	9,315.00
49	1470	817013	205	LF	Permanent Pavement Striping, Epoxy Resin Paint, White or Yellow, 5"	2.00	1.35	1.15	410.00	276.75	235.75
50	1535	817031	300	SF	Removal of Pavement Striping	7.00	7.00	7.00	2,100.00	2,100.00	2,100.00
51	715	802003	60	EA-DY	Arrow Panels, Type C	45.00	41.00	40.00	2,700.00	2,460.00	2,400.00
52	720	803001	30	EA-DY	Furnish & Maintain Portable Changeable Message Board	145.00	165.00	125.00	4,350.00	4,950.00	3,750.00
53	725	804001	2	EA-DY	Furnish & Maintain Portable Light Assembly (Flood Lights)	225.00	390.00	100.00	450.00	780.00	200.00
54	730	805001	1200	EA-DY	Plastic Drums	4.00	2.87	4.00	4,800.00	3,444.00	4,800.00
55	735	806001	20	HR	Traffic Officers	75.00	75.00	75.00	1,500.00	1,500.00	1,500.00
56	740	808002	30	EA-DY	Furnish & Maintain Truck Mounted Attenuator, Type II	220.00	250.00	500.00	6,600.00	7,500.00	15,000.00
57	745	810001	360	EA-DY	Temporary Warning Signs and Plaques	18.00	18.00	25.00	6,480.00	6,480.00	9,000.00
58	750	811001	180	HR	Flagger, New Castle County, State	84.00	74.85	67.00	15,120.00	13,473.00	12,060.00
59	765	811013	40	HR	Flagger, New Castle County, State, Overtime	122.00	112.30	100.00	4,880.00	4,492.00	4,000.00
					TOTAL TRAFFIC CONTRACTOR ITEMS →			→	255,266.75	270,290.50	313,662.25

INTERSECTION # 1: **W771 - E. 4th Street @ N. Church Street**

LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	UNIT COST BYERS	UNIT COST KRISS	UNIT COST ROMMEL	TOTAL COST BYERS	TOTAL COST KRISS	TOTAL COST ROMMEL
1	2025	999422	1	EA	**ADVANCE ORDERED!** Complete P Cabinet 2/ 12 Channel EPAC Controller (includes Mounting Rack w/ Power Supply)						
2	2170	999488	3	EA	**ADVANCE ORDERED!** Steel Round Mast Arm Pole, Type A (20'-40' Arm Length or 2-40' Arms)						
3	2215	999497	3	EA	**ADVANCE ORDERED!** 40' (12.2M) Steel Round Mast Arm						
4	2050	999427	1	EA	**ADVANCE ORDERED!** Base Extension (split) Aluminum w/ Natural Mill Finish						
5	2435	999601	5	EA	Rouleau Sign Brackets (2 per average sign, 3 per longer sign)	115.00	115.00	115.00	575.00	575.00	575.00
30											
					TOTAL TRAFFIC SUPPLY ITEMS	→		→	575.00	575.00	575.00
					TOTAL PROJECT CONTRACTOR ITEMS	→ →		→ →			
					TOTAL TRAFFIC CONTRACTOR ITEMS	→ →		→ →	255,266.75	270,290.50	313,662.25
					TOTAL TRAFFIC SUPPLY ITEMS	→ →		→ →	575.00	575.00	575.00
					CONTINGENCIES	→ →		→ →	25,584.18	27,086.55	31,423.73
					TOTAL COST	→ →		→ →	281,425.93	297,952.05	345,660.98

MULTIPLE INTERSECTION SUMMARY

Intersection #1: **W771 - E. 4th Street @ N. Church Street**

TOTAL PROJECT CONTRACTOR ITEMS	→ →	→ →	
TOTAL TRAFFIC CONTRACTOR ITEMS	→ →	→ →	255,266.75	270,290.50	313,662.25
TOTAL TRAFFIC SUPPLY ITEMS	→ →	→ →	575.00	575.00	575.00
CONTINGENCIES	→ →	→ →	25,584.18	27,086.55	31,423.73
TOTAL	→ →	→ →	**281,425.93**	**297,952.05**	**345,660.98**

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DELAWARE DEPARTMENT OF TRANSPORTATION

TRAFFIC ITMS ESTIMATE

E. 4th Street @ N. Church Street (2016 HEP, Site N)

CONTRACT # T201800402
F.A.P. # ESTP-2018(10)
PROJECT: E. 4th Street @ N. Church Street (2016 HEP, Site N)

		ITMS				UNIT COST			TOTAL COST		
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (PROJECT CONTRACTOR ITEMS)	BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
					TOTAL PROJECT CONTRACTOR ITEMS	→			0.00	0.00	0.00

		ITMS				UNIT COST			TOTAL COST		
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC CONTRACTOR ITEMS)	BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
1		N.I.B.	1	EA	Relocate Bluetooth Monitoring Device	1000.00	1000.00	1000.00	1,000.00	1,000.00	1,000.00
					TOTAL TRAFFIC CONTRACTOR ITEMS	→			1,000.00	1,000.00	1,000.00

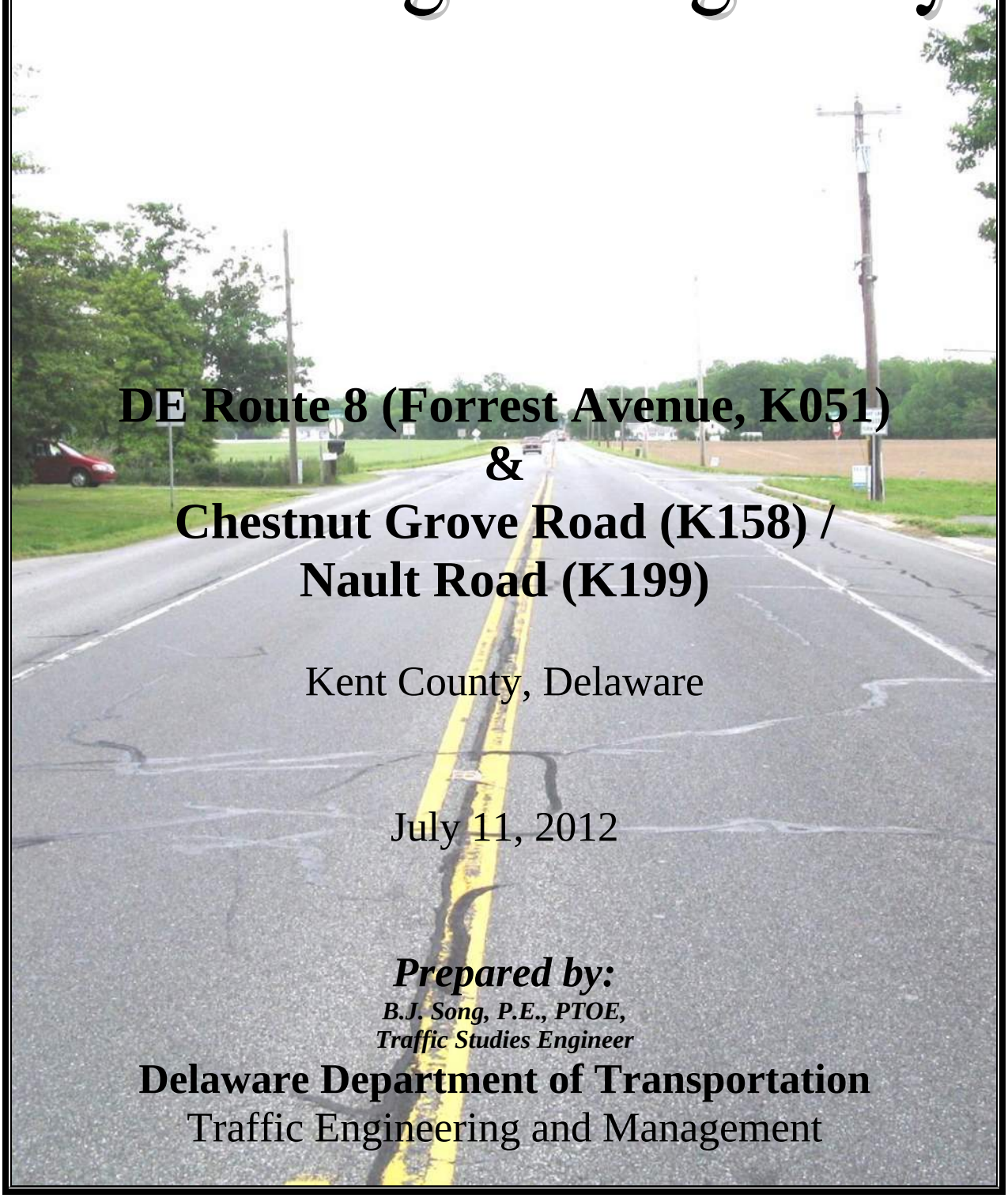
		ITMS				UNIT COST			TOTAL COST		
LINE	#	ITEM #	QTY	UOM	DESCRIPTION - (TRAFFIC SUPPLY ITEMS)	BYERS	KRISS	ROMMEL	BYERS	KRISS	ROMMEL
1	2535	999621	1	EA	CDMA	1200.00	1200.00	1200.00	1,200.00	1,200.00	1,200.00
2	2545	999623	1	EA	Camera/RWIS/Bluetooth Comm - AC Power	2000.00	2000.00	2000.00	2,000.00	2,000.00	2,000.00
3	2490	999612	1	EA	Camera (Includes Lowering Device, Controller, and Video Encoder)	12461.00	12461.00	12461.00	12,461.00	12,461.00	12,461.00
4	2495	999613	1	EA	Strain Pole Camera Mounting Adapter (Includes Cable Assembly)	741.00	741.00	741.00	741.00	741.00	741.00
					TOTAL TRAFFIC SUPPLY ITEMS	→			16,402.00	16,402.00	16,402.00

TOTAL PROJECT CONTRACTOR ITEMS	→ →	0.00	0.00	0.00
TOTAL TRAFFIC CONTRACTOR ITEMS	→ →	1,000.00	1,000.00	1,000.00
TOTAL TRAFFIC SUPPLY ITEMS	→ →	16,402.00	16,402.00	16,402.00
CONTINGENCIES	→ →	1,740.20	1,740.20	1,740.20
TOTAL COST	→ →	19,142.20	19,142.20	19,142.20

APPENDIX G

Sample Signal Study

Traffic Engineering Study



DE Route 8 (Forrest Avenue, K051)
&
Chestnut Grove Road (K158) / Nault Road (K199)

Kent County, Delaware

July 11, 2012

Prepared by:

B.J. Song, P.E., PTOE,
Traffic Studies Engineer

Delaware Department of Transportation
Traffic Engineering and Management

EXECUTIVE SUMMARY

The Delaware Department of Transportation (DelDOT) has received a request to evaluate the intersection of DE Route 8 (Forrest Avenue, S051) and Chestnut Grove Road (K158) / Nault Road (K199), located west of the City of Dover in Kent County, Delaware. Senator David G. Lawson of Delaware Legislative District 15 forwarded concerns for safety at the intersection from his constituents. More specifically, he requested DelDOT to review the feasibility of installing a traffic signal at the intersection.

Accordingly, the purpose of this traffic engineering study is to evaluate safety and traffic operations at the above-mentioned intersection and determine the feasibility of installing a traffic signal, as well as any other roadway, signing and/or traffic control device improvements at this location. This study includes a 12-hour turning movement count, a site condition diagram with photographs; and evaluations of intersection sight distance, review of traffic control devices, intersection capacity, crash history and traffic signal warrant analysis. .

The significant findings of this traffic engineering study at the intersection of DE Route 8 and Chestnut Grove Road / Nault Road are:

Intersection sight distance: From the Chestnut Grove Road approach and the Nault Road approach, the measured available intersection sight distance for vehicles looking left and right are greater than the distance recommended by AASHTO. The available intersection sight distances for vehicles turning left from the major street were also found to be greater than the minimums that are recommended by AASHTO.

Existing traffic volumes: The traffic count that was conducted for this study showed that the AM, Midday and PM peak hours of travel are 7:15 AM – 8:15 AM, 11:00 AM – 12:00 PM and 4:30 PM to 5:30 PM, respectively. The directional split of traffic indicates that the majority of traffic is traveling eastbound during the AM peak hour and evenly split during the Midday and PM peak hours on DE Route 8.

Existing intersection capacity: The results show that there are no delays (LOS A) for traffic turning left from both eastbound and westbound DE Route 8 during all three peak periods. The results also show that traffic approaching the intersection from the Nault Road approach operate with moderate delay (LOS C) during the Midday Peak period and heavy delay (LOS D & E) during the AM and the PM peak periods. The results also show that traffic approaching the intersection from the Chestnut Grove Road approach operate with minimal delay (LOS B) during the AM and the Midday peak periods and heavy delay (LOS D) during the PM peak period.

Speed Study Findings: The combined 85th percentile speed for both eastbound and westbound DE Route 8 was found to be 57 MPH for radar location 1, which indicates 85 percent of traffic is traveling at or below 57 MPH at location 1. Also, the combined 85th percentile speed for both eastbound and westbound DE Route 8 was found to be 56 MPH for radar location 2, which indicates 85 percent of traffic is traveling at or below 56 MPH at location 2. In addition, the data revealed that 68 percent of vehicles were traveling at speeds greater than the existing speed limit and 28 percent of vehicles were traveling at speeds 5 MPH or greater than the existing speed limit at radar location 1. Similarly, the data also revealed that 51 percent of vehicles were traveling at speeds greater than the existing speed limit and 20 percent of vehicles were traveling at speeds 5 MPH or greater than the existing speed limit at radar location 2.

Crash trend analysis: Crash data was obtained for this intersection covering the period from October 2008 to September 2011. The data showed that there were eleven (11) reported crashes occurring at this intersection. From January 2011 to December 2011, there were five (5) crashes that are susceptible to correction by the installation of a traffic signal.

Improvement Options:

- Based on the results of the traffic signal warrant analysis, a traffic signal is **warranted** at the intersection of DE Route 8 and Chestnut Grove Road / Nault Road.
- Based on observations of traffic operations at the intersection, upgrading the existing painted right-turn channelization islands to raised concrete islands should eliminate crashes involving vehicles using the right-turn lanes to pass stopped left-turning vehicles on DE Route 8.
- Field investigations revealed that the land use in the vicinity of the study intersection is predominantly residential. Installing rumble strips near a residential area could have a significant negative impact on the quality of life for nearby residents. Therefore, the installation of painted rumble strips is **not feasible** near the intersection of DE Route 8 and Chestnut Grove Road / Nault Road.

Based on the results of the traffic observations, data and analysis contained within this report, DelDOT presents the following improvement options to be considered for this location:

Option 1: *Install a traffic signal at the intersection of DE Route 8 and Chestnut Grove Road / Nault Road.*

Expected Benefits:

- Installing a traffic signal should reduce excessive delay experienced by vehicles approaching the intersection from the Chestnut Grove Road / Nault Road approaches.
- Installing a traffic signal should reduce the number of angle crashes and left-turn crashes at the intersection.
- Lane configuration change needed for the traffic signal installation should eliminate the crashes involving vehicles using the right-turn lanes to pass stopped left-turning vehicles on DE Route 8.

Possible Disadvantages:

- Increased delays to motorists on DE Route 8.
- Cost of operating and maintaining the traffic signal.
- Cost of possible additional land acquisition.
- Possible increase in number of rear-end crashes on DE Route 8.

Option 2: *Upgrade existing painted right-turn channelization islands on DE Route 8 to raised concrete right-turn channelization islands.*

Expected Benefits:

- Implementing raised concrete right-turn channelization islands should prohibit through vehicles on DE Route 8 from using the right-turn lanes to pass stopped left-turning vehicles.
- The provision of the raised right-turn channelization islands should eliminate angle crashes and left-turn crashes involving vehicles traveling through the intersection using the right-turn lanes.

Possible Disadvantages:

- Increased delays to motorists on DE Route 8.
- Cost of installing and maintaining the raised concrete channelization islands.

It should be noted that separate left-turn lanes will be added to the DE Route 8 approaches when the traffic signal is installed and right-turn channelization islands on DE Route 8 must be relocated. This means the proposed raised concrete right-turn channelization islands must be relocated at the time of the traffic signal installation; however, DelDOT recommends the raised concrete right-turn channelization islands to be installed as an interim improvement before the

traffic signal installation since the traffic signal installation will likely be a possible FY 2014 or FY2015 project.

DelDOT also considered installing Rumble Strips on the Chestnut Grove Road / Nault Road approaches. Field observations revealed that the land use in the vicinity of the study intersection is predominantly residential. Installing rumble strips near a residential area could have a significant negative impact on the quality of life for nearby residents. Therefore, DelDOT **does not recommend** installation of rumble strips at the intersection of DE Route 8 and Chestnut Grove Road / Nault Road.

Based on the results from the radar study, it appears that many motorists traveling on DE Route 8 are not complying with the existing speed limit of 50 MPH. Lowering the speed limit on DE Route 8 is not advisable since the majority of motorists are currently not obeying the existing speed limit. In order for a lower speed limit to be warranted, the 85th percentile speed should be lower than the existing posted speed limit and there should be roadside features or other factors that cause motorists to select lower speed. The only effective measure that can reduce the travel speeds of motorists is police enforcement. Police enforcement can influence lower travel speeds on a roadway for a short period of time; however, the resulting lower travel speed could increase when the police enforcement is discontinued. This is due to drivers being accustomed to driving at the speed at which they feel safe and are comfortable. Therefore, it is recommended that the existing speed limit of 50 MPH remain in effect on DE Route 8. In addition, DelDOT also recommends additional speed enforcements to be conducted by the Delaware State Police (DSP) on DE Route 8 at the locations where the safety of the police officers conducting the speed enforcement will not be compromised.

Field observations conducted at the intersection of DE Route 8 and Chestnut Grove Road / Nault Road have identified the need for minor traffic control device improvements. The proposed improvements are listed below:

- Remove existing Stop Ahead sign (W3-1) on southbound Chestnut Grove Road, located north of DE Route 8.
- Install new Stop Ahead sign (W3-1) and an Advance Street Name plaque (W16-8a-DE) for Forrest Avenue on southbound Chestnut Grove Road, approximately 250 feet north of DE Route 8.
- Remove existing Watch Children sign (W21-11-DE) and Advisory Speed 30 MPH sign (W13-1-30) on southbound Nault Road, located immediately south of DE Route 8.
- Remove existing Stop Ahead sign (W3-1) on northbound Nault Road, located south of DE Route 8.
- Install Stop Ahead sign (W3-1) and an Advance Street Name plaque (W16-8a-DE) for Forrest Avenue on northbound Nault Road, approximately 250 feet south of DE Route 8.

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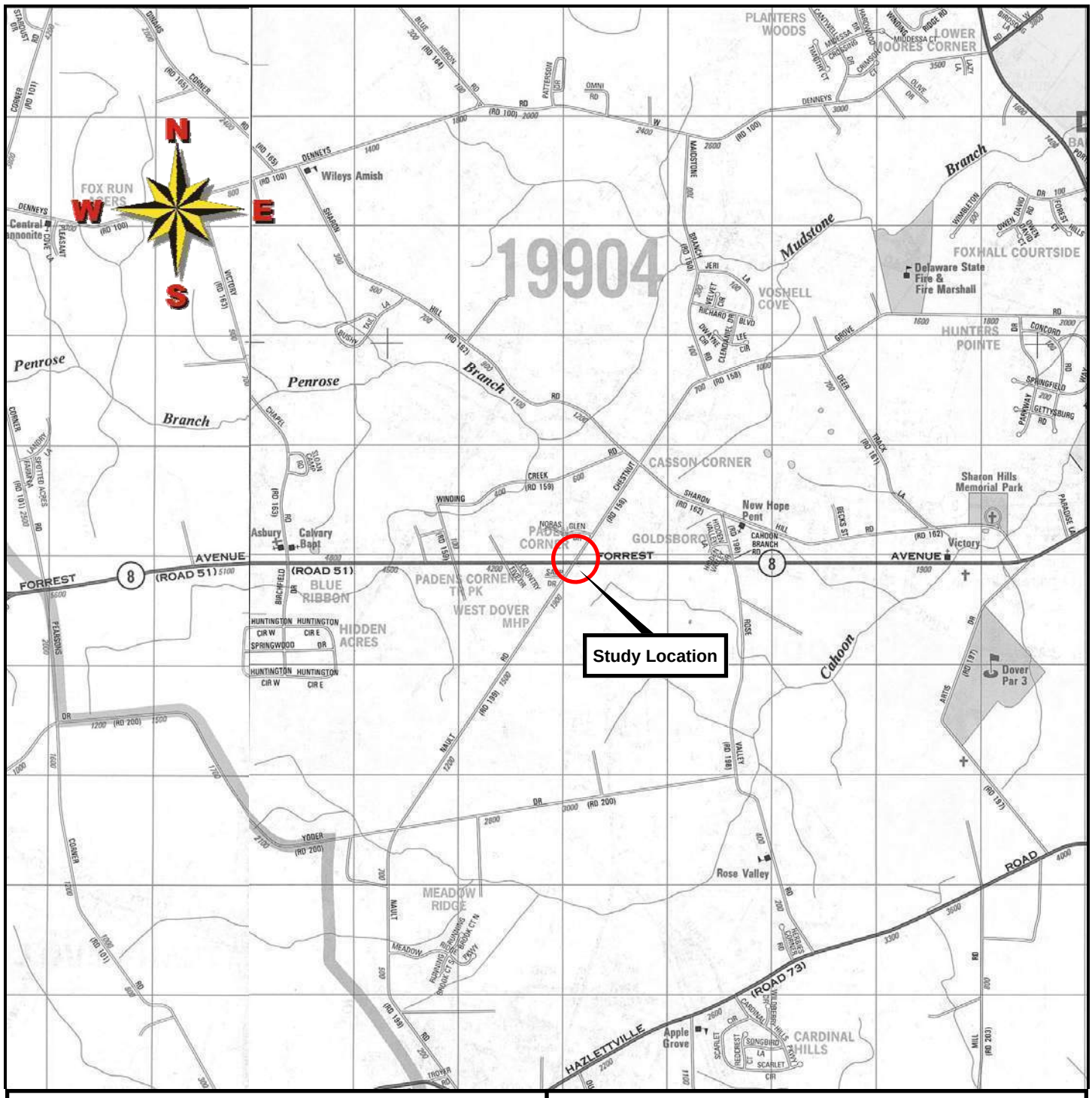
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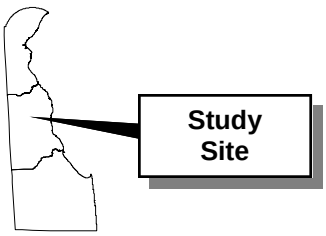
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Key Map of Delaware



Study Area Map

DE Route 8 (K051, Forrest Avenue)
@
Chestnut Grove Road (K158) / Nault Road (K199)

DelDOT Traffic	May 2012	Figure 1

I. Introduction

The Delaware Department of Transportation (DelDOT) has received a request to evaluate the intersection of DE Route 8 (Forrest Avenue, S051) and Chestnut Grove Road (K158) / Nault Road (K199), located west of the City of Dover in Kent County, Delaware. Senator David G. Lawson of Delaware Legislative District 15 forwarded concerns for safety at the intersection from his constituents. More specifically, he requested DelDOT to review the feasibility of installing a traffic signal at the intersection.

Accordingly, the purpose of this traffic engineering study is to evaluate safety and traffic operations at the above-mentioned intersection and determine the feasibility of installing a traffic signal, as well as any other roadway, signing and/or traffic control device improvements at this location. This study includes a 12-hour turning movement count, a site condition diagram with photographs; and evaluations of intersection sight distance, review of traffic control devices, intersection capacity, crash history and traffic signal warrant analysis.

All references to the American Association of State Highway and Transportation Officials (AASHTO) pertain to the 2011 edition of A Policy on Geometric Design of Highways and Streets. All references to the Delaware Manual on Uniform Traffic Control Devices (DEMUTCD) and to the Highway Capacity Manual (HCM) refer to the Year 2011 and the Year 2010 editions, respectively.

II. Previous Studies

Research of DelDOT archive revealed that the intersection of DE Route 8 and Chestnut Grove Road / Nault Road was previously studied in August 2006 and April 2009 for the consideration of a traffic signal. A traffic signal was not warranted based on the findings of both studies.

III. Roadway and Site Characteristics

The intersection of DE Route 8 and Chestnut Gove Road / Nault Road is located west of the City of Dover in Kent County (see Figure 1). DE Route 8 serves as the major roadway at the study intersection and the study segment of DE Route 8 is classified as a minor arterial according to DelDOT's 2005 Functional Classification Map for Kent County. According to DelDOT's Traffic Summary 2011, DE Route 8 has a 2011 Annual Average Daily Traffic (AADT) volume of 11,556 vehicles per day (vpd). DE Route 8 is a two-way roadway consisting of one lane in both the eastbound and westbound direction. DE Route 8 serves as one of the major east to west connectors in central Delaware connecting to the Delaware – Maryland state line to the west and to DE Route 9 (Bayside Drive, K017) to the east. DE Route 8 provides access to residential properties and agricultural properties in the vicinity of the study intersection. There are no separate left-turn lanes present on both the eastbound and the westbound DE Route 8; however, there are separate right-turn lanes present on both the eastbound and the westbound DE Route 8. The existing storage length for right-turn lanes are 500 feet and 350 feet for the eastbound and the westbound approach, respectively. A detailed sketch of the study intersection including lane widths, pavement markings and existing signing is shown in Figure 2.

Chestnut Grove Road / Nault Road serves as the minor roadway at the study intersection with Chestnut Grove Road referring to the portion of the roadway north of the DE Route 8 intersection and Nault Road referring to the portion of the roadway south of the DE Route 8 intersection. Both Chestnut Grove Road and Nault Road consist of one lane in both the northbound and southbound directions. The study segment of Chestnut Grove Road / Nault Road is classified as a local roadway according to DelDOT's 2005 Functional Classification Map for Kent County. According to DelDOT's Traffic Summary 2011, Chestnut Grove Road has AADT volume of 3,451 vehicles per day and Nault Road has AADT volume of 851 vehicles per day. Both Chestnut Grove Road / Nault Road provide access to residential and agricultural properties

N

NTS

LEGEND

EDGE OF ROAD

PAVEMENT MARKINGS

EXISTING SIGN POST

UTILITY POLE

DE ROUTE 8 (K051, FORREST AVENUE)

DE ROUTE 8 (K051, FORREST AVENUE)

WEST 8

SPEED LIMIT 50

Chestnut Grv Rd

STOP

Forrest Ave

SHARE THE ROAD

RIGHT LANE MUST TURN RIGHT

CHESTNUT GROVE Rd ← NAULT Rd →

BEGIN NO STOPPING STANDING OR PARKING

COUNTRY FIVE DR

CHESTNUT GROVE Rd ← NAULT Rd →

RIGHT LANE MUST TURN RIGHT

RIGHT LANE MUST TURN RIGHT

30 M.P.H.

SPEED LIMIT 50

Forrest Ave

STOP

Nault Rd

SAPP DR

ROCKY MEADOW DR

NAULT ROAD (K199)

EXISTING CONDITION DIAGRAM			
DE ROUTE 8 (K051, FORREST AVENUE)			
CHESTNUT GROVE ROAD (K158) / NAULT ROAD (K199)			
DELDOT TRAFFIC	DRAWN BY GBP	JUNE 2012	FIGURE 2

in the vicinity of the study intersection. There are no dedicated turning lanes present on the Chestnut Grove Road / Nault Road approaches.

- **Horizontal and Vertical Alignment**

The intersection of DE Route 8 and Chestnut Grove Road / Nault Road is located within a level terrain. The following geometric features were observed during the field study:

- There are no visible horizontal or vertical curves present on DE Route 8 in the vicinity of the study intersection.
- There are no visible horizontal curves present on Chestnut Grove Road / Nault Road; however, Chestnut Grove Road and Nault Road form a smooth vertical crest curve though the DE Route 8 intersection.
- Skew between DE Route 8 and Chestnut Grove Road / Nault Road is approximately 56 degrees.

- **Sidewalks and Shoulders**

There are 11 feet wide shoulder lanes present on eastbound and westbound DE Route 8. It should be noted that the shoulder lanes become right-turn lanes near the Chestnut Grove Road / Nault Road intersection. There are no shoulder lanes present on Chestnut Grove Road / Nault Road in the study area.

There are no sidewalks present on DE Route 8 or Chestnut Grove Road / Nault Road in the vicinity of the study intersection.

- **Signing and Pavement Markings**

The existing signing and pavement markings present on DE Route 8 and Chestnut Grove Road / Nault Road appear to be in compliance to the standards mandated by the DEMUTCD, however, the following observations were noted during the field investigation:

- Double yellow centerline markings, edge line marking and shoulder lane marking present on DE Route 8 appear to be worn out.
- There was no Advance Street Name plaque (W16-8a-DE) for Forrest Avenue (DE Route 8) present underneath the existing STOP Ahead signs on the Chestnut Grove Road / Nault Road approaches.
- There are painted right-turn channelization islands present on both the eastbound and the westbound DE Route 8.

- **Roadway Lighting**

There is no roadway or pedestrian lighting present along DE Route 8 or Chestnut Grove Road / Nault Road adjacent to the travel lane in the vicinity of the study intersection.

- **Adjacent Land Use**

The adjacent land use surrounding the intersection of DE Route 8 and Chestnut Grove Road / Nault Road predominantly consists of residential and agricultural. The northwest and southwest quadrants of the intersection appear to be used for residential purposes and the northeast and southeast quadrants of the intersection appears to be used for agricultural purposes. It should be noted that there is a new commercial building in the southwest quadrant; however the building appears to be vacant.

- **Sight Distance**

The available intersection sight distances were measured for the turning movements from the Chestnut Grove Road approach and the Nault Road approach onto DE Route 8. AASHTO recommends intersection sight distances that are a function of the design and/or operating speed of the major roadway. Table 1 includes the recommended minimum intersection sight distances for each movement calculated using the existing speed limit along DE Route 8 (50 MPH).

Table 1

Intersection Sight Distance Evaluation

		Measured Available ISD (feet)	AASHTO (2004) Recommended ISD (feet)
Northbound Nault Road	**Left-turn from Minor Road (AASHTO Case B1)**	> 1,000' (Looking Left) > 855' (Looking Right)	555' (50 mph Existing Speed Limit)
	Right-turn/Cross from Minor Road (AASHTO Cases B2 & B3)	> 1,000' (Looking Left) > 855' (Looking Right)	480' (50 mph Existing Speed Limit)
Southbound Chestnut Grove Road	**Left-turn from Minor Road (AASHTO Case B1)**	> 590' (Looking Left) > 1,000' (Looking Right)	555' (50 mph Existing Speed Limit)
	Right-turn/Cross from Minor Road (AASHTO Cases B2 & B3)	> 590' (Looking Left) > 1,000' (Looking Right)	480' (50 mph Existing Speed Limit)
Westbound DE Route 8	**Left-turn from Major Road (AASHTO Case F)**	> 1,000'	405' (50 mph Existing Speed Limit)
Eastbound DE Route 8	**Left-turn from Major Road (AASHTO Case F)**	> 1,000'	405' (50 mph Existing Speed Limit)

From the Chestnut Grove Road approach and the Nault Road approach, the measured available intersection sight distance for vehicles looking left and right are greater than the distance recommended by AASHTO.

AASHTO also provides recommended intersection sight distances for vehicles turning left from the major street. The available intersection sight distances for this case were also measured in the field and were found to be greater than the minimums that are recommended by AASHTO (see Table 1).

IV. Traffic Characteristics

- **Traffic Volumes**

An 8-hour turning movement count covering the AM, Middday and PM peak periods was performed at the intersection of DE Route 8 and Chestnut Grove Road / Nault Road on Wednesday, May 2, 2012 and Thursday, May 3, 2012. Then a supplemental turning movement count covering the non-peak periods was performed on Wednesday May 23, 2012 and Tuesday, May 29, 2012 to complete a 12-hour count for the study intersection. The AM, Midday and PM peak hours of travel were identified as 7:15 AM – 8:15 AM, 11:00 AM – 12:00 PM and 4:30 PM – 5:30 PM, respectively. A summary of the peak hour turning movement volumes for the

intersection is shown in Table 2. The complete results from the turning movement count are provided in Appendix A.

The directional split of traffic on DE Route 8, the major street of the study intersection, for each of the peak hours identified above was found to be 23% westbound / 77% eastbound during the AM peak hour, 41% westbound / 59% eastbound during the Midday peak hour and 50% westbound / 50% eastbound during the PM peak hour. The directional split of traffic indicates that the majority of traffic is traveling eastbound during the AM peak hour and evenly split during the Midday and PM peak hours on DE route 8.

Table 2
DE Route 8 @ Chestnut Grove Road / Nault Road
5/2/2012 and 5/3/2012 - Peak Hour Turning Movement Volumes

		AM Peak Hour (7:15 AM - 8:15 AM)				Midday Peak Hour (11:00 AM - 12:00 PM)				PM Peak Hour (4:30 PM - 5:30 PM)			
		L	**T**	**R**	***Total***	**L**	**T**	**R**	***Total***	**L**	**T**	**R**	***Total***
DE Route 8	WB	8	169	1	*178*	15	265	3	*283*	25	401	3	*429*
	EB	79	494	9	*582*	47	355	5	*407*	66	360	9	*435*
Chestnut Grove Road	SB	0	13	31	*44*	7	13	43	*63*	2	24	98	*125*
Nault Road	NB	2	34	29	*65*	8	12	27	*47*	6	19	16	*41*

- **Existing Capacity**

Capacity analyses were performed at the intersection of DE Route 8 and Chestnut Grove Road / Nault Road using the traffic volumes shown in Table 3. These analyses were performed using the Highway Capacity Software 2010 v6.1 (HCS 2010) for unsignalized intersections. The HCS 2010 software is based on the capacity analysis theories and methodologies that are provided in the 2010 version of the Highway Capacity Manual. Unsignalized intersection capacity is measured in terms of Levels of Service (LOS) and delay, primarily for vehicles on the stop controlled approaches and vehicles turning left from the major street approaches. LOS A (delay ≤ 10 sec/veh) represents the best possible operating conditions or free flow operations, whereas LOS F (delay > 50 sec/veh) represents congested conditions, corresponding with traffic that has reached or exceeded available capacity, resulting in relatively high average delay per vehicle and a breakdown in the flow of traffic. The worksheets and software outputs for all of the capacity analyses are provided in Appendix A.

Table 3 shows the results of the capacity analyses for the intersection of DE Route 8 and Chestnut Grove Road / Nault Road using HCS 2010 for unsignalized intersections. The results show that there are no delays (LOS A) for traffic turning left from both eastbound and westbound DE Route 8 during all three peak periods. The results also show that traffic approaching the intersection from the Nault Road approach operate with moderate delay (LOS C) during the Midday Peak period and heavy delay (LOS D & E) during the AM and the PM peak periods. The results also show that traffic approaching the intersection from the Chestnut Grove Road approach operate with minimal delay (LOS B) during the AM and the Midday peak periods and heavy delay (LOS D) during the PM peak period.

Table 3

DE Route 8 @ Chestnut Grove Road / Nault Road

Summary of HCS 2010 Unsignalized Analyses Results

Approach	AM Peak Hour	Midday Peak Hour	PM Peak Hour
	Movement LOS (delay)	Movement LOS (delay)	Movement LOS (delay)
Eastbound DE Route 8 Left-Turn	A (7.8 seconds/vehicle)	A (8.0 seconds/vehicle)	A (8.7 seconds/vehicle)
Westbound DE Route 8 Left-Turn	A (9.0 seconds/vehicle)	A (8.1 seconds/vehicle)	A (8.4 seconds/vehicle)
Northbound Nault Road Left-Through-Right	D (25.9 seconds/vehicle)	C (16.1 seconds/vehicle)	E (39.0 seconds/vehicle)
Southbound Chestnut Grove Road Left-Through-Right	B (14.3 seconds/vehicle)	B (14.6 seconds/vehicle)	D (26.0 seconds/vehicle)

- **Speed Study Findings**

Speed study was performed using a conventional radar gun on DE Route 8 on Wednesday, May 2, 2012. In the speed study, vehicle travel speeds were measured at two locations on DE Route 8: approximately 800 feet east of the Chestnut Grove Road / Nault Road intersection (location 1) and approximately 1,200 feet west of the Chestnut Grove Road / Nault Road intersection (location 2). The speed data that was gathered was then used to determine the 85th percentile speed for DE Route 8. The 85th percentile speed is the speed at which 85 percent of the vehicles recorded are traveling at or below. This is based on the theory that most motorists select their speed based on roadway conditions and the surrounding environment. Setting artificial speed limits much lower or higher than the 85th percentile speed reduces the effectiveness of the speed limit and could lead to poor motorist compliance, which may increase the risk of being in a crash. The results of the speed study for DE Route 8 are provided in Table 4.

Table 4
DE Route 8 Radar Study Results

Site	Existing Speed Limit	Combined 85th Percentile Speed	% Vehicles Over Speed Limit	% Vehicles 5 MPH Over Speed Limit
Location 1	50 MPH	57 MPH	68%	28%
Location 2	50 MPH	56 MPH	51%	20%

The combined 85th percentile speed for both eastbound and westbound DE Route 8 was found to be 57 MPH for radar location 1, which indicates 85 percent of traffic is traveling at or below 57 MPH at location 1. Also, the combined 85th percentile speed for both eastbound and westbound DE Route 8 was found to be 56 MPH for radar location 2, which indicates 85 percent of traffic is traveling at or below 56 MPH at location 2. In addition, the data revealed that 68 percent of vehicles were traveling at speeds greater than the existing speed limit and 28 percent of vehicles were traveling at speeds 5 MPH or greater than the existing speed limit at radar location 1. Similarly, the data also revealed that 51 percent of vehicles were traveling at speeds greater than

the existing speed limit and 20 percent of vehicles were traveling at speeds 5 MPH or greater than the existing speed limit at radar location 2.

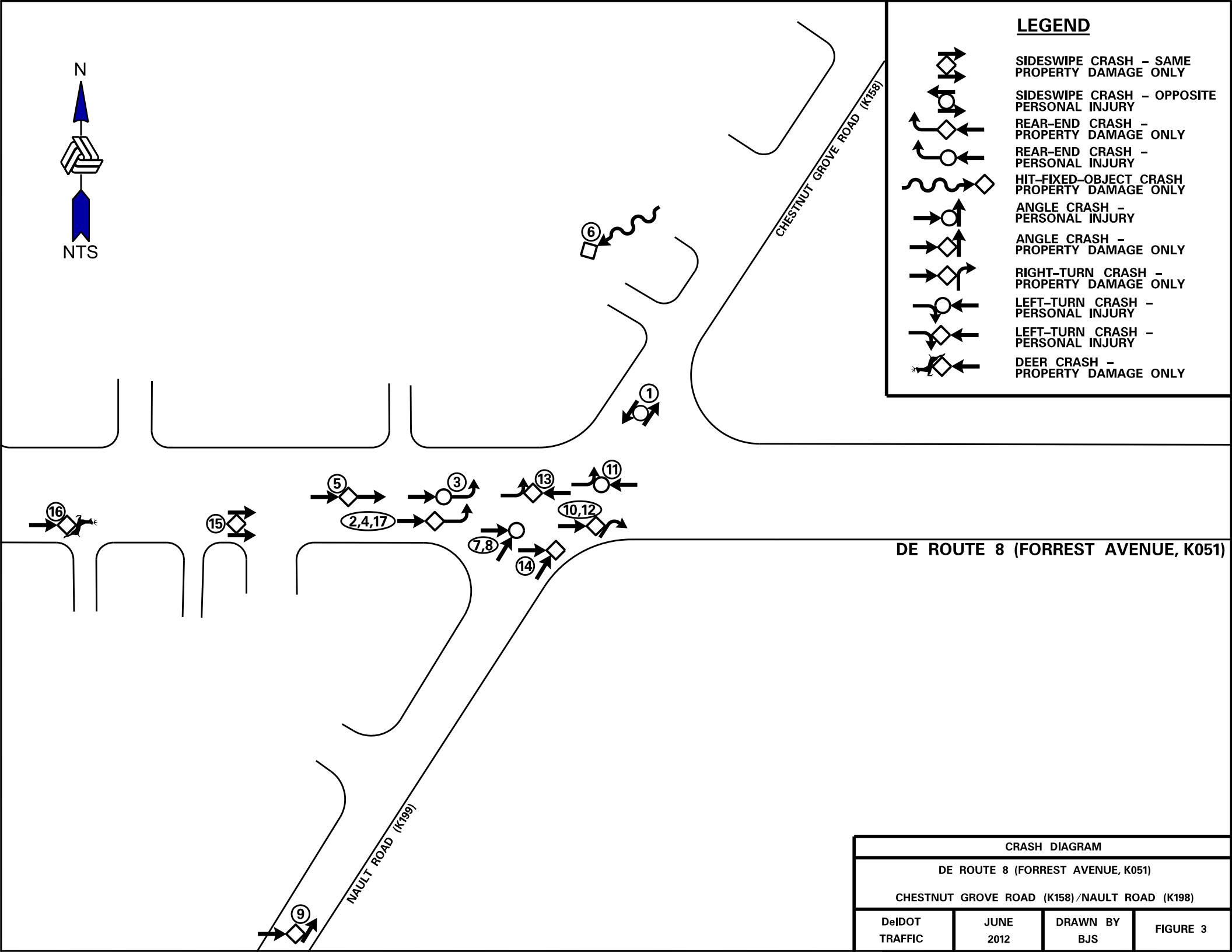
V. Crash Trend Analysis

The Planning Section of DelDOT provided the most recent crash data available for the study area, covering the period from April 2009 through April 2012. According to the available data, there were seventeen (17) reported crashes occurring at or near the intersection of DE Route 8 and Chestnut Grove Road / Nault Road.

The following trends were identifiable in the crash data set:

- There were five (5) crashes that resulted in personal injury at this location.
- Twelve (12) crashes occurred during daytime and five (5) crashes occurred during night time.
- There were eight (8) crashes susceptible to correction by the installation of a traffic signal. Crash data revealed that there were six (6) angle crashes and two (2) left-turn crashes; however, it should be mentioned one (1) of the reported angle crashes appears to have been occurred on Nault Road at a driveway immediately adjacent to the intersection. It appears angle crashes were attributable to motorists failing to remain stopped from the minor road approaches and left-turn crashes were attributable to motorists failing to yield right-of-way from eastbound DE Route 8 while attempting to make a left-turn on to Chestnut Grove Road.
- There were five (5) rear-end crashes reported and four (4) of the rear-end crashes were attributable to inattentive driving and one (1) rear-end crash was attributable to a motorist following another vehicle too closely.
- There was one (1) same-direction-sideswipe crash reported and the crash was attributable to a motorist performing an unsafe lane change on eastbound DE Route 8.
- There was one (1) opposite-direction-sideswipe crash reported and the crash was attributable to an eastbound motorist crossing into the westbound lane on DE Route 8.
- There was one (1) crash involving a motor vehicle and a deer in the roadway.

It should be noted that there were five (5) crashes susceptible to correction via the installation of a traffic signal within a 12-month period between January 2011 and December 2011.



CRASH DIAGRAM			
DE ROUTE 8 (FORREST AVENUE, K051)			
CHESTNUT GROVE ROAD (K158) /NAULT ROAD (K198)			
DelDOT TRAFFIC	JUNE 2012	DRAWN BY BJS	FIGURE 3

Table 5

DE Route 8 @ Chestnut Grove Road / Nault Road
Summary of Crash Data

	Date	Time	Day of Week	Weather	Lighting	Manner of Impact	Severity	Contributing Circumstances
1	6/24/2009	4:19 PM	Wednesday	Clear	Daylight	Sideswipe	Injury	Vehicle crossing centerline
2	5/21/2009	1:50 PM	Thursday	Clear	Daylight	Rear-end	PDO	Inattentive Driving
3	12/7/2009	2:40 PM	Monday	Clear	Daylight	Rear-end	Injury	Inattentive Driving
4	8/30/2009	5:49 PM	Sunday	Clear	Daylight	Rear-end	PDO	Inattentive Driving
5	9/19/2009	4:04 PM	Saturday	Clear	Daylight	Rear-end	PDO	Following too closely
6	5/22/2010	9:50 PM	Saturday	Rain	Dark/Unlit	ROR/HFO	PDO	Unknown / Hit & Run
7	8/16/2010	1:12 PM	Monday	Clear	Daylight	Angle	Injury	Failed to remain stopped
8	6/6/2010	2:15 PM	Sunday	Clear	Daylight	Angle	Injury	Failed to remain stopped
9	4/11/2011	12:00 AM	Monday	Cloudy	Daylight	Angle	PDO	Failed to remain stopped
10	8/16/2011	4:43 PM	Tuesday	Clear	Daylight	Angle	PDO	Failed to remain stopped
11	11/29/2011	8:45 AM	Tuesday	Rain	Daylight	Left-turn	Injury	Failed to yield ROW
12	5/9/2011	6:49 AM	Monday	Clear	Daylight	Angle	PDO	Failed to remain stopped
13	11/11/2011	5:37 PM	Friday	Clear	Dark/Unlit	Left-turn	PDO	Failed to yield ROW
14	1/25/2011	12:22 PM	Tuesday	Clear	Daylight	Angle	PDO	Failed to remain stopped
15	1/26/2012	6:33 AM	Thursday	Rain	Dark/Unlit	Sideswipe	PDO	Unsafe lane change
16	3/30/2012	8:59 PM	Friday	Clear	Dark/Unlit	Hit Deer	PDO	Animal in roadway
17	2/18/2012	5:40 PM	Saturday	Clear	Dark/Unlit	Rear-end	PDO	Inattentive Driving

PDO = Property Damage Only

ROR/HFO = Runoff-the-Road / Hit-Fixed-Object

VI. Observations of Traffic Operations

The following observations were recorded during visits to the study area during peak and off-peak periods:

- Vehicles traveling on the major street (DE Route 8) do not arrive at this intersection in platoons.
- There are painted right-turn channelization islands present on both eastbound and westbound DE Route 8 at the intersection; however, through vehicles were observed traversing over the painted right-turn channelization islands to pass stopped or slowing left-turning vehicles on both DE Route 8 approaches.
- Vehicles approaching the intersection from the southbound Chestnut Grove Road approach were observed stopping beyond the existing painted STOP bar due to shrubbery and mailbox present within the northwest quadrant of the intersection.

VII. Improvement Options

Based on the results of the traffic observations, data obtained and analyses contained within this report, DelDOT considered the following three (3) improvement options at the intersection of DE Route 8 and Chestnut Grove Road / Nault Road: installation of a traffic signal, installation of concrete right-turn channelization islands on DE Route 8 and installation of painted rumble strips on the Chestnut Grove Road / Nault Road approaches.

Option 1 – Traffic Signal

The State of Delaware Manual on Uniform Traffic Control Devices (DEMUTCD)[3] specifies nine (9) warrants that may be used in the process of determining whether a traffic signal is justified at an intersection. These warrants were reviewed using traffic volume information from the turning movement counts and the three year crash data for the intersection of DE Route 8 and Chestnut Grove Road / Nault Road. Results of the signal warrant analyses are summarized in Table 6. The individual signal warrants are described in detail following the summary table.

Results of the signal warrant study showed that **two** of the nine signal warrants were met at the intersection of DE Route 8 and Chestnut Grove Road / Nault Road. In addition, there were five (5) crashes susceptible to correction via the installation of traffic signal at the intersection within a 12-month period. The following is a detailed summary of the requirements for each of the warrants for traffic signal installation as specified by the DEMUTCD.

Warrant 1, Eight-Hour Vehicular Volumes

This warrant is divided into three parts. The first part, Condition A, minimum vehicular volume, is intended for use at locations where a large volume of intersecting traffic is the principal reason to consider signalization. The second part, Condition B, interruption of continuous traffic, is intended for use at locations where Condition A is not satisfied and where the traffic volume on the major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street. The third part of this warrant is the combination of Conditions A and B, which is intended for use at locations where Condition A or Condition B is not satisfied. The combination of A and B should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

- The traffic volumes on the DE Route 8 approaches must be at least 500 vph for Condition A and 750 vph for Condition B. The volume requirement for the combination of Condition A and Condition B is 80% of these values.

- The traffic volume on the most heavily traveled minor street approach (Chestnut Grove Road / Nault Road) must be at least 150 vph for Condition A and 75 vph for Condition B. The volume requirement for the combination of Condition A and Condition B is 80% of these values.

*The requirements for this warrant were **satisfied** by the existing conditions at this intersection.*

Hours met: 2 of 8 hours for Condition A

9 of 8 hours for Condition B

Condition C is not applicable to this location

Warrant 2, Four-Hour Vehicular Volumes

This warrant is satisfied when, for each of any four hours on an average day, the plotted points representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher volume minor street approach (one direction only) all fall above the curve in Figure 4C-1 of the DEMUTCD for the existing combination of approach lanes. Figure 4C-2 is used because the 70% criterion does apply to this location due to the speed limit on DE Route 8 being 50 MPH, which is greater than 40 MPH, as required by the warrant.

*The requirements for this warrant were **satisfied** by the existing conditions at this intersection.*

Hours Met: 4 of 4.

Warrant 3, Peak Hour

This warrant is intended for use at a location where traffic conditions are such that for a minimum of one hour of an average day, the minor-street traffic suffers undue delay when entering or crossing the major street. The DEMUTCD specifically states, "This signal warrant shall be applied only in unusual cases, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time. If the location meets these criteria, the peak hour warrant is satisfied when:

- The total stopped time delay experienced by the traffic on one minor street approach (Chestnut Grove Road / Nault Road) controlled by a stop sign equals or exceeds 4 vehicle-hours for a one-lane approach, and;
- The volume on the same minor street approach (Chestnut Grove Road / Nault Road) equals or exceeds 100 vehicles per hour for one moving lane of traffic, and;
- The total entering volume serviced during the hour equals or exceeds 650 vehicles per hour for intersections with three approaches or 800 vehicles per hour for intersections with 4 or more approaches.

The warrant can also be satisfied if the plotted point representing the vehicles per hour on the major (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor-street approach (one direction only) for 1 hour (any four consecutive 15-minute periods) of an average day falls above the applicable curve in Figure 4C-4 for the existing combination of approach lanes. Figure 4C-4 is used because the 70% criterion does apply to this location.

The intersection of DE Route 8 and Chestnut Grove Road / Nault Road cannot be considered an 'unusual case' since the intersection does not experience high volumes of vehicles entering and exiting this facility during short periods of time. Therefore, this warrant ***does not apply*** *to the intersection of DE Route and Chestnut Grove Road / Nault Road.*

Warrant 4, Pedestrian Volume

This warrant is intended for application where the traffic volume on a major street is so heavy that pedestrians experience excessive delay in crossing the major street.

- The pedestrian volume crossing the major street at an intersection or midblock location during an average day is 100 or more for each of any 4 hours or 190 or more during 1 hour, and;
- There are fewer than 60 gaps per hour in the traffic stream of adequate length to allow pedestrians to cross during the same period when the pedestrian volume criterion is satisfied.

The requirements for this warrant were ***not satisfied*** *by the existing conditions at the intersection of DE Route 8 and Chestnut Grove Road / Nault Road.*

Warrant 5, School Crossing

A traffic control signal may be warranted at an established school crossing when a traffic engineering study of the frequency and adequacy of gaps in the vehicular traffic stream as related to the number and size of groups of school children at the school crossing shows that the number of adequate gaps in the traffic stream during the period when the children are using the crossing is less than the number of minutes in the same period.

This warrant does not apply to the intersection of DE Route 8 and Chestnut Grove Road / Nault Road.

Table 6
Summary of Signal Warrant Analysis

	MUTCD Requirement	Current Condition	Criteria Met?	Warrant Met?
Warrant 1 – Eight-Hour Vehicular Volume				
A. Minimum Vehicular Volume (Condition A)	8 Hours	2 Hours	No	**Yes**
B. Minimum Vehicular Volume (Condition B)	8 Hours	9 Hours	No	
C. Combination of A and B	8 Hours	0 Hours	No	
Warrant 2 – Four-Hour Vehicular Volume				
Figure 4C-2 of the DE MUTCD	4 Hours	4 Hours	No	**Yes**
Warrant 3 – Peak Hour				
Delay on minor street for unusual locations	N/A	N/A	No	**No**
Warrant 4 – Pedestrian Volume				
A. Figure 4C-5	4 Hours	0 Hours	No	**No**
B. Figure 4C-7	1 Hour	0 Hours	No	
Warrant 5- School Crossing				
Frequency and adequacy of gaps in vehicular traffic stream	N/A	N/A	No	**No**
Warrant 6- Coordinate Signal System				
Adequate platooning of vehicles within a coordinated signal system	N/A	N/A	No	**No**
Warrant 7- Crash History				
Number of Crashes	5 Crashes	5 Crashes	Yes	**No**
Minimum Vehicular Volume	8 Hours	6 Hours	No	
Warrant 8 – Roadway Network				
All Warrants Failed?			Yes	**No**
Warrant 9 – Intersection Near a Grade Crossing				
This intersection is not Near a Grade Crossing				

Warrant 6, Coordinated Signal System

The need for a traffic signal shall be considered if adjacent traffic control signals do not provide the necessary degree of platooning and the proposed and adjacent traffic control signals will collectively provide a progressive operation on a two-way street. This warrant should not be applied if the resultant spacing of traffic control signals would be less than 1,000 ft.

This warrant does not apply to the intersection of DE Route 8 and Chestnut Grove Road / Nault Road since the intersection is not part of a coordinated signal system.

Warrant 7, Crash Experience

The following requirements must be met in order for this warrant to be satisfied:

- Other safety improvement alternatives have failed to produce adequate results, and;
- Five or more reported crashes, of types susceptible to correction by a traffic control signal, have occurred within a 12-month period, each crash involving personal injury or property damage apparently exceeding the applicable requirements for a reportable crash; and

- There exists a volume of vehicular and pedestrian traffic not less than 80 percent of the requirements specified in warrant 1.

*The requirements for this warrant were **not satisfied** by the existing conditions at the intersection of DE Route 8 and Chestnut Grove Road / Nault Road. Safety improvements such as right-turn channelization islands have been implemented at the intersection and there were **five (5)** crashes susceptible to correction by a traffic signal in a 12-month study period between January 2011 and December 2011; however, the 80% volume warrant was only satisfied 6 of 8 hours.*

Warrant 8, Roadway Network

The intent of this warrant is to encourage concentration and organization of traffic flow networks. For this reason, all elements of this warrant refer to intersections of two or more "major streets."

A major street as used in this warrant has one or more of the following characteristics:

- It is part of the street or highway system that serves as the principal network for through traffic flow;
- It includes rural or suburban highways outside, entering or traversing a city;
- It appears as a major route on an official plan such as a major street plan in a transportation study.

For this warrant to be met, the junction of two of more major streets must:

- Have a total entering volume of at least 1,000 vehicles during the peak hours of a typical weekday and have five year projected volumes which meet one or more requirements of Warrants 1, 2 and 3 during an average weekday.
- Have a total of existing or immediately projected entering volume of at least 1,000 vehicles for each of any five hours on a Saturday and/or Sunday.

This warrant does not apply to the intersection of DE Route 8 and Chestnut Grove Road / Nault Road, because the minor street (Chestnut Grove Road / Nault Road) approaches does not meet the requirements of a "major street."

Warrant 9, Intersection near a Grade Crossing

This warrant is applicable at locations where a grade crossing is located on an approach to an intersection and a traffic signal is needed in order to prevent vehicles from stopping on the tracks.

This warrant does not apply to the intersection of DE Route 8 and Chestnut Grove Road / Nault Road, since there are no grade crossings in the vicinity of the intersection.

Based on the results of the traffic signal warrant analysis, a traffic signal is **warranted** at the intersection of DE Route 8 and Chestnut Grove Road / Nault Road.

Option 2 – Raised concrete right-turn channelization islands on DE Route 8

As mentioned in observations of traffic operations section, many vehicles were observed using the right-turn lane to pass vehicles stopped in the shared left-turn / through lane to make a left-turn. There are painted right-turn channelization islands present on both eastbound and westbound DE Route 8; however, vehicles using the right-turn lane to pass left-turning vehicles were observed traversing over the painted-right-turn channelization islands. In addition, vehicles making a right-turn from the minor street approaches (Chestnut Grove Road / Nault Road) were observed stopping beyond the existing painted stop line due to the skew at the intersection, which resulted in many near-miss crashes with vehicles passing on right-turn lanes at the intersection. Further review of the crash data at the intersection revealed that two (2) of the five (5) relevant angle crashes may have involved eastbound vehicles using the right-turn lane to pass left-turning vehicles. In addition, vehicles using the right-turn lane to pass left-turning vehicles created further

conflicts with other through vehicles stopped behind left-turning vehicles when they proceeded through the intersection. Upgrading the existing painted right-turn channelization islands to raised concrete right-turn channelization islands should eliminate angle crashes involving vehicles using the right-turn lanes as bypass lanes.

Option 3 – Rumble Strips

DelDOT also determined the feasibility of installing painted rumble strips on the Chestnut Grove Road / Nault Road approaches. Field observation revealed that the land use in the vicinity of the study intersection is predominantly residential. Installing rumble strips near a residential area could have a significant negative impact on the quality of life for nearby residents. Therefore, installation of rumble strips near the intersection of DE Route 8 and Chestnut Grove Road / Nault Road is **not feasible**.

VIII. Conclusions

The significant findings of this traffic engineering study at the intersection of DE Route 8 and Chestnut Grove Road / Nault Road are:

Intersection sight distance: From the Chestnut Grove Road approach and the Nault Road approach, the measured available intersection sight distance for vehicles looking left and right are greater than the distance recommended by AASHTO. The available intersection sight distances for vehicles turning left from the major street were also found to be greater than the minimums that are recommended by AASHTO.

Existing traffic volumes: The traffic count that was conducted for this study showed that the AM, Midday and PM peak hours of travel are 7:15 AM – 8:15 AM, 11:00 AM – 12:00 PM and 4:30 PM to 5:30 PM, respectively. The directional split of traffic indicates that the majority of traffic is traveling eastbound during the AM peak hour and evenly split during the Midday and PM peak hours on DE Route 8.

Existing intersection capacity: The results show that there are no delays (LOS A) for traffic turning left from both eastbound and westbound DE Route 8 during all three peak periods. The results also show that traffic approaching the intersection from the Nault Road approach operate with moderate delay (LOS C) during the Midday Peak period and heavy delay (LOS D & E) during the AM and the PM peak periods. The results also show that traffic approaching the intersection from the Chestnut Grove Road approach operate with minimal delay (LOS B) during the AM and the Midday peak periods and heavy delay (LOS D) during the PM peak period.

Speed Study Findings: The combined 85th percentile speed for both eastbound and westbound DE Route 8 was found to be 57 MPH for radar location 1, which indicates 85 percent of traffic is traveling at or below 57 MPH at location 1. Also, the combined 85th percentile speed for both eastbound and westbound DE Route 8 was found to be 56 MPH for radar location 2, which indicates 85 percent of traffic is traveling at or below 56 MPH at location 2. In addition, the data revealed that 68 percent of vehicles were traveling at speeds greater than the existing speed limit and 28 percent of vehicles were traveling at speeds 5 MPH or greater than the existing speed limit at radar location 1. Similarly, the data also revealed that 51 percent of vehicles were traveling at speeds greater than the existing speed limit and 20 percent of vehicles were traveling at speeds 5 MPH or greater than the existing speed limit at radar location 2.

Crash trend analysis: Crash data was obtained for this intersection covering the period from October 2008 to September 2011. The data showed that there were eleven (11) reported crashes occurring at this intersection. From January 2011 to December 2011, there were five (5) crashes that are susceptible to correction by the installation of a traffic signal.

Improvement Options:

- Based on the results of the traffic signal warrant analysis, a traffic signal is **warranted** at the intersection of DE Route 8 and Chestnut Grove Road / Nault Road.
- Based on observations of traffic operations at the intersection, upgrading the existing painted right-turn channelization islands to raised concrete islands should eliminate crashes involving vehicles using the right-turn lanes to pass stopped left-turning vehicles on DE Route 8.
- Field investigations revealed that the land use in the vicinity of the study intersection is predominantly residential. Installing rumble strips near a residential area could have a significant negative impact on the quality of life for nearby residents. Therefore, the installation of painted rumble strips is **not feasible** near the intersection of DE Route 8 and Chestnut Grove Road / Nault Road.

IX. Recommendations

Based on the results of the traffic observations, data and analysis contained within this report, DelDOT presents the following improvement options to be considered for this location:

Option 1: *Install a traffic signal at the intersection of DE Route 8 and Chestnut Grove Road / Nault Road.*

Expected Benefits:

- Installing a traffic signal should reduce excessive delay experienced by vehicles approaching the intersection from the Chestnut Grove Road / Nault Road approaches.
- Installing a traffic signal should reduce the number of angle crashes and left-turn crashes at the intersection.
- Lane configuration change needed for the traffic signal installation should eliminate the crashes involving vehicles using the right-turn lanes to pass stopped left-turning vehicles on DE Route 8.

Possible Disadvantages:

- Increased delays to motorists on DE Route 8.
- Cost of operating and maintaining the traffic signal.
- Cost of possible additional land acquisition.
- Possible increase in number of rear-end crashes on DE Route 8.

Option 2: *Upgrade existing painted right-turn channelization islands on DE Route 8 to raised concrete right-turn channelization islands.*

Expected Benefits:

- Implementing raised concrete right-turn channelization islands should prohibit through vehicles on DE Route 8 from using the right-turn lanes to pass stopped left-turning vehicles.
- The provision of the raised right-turn channelization islands should eliminate angle crashes and left-turn crashes involving vehicles traveling through the intersection using the right-turn lanes.

Possible Disadvantages:

- Increased delays to motorists on DE Route 8.
- Cost of installing and maintaining the raised concrete channelization islands.

It should be noted that separate left-turn lanes will be added to the DE Route 8 approaches when the traffic signal is installed and right-turn channelization islands on DE Route 8 must be

relocated. This means the proposed raised concrete right-turn channelization islands must be relocated at the time of the traffic signal installation; however, DelDOT recommends the raised concrete right-turn channelization islands to be installed as an interim improvement before the traffic signal installation since the traffic signal installation will likely be a possible FY 2014 or FY2015 project.

DelDOT also considered installing Rumble Strips on the Chestnut Grove Road / Nault Road approaches. Field observations revealed that the land use in the vicinity of the study intersection is predominantly residential. Installing rumble strips near a residential area could have a significant negative impact on the quality of life for nearby residents. Therefore, DelDOT **does not recommend** installation of rumble strips at the intersection of DE Route 8 and Chestnut Grove Road / Nault Road.

Based on the results from the radar study, it appears that many motorists traveling on DE Route 8 are not complying with the existing speed limit of 50 MPH. Lowering the speed limit on DE Route 8 is not advisable since the majority of motorists are currently not obeying the existing speed limit. In order for a lower speed limit to be warranted, the 85th percentile speed should be lower than the existing posted speed limit and there should be roadside features or other factors that cause motorists to select lower speed. The only effective measure that can reduce the travel speeds of motorists is police enforcement. Police enforcement can influence lower travel speeds on a roadway for a short period of time; however, the resulting lower travel speed could increase when the police enforcement is discontinued. This is due to drivers being accustomed to driving at the speed at which they feel safe and are comfortable. Therefore, it is recommended that the existing speed limit of 50 MPH remain in effect on DE Route 8. In addition, DelDOT also recommends additional speed enforcements to be conducted by the Delaware State Police (DSP) on DE Route 8 at the locations where the safety of the police officers conducting the speed enforcement will not be compromised.

Field observations conducted at the intersection of DE Route 8 and Chestnut Grove Road / Nault Road have identified the need for minor traffic control device improvements. The proposed improvements are listed below:

- Remove existing Stop Ahead sign (W3-1) on southbound Chestnut Grove Road, located north of DE Route 8.
- Install new Stop Ahead sign (W3-1) and an Advance Street Name plaque (W16-8a-DE) for Forrest Avenue on southbound Chestnut Grove Road, approximately 250 feet north of DE Route 8.
- Remove existing Watch Children sign (W21-11-DE) and Advisory Speed 30 MPH sign (W13-1-30) on southbound Nault Road, located immediately south of DE Route 8.
- Remove existing Stop Ahead sign (W3-1) on northbound Nault Road, located south of DE Route 8.
- Install Stop Ahead sign (W3-1) and an Advance Street Name plaque (W16-8a-DE) for Forrest Avenue on northbound Nault Road, approximately 250 feet south of DE Route 8.

X. Reference

i. AASHTO A Policy on Geometric Design of Highways and Streets. American Association of State Highway and Transportation Officials. Washington, D. C. 20001. 2004.

ii. Highway Capacity Manual. Transportation Research Board. Washington, D.C. 20001. 2010.

iii. State of Delaware Manual on Uniform Traffic Control Devices (DE MUTCD). Delaware Department of Transportation. Smyrna, DE 19977. 2011.

SIGNING LEGEND

1	REMOVE EXISTING SIGN
2	EXISTING SIGN TO REMAIN
3	PLACE NEW SIGN
4	RENEW EXISTING SIGN
5	REPOSITION EXISTING SIGN

NOTE: DONE BY STATE FORCES

N

NTS

LEGEND

- EDGE OF ROAD
- PAVEMENT MARKINGS
- EXISTING SIGN POST
- UTILITY POLE
- PROPOSED SIGN POST

DE ROUTE 8 (K051, FORREST AVENUE)

DE ROUTE 8 (K051, FORREST AVENUE)

UPGRADE EXISTING PAINTED RIGHT-TURN CHANNELIZATION ISLANDS TO RAISED CONCRETE ISLANDS

PROPOSED SIGNING DIAGRAM

DE ROUTE 8 (K051, FORREST AVENUE)

CHESTNUT GROVE ROAD (K158)/NAULT ROAD (K199)

DELDOT TRAFFIC	DRAWN BY BJS	JULY 2012	FIGURE 4

APPENDIX A
Traffic Data

Existing Traffic Volume Data

HCS2010 Analysis Worksheets

Turning Movement Field Data

Requestor:	B.J. Song
Counter Name / Number:	Heather Mantz/ T-2923
County / City:	Kent County/ Dover
Road Number / Name:	Delaware Route 8-Forrest Avenue (K51) & Nault Road (K199)- Chestnut Grove Road (K158)
Signalized?	**Yes** **No**

Notes: This count was seperated to count in Bank 1 as Truck Traffic and Bank 2 as Bicycle Traffic. Horse and Buggies were counted as vehicles. Motorists were observed passing left turning vehicles in the right turn lane.

Pedestrian Count	
Bicycle Count	
Turning Movement Count	
Vehicle Separation	
Classification Count	
Intersection Delay Study	



Day 1	
Date	
05/02/12	
Wednesday	
Daylight, Clear, Dry	
Time	
7:00 - 9:00	
11:00 - 1:00	
2:00 - 6:00	
Day 2	
Date	
05/03/12	
Thursday	
Daylight, Clear, Dry	
Time	
7:00 - 9:00	
11:00 - 1:00	
2:00 - 6:00	

DelDOT- Traffic Management Center

169 Brick Store Landing Road
Smyrna, DE 19977
Telephone: 302-659-4066

Counter No.: T-2923
Counted By: Heather Mantz
Weather: Daylight/Clear/Dry
Day of Week: Wednesday

File Name : ForrestAve-NaultRd-Chestnut
Site Code : 00000000
Start Date : 5/3/2012
Page No : 1

Groups Printed- General Traffic - Truck Traffic - Bicycle Traffic

	Chestnut Grove Road (K158) Southbound					DE8-Forrest Avenue (K51) Westbound					Nault Road (K199) Northbound					DE8-Forrest Avenue (K51) Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	7	2	0	0	9	0	30	0	0	30	8	3	0	0	11	0	62	6	0	68	118
07:15 AM	6	3	0	0	9	0	32	3	0	35	10	8	0	0	18	1	122	22	0	145	207
07:30 AM	11	3	0	0	14	0	52	1	0	53	8	11	1	0	20	4	166	21	0	191	278
07:45 AM	8	4	0	0	12	1	53	3	0	57	8	6	1	0	15	2	133	14	0	149	233
Total	32	12	0	0	44	1	167	7	0	175	34	28	2	0	64	7	483	63	0	553	836
08:00 AM	6	3	0	0	9	0	32	1	0	33	3	9	0	0	12	2	73	22	0	97	151
08:15 AM	6	0	1	0	7	1	39	0	0	40	8	6	3	0	17	0	97	16	0	113	177
08:30 AM	6	2	2	0	10	0	31	1	0	32	2	2	3	0	7	2	103	21	0	126	175
08:45 AM	7	0	1	0	8	0	32	2	0	34	8	3	1	0	12	3	91	13	0	107	161
Total	25	5	4	0	34	1	134	4	0	139	21	20	7	0	48	7	364	72	0	443	664
*** BREAK ***																					
11:00 AM	8	2	2	0	12	0	65	5	0	70	3	2	1	0	6	1	94	12	0	107	195
11:15 AM	12	2	2	0	16	1	60	3	0	64	8	5	2	0	15	2	91	8	0	101	196
11:30 AM	15	5	1	0	21	0	67	4	0	71	4	1	2	0	7	1	84	17	0	102	201
11:45 AM	8	4	2	0	14	2	73	3	0	78	12	4	3	0	19	1	86	10	0	97	208
Total	43	13	7	0	63	3	265	15	0	283	27	12	8	0	47	5	355	47	0	407	800
12:00 PM	7	5	1	0	13	0	60	5	0	65	0	4	0	0	4	2	83	7	0	92	174
12:15 PM	13	3	0	0	16	0	68	8	0	76	3	2	3	0	8	0	77	10	0	87	187
12:30 PM	11	2	1	0	14	1	77	2	0	80	3	6	2	0	11	2	67	10	0	79	184
12:45 PM	9	2	0	0	11	1	69	3	0	73	1	3	2	0	6	0	83	14	0	97	187
Total	40	12	2	0	54	2	274	18	0	294	7	15	7	0	29	4	310	41	0	355	732
*** BREAK ***																					
02:00 PM	13	0	1	0	14	2	75	3	0	80	2	2	0	0	4	1	73	11	0	85	183
02:15 PM	13	4	0	0	17	0	72	5	0	77	4	1	3	0	8	1	69	11	1	82	184
02:30 PM	7	3	1	0	11	1	77	4	0	82	4	7	2	0	13	1	84	8	0	93	199
02:45 PM	22	4	2	0	28	0	75	1	0	76	3	7	4	0	14	4	60	19	0	83	201
Total	55	11	4	0	70	3	299	13	0	315	13	17	9	0	39	7	286	49	1	343	767
03:00 PM	19	2	0	0	21	3	89	3	0	95	6	4	2	0	12	3	71	9	0	83	211
03:15 PM	18	8	0	0	26	0	76	5	0	81	2	2	5	0	9	6	74	11	0	91	207
03:30 PM	15	10	5	0	30	0	93	5	0	98	1	5	2	0	8	1	90	3	0	94	230
03:45 PM	21	6	1	0	28	0	114	11	0	125	4	3	7	0	14	2	77	15	0	94	261
Total	73	26	6	0	105	3	372	24	0	399	13	14	16	0	43	12	312	38	0	362	909
04:00 PM	18	6	0	0	24	0	94	1	0	95	4	6	3	0	13	0	78	13	0	91	223

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File Name : ForrestAve-NaultRd-Chestnut
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Page No : 2

Groups Printed- General Traffic - Truck Traffic - Bicycle Traffic

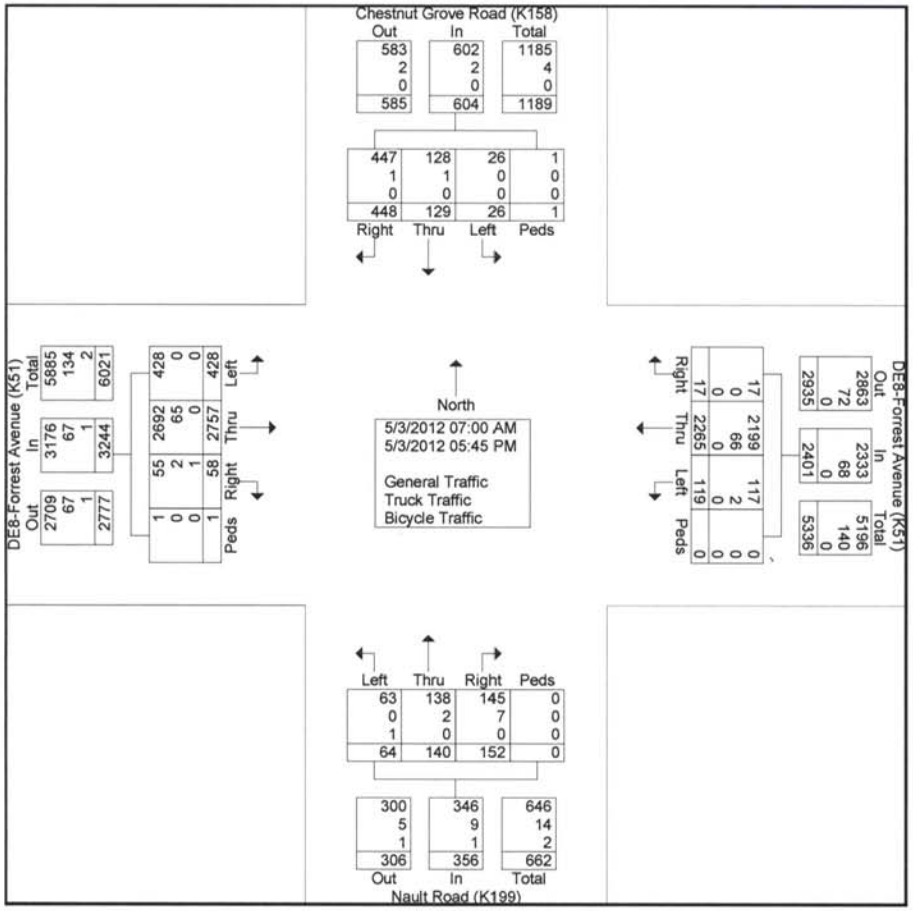
	Chestnut Grove Road (K158) Southbound					DE8-Forrest Avenue (K51) Westbound					Nault Road (K199) Northbound					DE8-Forrest Avenue (K51) Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:15 PM	28	8	0	0	36	0	92	6	0	98	4	3	1	0	8	4	47	9	0	60	202
04:30 PM	31	10	0	0	41	0	82	6	0	88	6	9	3	0	18	3	79	12	0	94	241
04:45 PM	28	8	1	0	37	0	127	9	0	136	2	4	1	0	7	1	84	16	0	101	281
Total	105	32	1	0	138	0	395	22	0	417	16	22	8	0	46	8	288	50	0	346	947
05:00 PM	21	2	1	1	25	2	100	3	0	105	3	5	1	0	9	3	84	18	0	105	244
05:15 PM	18	4	0	0	22	1	92	7	0	100	5	1	1	0	7	2	113	20	0	135	264
05:30 PM	20	3	0	0	23	1	85	3	0	89	7	3	2	0	12	3	79	19	0	101	225
05:45 PM	16	9	1	0	26	0	82	3	0	85	6	3	3	0	12	0	83	11	0	94	217
Total	75	18	2	1	96	4	359	16	0	379	21	12	7	0	40	8	359	68	0	435	950
Grand Total	448	129	26	1	604	17	2265	119	0	2401	152	140	64	0	356	58	2757	428	1	3244	6605
Apprch %	74.2	21.4	4.3	0.2		0.7	94.3	5	0		42.7	39.3	18	0		1.8	85	13.2	0		
Total %	6.8	2	0.4	0	9.1	0.3	34.3	1.8	0	36.4	2.3	2.1	1	0	5.4	0.9	41.7	6.5	0	49.1	
General Traffic	447	128	26	1	602	17	2199	117	0	2333	145	138	63	0	346	55	2692	428	1	3176	6457
% General Traffic	99.8	99.2	100	100	99.7	100	97.1	98.3	0	97.2	95.4	98.6	98.4	0	97.2	94.8	97.6	100	100	97.9	97.8
Truck Traffic	1	1	0	0	2	0	66	2	0	68	7	2	0	0	9	2	65	0	0	67	146
% Truck Traffic	0.2	0.8	0	0	0.3	0	2.9	1.7	0	2.8	4.6	1.4	0	0	2.5	3.4	2.4	0	0	2.1	2.2
Bicycle Traffic	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	1	2
% Bicycle Traffic	0	0	0	0	0	0	0	0	0	0	0	0	1.6	0	0.3	1.7	0	0	0	0	0

DelDOT- Traffic Management Center

169 Brick Store Landing Road
Smyrna, DE 19977
Telephone: 302-659-4066

Counter No.: T-2923
Counted By: Heather Mantz
Weather: Daylight/Clear/Dry
Day of Week: Wednesday

File Name : ForrestAve-NaultRd-Chestnut
Site Code : 00000000
Start Date : 5/3/2012
Page No : 3



DelDOT- Traffic Management Center

169 Brick Store Landing Road
Smyrna, DE 19977
Telephone: 302-659-4066

Counter No.: T-2923
Counted By: Heather Mantz
Weather: Daylight/Clear/Dry
Day of Week: Wednesday

File Name : ForrestAve-NaultRd-Chestnut
Site Code : 00000000
Start Date : 5/3/2012
Page No : 4

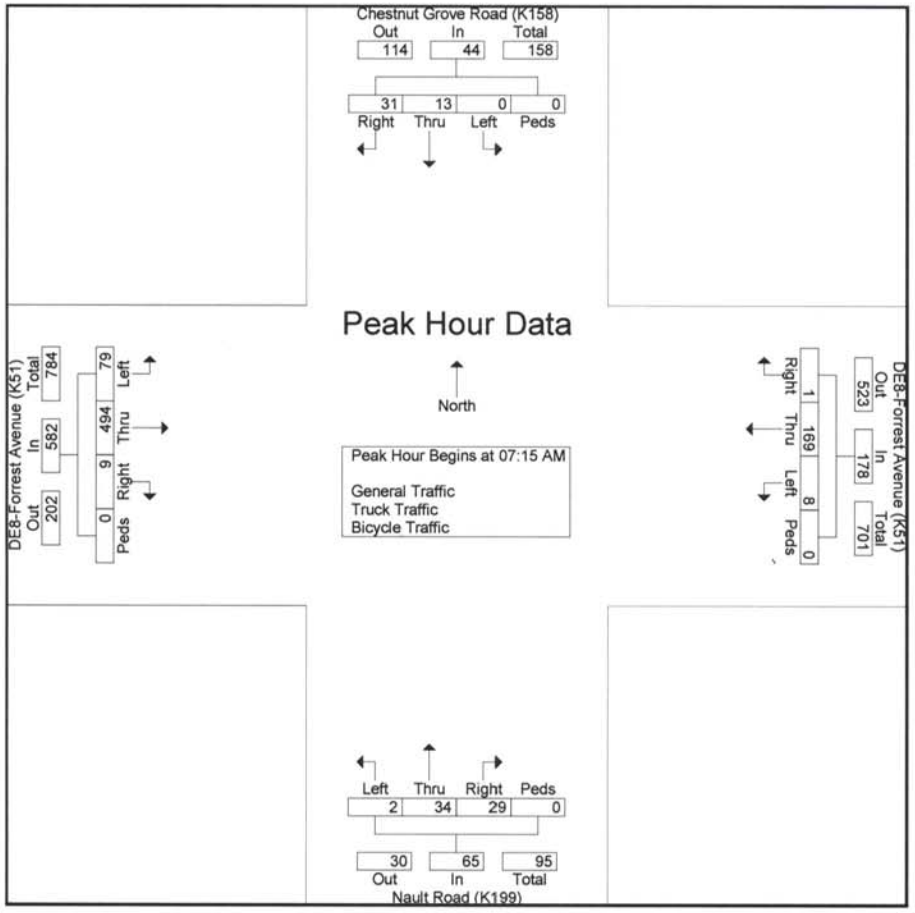
	Chestnut Grove Road (K158) Southbound					DE8-Forrest Avenue (K51) Westbound					Nault Road (K199) Northbound					DE8-Forrest Avenue (K51) Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	6	3	0	0	9	0	32	**3**	0	35	**10**	8	0	0	18	1	122	**22**	0	145	207
07:30 AM	**11**	3	0	0	**14**	0	52	1	0	53	8	**11**	**1**	0	**20**	**4**	**166**	21	0	**191**	**278**
07:45 AM	8	**4**	0	0	12	**1**	**53**	3	0	**57**	8	6	1	0	15	2	133	14	0	149	233
08:00 AM	6	3	0	0	9	0	32	1	0	33	3	9	0	0	12	2	73	22	0	97	151
Total Volume	31	13	0	0	44	1	169	8	0	178	29	34	2	0	65	9	494	79	0	582	869
% App. Total	70.5	29.5	0	0		0.6	94.9	4.5	0		44.6	52.3	3.1	0		1.5	84.9	13.6	0		
PHF	.705	.813	.000	.000	.786	.250	.797	.667	.000	.781	.725	.773	.500	.000	.813	.563	.744	.898	.000	.762	.781

DelDOT- Traffic Management Center

169 Brick Store Landing Road
Smyrna, DE 19977
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Counter No.: T-2923
Counted By: Heather Mantz
Weather: Daylight/Clear/Dry
Day of Week: Wednesday

File Name : ForrestAve-NaultRd-Chestnut
Site Code : 00000000
Start Date : 5/3/2012
Page No : 5



DelDOT- Traffic Management Center

169 Brick Store Landing Road
Smyrna, DE 19977
Telephone: 302-659-4066

Counter No.: T-2923
Counted By: Heather Mantz
Weather: Daylight/Clear/Dry
Day of Week: Wednesday

File Name : ForrestAve-NaultRd-Chestnut
Site Code : 00000000
Start Date : 5/3/2012
Page No : 6

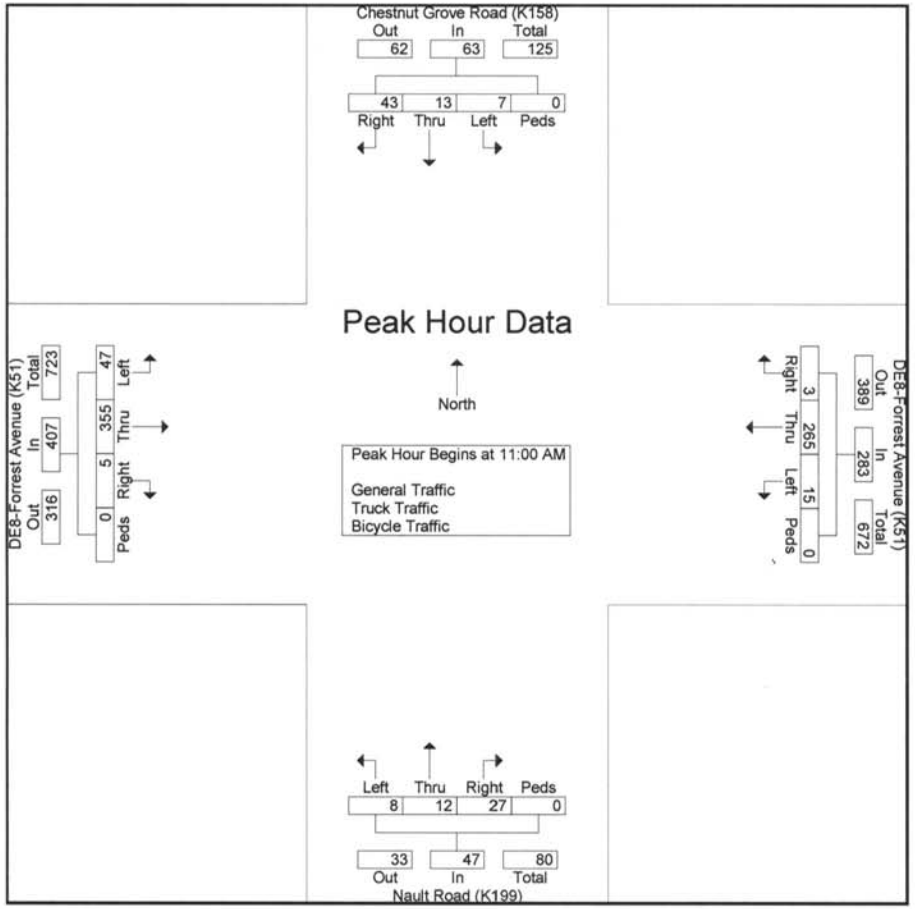
	Chestnut Grove Road (K158) Southbound					DE8-Forrest Avenue (K51) Westbound					Nault Road (K199) Northbound					DE8-Forrest Avenue (K51) Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:00 AM																					
11:00 AM	8	2	**2**	0	12	0	65	**5**	0	70	3	2	1	0	6	1	**94**	12	0	**107**	195
11:15 AM	12	2	2	0	16	1	60	3	0	64	8	**5**	2	0	15	**2**	91	8	0	101	196
11:30 AM	**15**	**5**	1	0	**21**	0	67	4	0	71	4	1	2	0	7	1	84	**17**	0	102	201
11:45 AM	8	4	2	0	14	**2**	**73**	3	0	**78**	**12**	4	**3**	0	**19**	1	86	10	0	97	**208**
Total Volume	43	13	7	0	63	3	265	15	0	283	27	12	8	0	47	5	355	47	0	407	800
% App. Total	68.3	20.6	11.1	0		1.1	93.6	5.3	0		57.4	25.5	17	0		1.2	87.2	11.5	0		
PHF	.717	.650	.875	.000	.750	.375	.908	.750	.000	.907	.563	.600	.667	.000	.618	.625	.944	.691	.000	.951	.962

DelDOT- Traffic Management Center

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File Name : ForrestAve-NaultRd-Chestnut
Site Code : 00000000
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DelDOT- Traffic Management Center

169 Brick Store Landing Road
Smyrna, DE 19977
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Counter No.: T-2923
Counted By: Heather Mantz
Weather: Daylight/Clear/Dry
Day of Week: Wednesday

File Name : ForrestAve-NaultRd-Chestnut
Site Code : 00000000
Start Date : 5/3/2012
Page No : 8

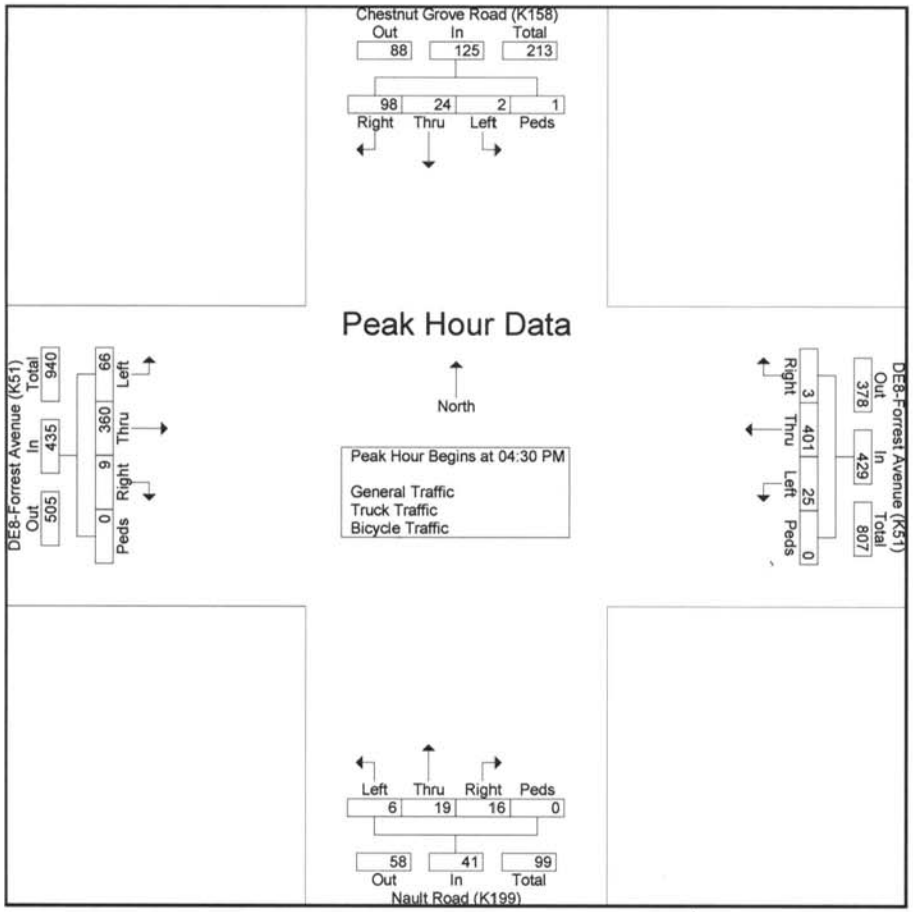
	Chestnut Grove Road (K158) Southbound					DE8-Forrest Avenue (K51) Westbound					Nault Road (K199) Northbound					DE8-Forrest Avenue (K51) Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	**31**	**10**	0	0	**41**	0	82	6	0	88	**6**	**9**	**3**	0	**18**	**3**	79	12	0	94	241
04:45 PM	28	8	**1**	0	37	0	**127**	**9**	0	**136**	2	4	1	0	7	1	84	16	0	101	**281**
05:00 PM	21	2	1	**1**	25	**2**	100	3	0	105	3	5	1	0	9	3	84	18	0	105	244
05:15 PM	18	4	0	0	22	1	92	7	0	100	5	1	1	0	7	2	**113**	**20**	0	**135**	264
Total Volume	98	24	2	1	125	3	401	25	0	429	16	19	6	0	41	9	360	66	0	435	1030
% App. Total	78.4	19.2	1.6	0.8		0.7	93.5	5.8	0		39	46.3	14.6	0		2.1	82.8	15.2	0		
PHF	.790	.600	.500	.250	.762	.375	.789	.694	.000	.789	.667	.528	.500	.000	.569	.750	.796	.825	.000	.806	.916

DelDOT- Traffic Management Center

169 Brick Store Landing Road
Smyrna, DE 19977
Telephone: 302-659-4066

Counter No.: T-2923
Counted By: Heather Mantz
Weather: Daylight/Clear/Dry
Day of Week: Wednesday

File Name : ForrestAve-NaultRd-Chestnut
Site Code : 00000000
Start Date : 5/3/2012
Page No : 9



TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*BJS*	Intersection	*DE 8 @ K158 / K199*
Agency/Co.	*DelDOT Traffic*	Jurisdiction	*Kent County*
Date Performed	*6/26/2012*	Analysis Year	*2012*
Analysis Time Period	*AM Peak(7:15AM-8:15AM)*		

Project Description *DE Route 8 @ K158/K199 - Signal Warrant Study*

East/West Street: *DE Route 8* | North/South Street: *Chestnut Grove / Nault Road*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*79*	*494*	*9*	*9*	*169*	*1*
Peak-Hour Factor, PHF	*0.90*	*0.74*	*0.56*	*0.67*	*0.80*	*0.25*
Hourly Flow Rate, HFR (veh/h)	*87*	*663*	*15*	*13*	*212*	*4*
Percent Heavy Vehicles	*0*	--	--	*2*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*1*	*0*	*1*	*1*
Configuration	*LT*		*R*	*LT*		*R*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*2*	*34*	*29*	*0*	*13*	*31*
Peak-Hour Factor, PHF	*0.50*	*0.77*	*0.73*	*1.00*	*0.81*	*0.70*
Hourly Flow Rate, HFR (veh/h)	*4*	*43*	*39*	*0*	*15*	*44*
Percent Heavy Vehicles	*2*	*1*	*5*	*0*	*1*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*	*LT*		*LTR*			*LTR*	
v (veh/h)	*87*	*13*		*86*			*59*	
C (m) (veh/h)	*1366*	*914*		*257*			*448*	
v/c	*0.06*	*0.01*		*0.33*			*0.13*	
95% queue length	*0.20*	*0.04*		*1.42*			*0.45*	
Control Delay (s/veh)	*7.8*	*9.0*		*25.9*			*14.3*	
LOS	*A*	*A*		*D*			*B*	
Approach Delay (s/veh)	--	--	*25.9*			*14.3*		
Approach LOS	--	--	*D*			*B*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*BJS*
Agency/Co.	*DelDOT Traffic*
Date Performed	*6/26/2012*
Analysis Time Period	*MD Peak(11:00AM-12:00PM)*

Site Information

Intersection	*DE 8 @ K158 / K199*
Jurisdiction	*Kent County*
Analysis Year	*2012*

Project Description *DE Route 8 @ K158/K199 - Signal Warrant Study*

East/West Street: *DE Route 8* North/South Street: *Chestnut Grove / Nault Road*

Intersection Orientation: *East-West* Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*47*	*355*	*5*	*15*	*265*	*3*
Peak-Hour Factor, PHF	*0.69*	*0.94*	*0.63*	*0.75*	*0.91*	*0.38*
Hourly Flow Rate, HFR (veh/h)	*68*	*376*	*8*	*20*	*291*	*8*
Percent Heavy Vehicles	*0*	--	--	*2*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*1*	*0*	*1*	*1*
Configuration	*LT*		*R*	*LT*		*R*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*8*	*12*	*27*	*7*	*13*	*43*
Peak-Hour Factor, PHF	*0.67*	*0.60*	*0.56*	*0.88*	*0.65*	*0.72*
Hourly Flow Rate, HFR (veh/h)	*11*	*19*	*47*	*8*	*20*	*59*
Percent Heavy Vehicles	*2*	*1*	*5*	*0*	*1*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*	*LT*		*LTR*			*LTR*	
v (veh/h)	*68*	*20*		*77*			*87*	
C (m) (veh/h)	*1274*	*1174*		*401*			*463*	
v/c	*0.05*	*0.02*		*0.19*			*0.19*	
95% queue length	*0.17*	*0.05*		*0.70*			*0.68*	
Control Delay (s/veh)	*8.0*	*8.1*		*16.1*			*14.6*	
LOS	*A*	*A*		*C*			*B*	
Approach Delay (s/veh)	--	--	*16.1*			*14.6*		
Approach LOS	--	--	*C*			*B*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*BJS*	Intersection	*DE 8 @ K158 / K199*
Agency/Co.	*DelDOT Traffic*	Jurisdiction	*Kent County*
Date Performed	*6/26/2012*	Analysis Year	*2012*
Analysis Time Period	*PM Peak(4:30PM-5:30PM)*		

Project Description *DE Route 8 @ K158/K199 - Signal Warrant Study*

East/West Street: *DE Route 8* | North/South Street: *Chestnut Grove / Nault Road*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*66*	*360*	*9*	*25*	*401*	*3*
Peak-Hour Factor, PHF	*0.83*	*0.80*	*0.75*	*0.69*	*0.79*	*0.38*
Hourly Flow Rate, HFR (veh/h)	*79*	*451*	*12*	*36*	*508*	*8*
Percent Heavy Vehicles	*0*	--	--	*2*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*1*	*0*	*1*	*1*
Configuration	*LT*		*R*	*LT*		*R*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*6*	*19*	*16*	*2*	*24*	*98*
Peak-Hour Factor, PHF	*0.50*	*0.53*	*0.67*	*0.50*	*0.60*	*0.79*
Hourly Flow Rate, HFR (veh/h)	*12*	*35*	*23*	*4*	*39*	*124*
Percent Heavy Vehicles	*2*	*1*	*5*	*0*	*1*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*	*LT*		*LTR*			*LTR*	
v (veh/h)	*79*	*36*		*70*			*167*	
C (m) (veh/h)	*1060*	*1098*		*174*			*335*	
v/c	*0.07*	*0.03*		*0.40*			*0.50*	
95% queue length	*0.24*	*0.10*		*1.78*			*2.65*	
Control Delay (s/veh)	*8.7*	*8.4*		*39.0*			*26.0*	
LOS	*A*	*A*		*E*			*D*	
Approach Delay (s/veh)	--	--	*39.0*			*26.0*		
Approach LOS	--	--	*E*			*D*		

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APPENDIX B

Radar Data

RADAR COLLECTION DATA

REQUESTED BY:	**B.J. Song**	SHEET NO.:	**One of Two**
COUNTY:	**Kent County**	DATE:	**5/2/2012**
ROAD NO.:	**K51**	BY:	**Heather Mantz**
ROAD NAME:	**Forrest Avenue**		

SPEED	EASTBOUND		WESTBOUND		TOTAL	SECONDS
65	I	1	I	1	2	0.93
64	I	1	I	1	2	
63			I	1	1	
62			II	2	2	
61			I	1	1	
60	II	2	II	2	4	1.0
59	III	3	I	1	4	
58	IIIII II	7	IIII	4	11	
57	IIII	4	IIII	4	8	
56	IIIII	5	IIII	4	9	
55	IIIII II	7	IIIII	5	12	
54	IIIII IIIII IIIII I	16	IIIII IIIII	10	26	1.1
53	IIIII II	7	IIIII IIIII II	12	19	
52	IIIII	5	IIIII IIII	9	14	
51	IIIII IIIII II	12	IIIII III	8	20	
50	IIIII IIIII IIIII	15	IIIII IIIII	10	25	1.2
49	IIIII	5	IIIII I	6	11	
48	IIII	4	IIIII	5	9	
47	I	1	IIII	4	5	
46	III	3	II	2	5	1.3
45	II	2	I	1	3	
44			II	2	2	
43			II	2	2	1.4
42			III	3	3	
41					0	
40					0	1.5
39					0	
38					0	
37					0	1.6
36					0	
35					0	1.7
34					0	
33					0	1.8
32					0	
31					0	1.9
30					0	2.0
29					0	2.1
28					0	
27					0	2.2
26					0	2.3
25					0	2.4
24					0	2.5
23					0	2.6
22					0	
21					0	2.8
20					0	3.0
TOTALS:		**100**		**100**	**200**	

POSTED SPEED: **50** MPH

WEATHER: **Daylight/Cloudy/Dry**

OBSERVATION POINT: On Forrest Avenue approximately 800' east of Nault Road (K199)

PERCENTILE SPEEDS:

	50%	85%	TIME:
EASTBOUND	53 MPH	57 MPH	**1:15 pm - 1:55 pm**
WESTBOUND	52 MPH	57 MPH	**1:15 pm - 1:55 pm**
COMBINED	53 MPH	57 MPH	**1:15 pm - 1:55 pm**

Field Notes:

RADAR COLLECTION DATA

REQUESTED BY:	**B.J. Song**	SHEET NO.:	**Two of Two**
COUNTY:	**Kent County**	DATE:	**5/2/2012**
ROAD NO.:	**K51**	BY:	**Heather Mantz**
ROAD NAME:	**Forrest Avenue**		

SPEED	EASTBOUND		WESTBOUND		TOTAL	SECONDS
65			I	1	1	0.93
64					0	
63			I	1	1	
62					0	
61	I	1	I	1	2	
60	II	2	I	1	3	1.0
59			II	2	2	
58	II	2	IIII	4	6	
57	IIIII	5	IIIII I	6	11	
56	IIII	4	III	3	7	
55	III	3	IIII	4	7	
54	IIIII II	7	IIIII II	7	14	1.1
53	IIIII III	8	IIIII I	6	14	
52	IIIII II	7	IIIII IIII	9	16	
51	IIIII IIIII I	11	IIIII II	7	18	
50	IIIII I	6	IIIII IIIII III	13	19	1.2
49	IIIII IIIII III	13	IIIII III	8	21	
48	IIIII IIII	9	IIIII	5	14	
47	IIII	4	IIII	4	8	
46	IIIII III	8	IIIII I	6	14	1.3
45	IIII	4	IIII	4	8	
44			IIIII I	6	6	
43	III	3	I	1	4	1.4
42	I	1	I	1	2	
41					0	
40	I	1			1	1.5
39					0	
38					0	
37	I	1			1	1.6
36					0	
35					0	1.7
34					0	
33					0	1.8
32					0	
31					0	1.9
30					0	2.0
29					0	2.1
28					0	
27					0	2.2
26					0	2.3
25					0	2.4
24					0	2.5
23					0	2.6
22					0	
21					0	2.8
20					0	3.0
TOTALS:		**100**		**100**	**200**	

POSTED SPEED: **50** MPH

WEATHER: **Daylight/Cloudy/Dry**

OBSERVATION POINT: On Forrest Avenue approximately 1200' west of Nault Road (K199)

PERCENTILE SPEEDS:

	50%	85%	TIME:
EASTBOUND	51 MPH	55 MPH	**1:55 pm - 2:30 pm**
WESTBOUND	51 MPH	57 MPH	**1:55 pm - 2:30 pm**
COMBINED	51 MPH	56 MPH	**1:55 pm - 2:30 pm**

Field Notes:

APPENDIX C

Crash Data

Delaware Crash Analysis Reporting System (CARS)

Crash Study Time Period: *Study Period from 04-27-2009 to 04-27-2012*
Query Type: *singlePoint*
Description: *reports - DE Rt 8 @ Chestnut Grove Road/Nault Road*

Study Requested By:
Study Generated By: TDTSDLR
Number of Crashes: 17
Includes Non-Reportable Crashes: N
Study Code:



Disclaimer for CARS: Crash data and associated police reports are intended for DelDOT use only and shall not be transmitted, copied, distributed or provided to any entity other than DelDOT unless written approval is received from the DelDOT Legal Section. Police reports are the property of the Delaware State Police.

DE Route 8 (K051, Forrest Avenue) @
Chestnut Grove Road (K158) / Nault Road (K199)

Crash History Table
(April 2009 - April 2012)

12/11/2012
DelDOT Traffic

	Date	Time	Weather	Lighting	Surface	Manner of Impact	Severity	Milepoint	Contributing Circumstances	Orientation	Location
1	6/24/2009	4:19 PM	Clear	Daylight	Dry	Siedswipe-opposite	Injury	2.08	Vehicle crossed centerline	WB/EB	At intersection
2	5/21/2009	1:50 PM	Clear	Daylight	Dry	Rear-end	PDO	2.08	Innatentive driving	EBLT/EB	At intersection
3	12/7/2009	2:40 PM	Clear	Daylight	Dry	Rear-end	Injury	2.08	Innatentive driving	EBLT/EB	At intersection
4	8/30/2009	5:49 PM	Clear	Daylight	Dry	Rear-end	PDO	2.08	Innatentive driving	EBLT/EB	At intersection
5	9/19/2009	4:04 PM	Clear	Daylight	Dry	Rear-end	PDO	2.08	Following too closely	EB/EB	At intersection
6	5/22/2010	9:50 PM	Rain	Dark-unlit	Wet	ROR/HFO	PDO	0.01	Unknown / Hit-and-run	SB	Chestnut Grove Road
7	8/16/2010	1:12 PM	Clear	Daylight	Dry	Angle	Injury	0.00	Failure to remain stopped at a STOP sign	EB/SB	At intersection
8	6/6/2010	2:15 PM	Clear	Daylight	Dry	Angle	Injury	2.08	Failure to remain stopped at a STOP sign	EB/SB	At intersection
9	4/11/2011	12:00 AM	Cloudy	Daylight	Dry	Angle	PDO	2.01	Failure to remain stopped at a STOP sign	NB/EB	Nault Road at Sapp Drive
10	8/16/2011	4:43 PM	Clear	Daylight	Dry	Angle	PDO	2.08	Failure to remain stopped at a STOP sign	EB/NBRT	At intersection
11	11/29/2011	8:45 AM	Rain	Daylight	Wet	Left-turn	Injury	0.00	Failure to yield right of way	WB/EBLT	At intersection
12	5/9/2011	6:49 AM	Clear	Daylight	Dry	Angle	PDO	2.08	Failure to remain stopped at a STOP sign	EB/NBRT	At intersection
13	11/11/2011	5:37 PM	Clear	Dark-unlit	Dry	Left-turn	PDO	0.00	Failure to yield right of way	WB/EBLT	At intersection
14	1/25/2011	12:22 PM	Clear	Daylight	Dry	Angle	PDO	1.86	Failure to remain stopped at a STOP sign	EB/NB	At intersection
15	1/26/2012	6:33 AM	Rain	Dark-unlit	Wet	Sideswipe-same	PDO	0.00	Unsafe lane change	EB/EB	At intersection
16	3/30/2012	8:59 PM	Clear	Dark-unlit	Dry	Hit deer	PDO	1.91	Animal in roadway	EB	165' W/O Nault Road
17	2/18/2012	5:40 PM	Clear	Dark-unlit	Dry	Rear-end	PDO	0.00	Innatentive driving	EBLT/EB	At intersection

ROR: Run-off the Road

PDO: Property Damage Only

APPENDIX D

Traffic Signal Warrant Worksheets

DELAWARE DEPARTMENT OF TRANSPORTATION

TRAFFIC ENGINEERING AND MANAGEMENT

SUPPLEMENTAL TRAFFIC SIGNAL EVALUATION FORM

This form is based on the Traffic Signal Warrants from the 2003 Edition of the Manual on Uniform Traffic Control Devices published by the Federal Highway Administration

Location: DE Roue 8 @ Chestnut Grove Road / Nault Road **Date:** June 4, 2012

County: Kent **Analyst:** BJS

FORM NAVIGATION

Click on the links below to navigate to a particular location in this form

Intersection Characteristics
Volume Input
Warrant 1 *Eight-Hour Vehicular Volume*
Warrant 2 *Four-Hour Vehicular Volume*
Warrant 3 *Peak Hour*
Warrant 4 *Pedestrian Volume*
Warrant 5 *School Crossing*
Warrant 6 *Coordinated Signal System*
Warrant 7 *Crash Experience*
Warrant 8 *Roadway Network*

INTERSECTION CHARACTERISTICS

Major Road Name: DE Route 8 **Orientation:** East/West

Minor Road Name: Chestnut Grove Road / Nault Road **Orientation:** North/South

Choose the number of travel lanes on the MAJOR road and MINOR road, respectively.

Major Street Approach	Minor Street Approach
1 Lane	1 Lane

Does the 85th percentile speed of major street traffic or the speed limit exceed 40 MPH?

Please enter the major street 85th-percentile speed or roadway speed limit in the box at right. 50 MPH — YES

Does the intersection lie within the built up area of an isolated community, having a population of less than 10,000? No

INPUT HOURLY AND PEDESTRIAN VOLUMES

Hours	Major Street Volumes				Minor Street Volumes		
	DE Route 8			Peds Crossing	Chestnut Grove Road / Nault Road		
	Eastbound	Westbound	Approach Total	Major Street	Northbound	Southbound	Maximum Volume
7 - 8 AM	553	175	***728***	0	69	44	***69***
8 - 9 AM	443	139	***582***	0	48	34	***48***
9 - 10 AM	383	185	***568***	0	41	41	***41***
10 - 11 AM	352	214	***566***	0	35	33	***35***
11 AM - 12 PM	407	283	***690***	0	47	63	***63***
12 - 1 PM	355	294	***649***	0	29	54	***54***
1 - 2 PM	370	258	***628***	0	38	54	***54***
2 - 3 PM	343	315	***658***	1	39	70	***70***
3 - 4 PM	362	399	***761***	0	43	105	***105***
4 - 5 PM	346	417	***763***	0	46	138	***138***
5 - 6 PM	435	379	***814***	0	40	96	***96***
6 - 7 PM	297	289	***586***	0	27	55	***55***

WARRANT 1 - EIGHT HOUR VEHICULAR VOLUME

The need for a traffic control signal shall be considered if an engineering study finds that Condition A or Condition B is met for each of any 8 hours of an average day.

Condition A

A minimum of **350** vehicles per hour required on the major road and a minimum of **105** vehicles per hour required on the higher volume minor road approach.
A total of **2** hours meet Condition A.

WARRANT 1 IS NOT SATISFIED BY CONDITION A - PROCEED TO CONDITION B

Condition B

A minimum of **525** vehicles per hour required on the major road and a minimum of **53** vehicles per hour required on the higher volume minor road approach.
A total of **9** hours meet Condition B.

WARRANT IS SATISFIED BY CONDITION B

The combination of Conditions A and B is intended for application at locations where Condition A and Condition B are not satisified. The combination of Conditions A and B should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.
The need for a traffic control signal shall be considered if an engineering study finds that both of the following conditions are met for each of any 8 hours of an average day.

Question 1a: Have other alternatives that could cause less delay and inconvenience to traffic been tried at this location? **No**
Question 1b: If the answer to question 1a is yes, have those alternatives failed to correct the traffic problems?

Condition A

A minimum of **280** vehicles per hour required on the major road and a minimum of **84** vehicles per hour required on the higher volume minor road approach.
A total of **N/A** hours meet Condition A.

Condition B

A minimum of **420** vehicles per hour required on the major road and a minimum of **42** vehicles per hour required on the higher volume minor road approach.
A total of **N/A** hours meet Condition B.

A total of **N/A** hours meet the Combination of Condition A and Condition B.

THE COMBINATION OF CONDITIONS A & B IS NOT APPLICABLE TO THIS LOCATION

WARRANT 2 - FOUR HOUR VEHICULAR VOLUME

The Four-Hour Vehicular Volume signal warrant conditions are intended to be applied whre the volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

The need for a traffic control signal shall be considered if an engineering study finds that, for each of any 4 hours of an average day, the plotted points representing the vehicles per hour on the major-street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor-street approach (one direction only) all fall above the applicable curve in the figures below for the existing combination of approach lanes.

Figure 4C-1 - Warrant 2, Four-Hour Vehicular Volume

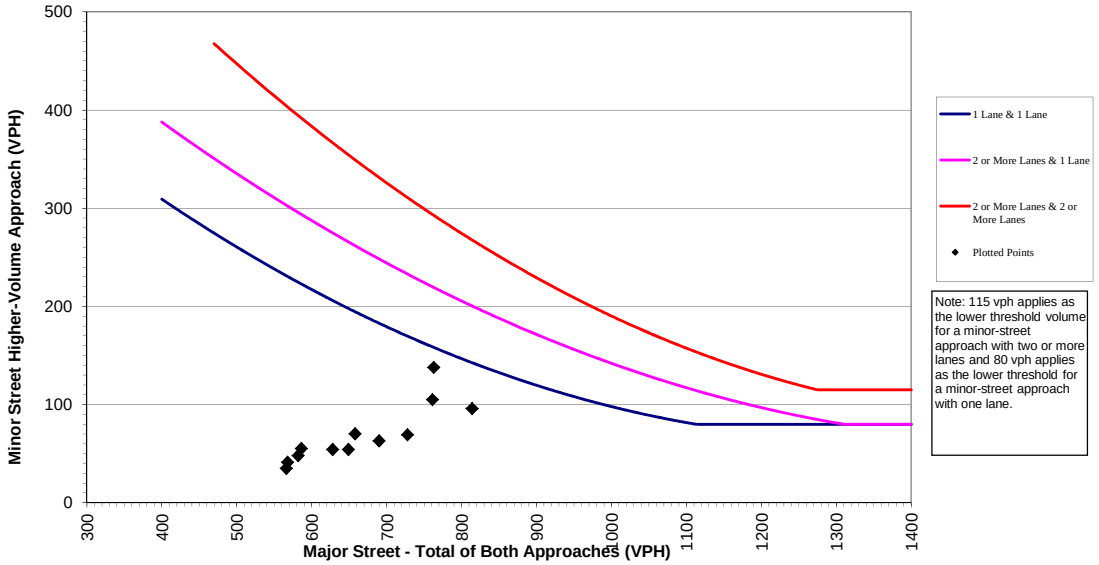
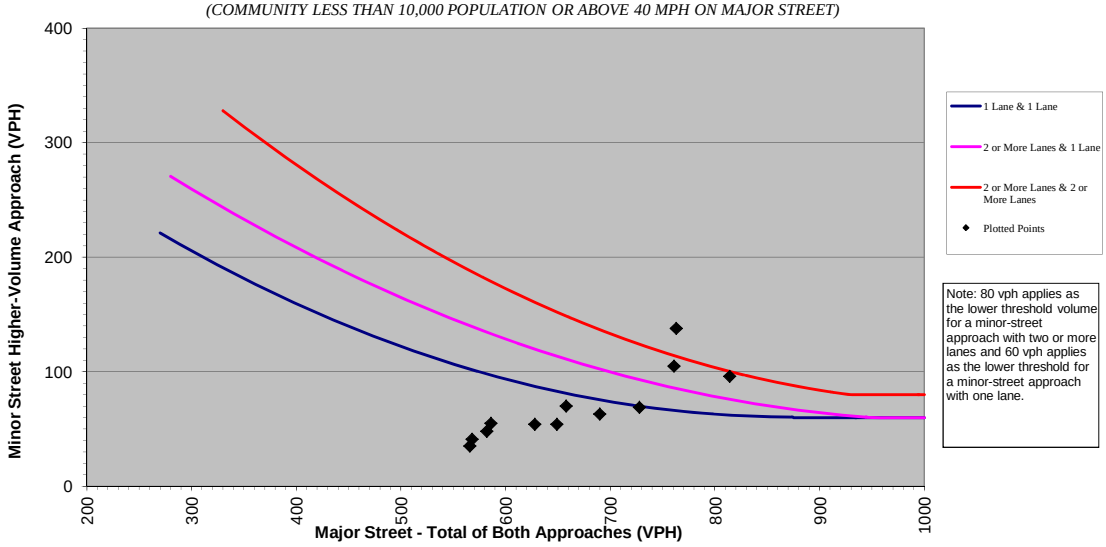


Figure 4C-2 - Warrant 2, Four-Hour Vehicular Volume (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



Enter the number of points that lie above the applicable curve in either Figure 4C-1 or Figure 4C-2 | **4**

WARRANT 2 IS SATISFIED - PROCEED TO WARRANT 3

WARRANT 3 - PEAK HOUR

The Peak Hour signal warrant ins intended for use at a location where traffic conditions are such that for a minimum of 1 hour of an average day, the minor-street traffic suffers undue delay when entering or crossing the major street.

This signal warrant shall be applied only in unusual cases, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

	Is this location an "unusual case" such as an office complex, manufacturing plant, industrial complex or high-occupancy vehicle facility that attracts or discharges large numbers of vehicles over a short time?	NO

Warrant 3 is not applicable to this intersection - Proceed to Warrant 4

The need for a traffic control signal shall be considered if an engineering study finds that the criteria in either of the following two categories are met:

Category A:	If all three of the following conditions exist for the same 1 hour (any four consecutive 15-minute periods) of an average day:	
Question 1:	Does the total stopped time delay experienced by the traffic on one minor-street approach (one direction only) that is controlled by a STOP sign equal or exceed: 4 vehicle-hours for a one-lane approach; or 5 vehicle-hours for a two-lane approach?	

NOTE: Delay must be determined from the completion of a STOP sign delay study performed in the field. Delay values from typical capacity analyses are not acceptable.

Question 2:	Does the volume on the same minor-street approach (one direction only) equal or exceed 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes?	
Question 3:	Does the total entering volume serviced during the hour equal or exceed 650 vehicles per hour for an intersection with three approaches or 800 vehicles per hour for intersections with four or more approaches?	
Category B:	Does the plotted point representing the vehicles per hour on the major-street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor-street approach (one direction only) for 1 hour (any four consecutive 15-minute periods) of an average day fall above the applicable curve in Figure 4C-3 or Figure 4C-4, below, for the existing combination of approach lanes?	YES

Figure 4C-3 - Warrant 3, Peak Hour

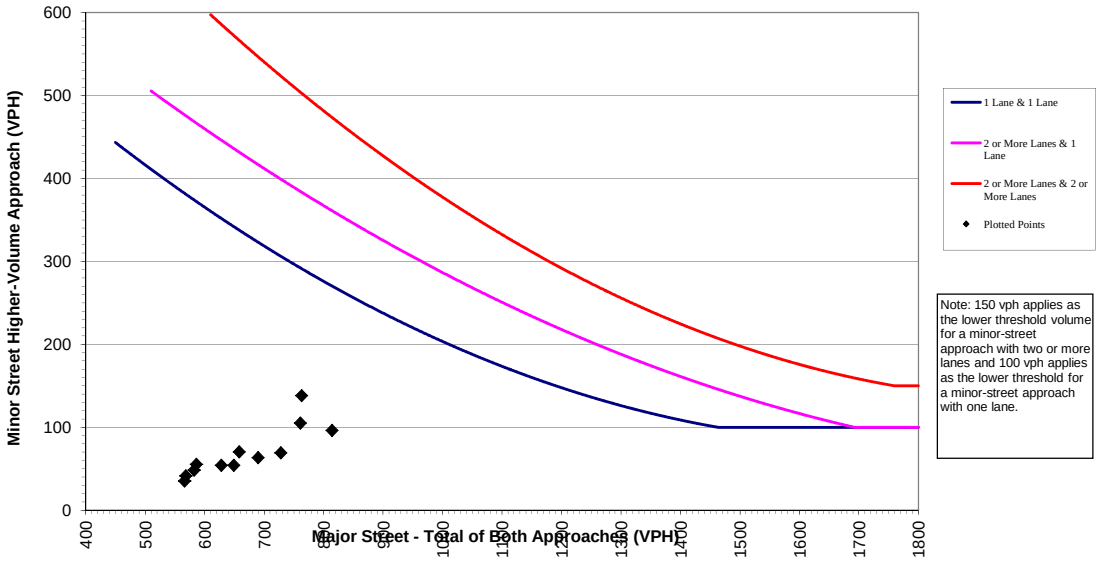
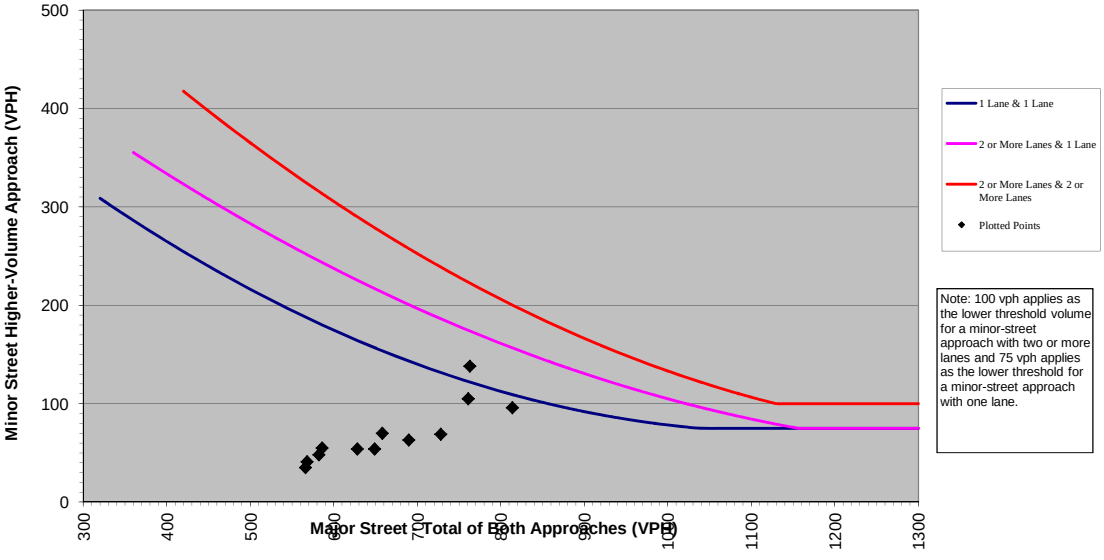


Figure 4C-4 - Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



	Enter the number of points that lie above the applicable curve in either Figure 4C-3 or Figure 4C-4	1

WARRANT 3 IS NOT APPLICABLE TO THIS INTERSECTION - PROCEED TO WARRANT 4

WARRANT 4 - PEDESTRIAN VOLUME

The Pedestrian Volume signal warrant is intended for application where the traffic volume on a major street is so heavy that pedestrians experience excessive delay in crossing the major street.

The Pedestrian Volume signal warrant shall not be applied at locations where the distance to the nearest traffic control signal along the major street is less than 300 ft (90 m), unless the proposed traffic control signal will not restrict the progressive movement of traffic.

Question 1a:	What is the distance to the nearest traffic control signal along the major street?	10000
Question 1b:	If the proposed signal is less than 300 feet from the nearest existing signal on the major street, will the proposed signal restrict the progressive movement of traffic?	NO

Proceed to next step

The need for a traffic control signal at an intersection or midblock crossing shall be considered if an engineering study finds that both of the following criteria are met:

Criteria A:	Does the pedestrian volume crossing the major street at an intersection or midblock location during an average day equal 100 or more for each of any 4 hours or 190 or more during any 1 hour?	NO
Criteria B:	Are there fewer than 60 gaps per hour in the traffic stream of adequate length to allow pedestrians to cross during the same period when the pedestrian volume criterion is satisfied? *Where there is a divided street having a median of sufficient width for pedestrians to wait, the requirement applies separately to each direction of vehicular traffic .*	gaps/hour

NOTE: Gaps in vehicular traffic must be determined by performing a gap study in the field.

WARRANT 4 IS NOT SATISFIED - PROCEED TO WARRANT 5

WARRANT 5 - SCHOOL CROSSING

The School Crossing signal warrant is intended for applications where the fact that school children cross the major street is the principal reason to consider installing a traffic control signal.

Question 1:	Is the study intersection within an established school zone?	NO

Warrant 5 is not applicable to this location - Proceed to Warrant 6

The School Crossing signal warrant shall not be applied at locations where the distance to the nearest traffic control signal along the major street is less than 300 ft (90 m), unless the proposed traffic control signal will not restrict the progressive movement of traffic.

Question 2a:	What is the distance to the nearest traffic control signal along the major street?	
Question 2b:	If the proposed signal is less than 300 feet from the nearest existing signal on the major street, will the proposed signal restrict the progressive movement of traffic?	

The need for a traffic control signal shall be considered when an engineering study of the frequency and adequacy of gaps in the vehicular traffic stream as related to the number and size of groups of school children at an established school crossing across the major street shows that the number of adequate gaps in the traffic stream during the period when the children are using the crossing is less than the number of minutes in the same period (see Section 7A.03 of the MUTCD) and there are a minimum of 20 students during the highest crossing hour.

Question 3a:	What is the number of adequate gaps in the traffic stream during the period when the children are using the crossing?	
Question 3b:	What is the number of minutes during the same period when the children are using the crossing?	
Question 3c:	What is the number of students during the highest crossing hour?	

WARRANT 5 IS NOT APPLICABLE TO THIS LOCATION - PROCEED TO WARRANT 6

WARRANT 6 - COORDINATED SIGNAL SYSTEM

Progressive movement in a coordinated signal system sometimes necessitates installing traffic control signals at intersections where they would not otherwise be needed in order to maintain proper platooning of vehicles.

Question 1:	Is this unsignalized intersection within a corrdior of signals that operate on a coordinated signal system?	NO

Proceed to Warrant 7

Question 2:	If a signal was installed at this intersection, would the resultant spacing of traffic control signals be less than 1000 feet apart?	

The need for a traffic control signal shall be considered if an engineering study finds that one of the following criteria is met:

Criteria A:	On a one-way street or a street that has traffic predominantly in one direction, are the adjacent traffic control signals so far apart that they do not provide the necessary degree of vehicular platooning?	
Criteria B:	On a two-way street, do the adjacent traffic control signals provide the necessary degree of platooning?	
Question 3:	Will the proposed and adjacent traffic control signals collectively provide a progressive operation?	

WARRANT 6 IS NOT APPLICABLE TO THIS INTERSECTION - PROCEED TO WARRANT 7

WARRANT 7 - CRASH EXPERIENCE

The Crash Experience signal warrant conditions are intended for application where the severity and frequency of crashes are the principal reasons to consider installing a traffic control signal.

The need for a traffic control signal shall be considered if an engineering study finds that all of the following criteria are met:

Criteria A:	Has an adequate trial of alternatives with satisfactory observance and enforcement failed to reduce the crash frequency?		No
	If answer to Criteria A is YES, please list the failed alternatives below:		
	_____ _____ _____		
	_____ _____ _____		
Criteria B:	Has five (5) or more crashes, of types susceptible to correction by a traffic control signal, occurred within a 12-month period? Each crash must involve personal injury or property damage exceeding the applicable requirements for a reportable crash.		YES
	Number of crashes of types susceptible to correction by a traffic control signal occurring within a 12-month period.	5	
Criteria C:	Are 80% of the requirements of Warrant 1 or Warrant 4 met?		YES

WARRANT 7 IS NOT SATISFIED - PROCEED TO WARRANT 8

WARRANT 8 - ROADWAY NETWORK

Installing a traffic control signal at some intersections might be justified to encourage concentration and organization of traffic flow on a roadway network.

Question 1:	**In order for this warrant to be applicable to the study intersection, the study intersection must be the junction of two (2) or more major routes. A major route as used in this signal warrant shall have one or more of the following characteristics:**		
Criteria A:	Is each route part of the street or highway system tat serves as the principal roadway network for through traffic flow?		No
Criteria B:	Does each route include rural or suburban highways outside, entering or traversing a City?		
Criteria C:	Does each route appear as a major route on an official plan, such as a major street plan in an urban area traffic and transportation study?		No

The study intersection is not the junction of two or more major routes - Warrant 8 is not applicable to this intersection, Proceed to the end of the worksheet

The need for a traffic control signal shall be considered if an engineering study finds that the common intersection of two or more major routes meets one or both of the following criteria:

Criteria A:	Does the intersection have a total existing, or immediately projected, entering volume of at least 1,000 vehicles per hour during the peak hour of a typical weekday and have a 5-year preojcted traffic volume, based on an engineering study, that meets one or more of Warrants 1, 2, and 3 during an average weekday?	No
Criteria B:	Does the intersection have a total existing, or immediately projected entering volume of at least 1,000 vehicles per hour for each of any 5 hours of a nonnormal business day (Saturday or Sunday)?	No

WARRANT 8 IS NOT APPLICABLE

APPENDIX E

Site Photographs



1) DE Route 8 looking West toward Chestnut Grove Road / Nault Road



2) DE Route 8 looking East toward Chestnut Grove Road / Nault Road



3) Chestnut Grove Road Looking South Toward DE Route 8



4) Nault Road Looking North Toward DE Route 8



5) Southbound Chestnut Grove Road Looking Left (East)



6) Southbound Chestnut Grove Road Looking Right (West)



7) Northbound Nault Road Looking Left (West)



8) Northbound Nault Road Looking Right (East)

APPENDIX H

Sample Highway Safety Manual Predictive Method

Chapter 10: Predictive Method for Rural Two-Lane, Two-Way Roads

Site Conditions

Approach	Functional Classification	AADT (veh/day)
DE 42/Seven Hickories Road	Rural Major Collector	7,711
DE 15/Brenford Road	Rural Major Collector	2,171
Seeneytown Road	Rural Local	1,688

Intersection Skew: 90°
Left Turn Lanes: SB Brenford Road
Right Turn Lanes: None
Lighting: SW and SE quadrants
Analysis Year: 2012

Predictive Model for Intersections (Equation 10-3):

$$N_{predicted,int} = N_{SPF,int} \times C_i \times (CMF_{1i} \times CMF_{2i} \times CMF_{3i} \times CMF_{4i})$$

Safety Performance Function for Four-Leg, Stop-Controlled Intersections (Equation 10-9):

$$N_{SPF,4ST} = exp[-8.56 + 0.60 \times ln(AADT_{maj}) + 0.61 \times ln(AADT_{min})]$$

NOTE: Since side streets have two different AADT volumes, use the greater value.

$$N_{SPF,4ST} = exp[-8.56 + 0.60 \times ln(7,711) + 0.61 \times ln(2,171)]$$
$$N_{SPF,4ST} = 4.47\ crashes/year$$

Inclusion of Crash Modification Factors (CMFs):

Skew (Base Condition = 90°):
$$CMF_{1i} = exp(0.0054 \times skew)$$
$$CMF_{1i} = 1.00$$

Left Turn Lanes (Base Condition = None)
NOTE: Left turn lanes on side street approaches have no effect on the CMF, therefore it can be disregarded.

$$CMF_{2i} = 1.00$$

Right Turn Lanes (Base Condition = None)
$$CMF_{3i} = 1.00$$

Lighting (Base Condition = None)

$$CMF_{4i} = 1 - 0.38 \times p_{ni}$$
$$CMF_{4i} = 1 - 0.38 \times 0.244 \quad \textbf{(Table 10-15)}$$
$$CMF_{4i} = 0.91$$

Inclusion of Calibration Factor (C_i):

$$C_i = 1.00$$

NOTE: DelDOT is in the process of formulating local calibration factors. Until a formal set of calibration factors has been issued by the Department, the value of C_i is assumed to be 1.00.

Inclusion in Predictive Model:

$$N_{predicted,int} = 4.47 \times 1.00 \times (1.00 \times 1.00 \times 1.00 \times 0.91)$$

$$\boxed{N_{predicted,int} = 4.06\ crashes/year}$$

Safety Performance Function for Four-Leg, Signalized Intersections (Equation 10-10):

$$N_{SPF,4SG} = exp[-5.13 + 0.60 \times ln(AADT_{maj}) + 0.20 \times ln(AADT_{min})]$$

NOTE: Since side streets have two different AADT volumes, use the greater value.

$$N_{SPF,4SG} = exp[-5.13 + 0.60 \times ln(7,711) + 0.20 \times ln(2,171)]$$
$$N_{SPF,4SG} = 5.91\ crashes/year$$

Inclusion of Crash Modification Factors (CMFs):

Skew (Base Condition = 90°):
$$CMF_{1i} = exp(0.0054 \times skew)$$
$$CMF_{1i} = 1.00$$

Left Turn Lanes (Base Condition = None)
NOTE: Left turn lanes on side street approaches have no effect on the CMF, therefore it can be disregarded.

$$CMF_{2i} = 1.00$$

Right Turn Lanes (Base Condition = None)
$$CMF_{3i} = 1.00$$

Lighting (Base Condition = None)
$$CMF_{4i} = 1 - 0.38 \times p_{ni}$$
$$CMF_{4i} = 1 - 0.38 \times 0.286 \quad \textbf{(Table 10-15)}$$
$$CMF_{4i} = 0.89$$

Inclusion of Calibration Factor (C_i):
$$C_i = 1.00$$

Inclusion in Predictive Model:

$$N_{predicted,int} = 4.47 \times 1.00 \times (1.00 \times 1.00 \times 1.00 \times 0.89)$$

$$\boxed{N_{predicted,int} = 5.26\ crashes/year}$$

Predicted Crash Type Distribution Comparison for All Severities (Table 10-6):

All Severities		Stop-Controlled N = 4.06		Signalized N = 5.26	
	Collision Type	%	# Crashes	%	# Crashes
Single Vehicle Crashes	Animal	1.0%	0.04	0.2%	0.01
	Bicycle	0.1%	0.00	0.1%	0.01
	Pedestrian	0.1%	0.00	0.1%	0.01
	Overturn	0.5%	0.02	0.3%	0.02
	Run Off Road	12.2%	**0.50**	6.4%	**0.34**
	Other	0.8%	0.03	0.5%	0.03
	Total Single Vehicle Crashes	*14.7%*	*0.60*	*7.6%*	*0.40*
Multi-Vehicle Crashes	Angle	43.1%	**1.75**	27.4%	1.44
	Head On	4.0%	0.16	5.4%	0.28
	Rear End	24.2%	0.98	42.6%	**2.24**
	Sideswipe	10.1%	0.41	11.8%	0.62
	Other	3.9%	0.16	5.2%	0.27
	Total Multi-Vehicle Crashes	*85.3%*	*3.46*	*92.4%*	*4.86*
Total Crashes		***100.0%***	***4.06***	***100.0%***	***5.26***

Chapter 14: Crash Modification Factors (CMFs) for Intersections

Crash Summary, 1/1/2012 to 12/31/2012 (0.1-mile along all legs of intersection)
7 Crashes

5 Property Damage Only
2 Personal Injury
0 Fatality

3 Angle
2 Rear End
1 Left Turn
1 Other (Single Vehicle Crash)

Treatment #1: Convert Four-Leg Stop-Controlled Intersection to Four-Leg Signalized Intersection

Table 14-7: Rural Four-Leg

Crash Type	CMF	# Crashes (2012)	Predicted # Crashes per Year
Right Angle	0.23	3	0.7
Left Turn	0.4	1	0.4
Rear End	1.58	2	3.2
All Types	*0.56*	*7*	***3.9***

By using the CMF method for this specific treatment, we can conclude that this intersection will experience approximately 4 crashes per year.

Treatment #2: Convert Four-Leg Stop-Controlled Intersection to Four-Leg, All-Way Stop Intersection

Table 14-5: Rural, Assume all MUTCD warrants met

Crash Type	CMF	# Crashes (2012)	Predicted # Crashes per Year
All Types	*0.52*	*7*	***3.6***

By using the CMF method for this specific treatment, we can conclude that this intersection will experience approximately 4 crashes per year.

Treatment #3: Convert Four-Leg Stop-Controlled Intersection to Modern Roundabout

Table 14-4: Rural, Assume One-Lane

Crash Type	CMF	# Crashes (2012)	Predicted # Crashes per Year
All Types	*0.29*	*7*	***2.0***

By using the CMF method for this specific treatment, we can conclude that this intersection will experience approximately 2 crashes per year.

Crash Rates for Historical Countermeasures

At the intersection of DE 42 (Seven Hickories Road) & DE 15 (Brenford Road)/Seeneytown Road, two historical crash countermeasures have been implemented:

- Lighting on the southeast and southwest quadrants was installed on 1/5/2009.
- Solar-Powered, Flashing Red Beacons were installed on both STOP signs in the northbound and southbound directions on 11/8/2010.

Base Condition	Countermeasure	Study Period	# Years in Study Period	# Crashes in Study Period	Crash Rate (crashes per year)
No Treatment	Install Lighting	1/5/2006 - 1/5/2009	3.00	8	**2.67**
Lighting	Install Flashing Beacons	1/6/2009 - 11/8/2010	1.84	8	**4.35**
Flashing Beacons	Present	11/9/2010 - 7/19/2013	2.70	16	**5.93**

Chapter 12: Predictive Method for Urban and Suburban Arterials

Site Conditions

Approach	Functional Classification	AADT (veh/day)
South Broad Street	Urban Arterial	7,842
East Green Street	Urban Local	2,000
West Green Street	Urban Local	2,000

- Stop-controlled on side streets
- Intersection Skew: 90°
- Left Turn Lanes: All approaches
- Right Turn Lanes: All approaches
- Lighting: All quadrants
- Analysis Year: 2012
- 2 Bus Stops within 1,000 ft of intersection
- No Schools within 1,000 ft of intersection
- No Alcohol Sales Establishments within 1,000 ft of intersection
- Pedestrian Volume (PedVol): 40 Peds/day
- Maximum # of lanes for pedestrian crossing (n_{lanes}): 6

Determine the predicted number of crashes at the existing stop-controlled intersection and a proposed signalized intersection.

Determine the predicted number of crashes at the existing stop-controlled intersection.

Safety Performance Function for Multi-Vehicle Crashes at Four-Leg, Stop-Controlled Intersections

$$N_{bimv,4ST} = exp[a + b \times ln(AADT_{maj}) + c \times ln(AADT_{min})]$$ **(Equation 12-21)**

NOTE: If side streets have two different AADT volumes, use the greater value.

Use Table 12-10 to find SPF coefficients for 4ST.

$$N_{bimv,4ST} = exp[-8.90 + 0.82 \times ln(7,842) + 0.25 \times ln(2,000)]$$
$$N_{bimv,4ST} = 1.42\ crashes/year$$

If desired, find the number of multi-vehicle crashes based on severity level: Fatal/Injury (FI) and Property Damage Only (PDO). Use Equation 12-21 with appropriate crash severity coefficients from Table 12-10.

Fatal/Injury Crashes

$$N'_{bimv(FI),4ST} = exp[-11.13 + 0.93 \times ln(7,842) + 0.28 \times ln(2,000)]$$
$$N'_{bimv(FI),4ST} = 0.51\ crashes/year$$

Property Damage Only Crashes

$$N'_{bimv(PDO),4ST} = exp[-8.74 + 0.77 \times ln(7,842) + 0.23 \times ln(2,000)]$$
$$N'_{bimv(PDO),4ST} = 0.91\ crashes/year$$

Therefore, in order to assure that $N_{bimv(FI),4ST}$ and $N_{bimv(PDO),4ST}$ sum to $N_{bimv(total),4ST}$,

$$N_{bimv(FI),4ST} = N_{bimv(total),4ST} \times \left(\frac{N'_{bimv(FI)}}{N'_{bimv(FI)} + N'_{bimv(PDO)}}\right)$$ **(Equation 12-22)**

$$N_{bimv(FI),4ST} = 1.42 \times \left(\frac{0.51}{0.51 + 0.91}\right)$$
$$N_{bimv(FI),4ST} = 0.51\ crashes/year$$

And thus,

$$N_{bimv(PDO),4ST} = N_{bimv(total),4ST} - N_{bimv(FI),4ST}$$ **(Equation 12-23)**
$$N_{bimv(PDO),4ST} = 1.42 - 0.51$$
$$N_{bimv(PDO),4ST} = 0.91\ crashes/year$$

Safety Performance Function for Single-Vehicle Crashes at Four-Leg, Stop-Controlled Intersections

$$N_{bisv,4ST} = exp[a + b \times ln(AADT_{maj}) + c \times ln(AADT_{min})] \quad \textbf{(Equation 12-24)}$$

NOTE: If side streets have two different AADT volumes, use the greater value.

Use Table 12-12 to find SPF coefficients for 4ST.

$$N_{bisv,4ST} = exp[-5.33 + 0.33 \times ln(7,842) + 0.12 \times ln(2,000)]$$
$$N_{bisv,4ST} = 0.23\ crashes/year$$

Add results from both crash type totals.

$$N_{SPF,int} = N_{bimv,4ST} + N_{bisv,4ST} \quad \textbf{(Equation 12-7)}$$
$$N_{SPF,int} = 1.42 + 0.23$$
$$N_{SPF,int} = 1.65\ crashes/year$$

If desired, find the number of single-vehicle crashes based on severity level: Fatal/Injury (FI) and Property Damage Only (PDO). Use Equation 12-24 with appropriate crash severity coefficients from Table 12-12.

Fatal/Injury Crashes
***NOTE: No models are available for Fatal/Injury crashes for 4ST. Instead, use:*

$$N_{bisv(FI),4ST} = N_{bisv(total)} \times (f_{bisv}) \quad \textbf{(Equation 12-27)}$$

Where

$$f_{bisv} = proportion\ of\ fatal\ \&\ injury\ crashes\ for\ combined\ sites = 0.28\ for\ 4ST$$

Therefore,

$$N'_{bisv(FI),4ST} = 0.23 \times (0.28)$$
$$N'_{bisv(FI),4ST} = 0.06\ crashes/year$$

Property Damage Only Crashes
$$N'_{bisv(PDO),4ST} = exp[-7.04 + 0.36 \times ln(7,842) + 0.25 \times ln(2,000)]$$
$$N'_{bisv(PDO),4ST} = 0.16\ crashes/year$$

Therefore, in order to assure that $N_{bisv(FI),4ST}$ and $N_{bisv(PDO),4ST}$ sum to $N_{bisv(total),4ST}$,

$$N_{bisv(FI),4ST} = N_{bisv(total),4ST} \times \left(\frac{N'_{bisv(FI)}}{N'_{bisv(FI)}+N'_{bisv(PDO)}}\right)$$ **(Equation 12-25)**

$$N_{bisv(FI),4ST} = 0.23 \times \left(\frac{0.06}{0.06+0.15}\right)$$
$$N_{bisv(FI),4ST} = 0.07\ crashes/year$$

And thus,

$$N_{bisv(PDO),4ST} = N_{bisv(total),4ST} - N_{bisv(FI),4ST}$$ **(Equation 12-23)**
$$N_{bisv(PDO),4ST} = 0.23 - 0.07$$
$$N_{bisv(PDO),4ST} = 0.16\ crashes/year$$

Inclusion of *Intersection* Crash Modification Factors (CMFs):

Intersection Left Turn Lanes (Table 12-24)
NOTE: Left turn lanes on side street approaches have no effect on the CMF for stop-controlled intersections, therefore these two approaches can be disregarded.

$$CMF_{1i} = 0.53$$

Intersection Left-Turn Phasing (Table 12-25)
Note: This CMF is only applicable to signalized intersections. For unsignalized intersections, use 1.00.

$$CMF_{2i} = 1.00$$

Intersection Right Turn Lanes (Table 12-26)
NOTE: Right turn lanes on side street approaches have no effect on the CMF for stop-controlled intersections, therefore these two approaches can be disregarded.

$$CMF_{3i} = 0.74$$

Right Turn on Red
Note: This CMF is only applicable to signalized intersections. For unsignalized intersections, use 1.00.

$$CMF_{4i} = 1.00$$

Lighting (Table 12-27)

$$CMF_{5i} = 1 - 0.38 \times p_{ni}$$ **(Equation 12-36)**
$$CMF_{5i} = 1 - 0.38 \times (0.229)$$
$$CMF_{5i} = 0.91$$

Red-Light Cameras

Note: This CMF is only applicable to signalized intersections. For unsignalized intersections, use 1.00.

$$CMF_{6i} = 1.00$$

**There are no pedestrian-vehicle CMFs for intersection type 4ST. To determine pedestrian and bicycle crash rates for 4ST, use the following:

$$N_{bi} = N_{SPF,int} \times (CMF_{1i} \times \ldots \times CMF_{6i}) \quad \textbf{(Equation 12-6)}$$
$$N_{bi} = (1.65) \times (0.53) \times (1.00) \times (0.74) \times (1.00) \times (0.91) \times (1.00)$$
$$N_{bi} = 0.59\ crashes/year$$

$$N_{pedi} = N_{bi} \times (f_{pedi}) \quad \textbf{(Equation 12-30)}$$

Use Table 12-16 to determine f_{pedi}

$$N_{pedi} = 0.59 \times (0.022)$$
$$N_{pedi} = 0.01\ crashes/year$$

$$N_{bikei} = N_{pedi} \times (f_{bikei}) \quad \textbf{(Equation 12-31)}$$

Use Table 12-17 to determine f_{bikei}

$$N_{bikei} = 0.01 \times (0.018)$$
$$N_{bikei} = 0.00\ crashes/year$$

Inclusion of Calibration Factor C_i :

$$C_i = 1.00$$

NOTE: DelDOT is in the process of formulating local calibration factors. Until a formal set of calibration factors has been issued by the Department, the value of C_i is assumed to be 1.00.

Inclusion in Predictive Model:

$$N_{predicted,int} = C_i \times (N_{bi} + N_{pedi} + N_{bikei}) \quad \textbf{(Equation 12-5)}$$
$$N_{predicted,int} = 1.00 \times (0.59 + 0.01 + 0.00)$$

$$\boxed{N_{predicted,int} = 0.60\ crashes/year}$$

***Determine the predicted number of crashes at the intersection, should a signal be installed.*

Safety Performance Function for Multi-Vehicle Crashes at Four-Leg, Signalized Intersections

$$N_{bimv,4SG} = exp[a + b \times ln(AADT_{maj}) + c \times ln(AADT_{min})]$$ **(Equation 12-21)**

NOTE: If side streets have two different AADT volumes, use the greater value.

Use Table 12-10 to find SPF coefficients for 4SG.

$$N_{bimv,4SG} = exp[-10.99 + 1.07 \times ln(7,842) + 0.23 \times ln(2,000)]$$
$$N_{bimv,4SG} = 1.42\ crashes/year$$

If desired, find the number of multi-vehicle crashes based on severity level: Fatal/Injury (FI) and Property Damage Only (PDO). Use Equation 12-21 with appropriate crash severity coefficients from Table 12-10.

Fatal/Injury Crashes

$$N'_{bimv(FI),4SG} = exp[-13.14 + 1.18 \times ln(7,842) + 0.22 \times ln(2,000)]$$
$$N'_{bimv(FI),4SG} = 0.44\ crashes/year$$

Property Damage Only Crashes

$$N'_{bimv(PDO),4SG} = exp[-11.02 + 1.02 \times ln(7,842) + 0.24 \times ln(2,000)]$$
$$N'_{bimv(PDO),4SG} = 0.98\ crashes/year$$

Therefore, in order to assure that $N_{bimv(FI),4SG}$ and $N_{bimv(PDO),4SG}$ sum to $N_{bimv(total),4SG}$,

$$N_{bimv(FI),4SG} = N_{bimv(total),4SG} \times \left(\frac{N'_{bimv(FI)}}{N'_{bimv(FI)} + N'_{bimv(PDO)}}\right)$$ **(Equation 12-22)**

$$N_{bimv(FI),4SG} = 1.42 \times \left(\frac{0.44}{0.44 + 0.98}\right)$$
$$N_{bimv(FI),4SG} = 0.44\ crashes/year$$

And thus,

$$N_{bimv(PDO),4SG} = N_{bimv(total),4SG} - N_{bimv(FI),4SG}$$ **(Equation 12-23)**
$$N_{bimv(PDO),4SG} = 1.42 - 0.44$$
$$N_{bimv(PDO),4SG} = 0.98\ crashes/year$$

Safety Performance Function for Single-Vehicle Crashes at Four-Leg, Signalized Intersections

$$N_{bisv,4SG} = exp[a + b \times ln(AADT_{maj}) + c \times ln(AADT_{min})] \quad \textbf{(Equation 12-24)}$$

NOTE: If side streets have two different AADT volumes, use the greater value.

Use Table 12-12 to find SPF coefficients for 4SG.

$$N_{bisv,4SG} = exp[-10.21 + 0.68 \times ln(7,842) + 0.27 \times ln(2,000)]$$
$$N_{bisv,4SG} = 0.13\ crashes/year$$

Add results from both crash types.

$$N_{SPF,int} = N_{bimv,4SG} + N_{bisv,4SG} \quad \textbf{(Equation 12-7)}$$
$$N_{SPF,int} = 1.42 + 0.13$$
$$N_{SPF,int} = 1.55\ crashes/year$$

If desired, find the number of single-vehicle crashes based on severity level: Fatal/Injury (FI) and Property Damage Only (PDO). Use Equation 12-24 with appropriate crash severity coefficients from Table 12-12.

Fatal/Injury Crashes

$$N'_{bisv(FI),4SG} = exp[-9.25 + 0.43 \times ln(7,842) + 0.29 \times ln(2,000)]$$
$$N'_{bisv(FI),4SG} = 0.04\ crashes/year$$

Property Damage Only Crashes

$$N'_{bisv(PDO),4SG} = exp[-11.34 + 0.78 \times ln(7,842) + 0.25 \times ln(2,000)]$$
$$N'_{bisv(PDO),4SG} = 0.09\ crashes/year$$

Therefore, in order to assure that $N_{bisv(FI),4SG}$ and $N_{bisv(PDO),4SG}$ sum to $N_{bisv(total),4SG}$,

$$N_{bisv(FI),4SG} = N_{bisv(total),4SG} \times \left(\frac{N'_{bisv(FI)}}{N'_{bisv(FI)} + N'_{bisv(PDO)}}\right) \quad \textbf{(Equation 12-25)}$$

$$N_{bisv(FI),4SG} = 0.13 \times \left(\frac{0.04}{0.04 + 0.09}\right)$$
$$N_{bisv(FI),4SG} = 0.04\ crashes/year$$

And thus,

$$N_{bisv(PDO),4SG} = N_{bisv(total),4SG} - N_{bisv(FI),4SG} \quad \textbf{(Equation 12-23)}$$

$N_{bisv(PDO),4SG} = 0.13 - 0.04$
$N_{bisv(PDO),4SG} = 0.09\ crashes/year$

Inclusion of *Intersection* Crash Modification Factors (CMFs):

Intersection Left Turn Lanes (Table 12-24)

$CMF_{1i} = 0.66$

Intersection Left-Turn Phasing (Table 12-25)
Note: Protected/Permissive left-turn phasing is assumed for this intersection.

$CMF_{2i} = 0.99$

Intersection Right Turn Lanes (Table 12-26)

$CMF_{3i} = 0.85$

Right Turn on Red
Note: Assume right turns on red are permitted on all approaches.

$CMF_{4i} = 1.00$

Lighting (Table 12-27)

$CMF_{5i} = 1 - 0.38 \times p_{ni}$ **(Equation 12-36)**
$CMF_{5i} = 1 - 0.38 \times (0.235)$
$CMF_{5i} = 0.91$

Red-Light Cameras
Note: Assume no red-light cameras will be in use at this intersection.

$CMF_{6i} = 1.00$

Therefore,

$N_{bi} = N_{SPF,int} \times (CMF_{1i} \times \ldots \times CMF_{6i})$ **(Equation 12-6)**
$N_{bi} = 1.55 \times (0.66 \times 0.99 \times 0.85 \times 1.00 \times 0.91 \times 1.00)$
$N_{bi} = 0.78\ crashes/year$

Inclusion of *Pedestrian* Crash Modification Factors (CMFs):

Bus Stops (Table 12-28)

$$CMF_{1p} = 2.78$$

Schools (Table 12-29)

$$CMF_{2p} = 1.00$$

Alcohol Sales Establishments (Table 12-30)

$$CMF_{3p} = 1.00$$

To determine pedestrian and bicycle crash rates for 4SG, use the following:

$$N_{pedi} = N_{pedbase} \times CMF_{1p} \times CMF_{2p} \times CMF_{3p}$$ **(Equation 12-28)**

Where: **(Equation 12-29, Table 12-14)**

$$N_{pedbase} = exp(a + b \times ln(AADT_{total}) + c \times ln\left(\frac{AADT_{min}}{AADT_{maj}}\right) + d \times ln(PedVol) + e \times n_{lanes}$$

$$N_{pedbase} = exp(-9.53 + 0.40 \times ln(9,842) + 0.26 \times ln\left(\frac{2,000}{7,842}\right) + 0.45 \times ln(40) + 0.04 \times (6)$$
$$N_{pedbase} = 0.01\ crashes/year$$

Therefore,

$$N_{pedi} = 0.01 \times (2.78) \times (1.00) \times (1.00)$$
$$N_{pedi} = 0.04\ crashes/year$$

And therefore,

$$N_{bikei} = N_{bi} \times f_{bikei}$$ **(Equation 12-31)**

Use Table 12-17 to determine f_{bikei}

$$N_{bikei} = 0.78 \times (0.015)$$
$$N_{bikei} = 0.01\ crashes/year$$

Inclusion of Calibration Factor C_i :

$$C_i = 1.00$$

NOTE: DelDOT is in the process of formulating local calibration factors. Until a formal set of calibration factors has been issued by the Department, the value of C_i is assumed to be 1.00.

Inclusion in Predictive Model:

$$N_{predicted,int} = C_i \times (N_{bi} + N_{pedi} + N_{bikei}) \quad \textbf{(Equation 12-5)}$$
$$N_{predicted,int} = 1.00 \times (0.78 + 0.04 + 0.01)$$

$$\boxed{N_{predicted,int} = 0.83\ crashes/year}$$

Final Results:

$$N_{predicted,int,4ST} = 0.60\ crashes/year$$
$$N_{predicted,int,4SG} = 0.83\ crashes/year$$

APPENDIX I

Guidelines for Conducting CMS Analysis

Note: This form will be regularly updated. View most recent version online.

Formerly Appendix P- Critical Movement Summation (CMS) How-To Guide

P.1 BACKGROUND

The critical movement summation (CMS) method focuses on "raw" intersection capacity, that is, the ability for an intersection to process a given traffic demand with a given lane use configuration and given phase sequence.

Traffic signal phasing is one component of the analysis, but it is important to note that most of the subtleties of traffic signal phasing and operation are not included in the analysis.

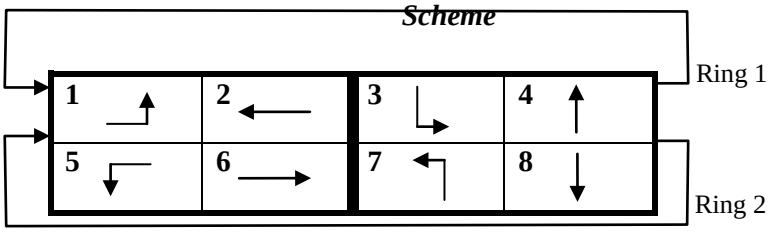
The analyst can use this simple hands-on approach to get right to the point of an intersection's ability to handle traffic demands. CMS looks at each of the "critical" movements at an intersection. It is a volume-based measure.

P.2 PROCESS

Step 1. Gather CMS Inputs

- Hourly Volumes – Use vehicles per hour. If analyzing the peak hour, use the largest sum of 4 consecutive 15-minute periods for that intersection, e.g. 7:45 – 8:45 AM.
- Lane Use Configurations – Determined through observation of existing geometry and operations.
- Signal Phasing – Use National Electrical Manufacturers Association (NEMA) standard 8-phase operation with adjustments as needed. The top line of phasing on the CMS worksheet is intended to show existing phasing. The adjacent line below is workspace intended for conceptual improvements to phasing. See Figure P.1 for a typical NEMA phase numbering schemes.

Figure P-1 Typical Phase numbering Scheme



Step 2. Fill in CMS Worksheet

For each row, fill in the columns:

- Movement (describe in words, e.g. NB through, SB through, EB left, etc.)
- Phase (indicate movement number)
- Volume (in the case of a shared lane, write each volume long-hand, and then sum, e.g. 100 + 150 + 25)
- LU (Lane Use factor, see table at bottom of worksheet.)
- Lane Volume (multiply the Volume by the Lane Use Factor.)
- OL (Opposing Lefts, to be added. See description of Permissive Only Lefts below.)

- LTC (Left Turn Credit, to be subtracted. See description of Concurrent Lefts or Lead/Lead-Lag Left below.)
- Critical Lane Volume (apply OL or LTC to the Lane Volume to get this Critical Lane Volume.)

Step 3. Determine Critical Movements

In the CM column, note the highest of each movement pair (e.g. highest of NB/SB through, highest of NB left/SB left, etc.) with an asterisk*. There should be an asterisk (*) corresponding to each block in the top line of phasing on the CMS worksheet.

Step 4. Sum the Critical Movements

Fill in the "Total" by adding the movements that have asterisks*. Assign a Level of Service (LOS) by using the Level of Service table at the bottom of the CMS worksheet.

P.3 RULES FOR TURNING MOVEMENTS

P.3.1 RIGHT TURNS

If right-turn is "hot" or "free" (i.e. has a dedicated, channelized deceleration and acceleration lanes) and is not signal controlled, leave out of computation.

If right-turn has a dedicated lane and is signal controlled with right-turn-on-red permitted, assume 50% of right-turn volume.

If right-turn has a dedicated lane and is signal controlled with "No right turn on red," assume 100% of right-turn volume.

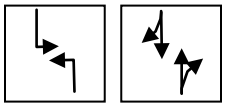
If right-turn has a dedicated lane and is signal controlled for rights to move concurrently with lefts (e.g. NB rights move with WB lefts), reduce the right-turn volume in the amount of the left-turn volume.

If there is a shared through/right lane, add through and right volumes.

P.3.2 LEFT TURNS

Left turns are to be treated as either protected (signalized left-turn arrow) or permissive (no left-turn arrow). If existing condition allows a left-turn movement to be both protected and permissive, analyze as protected (only) in CMS.

P.3.2.1 Concurrent Lefts

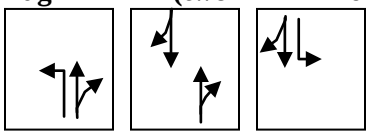


Account for Left Turn Credit (LTC) as follows:

- Calculate lane volumes for left-turn moves
- Apply lane-use factor
- Calculate difference of lefts (e.g. NB/SB lefts or EB/WB lefts)
- Subtract this difference from the through movement that's in the same direction as the greater left-turn volume.

CMS may over or underestimate the impact of left turn traffic on shared left-through-right lane in situations where through opposing volume is high. Additional Analysis (such as the methods of the *Highway Capacity Manual)* may be warranted.

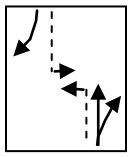
P.3.2.2 Lead Left (one direction), or Lead-Lag (two directions)



Account for Left Turn Credit (LTC) as follows:

- Identify left-turn volume associated with the lead (or lag) phase.
- Apply lane-use factor.
- Subtract that left-turn volume from the through movement on the same approach.

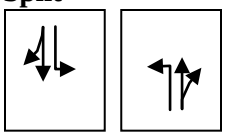
P.3.2.3 Permissive Only Lefts (no left-turn arrow)



Account for Opposing Lefts (OL) as follows:

- Identify left-turn volume that will be awaiting gaps in the through volume. (These lefts are considered "opposing lefts" – opposing the through volume being analyzed.)
- Add that left-turn volume to the opposing through movement.
- The left turns cannot move until the opposing through movement is complete. So you must consider the total of these two movements, since they cannot move simultaneously.

P.3.2.4 Split Phasing



- Left-turn credit (LTC) does not apply.
- Opposing lefts (OL) do not apply.

P.4 SIGNAL TIMING

CMS can be used as a prerequisite to signal timings. The following steps follow CMS to determine cycle length and required green and clearance (yellow and all red) time:

Step 1. Transfer phasing and Critical Lane Volume (CLV) Inputs from CMS worksheet onto the Traffic Signal Timing Worksheet (see Figure P-2)

Step 2. Determine number of vehicles per cycle per phase. The table included in the Traffic Signal Timing Worksheet can be used to determine the number of cycles in an hour (or simply divide 3600 seconds by the cycle length).

Step 3. Determine green time required from Greenshield's model (see Figure P-3)

Step 4. Determine clearance and pedestrian timings.

Step 5. Determine total time required and compare to cycle length.

P.5 CMS SAMPLE EXERCISE PROBLEMS

See Figures P-5 through P-14 for CMS sample exercise problems.

P.6 SIGNAL TIMING SAMPLE EXERCISE PROBLEM

See Figure P-16 for a sample signal timing exercise problem.

Figure P-2 Traffic Signal Timing Worksheet

Location: _____ Date: _____

Cycle Length: _____ Cycles per Hour: _____ Prepared by: _____

Time of Day: _____

Phases	Movement	Critical lane Volume (CLV)	Vehicles per Cycle	Green Time Required (see Greenshield Figure P-3)	Clearance (Red + Yellow)	Walk + Don't Walk

Total Green			
Total Clearance			
Total Time Required			

Cycle Length	Cycles per Hour
45	80
60	60
75	48
90	40
100	36
120	30
150	24
180	20
210	17
240	15

Figure P-3 Traffic Signal Green Time Requirements (Greenshield's Model)

Vehicles per Cycle per lane	Seconds per Vehicle	Cumulative seconds	Vehicles per Cycle per lane	Seconds per Vehicle	Cumulative seconds
1	3.8	3.8	24	2.1	54.1
2	3.1	6.9	25	2.1	56.2
3	2.7	9.6	26	2.1	58.3
4	2.4	12.0	27	2.1	60.4
5	2.2	14.2	28	2.1	62.5
6	2.1	16.3	29	2.1	64.6
7	2.1	18.4	30	2.1	66.7
8	2.1	20.5	31	2.1	68.8
9	2.1	22.6	32	2.1	70.9
10	2.1	24.7	33	2.1	73.0
11	2.1	26.8	34	2.1	75.1
12	2.1	28.9	35	2.1	77.2
13	2.1	31.0	36	2.1	79.3
14	2.1	33.1	37	2.1	81.4
15	2.1	35.2	38	2.1	83.5
16	2.1	37.3	39	2.1	85.6
17	2.1	39.4	40	2.1	87.7
18	2.1	41.5	41	2.1	89.8
19	2.1	43.6	42	2.1	91.9
20	2.1	45.7	43	2.1	94.0
21	2.1	47.8	44	2.1	96.1
22	2.1	49.9	45	2.1	98.2
23	2.1	52.0	46	2.1	100.3

Figure P-4 CMS Blank Sheet

DelDOT

CRITICAL LANE MOVEMENT SUMMATION AND LEVEL OF SERVICE

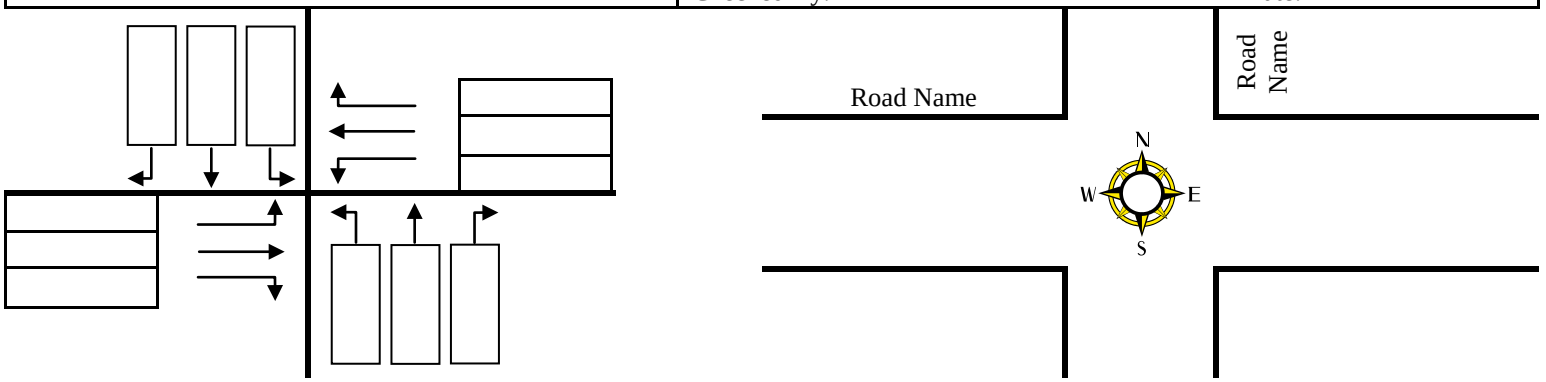
Location: _____

Count Date: _____

Scenario: _____

Computed By: _____ Date: _____

Checked By: _____ Date: _____



Signal Phasing (Φ)

Φ	Movement	Volume		LU	Lane Volume	OL (Add)	LTC (Subtract)	Critical Lane Volume	CM (*)

Remarks:

TOTAL:

LEVEL OF SERVICE:

Level	Critical Movement Volume
A	Less than 1,000 veh/hr
B	1,000 to 1,150 veh/hr
C	1,151 to 1,300 veh/hr
D	1,301 to 1,450 veh/hr
E	1,451 to 1,600 veh/hr
F	More than 1,600 veh/hr

No. of Lanes	Lane Use factor (LU)
1	1.00
2	0.55
3	0.40
4	0.30

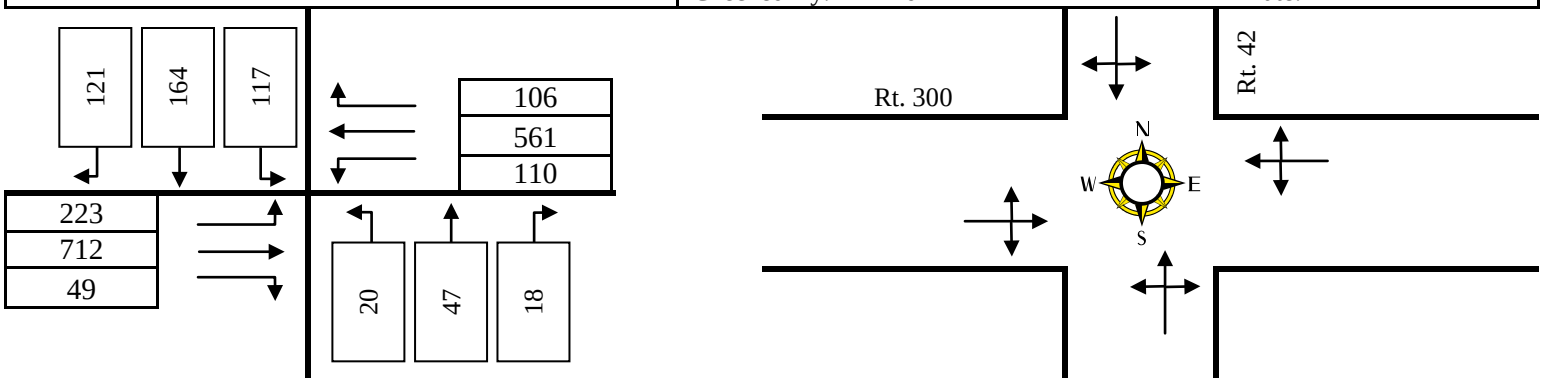
LEGEND	
OL =	Opposing Lefts
LTC =	Left Turn Credit

Figure P-5 CMS Example 1 – Permissive Lefts – Shared Lefts

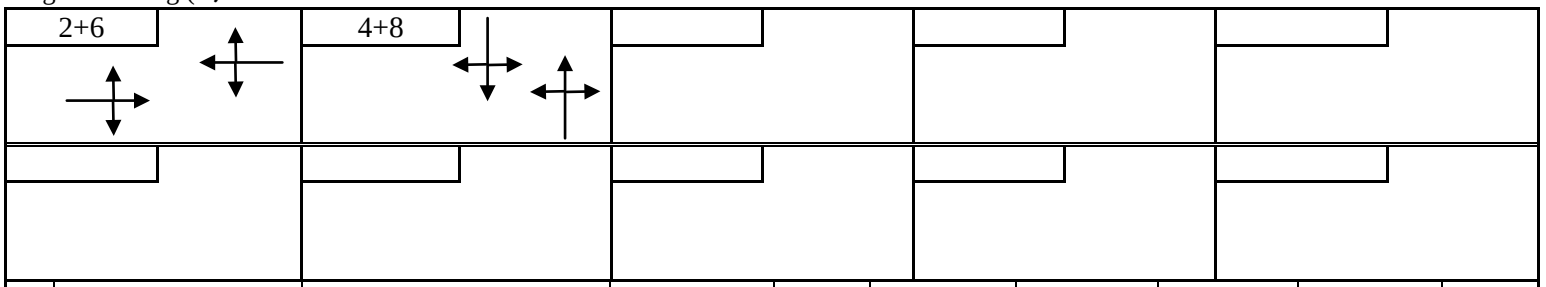
DelDOT

CRITICAL LANE MOVEMENT SUMMATION
AND LEVEL OF SERVICE

Location:	Rt. 300 and Rt. 42		
Count Date:	12/25/2005		
Scenario:	Existing – Permissive Lefts – Shared lefts		
Computed By:	ABC	Date:	01/01/06
Checked By:	JHI	Date:	01/02/06



Signal Phasing (Φ)



Φ	Movement	Volume		LU	Lane Volume	OL (Add)	LTC (Subtract)	Critical Lane Volume	CM (*)
2	Rt. 300 EB.	223+712+49	984	1.00	984	110		1094	*
6	Rt. 300 WB.	110+561+106	777	1.00	777	223		1000	
4	Rt. 42 SB.	117+164+121	402	1.00	402	20		422	*
8	Rt. 42 NB.	20+47+18	85	1.00	85	117		202	

Remarks:

TOTAL:	1516
LEVEL OF SERVICE:	E

Level	Critical Movement Volume
A	Less than 1,000 veh/hr
B	1,000 to 1,150 veh/hr
C	1,151 to 1,300 veh/hr
D	1,301 to 1,450 veh/hr
E	1,451 to 1,600 veh/hr
F	More than 1,600 veh/hr

No. of Lanes	Lane Use factor (LU)
1	1.00
2	0.55
3	0.40
4	0.30

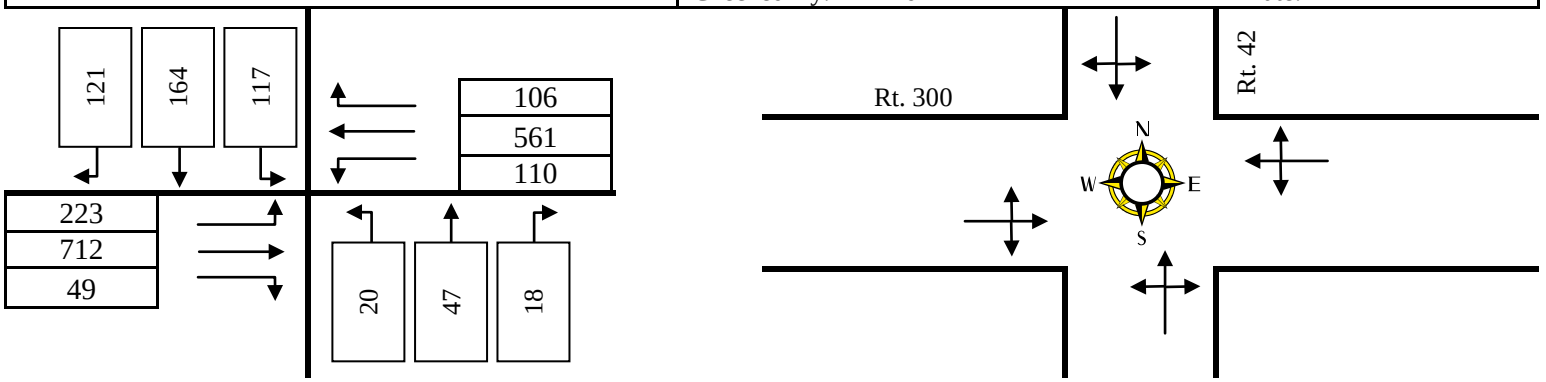
LEGEND	
OL =	Opposing Lefts
LTC =	Left Turn Credit

Figure P-6 CMS Example 2 – Split E-W Phasing – Shared Lefts

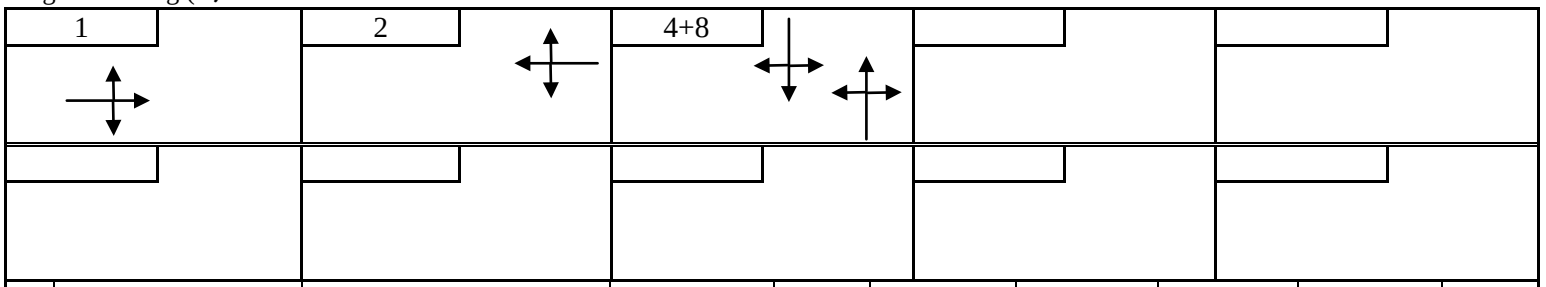
DelDOT

CRITICAL LANE MOVEMENT SUMMATION
AND LEVEL OF SERVICE

Location:	Rt. 300 and Rt. 42		
Count Date:	12/25/2005		
Scenario:	Existing – Split E-W Phasing – Shared lefts		
Computed By:	ABC	Date:	01/01/06
Checked By:	JHI	Date:	01/02/06



Signal Phasing (Φ)



Φ	Movement	Volume		LU	Lane Volume	OL (Add)	LTC (Subtract)	Critical Lane Volume	CM (*)
1	Rt. 300 EB.	223+712+49	984	1.00	984			984	*
2	Rt. 300 WB.	110+561+106	777	1.00	777			777	*
4	Rt. 42 SB.	117+164+121	402	1.00	402	20		422	*
8	Rt. 42 NB.	20+47+18	85	1.00	85	117		202	

Remarks:

TOTAL:	2183
LEVEL OF SERVICE:	F

Level	Critical Movement Volume
A	Less than 1,000 veh/hr
B	1,000 to 1,150 veh/hr
C	1,151 to 1,300 veh/hr
D	1,301 to 1,450 veh/hr
E	1,451 to 1,600 veh/hr
F	More than 1,600 veh/hr

No. of Lanes	Lane Use factor (LU)
1	1.00
2	0.55
3	0.40
4	0.30

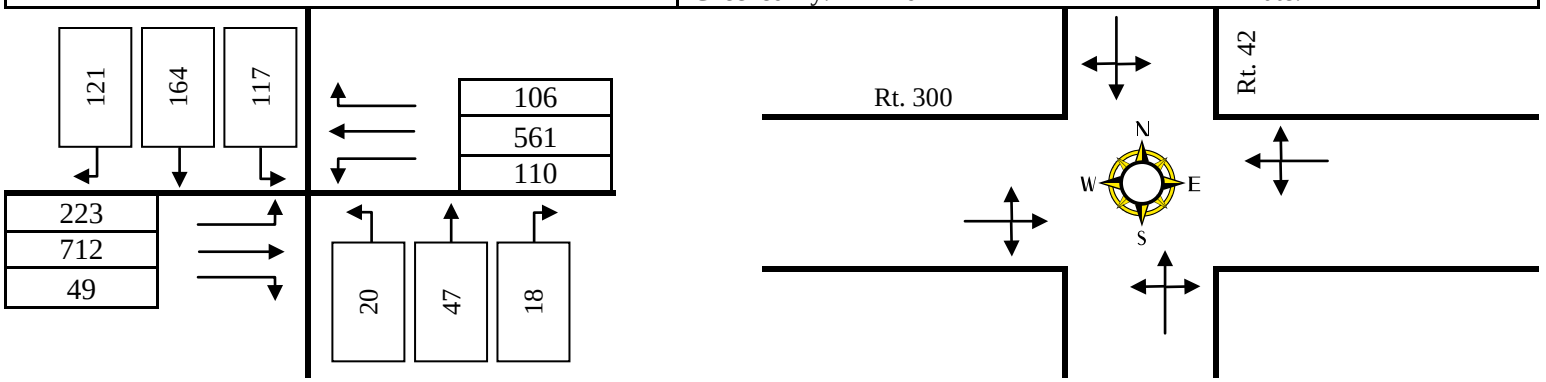
LEGEND	
OL =	Opposing Lefts
LTC =	Left Turn Credit

Figure P-7 CMS Example 3 – Split All Phasing – Shared Lefts

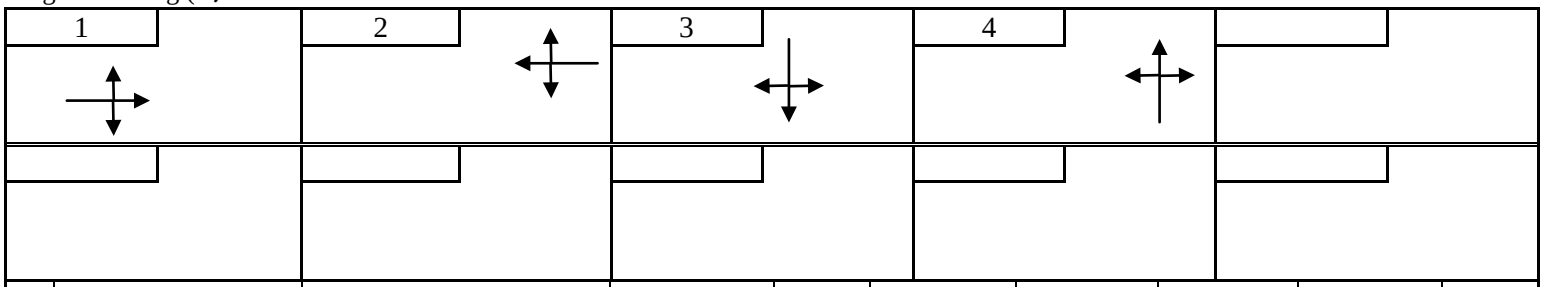
DelDOT

CRITICAL LANE MOVEMENT SUMMATION
AND LEVEL OF SERVICE

Location:	Rt. 300 and Rt. 42		
Count Date:	12/25/2005		
Scenario:	Existing – Split All Phasing - Shared Lefts		
Computed By:	ABC	Date:	01/01/06
Checked By:	JHI	Date:	01/02/06



Signal Phasing (Φ)



Φ	Movement	Volume		LU	Lane Volume	OL (Add)	LTC (Subtract)	Critical Lane Volume	CM (*)
1	Rt. 300 EB.	223+712+49	984	1.00	984			984	*
2	Rt. 300 WB.	110+561+106	777	1.00	777			777	*
3	Rt. 42 SB	117+164+121	402	1.00	402			402	*
4	Rt. 42 NB	20+47+18	85	1.00	85			85	*

Remarks:

TOTAL:	2248
LEVEL OF SERVICE:	F

Level	Critical Movement Volume
A	Less than 1,000 veh/hr
B	1,000 to 1,150 veh/hr
C	1,151 to 1,300 veh/hr
D	1,301 to 1,450 veh/hr
E	1,451 to 1,600 veh/hr
F	More than 1,600 veh/hr

No. of Lanes	Lane Use factor (LU)
1	1.00
2	0.55
3	0.40
4	0.30

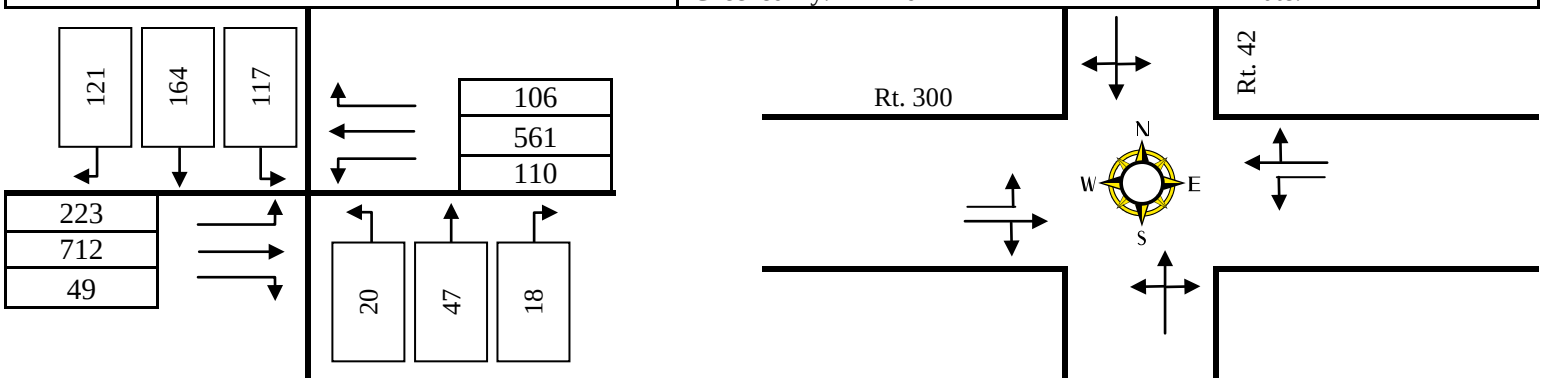
LEGEND	
OL =	Opposing Lefts
LTC =	Left Turn Credit

Figure P-8 CMS Example 4 – Permissive Lefts – Separate Lefts

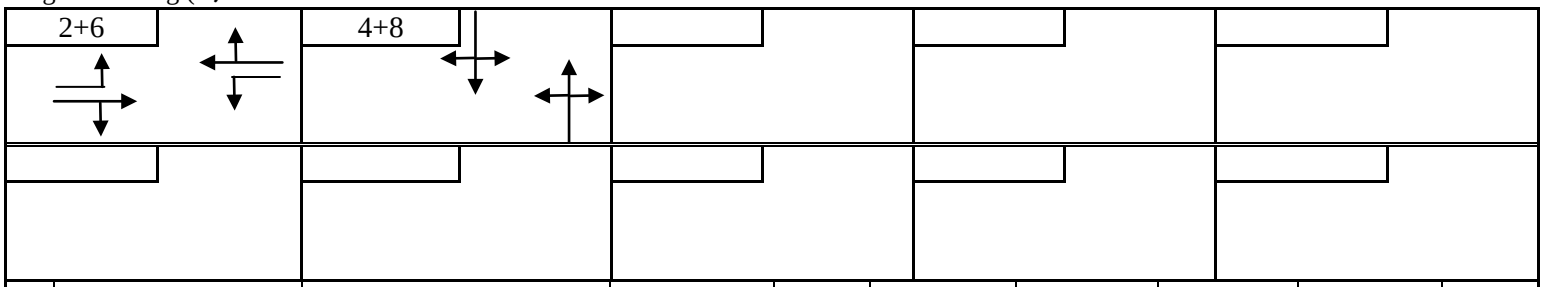
DelDOT

CRITICAL LANE MOVEMENT SUMMATION
AND LEVEL OF SERVICE

Location:	Rt. 300 and Rt. 42		
Count Date:	12/25/2005		
Scenario:	Existing – Permissive Lefts - Separate Lefts		
Computed By:	ABC	Date:	01/01/06
Checked By:	JHI	Date:	01/02/06



Signal Phasing (Φ)



Φ	Movement	Volume		LU	Lane Volume	OL (Add)	LTC (Subtract)	Critical Lane Volume	CM (*)
2	Rt.300 EB.	712+49	761	1.00	761	110		871	
6	Rt. 300 WB.	561+106	667	1.00	667	223		890	*
4	Rt. 42 SB	117+164+121	402	1.00	402	20		422	*
8	Rt. 42 NB	20+47+18	85	1.00	85	117		202	

Remarks:

TOTAL:	1312
LEVEL OF SERVICE:	D

Level	Critical Movement Volume
A	Less than 1,000 veh/hr
B	1,000 to 1,150 veh/hr
C	1,151 to 1,300 veh/hr
D	1,301 to 1,450 veh/hr
E	1,451 to 1,600 veh/hr
F	More than 1,600 veh/hr

No. of Lanes	Lane Use factor (LU)
1	1.00
2	0.55
3	0.40
4	0.30

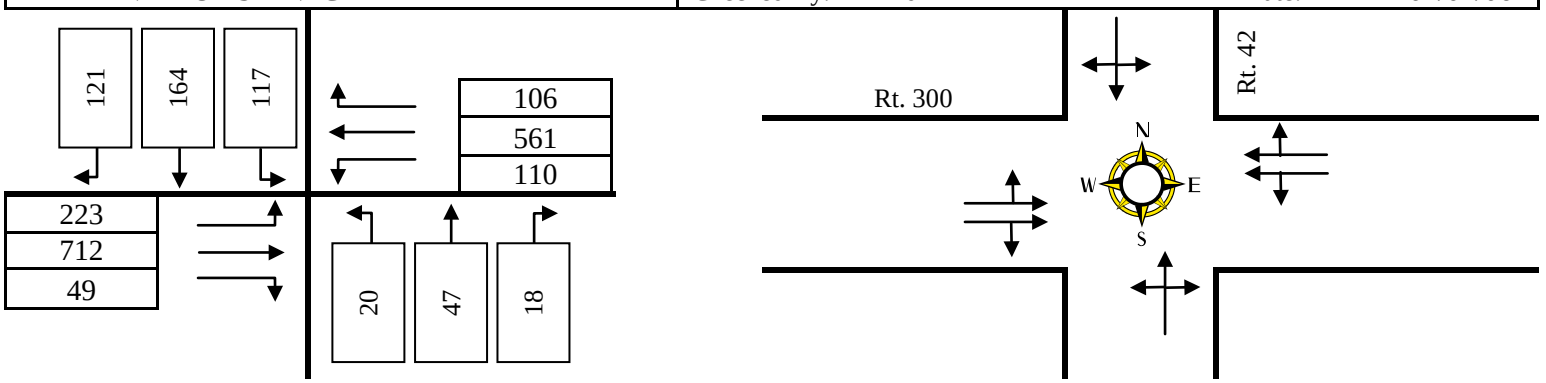
LEGEND	
OL =	Opposing Lefts
LTC =	Left Turn Credit

Figure P-9 CMS Example 5 – Permissive Lefts – Two Throughs and a Shared Left

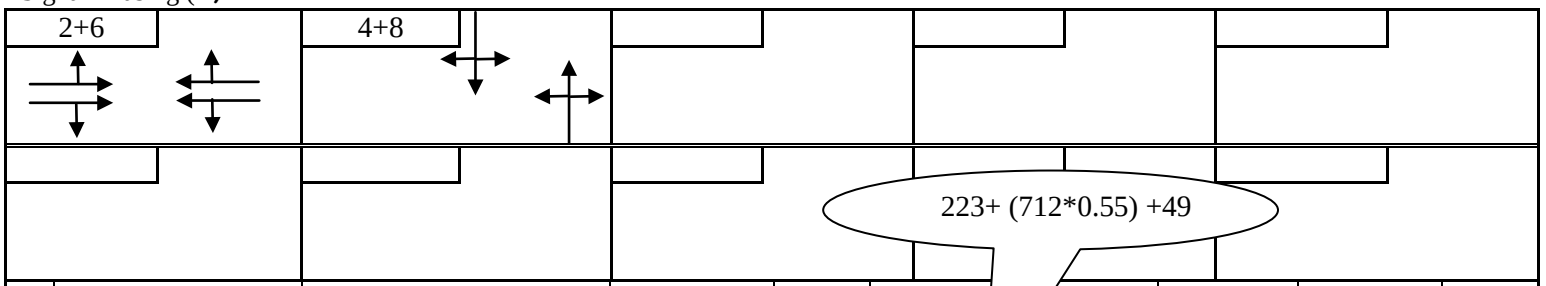
DelDOT

CRITICAL LANE MOVEMENT SUMMATION AND LEVEL OF SERVICE

Location:	Rt. 300 and Rt. 42		
Count Date:	12/25/2005		
Scenario:	Existing – Permissive Lefts – Two Throughs and a Shared Left		
Computed By:	ABC	Date:	01/01/06
Checked By:	JHI	Date:	01/02/06



Signal Phasing (Φ)



223+ (712*0.55) +49

110+ (561*0.55) +106

Φ	Movement	Volume		LU	Lane Volume	OL (Add)	LTC (Subtract)	Critical Lane Volume	CM (*)
2	Rt.300 EB.				664	110		774	*
6	Rt. 300 WB.				525	223		748	
4	Rt. 42 SB	117+164+121	402	1.00	402	20		422	*
8	Rt. 42 NB	20+47+18	85	1.00	85	117		202	
Remarks:						TOTAL:		1196	
						LEVEL OF SERVICE:		C	

Level	Critical Movement Volume
A	Less than 1,000 veh/hr
B	1,000 to 1,150 veh/hr
C	1,151 to 1,300 veh/hr
D	1,301 to 1,450 veh/hr
E	1,451 to 1,600 veh/hr
F	More than 1,600 veh/hr

No. of Lanes	Lane Use factor (LU)
1	1.00
2	0.55
3	0.40
4	0.30

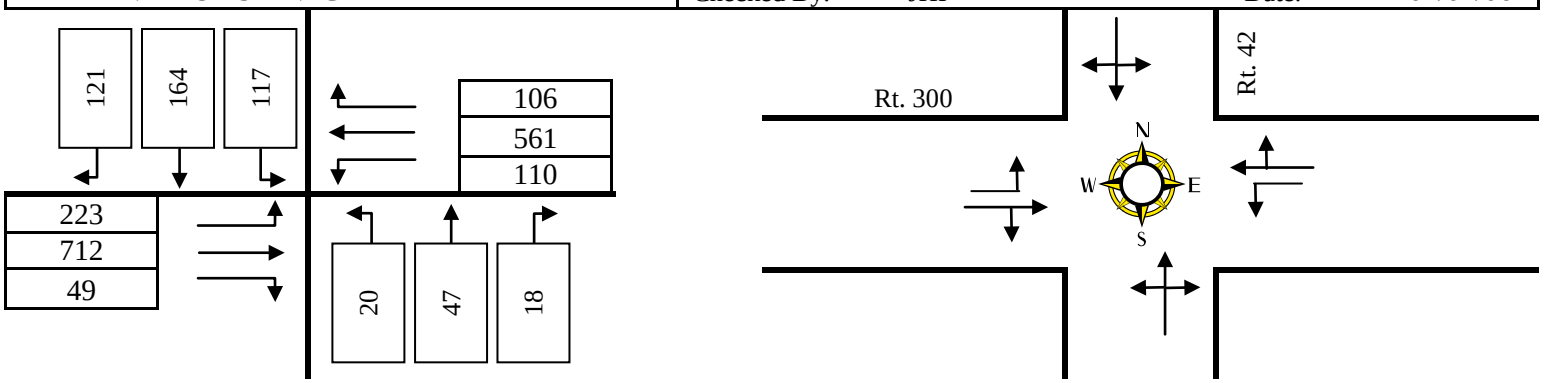
LEGEND	
OL =	Opposing Lefts
LTC =	Left Turn Credit

Figure P-10 CMS Example 6 – Protected Lefts – Separate Lefts

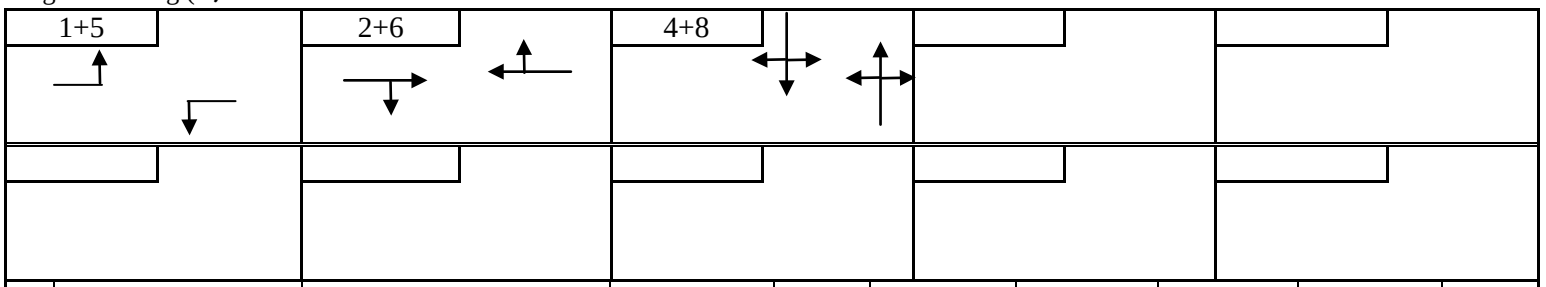
DelDOT

CRITICAL LANE MOVEMENT SUMMATION
AND LEVEL OF SERVICE

Location:	Rt. 300 and Rt. 42
Count Date:	12/25/2005
Scenario:	Existing – Protected Lefts – Separate Lefts
Computed By:	ABC Date: 01/01/06
Checked By:	JHI Date: 01/02/06



Signal Phasing (Φ)



Φ	Movement	Volume		LU	Lane Volume	OL (Add)	LTC (Subtract)	Critical Lane Volume	CM (*)
1	Rt. 300 WB.	110	110	1.00	110			110	
5	Rt.300 EB.	223	223	1.00	223			223	*
2	Rt.300 EB.	712+49	761	1.00	761		113	648	
6	Rt. 300 WB.	561+106	667	1.00	667			667	*
4	Rt. 42 SB	117+164+121	402	1.00	402	20		422	*
8	Rt. 42 NB	20+47+18	85	1.00	85	117		202	

Remarks:

TOTAL:	1312
LEVEL OF SERVICE:	D

Level	Critical Movement Volume
A	Less than 1,000 veh/hr
B	1,000 to 1,150 veh/hr
C	1,151 to 1,300 veh/hr
D	1,301 to 1,450 veh/hr
E	1,451 to 1,600 veh/hr
F	More than 1,600 veh/hr

No. of Lanes	Lane Use factor (LU)
1	1.00
2	0.55
3	0.40
4	0.30

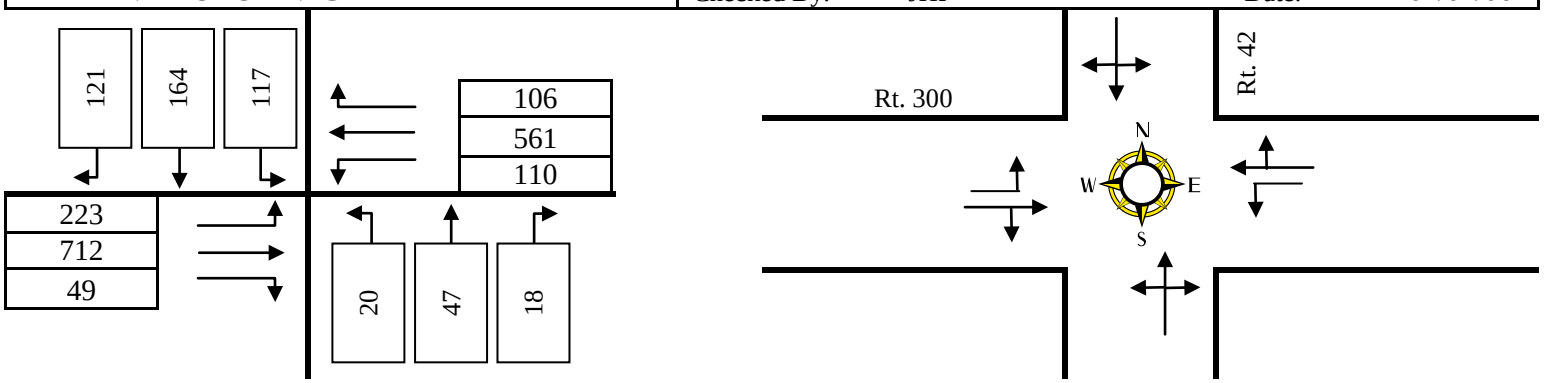
LEGEND	
OL =	Opposing Lefts
LTC =	Left Turn Credit

Figure P-11 CMS Example 7 – Split EW – Separate Lefts

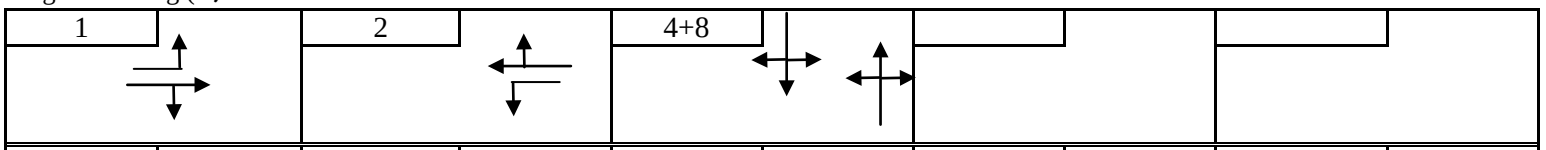
DelDOT

CRITICAL LANE MOVEMENT SUMMATION
AND LEVEL OF SERVICE

Location:	Rt. 300 and Rt. 42
Count Date:	12/25/2005
Scenario:	Existing – Split EW – Separate Lefts
Computed By:	ABC Date: 01/01/06
Checked By:	JHI Date: 01/02/06



Signal Phasing (Φ)



Max (712+49 or 223)

Max (561+106 or 110)

Φ	Movement	Volume		LU	Lane Volume	OL (Add)	LTC (Subtract)	Critical Lane Volume	CM (*)
1	Rt.300 EB.	712+49	761	1.00	761			761	*
2	Rt. 300 WB.	561+106	667	1.00	667			667	*
4	Rt. 42 SB	117+164+121	402	1.00	402	20		422	*
8	Rt. 42 NB	20+47+18	85	1.00	85	117		202	
Remarks:						TOTAL:		1850	
						LEVEL OF SERVICE:		F	

Level	Critical Movement Volume
A	Less than 1,000 veh/hr
B	1,000 to 1,150 veh/hr
C	1,151 to 1,300 veh/hr
D	1,301 to 1,450 veh/hr
E	1,451 to 1,600 veh/hr
F	More than 1,600 veh/hr

No. of Lanes	Lane Use factor (LU)
1	1.00
2	0.55
3	0.40
4	0.30

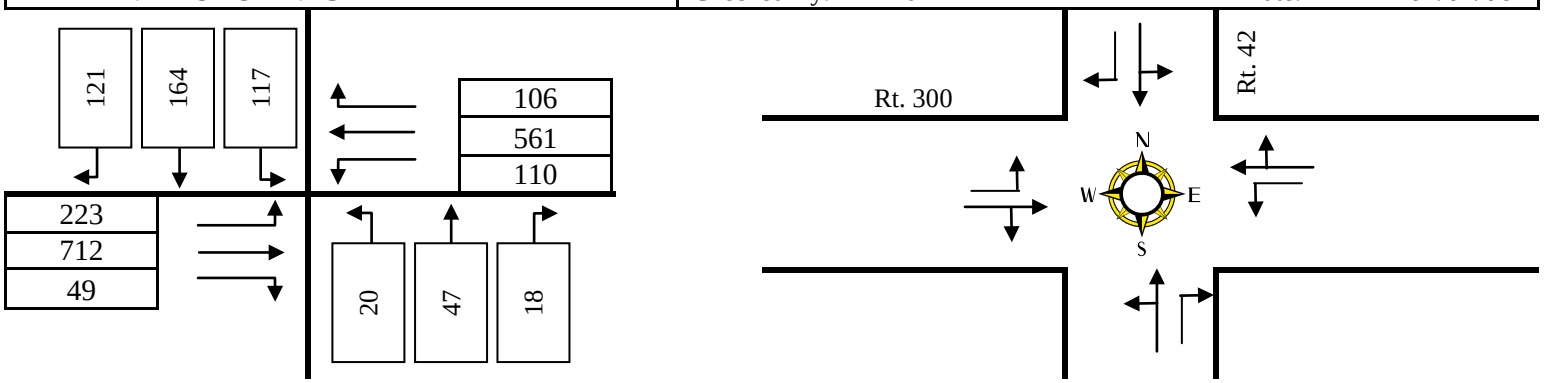
LEGEND	
OL =	Opposing Lefts
LTC =	Left Turn Credit

Figure P-12 CMS Example 8 – Protected Permissive Lefts – Separate Lefts – Separate Rights

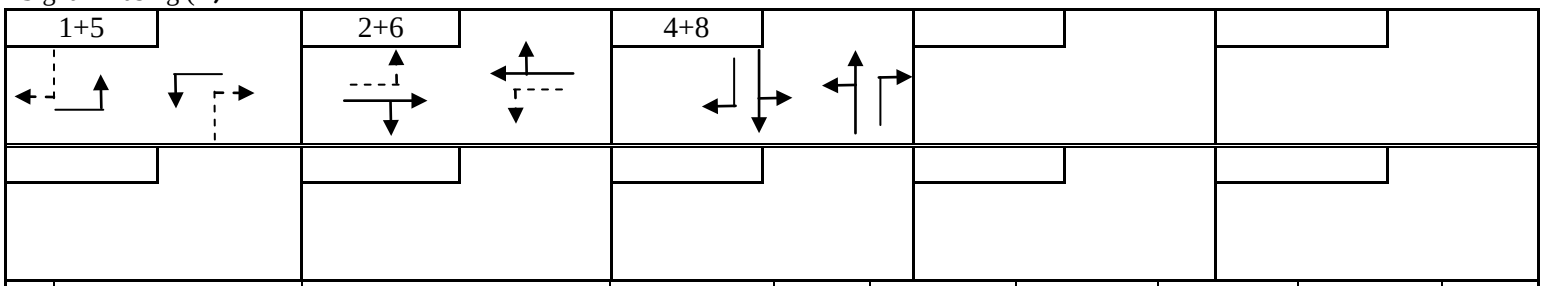
DelDOT

CRITICAL LANE MOVEMENT SUMMATION AND LEVEL OF SERVICE

Location:	Rt. 300 and Rt. 42		
Count Date:	12/25/2005		
Scenario:	Existing – Protected Permissive Lefts – Separate Lefts – Separate Rights		
Computed By:	ABC	Date:	01/01/06
Checked By:	JHI	Date:	01/02/06



Signal Phasing (Φ)



Φ	Movement	Volume		LU	Lane Volume	OL (Add)	LTC (Subtract)	Critical Lane Volume	CM (*)
1	Rt. 300 WB.	110	110	1.00	110			110	
5	Rt.300 EB.	223	223	1.00	223			223	*
2	Rt.300 EB.	712+49	761	1.00	761		113	648	
6	Rt. 300 WB.	561+106	667	1.00	667			667	*
4	Rt. 42 SB	117+164	281	1.00	281	20		301	*
8	Rt. 42 NB	20+47	67	1.00	67	117		184	

Remarks:

TOTAL:	1191
LEVEL OF SERVICE:	C

Level	Critical Movement Volume
A	Less than 1,000 veh/hr
B	1,000 to 1,150 veh/hr
C	1,151 to 1,300 veh/hr
D	1,301 to 1,450 veh/hr
E	1,451 to 1,600 veh/hr
F	More than 1,600 veh/hr

No. of Lanes	Lane Use factor (LU)
1	1.00
2	0.55
3	0.40
4	0.30

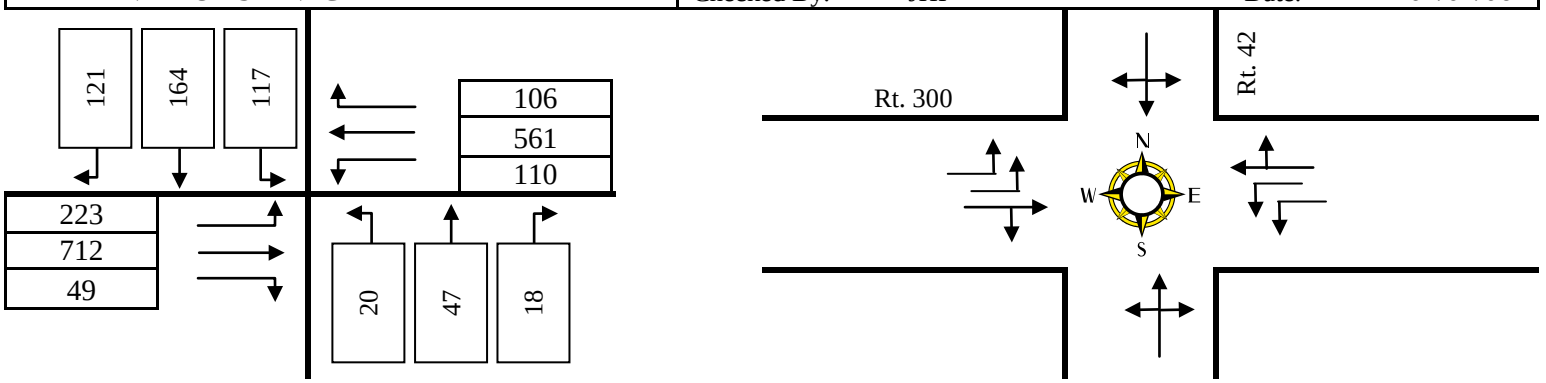
LEGEND	
OL =	Opposing Lefts
LTC =	Left Turn Credit

Figure P-13 CMS Example 9 – Protected Lefts – Double Lefts

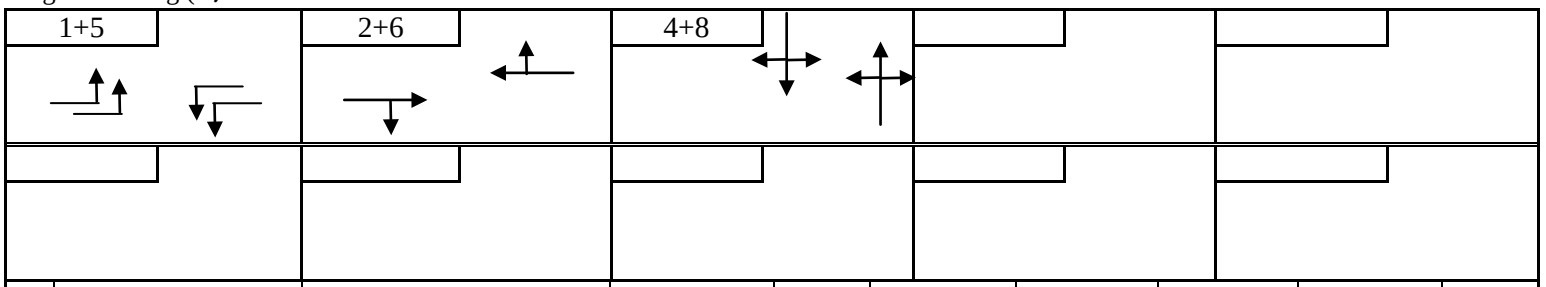
DelDOT

CRITICAL LANE MOVEMENT SUMMATION
AND LEVEL OF SERVICE

Location:	Rt. 300 and Rt. 42
Count Date:	12/25/2005
Scenario:	Existing – Protected Lefts –Double Lefts
Computed By:	ABC Date: 01/01/06
Checked By:	JHI Date: 01/02/06



Signal Phasing (Φ)



Φ	Movement	Volume		LU	Lane Volume	OL (Add)	LTC (Subtract)	Critical Lane Volume	CM (*)
1	Rt. 300 WB.	110	110	0.55	66			66	
5	Rt.300 EB.	223	223	0.55	123			123	*
2	Rt.300 EB.	712+49	761	1.00	761		62	699	*
6	Rt. 300 WB.	561+106	667	1.00	667			667	
					= (223*0.55)-(110*0.55)				
4	Rt. 42 SB	117+164+121	402	1.00	402	20		422	*
8	Rt. 42 NB	20+47+18	85	1.00	85	117		202	
Remarks:						TOTAL:		1244	
						LEVEL OF SERVICE:		C	

Level	Critical Movement Volume
A	Less than 1,000 veh/hr
B	1,000 to 1,150 veh/hr
C	1,151 to 1,300 veh/hr
D	1,301 to 1,450 veh/hr
E	1,451 to 1,600 veh/hr
F	More than 1,600 veh/hr

No. of Lanes	Lane Use factor (LU)
1	1.00
2	0.55
3	0.40
4	0.30

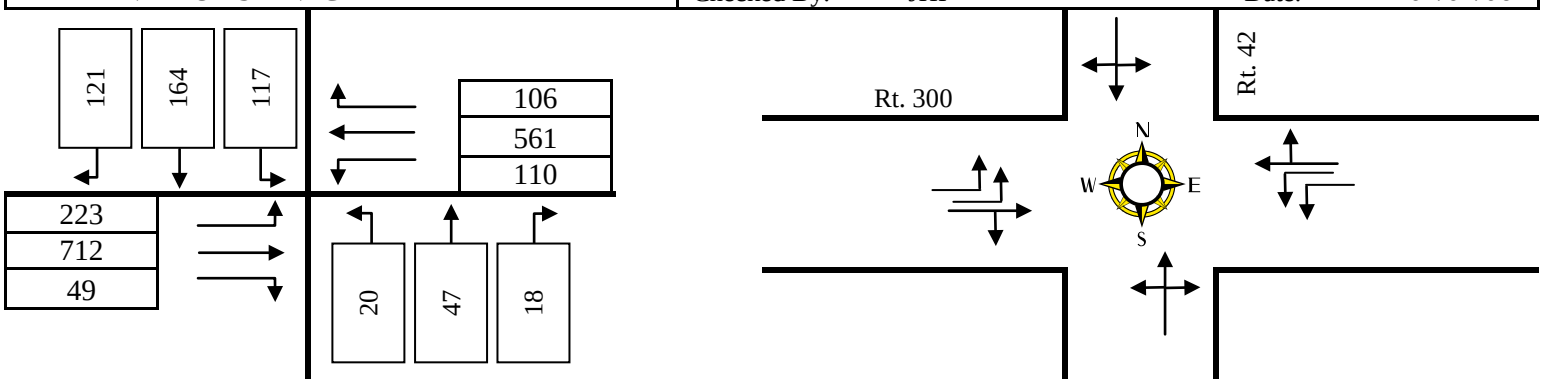
LEGEND	
OL =	Opposing Lefts
LTC =	Left Turn Credit

Figure P-14 CMS Example 10 – Lead-Lag Phasing

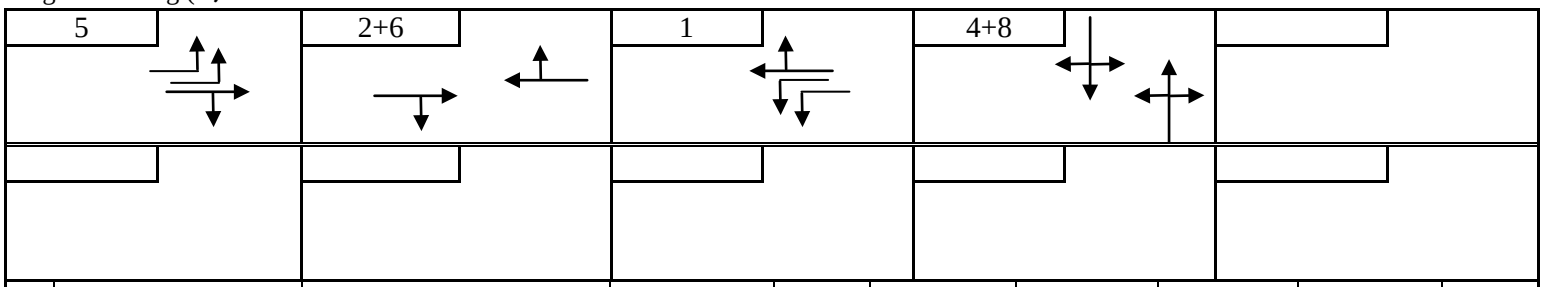
DelDOT

CRITICAL LANE MOVEMENT SUMMATION
AND LEVEL OF SERVICE

Location:	Rt. 300 and Rt. 42		
Count Date:	12/25/2005		
Scenario:	Existing – Lead-Lag Phasing		
Computed By:	ABC	Date:	01/01/06
Checked By:	JHI	Date:	01/02/06



Signal Phasing (Φ)



Φ	Movement	Volume		LU	Lane Volume	OL (Add)	LTC (Subtract)	Critical Lane Volume	CM (*)
5	Rt.300 EB.	223	223	0.55	123			123	*
2	Rt.300 EB.	712+49	761	1.00	761		123	638	*
6	Rt. 300 WB.	106+561	667	1.00	667		61	606	
1	Rt. 300 WB.	110	110	0.55	61			61	*
4	Rt. 42 SB	117+164+121	402	1.00	402	20		422	*
8	Rt. 42 NB	20+47+18	85	1.00	85	117		202	

Remarks:

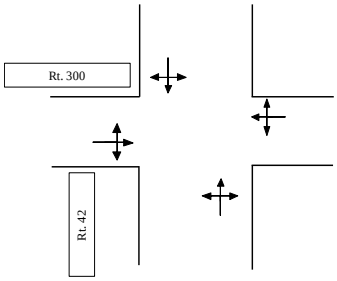
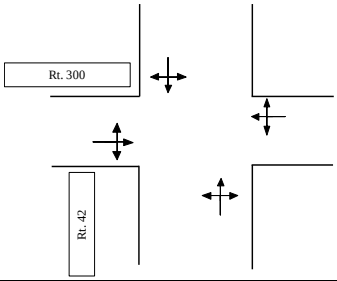
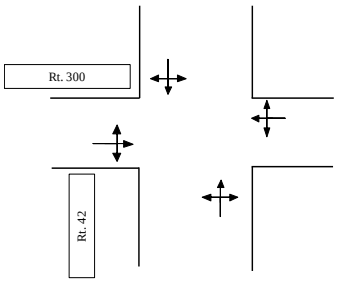
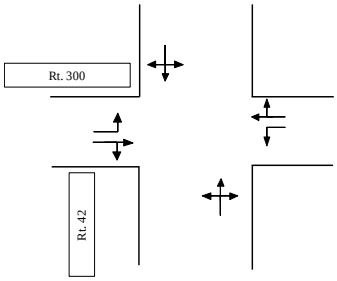
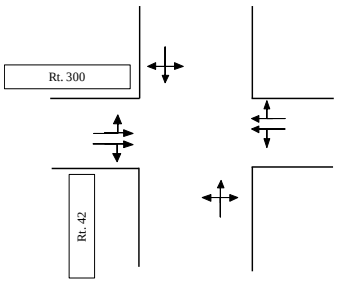
TOTAL:	1244
LEVEL OF SERVICE:	C

Level	Critical Movement Volume
A	Less than 1,000 veh/hr
B	1,000 to 1,150 veh/hr
C	1,151 to 1,300 veh/hr
D	1,301 to 1,450 veh/hr
E	1,451 to 1,600 veh/hr
F	More than 1,600 veh/hr

No. of Lanes	Lane Use factor (LU)
1	1.00
2	0.55
3	0.40
4	0.30

LEGEND	
OL =	Opposing Lefts
LTC =	Left Turn Credit

Figure P-15 Summary of Exercises

Exercise	Picture	Phasing	Number of critical movements	Results	
				Critical Movement Summation	LOS
1		Simple 2-phase (permissive lefts)	2	1516	E
2		Split E-W	3	2183	F
3		Split all	4	2248	F
4		Simple 2-phase (permissive lefts)	2	1312	D
5		Simple 2-phase (permissive lefts)	2	1196	C

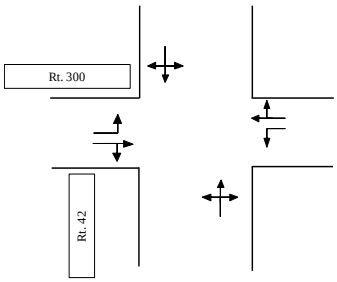
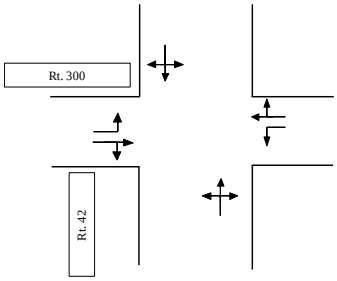
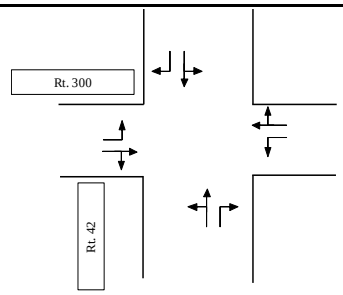
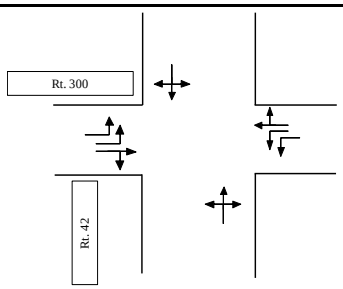
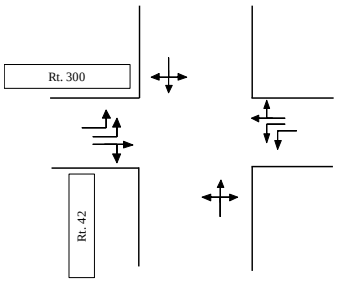
Exercise	Picture	Phasing	Number of critical movements	Results	
				Critical Movement Summation	LOS
6		Exclusive concurrent E-W lefts	3	1312	D
7		Split E-W	3	1850	F
8		Exclusive concurrent E-W lefts with N-S rights	3	1191	C
9		Exclusive concurrent E-W lefts	3	1255	C
10		Lead-Lag E-W	3	1611	F

Figure P-16 Traffic Signal Timing Exercise

Location: Rt. 300 and Rt. 42 Date: 01/01/06

Cycle Length: 100 Cycles per Hour: 36 Prepared by: ABC 01/01/06

Time of Day: AM Peak Hour Checked by: JHI 01/02/06

Phases	Movement	Critical lane Volume (CLV)	Vehicles per Cycle	Green Time Required (see Greenshield Figure P-3)	Clearance (Red + Yellow)	Walk + Don't Walk
2+6	Rt. 300	1094	30	67	3+2	-
4+8	Rt. 42	422	12	29	3+2	-

Total Green	96		
Total Clearance	10		
Total Time Required	106		

Cycle Length	Cycles per Hour
45	80
60	60
75	48
90	40
100	36
120	30
150	24
180	20
210	17
240	15

APPENDIX J

Signal Design / Modification Request Form

Signal Design / Modification Request Form

169 Brick Store Landing Road, Smyrna, DE

This form, as well as the attached Signal Design Checklist, should be completed for all new signals and for all existing signals requiring design modifications on state-maintained highways in the State of Delaware.

Location: _____

_____

County: _____

Signal: ☐ New (Proposed)

☐ Existing (Permit #: _____)

If **new,** signal warrants met:
(Signal warrant evaluation forms should be attached)

☐ Warrant #1 ☐ Warrant #4 ☐ Warrant #7
☐ Warrant #2 ☐ Warrant #5 ☐ Warrant #8
☐ Warrant #3 ☐ Warrant #6 ☐ Warrant #9

If **existing**, proposed changes:

☐ Pedestrian Upgrades ☐ Phase / Operational Upgrades
☐ Maintenance Upgrades ☐ Intersection Improvements
☐ Developer ☐ Paving & Rehabilitation
☐ Other _____

Requested By: _____ **Date:** _____

Approved By: _____ **Date:** _____
(Chief of Traffic Operations)

Approved By: _____ **Date:** _____
(Chief of Traffic Engineering)

<u>Signal Design Checklist</u> (attached)

Completed By: _____ **Date:** _____
(DelDOT / Consultant) (Circle One)

Checked By: _____ **Date:** _____
(DelDOT Traffic Systems Design Engineer)

Approved By: _____ **Date:** _____
(DelDOT Traffic Systems Design Manager)

DELDOT TRAFFIC SIGNAL PLAN REVIEW CHECKLIST				
	Yes	No	N/A	Comments
The following items are included and shown correctly on the Plan Sheets:				
• Only pertinent levels, i.e., existing features and proposed geometrics, utilities, drainage, and clear zone / lateral offset, shown on the plans	☐	☐	☐	
• Limits of construction work	☐	☐	☐	
• Base mapping shown	☐	☐	☐	
• North arrow shown and oriented correctly	☐	☐	☐	
• Plans shown at the correct scale	☐	☐	☐	
• Signal legend matches symbols on plan	☐	☐	☐	
• Existing and proposed right-of-way and easements shown, including labels	☐	☐	☐	
• All equipment within the right-of-way. If needed, an Agreement "C" or easement has been provided for any equipment outside of the right-of-way.	☐	☐	☐	
• Overhead clearance callouts at cable crossing with signal structure are shown on plan	☐	☐	☐	
• General signal notes shown	☐	☐	☐	
• Street names and route numbers shown	☐	☐	☐	
• Route numbers with cardinal direction (e.g., US 13 (NBL)) and road names	☐	☐	☐	
• Current border, signature block, revision block used	☐	☐	☐	
• Construction details provided if required	☐	☐	☐	
• Pole and mast arm schedule filled out correctly	☐	☐	☐	
• Conduit schedule filled out correctly	☐	☐	☐	
• If span wire configuration, provide the span wire schedule with sag calculations	☐	☐	☐	
• Clear zone or lateral offset lines shown	☐	☐	☐	
• Signal equipment placed outside of clear zone or meets lateral offset requirements	☐	☐	☐	
Existing Signal Information				
• Existing signal plans and timesheets have been verified	☐	☐	☐	
• Site characteristics have been inventoried and examined	☐	☐	☐	
• All existing signal equipment to remain is labeled correctly	☐	☐	☐	
• Existing signal equipment to be removed is labeled correctly	☐	☐	☐	
• All existing DelDOT equipment (i.e., poles, flashers, sign structures, and lighting) shown on the plans	☐	☐	☐	
Proposed Signal Information				
• All proposed signal equipment is labeled correctly	☐	☐	☐	

DELDOT TRAFFIC SIGNAL PLAN REVIEW CHECKLIST				
	Yes	No	N/A	Comments
• Appropriate signal structure, structure configuration / placement	☐	☐	☐	
o Lateral and vertical clearance requirements from utilities are met	☐	☐	☐	
o Centerlines of existing and proposed signal pole foundations are at least 10' apart	☐	☐	☐	
o Alternative pole configurations are used where applicable	☐	☐	☐	
• Signal controller cabinet location and type	☐	☐	☐	
o Cabinet is placed with the door facing away from the road	☐	☐	☐	
o Four 4" conduits are provided from the cabinet to the first Type 4 conduit junction well	☐	☐	☐	
o Cabinet location permits safe access and is protected if needed	☐	☐	☐	
o Cabinet is located near a power source if possible	☐	☐	☐	
o Cabinet does not restrict driver visibility	☐	☐	☐	
o Cabinet base extension provide	☐	☐	☐	
• Signal heads and pedestrian heads are numbered per the sequence of operation chart (heads, poles, and signs are numbered left to right on each approach and in order starting with mainline NB then SB or EB then WB and then side streets)	☐	☐	☐	
o At least one signal head per movement is placed 40’ or more from the stop line	☐	☐	☐	
o Signal heads are located no more than 150’ from stop line, or 180’ maximum if near-side signal head is provided	☐	☐	☐	
o Minimum of two signal heads provided for each movement. If approach is more than two lanes, one signal head is provided per lane.	☐	☐	☐	
o Vertical signal head clearance requirements are met (15’ min. from bottom - 25.6’ max. to top)	☐	☐	☐	
o Adequate signal visibility is provided	☐	☐	☐	
o Signal head sections are appropriate for each movement and aligned correctly with lanes based on lane use	☐	☐	☐	
• Countdown pedestrian signals and pushbuttons follow design and installation guidelines	☐	☐	☐	
o Countdown pedestrian signal heads are located within 5’ from the outside edge of the crosswalk and visibility is unobstructed	☐	☐	☐	
o Pushbuttons located correctly and readily accessible from 60”x60” level landing area or the sidewalk (maximum	☐	☐	☐	

DELDOT TRAFFIC SIGNAL PLAN REVIEW CHECKLIST				
	Yes	No	N/A	Comments
10’ from face of curb)				
o Pedestrian countdown signals aligned parallel with crosswalk	☐	☐	☐	
o The bottom of the pedestrian signal housing, including brackets, is not less than 7 feet or more than 10 feet above sidewalk level	☐	☐	☐	
o Pedestrian pushbuttons and sign (with arrow) aligned perpendicular with crosswalk	☐	☐	☐	
o Pedestrian pushbuttons are installed at least 38” and no more than 46” above sidewalk level	☐	☐	☐	
o Pedestrian pushbuttons are accessible from a flat landing area and are no more than 10' from face of curb	☐	☐	☐	
o An 18" landing area extension is provided at locations where the pushbutton is not directly accessible by a pedestrian in a wheelchair	☐	☐	☐	
• Availability of electrical power determined	☐	☐	☐	
o Power source location coordinated with utility company	☐	☐	☐	
o Power source pole number and owner shown	☐	☐	☐	
o Service disconnect and meter placed 10' or less from the power source	☐	☐	☐	
o Additional service disconnect provided where the pedestal meter is across the roadway from the cabinet or where the cabinet is located more than 100' from the power source.	☐	☐	☐	
• Metered service pedestal	☐	☐	☐	
• Secondary disconnect (if needed)	☐	☐	☐	
o Confirm service load is available	☐	☐	☐	
• Conduit junction wells are appropriately located	☐	☐	☐	
• Conduit junction wells, conduits, and wires are the correct size and type	☐	☐	☐	
• Every conduit has a ground cable, except fiber conduits	☐	☐	☐	
• Conduit fill capacity checked (26% maximum fill for new construction, 35% for modifications)	☐	☐	☐	
• An Opticom emergency preemption detector provided for each intersection approach and installed on the near side of each approach	☐	☐	☐	
• Mast arm loadings for non-typical configurations have been verified with Union Metal or TST	☐	☐	☐	
• Two soil boring locations requested for each intersection, if needed	☐	☐	☐	

DELDOT TRAFFIC SIGNAL PLAN REVIEW CHECKLIST

	Yes	No	N/A	Comments
NEMA Phasing				
• Correct orientation	☐	☐	☐	
• Phasing numbers shown on plans	☐	☐	☐	
• Solid / Dashed lines shown correctly	☐	☐	☐	
• Correct phasing notes provided	☐	☐	☐	
• Pedestrian phases shown	☐	☐	☐	
• Split phasing	☐	☐	☐	
• Overlap(s) noted on plan	☐	☐	☐	
Detectors				
• Detection included and applied properly	☐	☐	☐	
• Presence loop detectors 1' behind stop line	☐	☐	☐	
• Sampling or system detection at location where traffic is expected to reach free flow conditions	☐	☐	☐	
• Passage loops at correct setback distance	☐	☐	☐	
• A 1 1/2-inch RGS conduit between the rotary drill hole and junction well is provided, if distance is equal to or exceeds 12"	☐	☐	☐	
• Verify if video detection equipment locations are correct with equipment supplier if applicable	☐	☐	☐	
Signs				
• Show all existing signs. Remove any existing signs that are no longer warranted	☐	☐	☐	
• Street name signs (overhead / post-mounted)	☐	☐	☐	
• Directional assemblies / other route signs	☐	☐	☐	
• Signal warning signs or new signal warning signs with NEW or NEW TRAFFIC PATTERN plaques	☐	☐	☐	
• Turn restriction signs	☐	☐	☐	
• Movement prohibition / lane control signs	☐	☐	☐	
• Remove Stop / Stop Ahead signs	☐	☐	☐	
• Special sign layouts	☐	☐	☐	
• Sign legend matches plan	☐	☐	☐	
• Signs on signal plans match signing plans	☐	☐	☐	
Pavement Markings				
• Lane use arrows/legend provided where necessary	☐	☐	☐	
• Stop (or yield) lines are perpendicular to curb				
• Stop (or yield) lines installed at least 4' from crosswalks	☐	☐	☐	
• Stop lines set back adequately to provide space for turning vehicles. Checked with Autorun (or turning template) by using appropriate design vehicle type(s)	☐	☐	☐	
• Edge lines, centerlines, (solid) lane lines shown	☐	☐	☐	
• Crosswalks have been rotated to align	☐	☐	☐	

DELDOT TRAFFIC SIGNAL PLAN REVIEW CHECKLIST				
	Yes	No	N/A	Comments
parallel with travel path of traffic				
• Crosswalks are correct width based on posted speed limit and pedestrian activity	☐	☐	☐	
• Lane dimensions are shown	☐	☐	☐	
• Pavement markings schedule provided, if needed	☐	☐	☐	
• Pavement markings labeled correctly	☐	☐	☐	
• All pavement marking items follow DelDOT specification	☐	☐	☐	
Dimensions / Stationing				
• Pavement Markings	☐	☐	☐	
• Signals and Signs	☐	☐	☐	
• Detectors (presence and advanced)	☐	☐	☐	
• Poles	☐	☐	☐	
• Controller cabinet	☐	☐	☐	
• Break lines	☐	☐	☐	
Geometrics				
• Stop line set back adequate distance for turning vehicles	☐	☐	☐	
• Pedestrian connections at crosswalks are correctly located and meet pedestrian accessibility standards	☐	☐	☐	
• Landing area or sidewalk provides access to pedestrian pushbutton	☐	☐	☐	
• Detectable Warning Surfaces (DWS) are applied correctly	☐	☐	☐	
Maintenance of Traffic				
• Applicable Typical Applications and allowable lane closure hours are noted on plans	☐	☐	☐	
Other Design Considerations				
• Pedestrian accessibility standards are met	☐	☐	☐	
• Median disturbance is minimized	☐	☐	☐	
• Design addresses environmental concerns (if present)	☐	☐	☐	
• Design addressed unique construction problems (if present)	☐	☐	☐	
• Design adheres to driver expectancy for the corridor	☐	☐	☐	
• Equipment locations do not affect maintenance activities	☐	☐	☐	
• Coordination has occurred with DelDOT's ITMS Section	☐	☐	☐	
• Other facilities within the project limits that require traffic signal devices (i.e., schools) are noted	☐	☐	☐	
• Railroad signal interconnect is provided if required	☐	☐	☐	
• Signal is not in conflict with any utilities	☐	☐	☐	

DELDOT TRAFFIC SIGNAL PLAN REVIEW CHECKLIST				
	Yes	No	N/A	Comments
• Special design considerations such as HIBs, pedestrians, preemption or interconnection are addressed	☐	☐	☐	
• Signal will work as a system with the roadway, signing and marking design	☐	☐	☐	
• Design is in accordance with Federal and DelDOT standards	☐	☐	☐	
Utilities				
• Overhead utility conflicts avoided	☐	☐	☐	
• Underground utility conflicts avoided	☐	☐	☐	
• Special signal poles detailed if needed	☐	☐	☐	
• Special pole foundations detailed if needed	☐	☐	☐	
• Utility relocations coordinated	☐	☐	☐	
○ Utility relocation details provided if required	☐	☐	☐	
RIGHT-OF-WAY				
• Adequate right-of-way is available for proposed pole locations	☐	☐	☐	
• Required right-of-way acquisitions are noted (if needed)	☐	☐	☐	
• Easement for special purpose is noted if needed	☐	☐	☐	

APPENDIX K

Signal Deactivation Guidance

DelDOT Guidelines for Signal Deactivation

1. **30 days prior** to converting the existing signal to flash mode:
   - Install SIGNAL UNDER STUDY FOR REMOVAL signs on each approach
   - Inform all affected agencies (TMC, DelDOT Community Relations, DelDOT Signal Maintenance, local municipalities, police, emergency service providers, local businesses, etc.) about the planned signal deactivation

2. **7 days prior** to converting the existing signal to flash mode:
   - Address sight distance restrictions from the approach that will be STOP controlled (move stop line towards the intersection, etc.)
   - Install NEW TRAFFIC PATTERN STARTING XX/XX/XXXX message boards on each intersection approach
   - Inform local municipalities about the proposed date of the conversion, and suggest they have uniformed law enforcement officers available, if necessary

3. **Day of** converting the existing signal to flash mode:
   - Place the signal on flash, mirroring future two-way or all-way stop control. Provide flashing yellow on the major street approaches and flashing red on the minor streetapproach(es), or flashing red on all approaches for all-way stop control.
   - Observe the operation at the intersection at the time when the signal is placed on flash mode to make sure it operates as planned
   - Observe queuing for 1-hour, documenting longest queue, and complete Stopped Time Delay Study for 1-Hour
   - Install STOP sign on the minor street approach(es), or on all approaches for all-way stop control, immediately after the transition to flash mode
   - Change the legend on the message boards to NEW TRAFFIC PATTERN AHEAD

4. **7 days after** the transition to flash mode:
   - Remove the message boards
   - Review traffic operations at the intersection
   - Observe queuing for 1-hour, documenting longest queue, and complete Stopped Time Delay Study for 1-Hour

5. **Two months after** the transition to flash mode:
   - Conduct a crash data analysis based on 2-months of crash data after the transition to flash mode
   - Review traffic operations at the intersection

6. **Ten months after** the transition to flash mode:
   - Conduct a crash data analysis based on 10-months of crash data after the transition to flash mode. If the crash analysis indicates that STOP-control is an adequate form of traffic control at the intersection:
   - Remove all traffic signal equipment and abandon conduit
   - Remove SIGNAL UNDER STUDY FOR REMOVAL signs and NEW plaques, and other conflicting signing and striping
   - RESCIND Signal Resolution (Traffic Studies) and notify TMC

7. **One year after** the transition to flash mode:
   - Complete another crash data analysis based on 12-months of crash data after the transition to flash mode
   - Confirm any additional signing and striping recommendations have been completed

APPENDIX L

Requests for APS Application Form

PedSafety

CAMPBELL COMPANY — EST. 1972 — EMPLOYEE OWNED SINCE 2020

Accessible Pedestrian Signals: Intersection Planning Sheet

Project City/County: Bear (NCCo.)

Project State: DE

Intersection: Route 40 @ Route 72

# of APS to be Installed: 8

Purchase Order#: T200411901

Guardian Wave ○ Guardian ◉ Guardian Mini ○ Beacon ○ BBU ○ WiAAPS ○

Station Color: Federal Yellow

Station Size: 9x15"

Sign Film Grade: DG3

Programmed Messages: Custom Voice Message

Actuator Color: Gloss Black

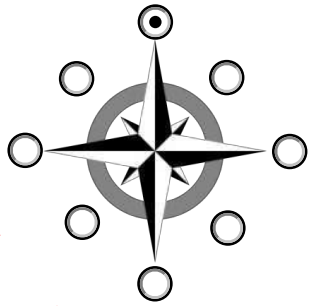
Sign Legend: R10-3e (COUNT-DOWN PEDESTRIA

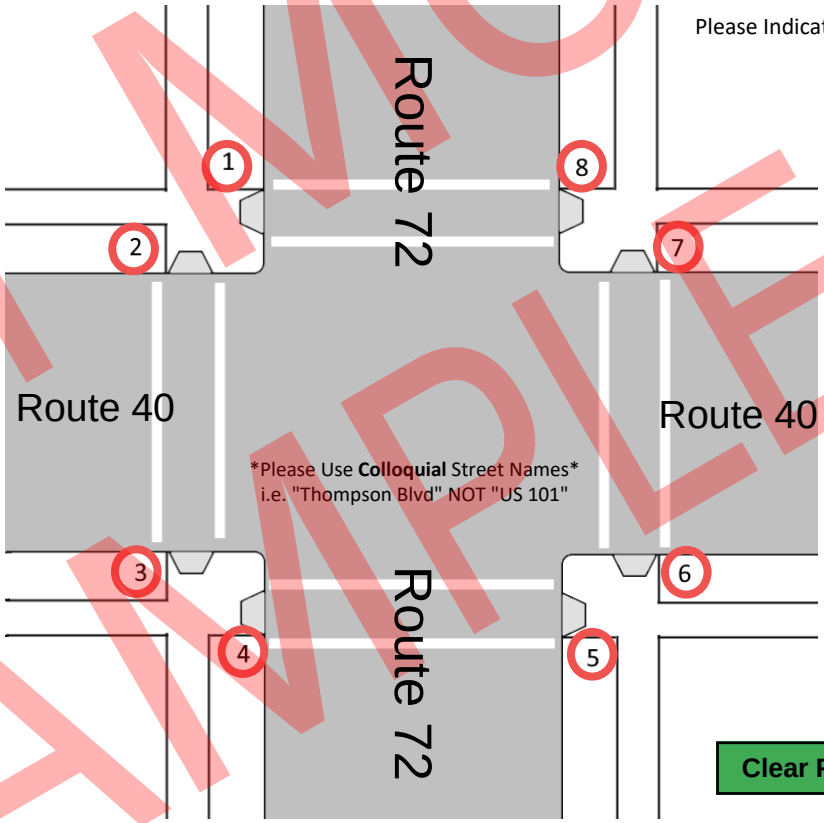
Braille on Sign: Yes

NOTE: BRAILLE IS PRINTED ON ONE SIDE ONLY. ARROW DIRECTION REQUIRED WHEN MUTCD SIGN LEGEND HAS ARROW PRESENT

Station #	Arrow Direction	Ped Phase	Walk Cycle Msg: Verbal	Tone
1	Left	6	☑	☐
2	Right	4	☑	☐
3	Left	4	☑	☐
4	Right	2	☑	☐
5	Right	2	☑	☐
6	Left	8	☑	☐
7	Right	8	☑	☐
8	Left	6	☑	☐

Please Indicate North in relation to the intersection:





Clear Form

Save Form

Notes:

- **All stations programmed with factory default MUTCD settings unless noted otherwise.**
- **GENERIC VOICE MESSAGES** consist of “WAIT" on press,"WAIT TO CROSS" on extended press, and "WALK SIGN IS ON TO CROSS” or Percussive Tone on walk cycle for all stations.
- **CUSTOM VOICE MESSAGES** consist of “WAIT" on press,"WAIT TO CROSS [Street Name] AT [Street Name]" on extended press, and "[Street Name], WALK SIGN IS ON TO CROSS [Street Name]” or Percussive Tone on walk cycle for all stations.
- ~~Per MUTCD 4E.10: Pedestrian stations with <10’ separation will use CUSTOM message for the walk cycle. Pedestrian stations with >10’ of separation will utilize a PERCUSSIVE (TONE) for the walk cycle.~~

Customer Notes:

NIGHT MODE shall be fully programmed (9 PM to 6 AM) from the factory/supplier in the Volume and Sound Controls

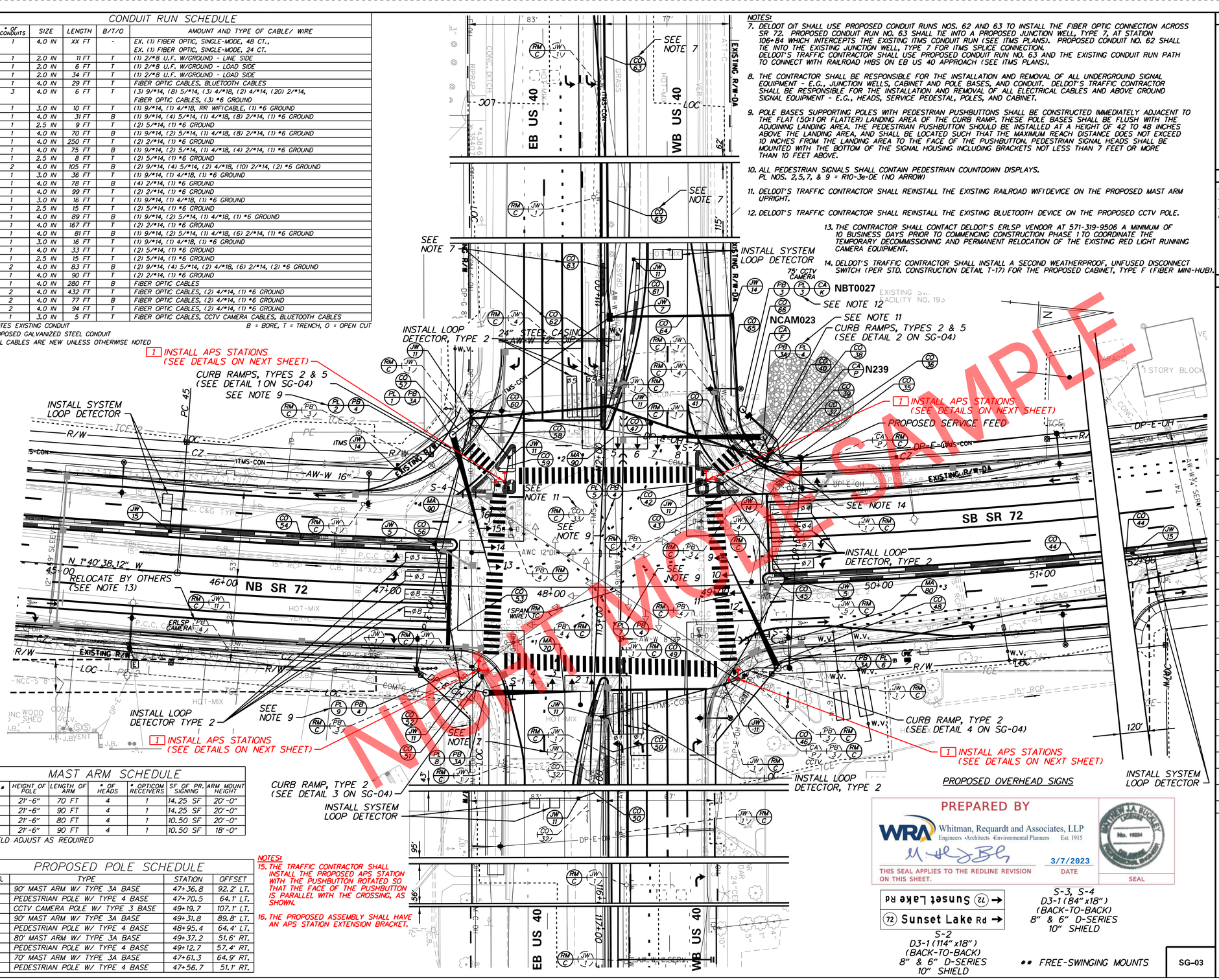
Please include **NIGHT MODE** instructions on all future orders via *Signal Construction* and *Signal Maintenance*

NIGHT MODE SAMPLE

CONDUIT RUN SCHEDULE

CO*	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
32●	1	4.0 IN	XX FT	-	EX. (1) FIBER OPTIC, SINGLE-MODE, 48 CT., EX. (1) FIBER OPTIC, SINGLE-MODE, 24 CT.
35●●	1	2.0 IN	11 FT	T	(1) 2/#8 U.F. W/GROUND - LINE SIDE
36●●	1	2.0 IN	6 FT	T	(1) 2/#8 U.F. W/GROUND - LOAD SIDE
37●●	1	2.0 IN	34 FT	T	(1) 2/#8 U.F. W/GROUND - LOAD SIDE
38	1	4.0 IN	29 FT	T	FIBER OPTIC CABLES, BLUETOOTH CABLES
39	3	4.0 IN	6 FT	T	(3) 9/#14, (8) 5/#14, (3) 4/#18, (2) 4/#14, (20) 2/#14, FIBER OPTIC CABLES, (3) #6 GROUND
40	1	3.0 IN	10 FT	T	(1) 9/#14, (1) 4/#18, RR WIFICABLE, (1) #6 GROUND
41	1	4.0 IN	31 FT	B	(1) 9/#14, (4) 5/#14, (1) 4/#18, (8) 2/#14, (1) #6 GROUND
42	1	2.5 IN	9 FT	T	(2) 5/#14, (1) #6 GROUND
43	1	4.0 IN	70 FT	B	(1) 9/#14, (2) 5/#14, (1) 4/#18, (8) 2/#14, (1) #6 GROUND
44	1	4.0 IN	250 FT	T	(2) 2/#14, (1) #6 GROUND
45	1	4.0 IN	75 FT	B	(1) 9/#14, (2) 5/#14, (1) 4/#18, (4) 2/#14, (1) #6 GROUND
46	1	2.5 IN	8 FT	T	(2) 5/#14, (1) #6 GROUND
47	2	4.0 IN	105 FT	B	(2) 9/#14, (4) 5/#14, (2) 4/#18, (10) 2/#14, (2) #6 GROUND
48	1	3.0 IN	36 FT	T	(1) 9/#14, (1) 4/#18, (1) #6 GROUND
49	1	4.0 IN	78 FT	B	(4) 2/#14, (1) #6 GROUND
50	1	4.0 IN	99 FT	T	(2) 2/#14, (1) #6 GROUND
51	1	3.0 IN	16 FT	T	(1) 9/#14, (1) 4/#18, (1) #6 GROUND
52	1	2.5 IN	15 FT	T	(2) 5/#14, (1) #6 GROUND
53	1	4.0 IN	89 FT	B	(1) 9/#14, (2) 5/#14, (1) 4/#18, (1) #6 GROUND
54	1	4.0 IN	167 FT	T	(2) 2/#14, (1) #6 GROUND
56	1	4.0 IN	81 FT	B	(1) 9/#14, (2) 5/#14, (1) 4/#18, (6) 2/#14, (1) #6 GROUND
57	1	3.0 IN	16 FT	T	(1) 9/#14, (1) 4/#18, (1) #6 GROUND
58	1	4.0 IN	33 FT	T	(2) 5/#14, (1) #6 GROUND
59	1	2.5 IN	15 FT	T	(2) 5/#14, (1) #6 GROUND
60	2	4.0 IN	83 FT	B	(2) 9/#14, (4) 5/#14, (2) 4/#18, (6) 2/#14, (2) #6 GROUND
61	1	4.0 IN	90 FT	T	(2) 2/#14, (1) #6 GROUND
62	1	4.0 IN	280 FT	B	FIBER OPTIC CABLES
63	2	4.0 IN	432 FT	T	FIBER OPTIC CABLES, (2) 4/#14, (1) #6 GROUND
64	2	4.0 IN	77 FT	B	FIBER OPTIC CABLES, (2) 4/#14, (1) #6 GROUND
65	2	4.0 IN	94 FT	T	FIBER OPTIC CABLES, (2) 4/#14, (1) #6 GROUND
66	1	3.0 IN	5 FT	T	FIBER OPTIC CABLES, CCTV CAMERA CABLES, BLUETOOTH CABLES

* DENOTES EXISTING CONDUIT
B = BORE, T = TRENCH, O = OPEN CUT
●● PROPOSED GALVANIZED STEEL CONDUIT
●●● ALL CABLES ARE NEW UNLESS OTHERWISE NOTED



MAST ARM SCHEDULE

MA●	HEIGHT OF POLE	LENGTH OF ARM	# OF HEADS	# OPTICOM RECEIVERS	SF OF P.R. SIGNING	ARM MOUNT HEIGHT
1	21'-6"	70 FT	4	1	14.25 SF	20'-0"
2	21'-6"	90 FT	4	1	14.25 SF	20'-0"
3	21'-6"	80 FT	4	1	10.50 SF	20'-0"
4	21'-6"	90 FT	4	1	10.50 SF	18'-0"

●FIELD ADJUST AS REQUIRED

PROPOSED POLE SCHEDULE

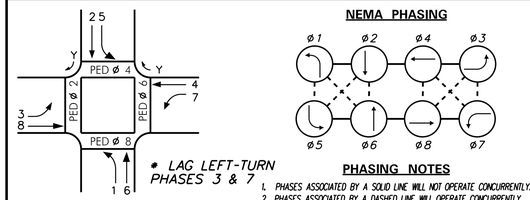
NO.	TYPE	STATION	OFFSET
1	90' MAST ARM W/ TYPE 3A BASE	47+36.8	92.2' LT.
2	PEDESTRIAN POLE W/ TYPE 4 BASE	47+70.5	64.1' LT.
3	CCTV CAMERA POLE W/ TYPE 3 BASE	49+19.7	107.1' LT.
4	90' MAST ARM W/ TYPE 3A BASE	49+31.8	89.8' LT.
5	PEDESTRIAN POLE W/ TYPE 4 BASE	48+95.4	64.4' LT.
6	80' MAST ARM W/ TYPE 3A BASE	49+37.2	51.6' RT.
7	PEDESTRIAN POLE W/ TYPE 4 BASE	49+12.7	57.4' RT.
8	70' MAST ARM W/ TYPE 3A BASE	47+61.3	64.9' RT.
9	PEDESTRIAN POLE W/ TYPE 4 BASE	47+56.7	51.1' RT.

NOTES:
15. THE TRAFFIC CONTRACTOR SHALL INSTALL THE PROPOSED APS STATION WITH THE PUSHBUTTON ROTATED SO THAT THE FACE OF THE PUSHBUTTON IS PARALLEL WITH THE CROSSING, AS SHOWN.
16. THE PROPOSED ASSEMBLY SHALL HAVE AN APS STATION EXTENSION BRACKET.

NOTES:
7. DELDOT OIT SHALL USE PROPOSED CONDUIT RUNS NOS. 62 AND 63 TO INSTALL THE FIBER OPTIC CONNECTION ACROSS SR 72. PROPOSED CONDUIT RUN NO. 63 SHALL TIE INTO A PROPOSED JUNCTION WELL, TYPE 7, AT STATION 106+84 WHICH INTERCEPTS THE EXISTING ITMS CONDUIT RUN (SEE ITMS PLANS). PROPOSED CONDUIT NO. 62 SHALL TIE INTO THE EXISTING JUNCTION WELL, TYPE 7 FOR ITMS SPLICE CONNECTION. DELDOT'S TRAFFIC CONTRACTOR SHALL USE PROPOSED CONDUIT RUN NO. 63 AND THE EXISTING CONDUIT RUN PATH TO CONNECT WITH RAILROAD HIBS ON EB US 40 APPROACH (SEE ITMS PLANS).
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION AND REMOVAL OF ALL UNDERGROUND SIGNAL EQUIPMENT - E.G., JUNCTION WELLS, CABINET AND POLE BASES, AND CONDUIT. DELDOT'S TRAFFIC CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION AND REMOVAL OF ALL ELECTRICAL CABLES AND ABOVE GROUND SIGNAL EQUIPMENT - E.G., HEADS, SERVICE PEDESTAL, POLES, AND CABINET.
9. POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (5.0:1 OR FLATTER) LANDING AREA OF THE CURB RAMP. THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA, AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE DOES NOT EXCEED 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE.
10. ALL PEDESTRIAN SIGNALS SHALL CONTAIN PEDESTRIAN COUNTDOWN DISPLAYS. PL NOS. 2, 5, 7, & 9 = R10-3e-DE (NO ARROW)
11. DELDOT'S TRAFFIC CONTRACTOR SHALL REINSTALL THE EXISTING RAILROAD WIFI DEVICE ON THE PROPOSED MAST ARM UPRIGHT.
12. DELDOT'S TRAFFIC CONTRACTOR SHALL REINSTALL THE EXISTING BLUETOOTH DEVICE ON THE PROPOSED CCTV POLE.
13. THE CONTRACTOR SHALL CONTACT DELDOT'S ERLSP VENDOR AT 571-319-9506 A MINIMUM OF 10 BUSINESS DAYS PRIOR TO COMMENCING CONSTRUCTION PHASE 1 TO COORDINATE THE TEMPORARY DECOMMISSIONING AND PERMANENT RELOCATION OF THE EXISTING RED LIGHT RUNNING CAMERA EQUIPMENT.
14. DELDOT'S TRAFFIC CONTRACTOR SHALL INSTALL A SECOND WEATHERPROOF, UNFUSED DISCONNECT SWITCH (PER STD. CONSTRUCTION DETAIL T-17) FOR THE PROPOSED CABINET, TYPE F (FIBER MINI-HUB).

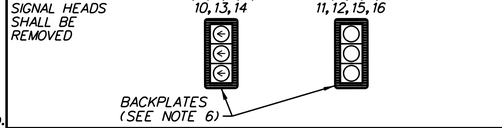
NOT FOR CONSTRUCTION
SAMPLE

ULTIMATE SIGNAL PHASING



PHASING NOTES
1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

ULTIMATE SIGNAL HEAD DIAGRAM



LEGEND

AB	ABANDON	
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH • EXISTING OVERHEAD RUN IDENTIFIER (• OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	OH • PROPOSED OVERHEAD RUN IDENTIFIER (• OF OVERHEAD RUN)
CO •	EXISTING CONDUIT RUN IDENTIFIER (• OF CONDUIT RUN)	PB X EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO •	PROPOSED CONDUIT RUN IDENTIFIER (• OF CONDUIT RUN)	PB X PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X EXISTING POLE IDENTIFIER (• OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X PROPOSED POLE IDENTIFIER (• OF POLE)
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM C REMOVE BY CONTRACTOR
MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O REMOVE BY OTHERS
		RM TC REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL		P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
SPAN INSULATOR		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION		

GENERAL SIGNAL NOTES

1. PROPOSED LOOP DETECTORS:
   TYPE #2 - 6' x 25' - TO BE INSTALLED ON US 40 LEFT-TURN MOVEMENTS AND SR 72 THROUGH AND LEFT-TURN MOVEMENTS.
   SYSTEM - 6' x 6' - TO BE INSTALLED IN US 40 AND SR 72 RECEIVING LANES, AS SHOWN.
2. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
3. POLE BASES, CABINET BASE AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 211 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.
4. ALL CONDUITS SHALL BE SCHEDULE 80 PVC WHEN INSTALLED BY TRENCHING AND SCHEDULE 80 HDPE WHEN INSTALLED BY BORING, UNLESS OTHERWISE NOTED.
5. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.
6. DELDOT TRAFFIC SHALL INSTALL BACKPLATES ON SIGNAL HEADS 1-16.

PREPARED BY
WRA Whitman, Requardt and Associates, LLP
Engineers • Architects • Environmental Planners Est. 1915
THIS SEAL APPLIES TO THE REDLINE REVISION ON THIS SHEET.
3/7/2023 DATE
MATTHEW J.A. BUCKLEY No. 16934 PROFESSIONAL ENGINEER SEAL

Sunset Lake Rd (72) →
(72) Sunset Lake Rd →
S-2
D3-1 (114" x18")
(BACK-TO-BACK)
8" & 6" D-SERIES
10" SHIELD

S-3, S-4
D3-1 (84" x18")
(BACK-TO-BACK)
8" & 6" D-SERIES
10" SHIELD

** FREE-SWINGING MOUNTS

SG-03

RECOMMENDED	DATE:	RECOMMENDED	DATE:	RECOMMENDED Signature on file	DATE: 9/7/2017	APPROVED TRAFFIC ENGINEER Signature on file	DATE: 9/7/2017	APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER Signature on file	DATE: 9/7/2017

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS
1 INSTALLED APS STATIONS AND PEDESTRIAN WARNING SIGNS. B. WALKER (WRA) 02-2023 (P.O. #65506/443055)

SCALE 0 30 60 90 FEET

US 40 / SR 72
INTERSECTION
IMPROVEMENTS

CONTRACT	PERMIT NO.	N239, NBT0027, & NCAM023
T200411901	DESIGNED BY: D.W.C. (WRA)	
COUNTY	CHECKED BY: M.J.B. (WRA)	
NEW CASTLE		

SIGNAL PLAN
US 40 (PULASKI HWY)
SR 72 (WRANGLE HILL RD / SUNSET LAKE RD)

SHEET NO.	TOTAL SHTS.
174	179

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CONDUIT RUN SCHEDULE

CO*	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
32*	1	4.0 IN	XX FT	-	EX. (1) FIBER OPTIC, SINGLE-MODE, 48 CT., EX. (1) FIBER OPTIC, SINGLE-MODE, 24 CT.
35**	1	2.0 IN	11 FT	T	(1) 2/*8 U.F. W/GROUND - LINE SIDE
36**	1	2.0 IN	6 FT	T	(1) 2/*8 U.F. W/GROUND - LOAD SIDE
37**	1	2.0 IN	34 FT	T	(1) 2/*8 U.F. W/GROUND - LOAD SIDE
38	1	4.0 IN	29 FT	T	FIBER OPTIC CABLES, BLUETOOTH CABLES
39	3	4.0 IN	6 FT	T	(3) 9/*14, (8) 5/*14, (3) 4/*18, (2) 4/*14, (20) 2/*14, FIBER OPTIC CABLES, (3) *6 GROUND
40	1	3.0 IN	10 FT	T	(1) 9/*14, (1) 4/*18, RR WIFICABLE, (1) *6 GROUND
41	1	4.0 IN	31 FT	B	(1) 9/*14, (4) 5/*14, (1) 4/*18, (8) 2/*14, (1) *6 GROUND
42	1	2.5 IN	9 FT	T	(2) 5/*14, (1) *6 GROUND
43	1	4.0 IN	70 FT	B	(1) 9/*14, (2) 5/*14, (1) 4/*18, (8) 2/*14, (1) *6 GROUND
44	1	4.0 IN	250 FT	T	(2) 2/*14, (1) *6 GROUND
45	1	4.0 IN	75 FT	B	(1) 9/*14, (2) 5/*14, (1) 4/*18, (4) 2/*14, (1) *6 GROUND
46	1	2.5 IN	8 FT	T	(2) 5/*14, (1) *6 GROUND
47	2	4.0 IN	105 FT	B	(2) 9/*14, (4) 5/*14, (2) 4/*18, (10) 2/*14, (2) *6 GROUND
48	1	3.0 IN	36 FT	T	(1) 9/*14, (1) 4/*18, (1) *6 GROUND
49	1	4.0 IN	78 FT	B	(4) 2/*14, (1) *6 GROUND
50	1	4.0 IN	99 FT	T	(2) 2/*14, (1) *6 GROUND
51	1	3.0 IN	16 FT	T	(1) 9/*14, (1) 4/*18, (1) *6 GROUND
52	1	2.5 IN	15 FT	T	(2) 5/*14, (1) *6 GROUND
53	1	4.0 IN	89 FT	B	(1) 9/*14, (2) 5/*14, (1) 4/*18, (1) *6 GROUND
54	1	4.0 IN	167 FT	T	(2) 2/*14, (1) *6 GROUND
56	1	4.0 IN	81 FT	B	(1) 9/*14, (2) 5/*14, (1) 4/*18, (6) 2/*14, (1) *6 GROUND
57	1	3.0 IN	16 FT	T	(1) 9/*14, (1) 4/*18, (1) *6 GROUND
58	1	4.0 IN	33 FT	T	(2) 5/*14, (1) *6 GROUND
59	1	2.5 IN	15 FT	T	(2) 5/*14, (1) *6 GROUND
60	2	4.0 IN	83 FT	B	(2) 9/*14, (4) 5/*14, (2) 4/*18, (6) 2/*14, (2) *6 GROUND
61	1	4.0 IN	90 FT	T	(2) 2/*14, (1) *6 GROUND
62	1	4.0 IN	280 FT	B	FIBER OPTIC CABLES
63	2	4.0 IN	432 FT	T	FIBER OPTIC CABLES, (2) 4/*14, (1) *6 GROUND
64	2	4.0 IN	77 FT	B	FIBER OPTIC CABLES, (2) 4/*14, (1) *6 GROUND
65	2	4.0 IN	94 FT	T	FIBER OPTIC CABLES, (2) 4/*14, (1) *6 GROUND
66	1	3.0 IN	5 FT	T	FIBER OPTIC CABLES, CCTV CAMERA CABLES, BLUETOOTH CABLES

* DENOTES EXISTING CONDUIT
** PROPOSED GALVANIZED STEEL CONDUIT
*** ALL CABLES ARE NEW UNLESS OTHERWISE NOTED

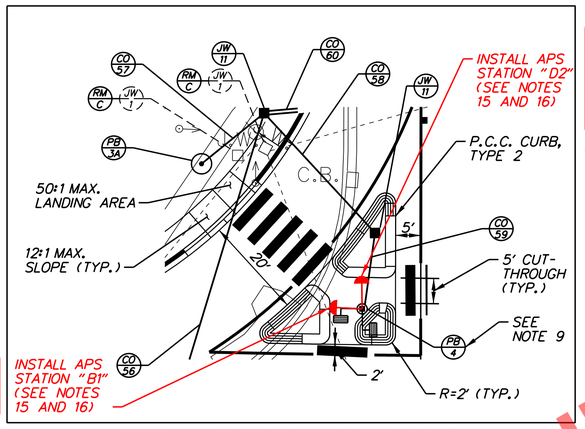
B = BORE, T = TRENCH, O = OPEN CUT

NOTES:

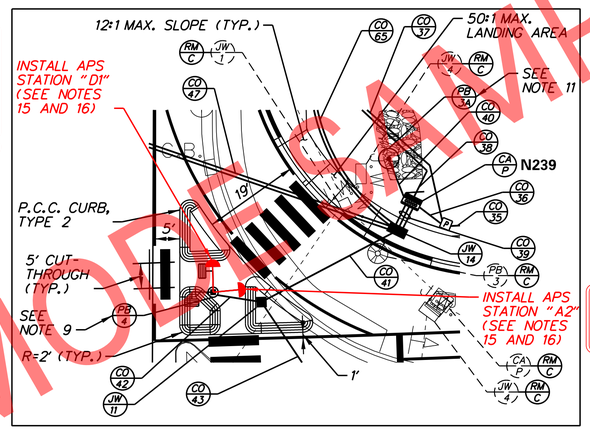
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16. THE PROPOSED ASSEMBLY SHALL HAVE AN APS STATION EXTENSION BRACKET.

PREPARED BY
WRA Whitman, Requardt and Associates, LLP
Engineers •Architects •Environmental Planners Est. 1915
3/7/2023
THIS SEAL APPLIES TO THE REDLINE REVISION ON THIS SHEET.
DATE
MATTHEW J.A. BUCKLEY No. 19224 PROFESSIONAL ENGINEER
SEAL

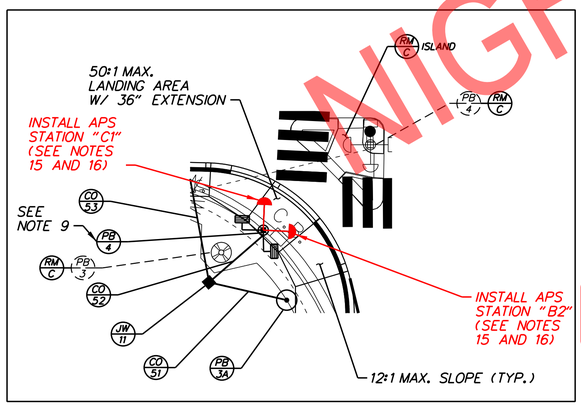
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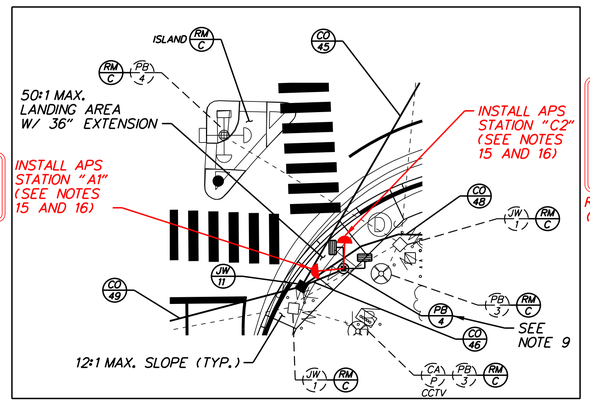
DETAIL 1 – CURB RAMPS, TYPES 2 & 5
SCALE: 1" = 15'



DETAIL 2 – CURB RAMPS, TYPES 2 & 5
SCALE: 1" = 15'

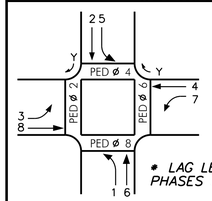


DETAIL 3 – CURB RAMP, TYPE 2
SCALE: 1" = 15'

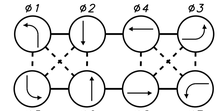


DETAIL 4 – CURB RAMP, TYPE 2
SCALE: 1" = 15'

ULTIMATE SIGNAL PHASING



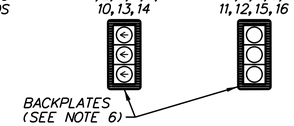
NEMA PHASING



PHASING NOTES
1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

ULTIMATE SIGNAL HEAD DIAGRAM

*ALL EXISTING SIGNAL HEADS SHALL BE REMOVED



LEGEND

AB	ABANDON	OH	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO *	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO *	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (* OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (* OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL		P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
SPAN INSULATOR		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION		

GENERAL SIGNAL NOTES

1. PROPOSED LOOP DETECTORS:
   TYPE *2 - 6' x 25' - TO BE INSTALLED ON US 40 LEFT-TURN MOVEMENTS AND SR 72 THROUGH AND LEFT-TURN MOVEMENTS.
   SYSTEM - 6' x 6' - TO BE INSTALLED IN US 40 AND SR 72 RECEIVING LANES, AS SHOWN.
2. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
3. POLE BASES, CABINET BASE AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 211.OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.
4. ALL CONDUITS SHALL BE SCHEDULE 80 PVC WHEN INSTALLED BY TRENCHING AND SCHEDULE 80 HDPE WHEN INSTALLED BY BORING, UNLESS OTHERWISE NOTED.
5. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.
6. DELDOT TRAFFIC SHALL INSTALL BACKPLATES ON SIGNAL HEADS 1-16.

SG-04

RECOMMENDED _____ DATE:_____
RECOMMENDED _____ DATE:_____
RECOMMENDED Signature on file DATE: 9/7/2017
APPROVED TRAFFIC ENGINEER Signature on file DATE: 9/7/2017
APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER Signature on file DATE: 9/7/2017

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS
1 INSTALLED APS STATIONS AND PEDESTRIAN WARNING SIGNS. B. WALKER (WRA) 02-2023 (P.O. #65506/443055)

US 40 / SR 72 INTERSECTION IMPROVEMENTS

CONTRACT T200411901
COUNTY NEW CASTLE
PERMIT NO. N239, NBT0027, & NCAM023
DESIGNED BY: D.W.C. (WRA)
CHECKED BY: M.J.B. (WRA)

SIGNAL PLAN
US 40 (PULASKI HWY)
SR 72 (WRANGLE HILL RD / SUNSET LAKE RD)

SHEET NO. 175
TOTAL SHTS. 179

WORK SAMPLE
NIGHT MOVE

C:\Users\bwalker\OneDrive - Whitman Requardt & Associates, LLP\Desktop\redline_SG04_4072.dgn
2/21/2023 7:32:24 AM

PedSafety

CAMPBELL COMPANY — EST. 1972 — EMPLOYEE OWNED SINCE 2020

Accessible Pedestrian Signals: Intersection Planning Sheet

Project City/County:_____

Project State:_____

Intersection:_____@_____

# of APS to be Installed:_____

Purchase Order#:_____

Guardian Wave ◉ Guardian ○ Guardian Mini ○ Beacon ○ BBU ○ WiAAPS ○

Station Color: _____

Station Size: _____

Sign Film Grade:_____

Programmed Messages: _____

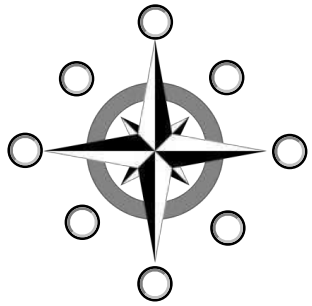
Actuator Color:_____

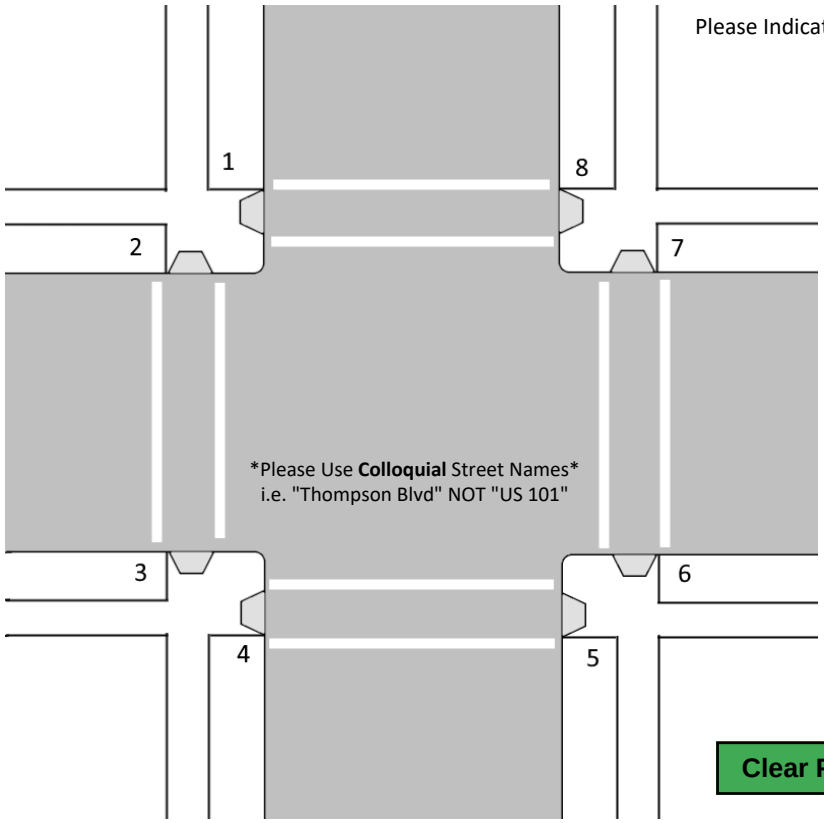
Sign Legend: _____

Braille on Sign:_____

Station #	Arrow Direction	Ped Phase	Walk Cycle Msg: Verbal	Tone
1			☐	☐
2			☐	☐
3			☐	☐
4			☐	☐
5			☐	☐
6			☐	☐
7			☐	☐
8			☐	☐

Please Indicate North in relation to the intersection:





Clear Form Save Form

Notes:

- **All stations programmed with factory default MUTCD settings unless noted otherwise.**
- **GENERIC VOICE MESSAGES** consist of “WAIT" on press,"WAIT TO CROSS" on extended press, and "WALK SIGN IS ON TO CROSS” or Percussive Tone on walk cycle for all stations.
- **CUSTOM VOICE MESSAGES** consist of “WAIT" on press,"WAIT TO CROSS [Street Name] AT [Street Name]" on extended press, and "[Street Name], WALK SIGN IS ON TO CROSS [Street Name]” or Percussive Tone on walk cycle for all stations.
- Per MUTCD 4E.10: Pedestrian stations with <10’ separation will use CUSTOM message for the walk cycle. Pedestrian stations with >10’ of separation will utilize a PERCUSSIVE (TONE) for the walk cycle.

Customer Notes:

PedSafety Accessible Pedestrian Signals: Intersection Planning Sheet

CAMPBELL COMPANY EST. 1972 EMPLOYEE OWNED SINCE 2020

"H" or Diverging Diamond Intersection- 16 max APS

Project City/County:_____

Project State:_____

Intersection:_____@_____

# of APS to be Installed:_____

Purchase Order#:_____

Guardian Wave ◉ Guardian ○ Guardian Mini ○ Beacon ○ BBU ○ WiAAPS ○

Station Color: _____

Station Size:

Sign Film Grade:_____

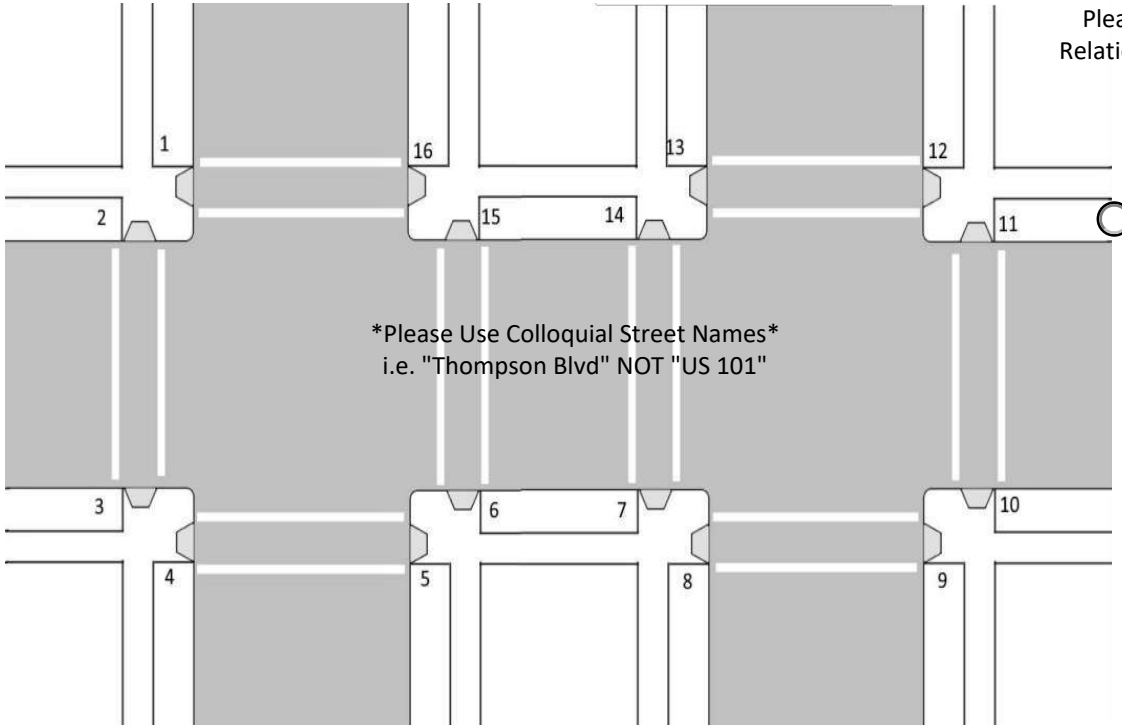
Programmed Messages: _____

Actuator Color:_____

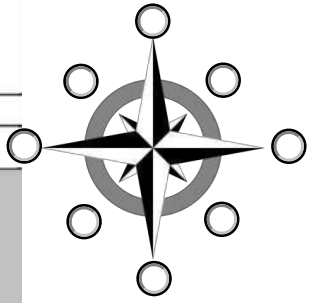
Sign Legend: _____

Braille on Sign:_____

Stn #	Dir of Arrow	Ped Phase	Walk Cycle Msg: Verbal	Tone
1			☐	☐
2			☐	☐
3			☐	☐
4			☐	☐
5			☐	☐
6			☐	☐
7			☐	☐
8			☐	☐
9			☐	☐
10			☐	☐
11			☐	☐
12			☐	☐
13			☐	☐
14			☐	☐
15			☐	☐
16			☐	☐



Please Indicate North in Relation to the Intersection:



NOTES:

- **All stations programmed with factory default MUTCD settings unless noted otherwise.**
- **GENERIC VOICE MESSAGES** consist of “WAIT" on press,"WAIT TO CROSS" on extended press, and "WALK SIGN IS ON TO CROSS” or Percussive Tone on walk cycle for all stations.
- **CUSTOM VOICE MESSAGES** consist of “WAIT" on press,"WAIT TO CROSS [Street Name] AT [Street Name]" on extended press, and "[Street Name], WALK SIGN IS ON TO CROSS [Street Name]” or Percussive Tone on walk cycle for all stations.
- Per MUTCD 4E.10: Pedestrian stations with <10’ separation will use CUSTOM message for the walk cycle. Pedestrian stations with >10’ of separation will utilize a PERCUSSIVE (TONE) for the walk cycle.

Clear Form Save Form

Customer Notes:

PedSafety

CAMPBELL COMPANY EST. 1972 EMPLOYEE OWNED SINCE 2020

Accessible Pedestrian Signals: Intersection Planning Sheet

Intersection with Medians- 16 max APS

Project City/County:_____

Project State:_____

Intersection:_____@_____

# of APS to be Installed:_____

Purchase Order#:_____

Guardian Wave ◉ Guardian ○ Guardian Mini ○ Beacon ○ BBU ○ WiAAPS ○

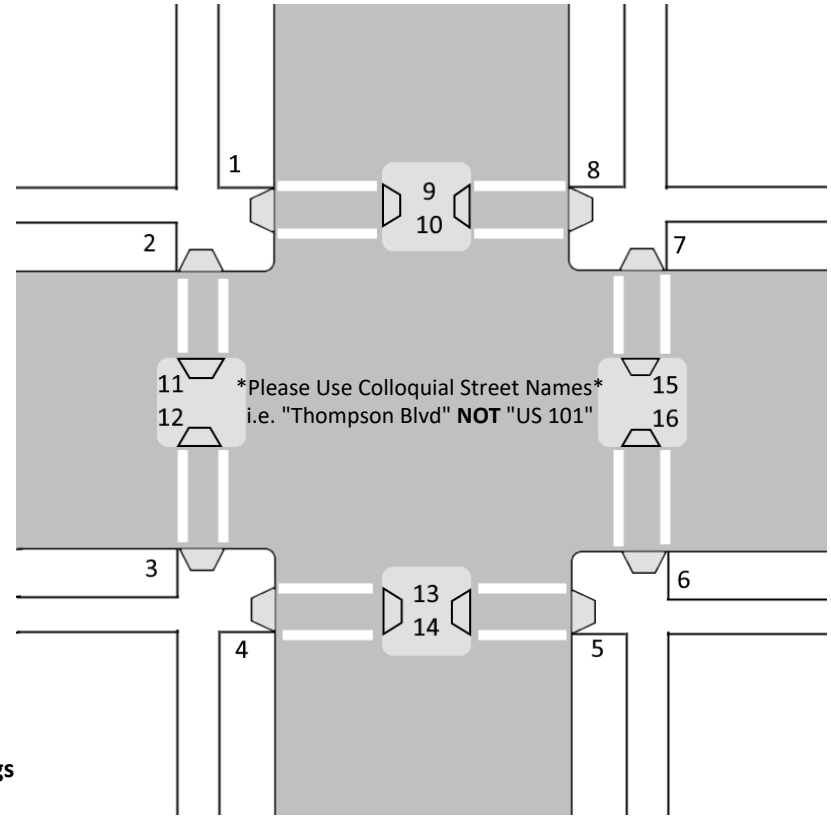
Station Color: _____ Actuator Color:_____

Station Size: Sign Legend: _____

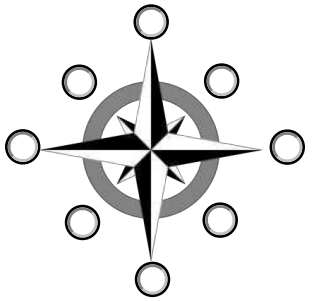
Sign Film Grade:___ Braille on Sign:

Programmed Messages: Custom Voice Message

Station #	Arrow Direction	Ped Phase	Walk Cycle Msg: Verbal	Tone
1			☐	☐
2			☐	☐
3			☐	☐
4			☐	☐
5			☐	☐
6			☐	☐
7			☐	☐
8			☐	☐
9			☐	☐
10			☐	☐
11			☐	☐
12			☐	☐
13			☐	☐
14			☐	☐
15			☐	☐
16			☐	☐



Please Indicate North in Relation to the Intersection:



Clear Form Save Form

NOTES:

- **All stations programmed with factory default MUTCD settings unless noted otherwise.**
- **GENERIC VOICE MESSAGES** consist of “WAIT" on press,"WAIT TO CROSS" on extended press, and "WALK SIGN IS ON TO CROSS” or Percussive Tone on walk cycle for all stations.
- **CUSTOM VOICE MESSAGES** consist of “WAIT" on press,"WAIT TO CROSS [Street Name] AT [Street Name]" on extended press, and "[Street Name], WALK SIGN IS ON TO CROSS [Street Name]” or Percussive Tone on walk cycle for all stations.
- **Per MUTCD 4E.10**: Pedestrian stations with <10’ separation will use CUSTOM message for the walk cycle. Pedestrian stations with >10’ of separation will utilize a PERCUSSIVE (TONE) for the walk cycle.

Customer Notes:

DelDOT
Delaware Department of Transportation

DELAWARE DEPARTMENT OF TRANSPORTATION
INTERIM GUIDELINES FOR THE INSTALLATION OF
ACCESSIBLE PEDESTRIAN SIGNALS
DECEMBER 11, 2007

I. INTRODUCTION

A. Background

The Transportation Equity Act for the 21st Century (TEA-21) directs that pedestrian safety considerations, including the installation of accessible traffic signals, where appropriate, be included in new transportation plans and projects [Sec. 1202(g)(2)]. The bill was signed into law by the President on June 9, 1998.

The Americans with Disabilities Act (ADA) requires access to the public right-of-way for people with disabilities. Access to traffic and signal information is an important feature of accessible sidewalks and street crossings for pedestrians who have vision impairments. While most intersections pose little difficulty for independent travelers who are blind or have low vision, there are some situations in which the information provided by an accessible pedestrian signal is necessary for independent and safe crossing.

An Accessible Pedestrian Signal (APS) is a device that is used in conjunction with pedestrian signals that communicates pedestrian signal information in nonvisual formats such as audible tones, verbal messages, and/or vibrating surfaces. APS let pedestrians who are blind or visually impaired know when the WALK interval begins and terminates. Pedestrians who know when the crossing interval begins will be able to start a crossing before turning cars enter the intersection and can complete a crossing with less delay. Audible signals can also provide directional guidance, which is particularly useful at non-perpendicular intersections and at wide multi-lane crossings.

B. Purpose and Scope

These interim guidelines provide the Delaware Department of Transportation (DelDOT) with a process to evaluate and prioritize APS installations when they are requested. These interim guidelines describe a process in which an intersection must first meet basic conditions in order to be considered for APS. If APS should be considered, an intersection must be evaluated to determine the need relative to other locations where APS has been requested. The scores received in the evaluation determine this relative need and can be used to develop a prioritized list of intersections to be funded. The goal is that all requests for APS installation receive a fair and equal assessment and that funds are expended in the most effective manner.

It should be noted that these guidelines apply only at locations where APS is requested. This approach is being taken due to potential changes resulting from comments on the Revised Draft Guidelines for Accessible Public Rights-of-Way (PROWAG). Additional guidelines concerning the installation of APS at new intersections or intersections that are undergoing improvements will be developed following finalization of PROWAG by the federal government.

II. GUIDELINES

The following is the procedure for determining whether APS installations should be considered at intersections. Three basic conditions should be met (as determined by DelDOT Traffic) for APS to be considered:

1) APS must be requested
2) Intersections must be signalized
3) Retrofitting the signal to include APS must be feasible[1]

For APS to be considered "requested," the "Request for the Installation of Accessible Pedestrian Signals Form" (see Appendix A) must be completed and submitted to DelDOT. This form is available on DelDOT's website and in hard copy from DelDOT's Public Relations office. A blind or visually impaired person also has the option of calling DelDOT Public Relations office at 1-800-652-5600 to give the information verbally so that it can be transcribed onto the form for DelDOT's records. The requestor should be a blind or visually impaired individual or a person or agency filing on his or her behalf.

If these three conditions are met, there are three cases that may be encountered, as discussed below. These cases apply to the specific crossing that is being requested. If it is determined that APS should be installed at the specific crossing that is being requested, APS should be installed at all signalized pedestrian crossings at the intersection to the maximum extent feasible.[1]

Case 1 – The crossing for which APS is being requested is equipped with pedestrian signals and there are no current improvements proposed to the pedestrian signal, perform an evaluation using the "Accessible Pedestrian Signal Evaluation Form" (see Appendix B). The evaluation form will determine the priority of the APS installation relative to other intersections for which APS has been requested. The scores received in the evaluation will be used to develop a prioritized list of intersections to be funded.

Case 2 – If there are plans for the installation of new pedestrian signals or plans for improvements to existing pedestrian signals on the crossing for which APS is being requested, revise the plans to include APS to the maximum extent feasible[1]. In this case, the intersection need not be evaluated.

Case 3 – If there is no pedestrian signal and no plans for them, conduct a traffic engineering study to determine if pedestrian signals are warranted. If warranted, include the appropriate

[1] From the Draft Public Rights-of-Way Accessibility Guidelines, "the phrase 'to the maximum extent feasible' applies to the occasional case where the nature of an existing facility makes it virtually impossible to comply fully with applicable accessibility standards through a planned alteration. In these circumstances, the alteration shall provide the maximum physical accessibility feasible. Any altered features of the facility that can be made accessible shall be made accessible."

"Existing conditions (e.g., underlying terrain, right-of-way availability, underground structures, adjacent developed facilities, drainage, the presence of a notable natural or historic feature) may limit choices in an alterations project. In determining the maximum feasible accessibility that can be achieved for pedestrians with disabilities within a given alterations project, covered entities may consider constructability limits commensurate with those of the project as a whole."

APS when the pedestrian signals are installed to the maximum extent feasible[1]. In this case, the intersection need not be evaluated using the "Accessible Pedestrian Signal Evaluation Form" (see Appendix B). If a pedestrian signal is not warranted, do not install APS.

III. INTERSECTION EVALUATION

A. Overview of Procedure

If the three basic requirements are met and there are no current improvements proposed by DelDOT to the existing pedestrian signal (Case 1), an evaluation shall be performed during a site visit to derive a score for each crossing where APS is being requested. The evaluation team should include the requesting blind or visually impaired person or their representative, DelDOT's ADA Coordinator, and a representative from DelDOT Traffic. If necessary at complex intersections, a certified orientation and mobility specialist may be included on the evaluation team.

The evaluation should be performed during the time of day when the requesting blind or visually impaired person typically crosses the intersection and/or when crossing the intersection would be most difficult. During the intersection visit, the evaluation team should thoroughly discuss all possible solutions to address the crossing needs of the requesting blind or visually impaired person. These discussions should include, but not be limited to, minor intersection improvements, installation of new crosswalks, installation of pedestrian signals with APS on crossings for which APS are not being requested, consideration of the needs of other potential blind or visually impaired individuals, and consideration of the intersection's characteristics after improvements are made. In addition, if APS are to be installed at nearby signalized intersections, it is important that signals from one intersection cannot be heard at other intersections.

At any point deemed appropriate by DelDOT or the requestor, an intersection may be reevaluated to account for changes that would influence the evaluation score and hence the ranking on the prioritized list. Similarly, if more than a year elapses between the intersection's evaluation and the design or installation of the APS system, DelDOT Traffic should ensure that there is a continued need for the APS. For example, the requesting blind or visually impaired person may have relocated since submitting the request.

B. Evaluation Factors and Rating Methodology

The following factors and rating methodology and the "Accessible Pedestrian Signal Evaluation Form" (see Appendix B) should be used to evaluate intersections for which APS installation has been requested (Case 1 only). The evaluation should be performed for the specific crossing(s) where APS is being requested. Some factors are more important than others, and the evaluation process allows the evaluation team to distinguish and account for this distinction through the use of the point system. The highest total points per requested crossing (north, south, east or west) will be used as the overall intersection score.

The evaluation will determine the specific needs of the requesting blind or visually impaired person and allow DelDOT to prioritize installations because funding is limited.

Following is a summary of the factors used in the evaluation process:

1. Configuration of Intersection: The number of approaches to an intersection and the geometric design (offset, skewed, etc.) can affect the ability of the blind or visually impaired pedestrian to cross the roadway safely. The blind or visually impaired pedestrian listens for the traffic going straight through the intersection that is close and parallel with the crosswalk being traversed to guide his or her passage across the roadway. Accordingly, when an intersection's configuration is skewed, offset, or does not have straight through movements (as is the case in a three-legged intersection), a crossing can become more difficult for the blind or visually impaired pedestrian.

2. Width of Crossing: Wider streets are more difficult for the blind/visually impaired pedestrian to safely cross. Points are assigned on the basis of the width of the crossing. Crossing width is measured from the curb at the embarkation point to the curb at the destination point including perpendicular ramp areas. Islands and medians should be included in the total crossing distance even if they are equipped with separate pedestrian pushbuttons. Efforts should be made to permit blind/visually impaired pedestrians to cross in one continuous movement. Divided streets with or without a pedestrian pushbutton in the median should be handled as a single crossing, with the width measured across the entire street.

3. Pedestrian Crashes: Past pedestrian crash experience at the intersection can be used as an indicator of potential safety. Accordingly, the higher the occurrence of crashes, the higher number of points given.

4. Posted Speed Limit or 85th Percentile Speed on Street to Be Crossed: The speed of approaching traffic reflects the capability of approaching drivers to stop for pedestrians clearing the intersection as the traffic signals and pedestrian signals change. Points are assigned on the basis of the posted speed limit or 85th percentile speed on the street to be crossed. To determine 85th percentile speeds, free flow speeds should be measured on the roadway approach to the pedestrian crossing. More points are assigned for higher speeds.

5. Traffic Volumes/Queues: The volume of traffic and queues on the street parallel to the crossing may help or hinder the capability of a blind/visually impaired pedestrian to cross the street. Optimal crossing conditions occur at locations with a moderate but steady flow of traffic through the intersection with a minimum of turning movements. Traffic volumes and queues that are light or erratic make it difficult for the pedestrian to pick up audible clues as to whether the light is red or green. Accordingly, more points are assigned for shorter queues on the roadway parallel to the crossing. Traffic volumes and queues should be collected during the time of day when the requesting blind or visually impaired person typically crosses the intersection and/or when crossing the intersection would be most difficult. Off-peak periods on weekdays from 9 AM to 3 PM and on weekends from 7 AM to 6 PM should be considered when assessing queues and traffic volumes. In resort areas or other special areas, off-peak season traffic volumes should be considered.

6. Right-Turn Operations: Heavy right-turn volumes from the street parallel to the pedestrian crossing may hinder the capability of a blind/visually impaired pedestrian to cross the street. Accordingly, points are assigned for higher right-turn volumes.

7. Free Right-Turn Operations: Free flow right-turn lanes (i.e. right-turns that are channelized and do not operate under signal control) hinder the capability of a blind or visually impaired

pedestrian to cross the street. Special care must be taken when installing APS to mitigate the problems associated with this condition. Accordingly, points are assigned if this condition impacts the crossing.

8. Special Signal Conditions: Certain signals operations including the presence of a lead pedestrian phase, an exclusive pedestrian phase, a mid-block exclusive pedestrian signal, or split phasing may hinder the capability of a blind or visually impaired pedestrian to cross the street. Accordingly, points are assigned if any of these conditions impact the crossing.

9. Proximity of Intersection to Key Facilities: APS should be considered at intersections that are close to facilities that attract or generate significant amounts of pedestrian traffic. APS would improve the safety and mobility of the blind or visually impaired pedestrian and make these facilities more accessible. Examples are medical, educational, social, recreational, commercial, shopping, public, governmental facilities, and transit stops. Pedestrian demand is based in part on how close the intersection is to these facilities; i.e., the closer a facility, the more the demand. Likewise, points are assigned based on the closeness of these facilities to the intersection; i.e., the closer a facility, the more the points. In the case of multiple facilities, points should be assigned using the closest facility to the proposed APS site.

10. Other Special Traffic and Mobility Conditions: This factor is intended to provide the evaluation team an opportunity to add 15 points based on special conditions not adequately covered by previous factors or based on special needs of the requesting party (e.g. disabled pedestrian generators in close proximity to the crossing).

IV. FUNDING PROCESS

At intersections where APS is installed under Cases 2 and 3, funding for APS will be included in the cost of the pedestrian signal project or capital project.

Intersections where APS is requested and approved and there are no current improvements proposed (Case 1) are generally funded on a “first come, first served” basis as funds are available. If funds are not available, the approved intersections are put on hold or carried over to the next funding cycle (typically a fiscal year). The new funds are distributed first to the carried over intersections based on the priority established by the Overall Intersection Score. If funds still remain after being distributed to the prioritized list, further requests for APS retrofit installations are once again funded, designed, and scheduled for implementation on a first come, first served basis until the funds are depleted. This basic process is repeated year after year.

It should also be noted that some traffic signals cannot be retrofitted with APS without major intersection modifications. If APS cannot be implemented by DelDOT Traffic’s on-call contractors due to right-of-way impacts, utility relocations, drainage improvements, or extensive geometric modifications required to install APS, the project may be forwarded to the Project Development Pipeline.

Appendix A

REQUEST FOR THE INSTALLATION OF ACCESSIBLE PEDESTRIAN SIGNALS FORM

Requesting Party's Name:

_____
(Blind or visually impaired pedestrian)

Address: _____City:_____

State: _____Zip Code: _____

Telephone (Home): _____ Telephone (Work): _____

I request that the Delaware Department of Transportation install Accessible Pedestrian Signals (APS) to cross the **NORTH** ☐ **SOUTH** ☐ **EAST** ☐ **WEST** ☐ *(check all that apply)* side of _____*(Route Number/Street Name)* where it crosses _____ *(Route Number/Street Name)* in _____ *(city, town, or county).*

Please describe the difficulty you have in crossing:

Please call DelDOT at 1-302-760-2048 with questions, or to seek assistance in filling out the form and/or mail form to:

DelDOT ADA Title II/Section 504 Coordinator
ATTN: Tom Nickel
P.O. Box 778
Dover, DE 19903
E-mail: DOT.ADASupport@delaware.gov

Submit Form Online

For Office Use Only

Date Received: _____ Received by: _____

Appendix B

ACCESSIBLE PEDESTRIAN SIGNAL EVALUATION FORM

Location:		
Date:	Day:	Time of Day:
Weather Conditions:		
Evaluation Team Members:		
Specific Needs of Requesting Party:		

REQUESTED APS CROSSINGS - Check all that apply (Evaluation of other crossings may be performed, but the scores should not be used when ranking intersections)	**INTERSECTION LEGS**			
	North	**South**	**East**	**West**

EVALUATION FACTOR	**POINTS**			
1. Configuration of Intersection	**North**	**South**	**East**	**West**

Configuration	Points	Comments:
(Points should be assigned to legs of the intersection affected by the configuration)		
4-leg right angle intersection	2	
3-leg tee intersection	4	
3 or 4-leg skewed intersection	6	
4-leg offset intersection	8	
Other complex or multiple leg intersections	10	

2. Width of Crossing	**North**	**South**	**East**	**West**

Width (feet)	Points	Comments:
40 or less	2	
41 to 52	4	
53 to 68	6	
69 to 78	8	
79 or more	10	

3. Pedestrian Crashes	**North**	**South**	**East**	**West**

Crashes / 5 Years	Points	Comments:
(Points should be assigned to all legs of the intersection)		
1	2	
2	4	
3	6	
4	8	
5 or more	10	

4. Posted Speed Limit (or 85th %ile Speed) on Street to be Crossed	North	South	East	West

Speed (mph)	Points	Comments:
0 to 25	1	
26 to 30	2	
31 to 35	3	
36 to 40	4	
41 or more	5	

5. Traffic Volumes/Queues	North	South	East	West

Queues on Parallel Street — Points — Comments:

(Queues should be measured during the time of day when the requesting blind of visually impaired person typically crosses the intersection and/or when crossing the intersection would be most difficult.)

> 2 vehicle queue per cycle	2
2 vehicle queue per cycle	4
1 vehicle queue per cycle	6
Average < 1 vehicle per cycle	8
0 vehicles per any 5 minute period	10

6. Right Turn Operations	North	South	East	West

Assign points for peak hour right-turn volumes from the street parallel with the pedestrian crossing.

Volume (vph)	Points	Comments:
20 to 40	2	
41 to 60	4	
61 to 80	6	
81 to 100	8	
> 100	10	

7. Free Right Turn Operations	North	South	East	West

If there is a free flow right-turn lane (i.e. right turn that is channelized and does not operate under signal control) that impacts the crossing, assign 5 points.

Comments:

8. Special Signal Conditions	North	South	East	West

If there are lead pedestrian phases, exclusive pedestrian phases, mid-block exclusive pedestrian signals, or split phasing that impact the crossing, assign 15 points.

Comments:

9. Proximity of Intersection to Key Facilities	North	South	East	West

Proximity to Facility	Points	Comments:
1201 ft to 2400 ft	2	
801 ft to 1200 ft	4	
401 ft to 800 ft	6	
Less than 400 ft	8	
At the Facility	10	

10. Other Special Traffic and Mobility Conditions	North	South	East	West

If special traffic and mobility conditions do exist, assign up to 15 points.

Comments:

TOTAL POINTS	North	South	East	West

OVERALL INTERSECTION SCORE (Highest Total Points By Approach)	

Additional Comments by Evaluation Team:

APPENDIX M

Memo – Requests for Electric Power Service (April 7, 2020)

Delaware Department of Transportation
Division of Transportation Solutions
Design Guidance Memorandum

Memorandum Number: 1-27

1. Road Design Manual
2. Bridge Design Manual
3. Utilities Design Manual
4. Right of Way Manual
5. Standard Specifications
6. Standard Construction Details
7. Traffic Design Manual

Title: Electric Power Service Request for Roadway Lighting, Traffic Signals and ITS Equipment
Effective Date: 4-07-2020

Sections to Implement:

_X_ Project Development	_X_ Planning	____ DTC
_X_ Bridge	____ Quality	_X_ Traffic
_X_ Team Support	_X_ Maintenance & Operations	____ Other
_X_ Utilities		

I. Purpose

To establish the procedures for processing the request for new electric power service for any DelDOT roadway lighting, traffic signal and/or ITS equipment as part of any new construction, or repair/upgrades to existing roadways on public use facilities.

II. Applicability

DelDOT recognizes the benefits of streamlining the electrical power needs across multiple sections within the Department to account for the type, size, location, maintenance responsibility, monthly billing arrangements, and installation cost specific to each project. This guidance only applies to Capital projects. Traffic led projects, projects involving construction of buildings, tariff based (i.e. utility owned) lighting on Capital projects, and any other projects will be addressed separately.

III. Design Guidance

1. For Capital Projects the 'designer' will identify power supply needs for roadway appurtenances (typically roadway lighting, traffic signals, and ITS devices) as early in the design phase as possible. For consultant led Capital projects, the designer will be the consultant's engineer whereas for internal DelDOT led Capital projects, the designer will be DelDOT's assigned traffic engineer within Traffic's System Design Section.
2. The designer should coordinate with DelDOT's Project Development (PD)/Bridge or Planning Project Manager, Traffic Section, and Utility Section regarding power source needs. The designer shall arrange a field meeting with the utility company to determine the power needs, location of the power source, type of power, cost to the department, and whether service will be metered or tariff. DelDOT's Project Manager and Utility Engineer will attend the field meeting, as necessary. However, if the highway design is led by PD then their highway designer should attend the field meeting as well. Additional support is available to the designer working with the utility company via DelDOT's monthly utility coordination meetings.
3. DelDOT Project Manager, Utility Engineer, and Traffic System Design Manager will coordinate to determine whether there is any reimbursable utility work on the project. If there is any reimbursable utility work, DelDOT Utility Section will request a cost estimate from the utility company for the installation of new power source. If there is no reimbursable

utility work associated with the Capital Project, then the cost estimate for power source will be obtained by the designer in coordination with the Utility Section and provided to the Traffic Section to be added to the traffic statement.

4. After the designer and utility company representatives have agreed upon the power source location, the designer is responsible to properly display the necessary information on the project plans and provide the plans to DelDOT's Project Manager, Traffic System Design Manager, and Utility Section. Additionally, the utility statement for the project should incorporate the power source and other relevant information. In the case of lighting design, the location of utility pole-based tariff lighting should also be provided on the utility statement.
5. If there are multiple power source requests in a project area, the utility company may request a gang meter where one combined meter setup with separate billing can be accommodated for multiple service requests (i.e. signals, ITS, lighting). In such case, the designer shall coordinate with DelDOT Traffic Signal Construction group and utility company for the feasibility of a gang meter (cluster of meters with a single power source) in their project assuming that voltage drops will not be an issue.
6. The utility statement shall provide the description of the work and identify the responsible parties for installation of the work associated with the provision of new electrical service. The utility statement should also identify responsibility of payment for installation of power service (whether by DelDOT Utility Section or Traffic Section) and parties responsible for payment of usage of service. If applicable, the utility statement should also provide information on gang meter and the type of services connected there.
7. DelDOT Utility Section will fund the power service work if there is any reimbursable work for utility relocation. If there is no reimbursable utility work, then DelDOT Traffic Section will address the funding need of the work through the traffic statement. Utility Engineer will support the Traffic Section, as necessary. A utility bar chart, showing the work schedule shall be prepared by the designer in coordination with the Utility section and the power company to show the timing of the power supply work and included in the Utility Statement.
8. DelDOT's Traffic Signal Construction group will be responsible for the preparation and delivery of the power service application with the support of the designer. Traffic personnel handling these requests can be confirmed through the Traffic Field Operations. For projects where there are more than two power service requests, a display map showing all the power source locations and the type of services should be provided by the designer and will be part of the power service application. A copy of the Utility Statement and power service application shall be sent to Traffic, the M&O Districts and Business Management at the time of PS&E.
9. The timing of the electric service processing, including when the service application will be submitted, should be discussed at the pre-con meeting. If the utility company isn't present at the pre-con meeting, then a separate meeting should be arranged soon after the pre-con meeting. That meeting will ensure (to the extent possible) that DelDOT Construction group, Traffic Signal Construction group, and the utility company are in agreement for the utility service schedule. However, no major utility change that may trigger any redesign of the Roadway Lighting, Traffic Signals, or ITS Equipment should be considered after PS&E. DelDOT Utility Section, designer, and others will assist the meeting, as necessary. The final Utility Statement and the power service application shall be sent to the utility company at the agreed upon time as determined during the meeting.
10. Once funding is setup and a Purchase Order established, the DelDOT Utility Section or Traffic Section will issue a Notice to Proceed (NTP) to the utility company who will be completing the power supply work. The NTP will authorize the utility company to order the necessary materials and to coordinate with DelDOT Construction (i.e. Construction) as to initiating work on the project site.
11. Utility company will coordinate the timing of the power service work with Construction Section and complete the work. If the NTP is issued by Traffic Finance Section, then the

utility company will submit the invoice to the Construction Section. However, if the NTP is issued by the Utility Section then the invoice will be submitted to the Utility Section who will review it and then forward to the Construction Section.

12. The Construction Section will review and confirm the quantities of power service work listed in the invoice and forward to the Utility Section for payment for reimbursable utility work. For non-reimbursable utility work, Construction Section will forward the invoice to Traffic Finance Section for payment. DelDOT Utility Section or Traffic Section will pay the invoice based on the type of work.
13. Bills for electric power usage will be sent to and paid by the appropriate Division/ Section as identified on the power service application form. This is typically the Business Management Section in the Division of Maintenance & Operations for lighting and the Traffic Section in the Division of Transportation Solutions for signals, ITS, and any other traffic devices.

IV. Justification

In order to promote efficiency and effective project delivery.

Prepared by: Traffic Engineering Section — Date: April 07, 2020

Peter Haag DelDOT — 4/8/2020

Recommended by: Chief of Traffic Engineering — Date

04/08/2020

Reviewed by: Deputy Director - Design — Date

4/8/2020

Approved: Chief Engineer — Date

Distribution:
Transportation Solutions
Utilities
Maintenance & Operations District Engineers
Consultants
DOT Internal Site

ELECTRIC POWER SERVICE REQUEST FOR ROADWAY LIGHTING, TRAFFIC SIGNALS, AND ITS EQUIPMENT FOR CAPITAL PROJECTS

Designer to identify power supply needs and coordinate with PM, Traffic Section and Utility Section.

- Designer could be consultant's engineer or DelDOT traffic engineer based on whether the design will be done in-house or by a consultant.

Designer shall arrange a field meeting with Utility Company to determine power needs, location of power source, type of power, cost to DelDOT, and type of lighting service (tariff or standalone pole).

- If PD is doing the highway design, then the PD highway engineer should attend field meeting as well.

DelDOT PM, Utility Coordinator and Traffic Systems Design Manager will determine if there is any reimbursable utility work on the project.

- YES: Utility Section will request cost estimate from Utility Company.
- NO: Designer will obtain cost estimate from Utility Company in coordination with the Utility Section, and add to Traffic Statement.

Designer is responsible to properly display the necessary information on the project plans. Utility Statement should incorporate power source and other relevant information.

- Utility Statement will identify the responsibility of payment either by Utility Section or by Traffic Section.

Final Utility Statement and power service application form shall be sent to the Utility Company at the time of project PS&E. Signal Construction will prepare the power service application form and submit to the Utility Company.

- A copy of the application will be sent to M&O Districts and Business Management at the same time.
- For projects with more than two power service requests, designer will prepare a display map showing all the power locations which will be submitted with the applications.

Utility Section or Traffic Section will issue NTP depending on the type of work (reimbursable or non-reimbursable). Utility Company will coordinate with Construction Section to complete the work.

- If Traffic Section assigned NTP then Utility Company will send invoice directly to DelDOT Construction.
- If Utility Section assigned NTP then the invoice will go to Utility Section and they will send it to DelDOT Construction Area Engineer.

DelDOT Construction will review the invoice and forward to appropriate section for payment. Utility Section or Traffic Section will pay the invoice based on the type of work.

- Bills for electric power usage will be sent to and paid by the appropriate division/section as identified on the power service application form.

APPENDIX N

Wiring Guidelines

Appendices

Appendix – Signal Wiring/Cabling

There are a variety of conductors and cables specifically designed for the traffic signal industry. The type and size of conductors and cables should conform to the National Electrical Code (NEC) and to IMSA cable specifications as a matter of good practice. In some cases, manufacturers may recommend specific types of wire or cable for the proper operation of their equipment. **Table 1** shows information related to wiring typically used by DelDOT Traffic.

Table 1
Wiring Diagram Supplemental Information

Device	Cable Type	Size	Volt. (AC)
HIB, Jumper Wire	4-Conductor Electrical Cable	No. 14 AWG (2)	600
Pedestrian Signal Head and Push Button (1 Way) per direction	5-Conductor Electrical Cable	No. 14 AWG (2)	600
1- & 2-Section Signal Heads, 3-Sect. Head w/Arrows & Jumper Wire (Mast arm)	4-Conductor Electrical Cable (1)	No. 14 AWG (2)	600
4- and 5-Section Signal Heads (mast arm)	9-Conductor Electrical Cable (1)	No. 14 AWG (2)	600
Signal Heads (span wire)	16-Conductor Electric Cable	No. 14 AWG (2)	600
Loop Wire Lead-In Cable	1-Conductor (Aluminum shielded)	No. 14 AWG	600
Loop Detector Home-Run Cable	2-Conductor (Aluminum shielded)	No. 14 AWG	600
Opticom Detector	4-Conductor Detector Cable	No. 18 AWG	300
Grounding	Strand. Bare Cop. Gnd. Wire	No. 6 AWG (2)	----
Power Feed (disconnect to cabinet)	2-Conductor Electrical Cable	No. 8/ 2 UF w/G (2)	110/220
Electrical Service (transformer to disconnect)	1-Conductor Electrical Cable	No. 8 THHN w/G(3) or No. 6 Triplex Service Cable (2)(3)	110/220

(1) – Consideration should be given to increasing the number of conductors needed in mast arm installations for spare and future use.
(2) – For longer runs, a heavier gauge cable may be required to reduce voltage drop.
(3) – Cable determined by power company providing service.

Field Cabling

Signal head wiring originates at the control cabinet and terminates at the signal head. Cables composed of multiple conductors are used for this application. The number of conductors making up the cables is standardized to three or four combinations to reduce inventory requirements. DelDOT Signal Construction uses cables with 1, 2, 4, 5, 9, and 16 conductors per cable. Additional sizes may be used if required but, prior approval from the Signal Construction Manager shall be required.

A separate neutral wire shall be used for signal display returns for each approach to the intersection. One neutral wire shall be used for a maximum of five (5) signal faces, all directed toward the same approach to the intersection. Separate neutral wires shall be used for pedestrian signal displays, and for pedestrian detector returns.

a. Cable Sizing

The number of conductors needed in a cable can be determined by counting the number of indications to be controlled, adding the conductors needed for neutral, and providing at least one spare. After the number of conductors needed is known, the cable size that is appropriate from the normal inventory can be selected. **Table 1** shows the resulting preferred cable type for each device.

The signal cable shall typically be continuous and unbroken between the control cabinet and the first signal head that it services. However, while they should generally be avoided, signal cable splices may be used in the bottom of steel poles or nearest conduit junction well for the following circumstances, such as:

- Mast Arm Designs
- Pre-wired pedestrian poles
- For emergency signal repairs

Cabling may be overhead or underground, depending on the type of signal installation and the availability of pole lines and/or underground conduits.

b. Span Wire Cabling and Splice configurations

Signal head cables for a span wire installation are typically underground from the control cabinet to the nearest steel pole, up the pole, and onto the span through a weather head.

Two (2) 16-conductor cables shall be installed for normal signal span installations. One cable will be used to serve both one major street approach and one side street approach. The other cable will be used for the remaining approaches.

Signal heads facing the same approach that will display identical displays throughout the signal cycle may be jumped together with a 4-conductor cable and be spliced into the appropriate 16-conductor cable, leading back to the control cabinet.

Table 2 illustrates the standard practices of signal wiring and color codes for span wire configuration.

Table 2
Standard Practices of Signal Wiring and Color Codes

Conductor Colors	16/#14 Cable #1 Direction	16/#14 Cable #2 Direction	Signal Color
Typical Installation			
Green	NB or EB Artery	SB or WB Artery	Green
Orange			Yellow
Red			Red
White			Neutral
Green / Black	NB or EB Side Street	SB or WB Side Street	Green
Orange / Black			Yellow
Red / Black			Red
White / Black			Neutral
Green / White	NB or EB Artery Left Turn (If Used)	SB or WB Artery Left Turn (If Used)	Green
Black / White			Yellow
Red / White			Red
Blue / White			Neutral
Blue	NB or EB Side Street Left Turn (If Used)	SB or WB Side Street Left Turn (If Used)	Green
Black			Yellow
Black / Red			Red
Blue / Black			Neutral
Permissive Left Turns (5 section signal head)			
Green	NB or EB Artery Left Turn	SB or WB Artery Left Turn	Green
Yellow			Yellow
Red			Red
Blue			Green ←
Black			Yellow ←
White			Neutral

c. Mast Arm Pole Cabling and Splicing Configurations

Signal head cabling for a mast arm pole typically needs fewer conductors and more cables than a span wire installation. Below is the typical cable layout for mast arm designs.

Signal head cables for a mast arm pole installation are typically underground from the control cabinet to the base of the up-right of the structure. The signal cables connecting the signal cabinet and each mast arm pole should be designed as follows:

- **Single Mast Arm with a Single Phase:** Use one (1) 9-conductor for the signal head, one (1) 5-conductor for each pedestrian indication and buttons, and one (1) 4-conductor for pre-emption devices.
- **Single or Dual Mast Arm with 2 to 3 Phases:** Use one (1) 16-conductor for the signal head, one (1) 5-conductor per each pedestrian indication(s) and push button(s), and one (1) 4- conductor for each pre-emption device installed.
- **Single or Dual Mast Arm with 4 Phases:** Use two (2) 16-conductors for signal head, one (1) 5-conductor for each pedestrian indication(s) and push button(s), and one (1) 4-conductor for each pre-emption device installed.

A single 4-conductor to each three (3)-section indication and a single 9-conductor to each four (4) or five (5)-section indication shall be installed on the mast arm pole to the base of the mast arm up-right, with no splices. At the bottom of the pole, signal head conductors shall be spliced into the proposed conductor from the controller cabinet. The splices shall be twisted and with wire nuts to ensure a good connection. All splices shall be covered and secured with electrical tape or a similar form of protection. All splices should occur in the hand hole at the base of the up-right.

Table 3a – 3d below illustrates the standard practices for wiring various types of signal equipment for a mast arm design.

Table 3a
Four-Conductor Cable Wiring and Color Codes

Conductor Colors	Single Section Signal Head	3 Section Signal Head
Green	Not used	Green lens
Black	Power Feed	Yellow Lens
Red	Not used	Red Lens
White	Neutral	Neutral

Table 3b
Nine-Conductor Signal Wiring and Color Codes

Conductor Colors	Single Ped Signal	2-way Ped Signal	4-section "T" Head	4-section "⊥" Head	5-section Head
Green	Walk	#1 Walk	Green	Green	Green
Orange	Not used	Not used	Yellow	Yellow	Yellow
Red	Don't Walk	#1 Don't Walk	Red	Red	Red
White	Neutral	Neutral	Neutral	Neutral	Neutral
Green / Black	Not used	#2 Walk	Not used	Green Arrow	Not used
Black	P.B. Output	#1 P.B.	Not used	Not used	Yellow Arrow
Red / Black	Not used	#2 Don't Walk	Red Arrow	Not used	Not used
White / Black	P.B. Ground	P.B. Ground	Not used	Not used	Not used
Blue	Not used	#2 P.B.	Not used	Not used	Green Arrow

Table 3c
Left Turn Signal Head Wiring

Option #1 5-Section Signal Head			
Orange / Black	Side Street	Side Street	Yellow
Red / Black	Left Turn	Left Turn	Red
Blue / Black			Green ←
Black / Red			Yellow ←
White / Black			Neutral
Option #2 **Flashing Red Arrow (4-Section "T" Head) Artery Left Turns Only**			
Green / White	N.B. or E.B.	SB or W.B.	Green ←
Black / White	Artery	Artery	Yellow ←
Red / White	Left Turn	Left Turn	Red
Black / Red			FL Red ←
Blue / White			Neutral

Table 3d **16-Conductor of Signal Wiring and Color Codes**			
Conductor Colors	**16/#14 Cable #1 Direction**	**16/#14 Cable #2 Direction**	**Signal Color**
Typical Installation			
Green	NB or EB Artery	SB or WB Artery	Green
Orange			Yellow
Red			Red
White			Neutral
Green / Black	NB or EB Side Street	SB or WB Side Street	Green
Orange / Black			Yellow
Red / Black			Red
White / Black			Neutral
Green / White	NB or EB Artery Left Turn (If Used)	SB or WB Artery Left Turn (If Used)	Green
Black / White			Yellow
Red / White			Red
Blue / White			Neutral
Blue	NB or EB Side Street Left Turn (If Used)	SB or WB Side Street Left Turn (If Used)	Green
Black			Yellow
Black / Red			Red
Blue / Black			Neutral
Permissive Left Turns (5 section signal head)			
Green	NB or EB Artery Left Turn	SB or WB Artery Left Turn	Green
Yellow			Yellow
Red			Red
Blue			Green ←
Black			Yellow ←
White			Neutral

d. Detector Wiring

Detector wiring generally consists of electrically connecting the detector (usually an inductive loop detector) with its electronics in the control cabinet. DelDOT Traffic has specific requirements for loop detectors, optical detectors and video detectors:

Loop Detectors: These loops are formed by saw cutting the roadway and placing a one-conductor encased in flexible tubing in the saw cut which is then sealed. To ensure that the wire is protected in the transition from roadway to the nearest conduit junction well all loop wire lead-in cables should be placed in a 1.5" galvanized rigid metal conduit and weatherproof fitting in this transition area. The detector connection from the conduit junction well to the controller cabinet shall be a 2-conductor (aluminum-shielded) home-run cable for each loop detector and consist of a continuous run, without splices, between the control cabinet and the conduit junction well adjacent to the loop installation.

The loop detector shall be spliced to the "home-run" cable in the conduit junction well adjacent to the loop installation. All connections in the loop splice shall be soldered and individually insulated, with heat shrink tubing. When all connections are completed, the entire splice shall be encased in an epoxy-filled splicing kit (for example, 3M Scotch Cast #82-A1 or approved equal).

These installation procedures will minimize noise in the cable, which could interfere with the proper operation of the detector. Each splice will inevitably add electrical resistance, which would impede the proper operation of the detector. Therefore, only one splice will be allowed between the loop location and the control cabinet.

Optical and Video Detectors: Shall comply with all the recommended manufacture wiring requirements to achieve maximum data output.

e. Grounding

The following guidelines should be followed to ensure proper grounding of all wire:

- A single No. 6 AWG stranded copper ground wire shall run through all pathways between the cabinet and junction wells and the bases of all pole structures to ensure proper grounding of all wires.
- In the control cabinet:
    - The white wire and the ground (bare copper) wire from the service shall be connected directly to the ground rod in the concrete cabinet base. The white wire shall continue, unbroken, to the ground buss on the "Power Panel."
    - The green ground wire in the cabinet shall be connected as directly as possible to the ground rod.

- All individual signal neutral returns shall be connected to the ground buss on the "Power Panel."

f. Calculation of Wiring for Signal Heads

Many applications for signal head wiring use two (2) 16/#14 cables to accommodate all movements. The following is a list of steps taken to determine the cable size:

1. Determine the furthest grouping of heads for one movement
2. Determine all signal heads that will operate together
3. One wire will be used for each of these signal head groups
4. Add one wire for grounding

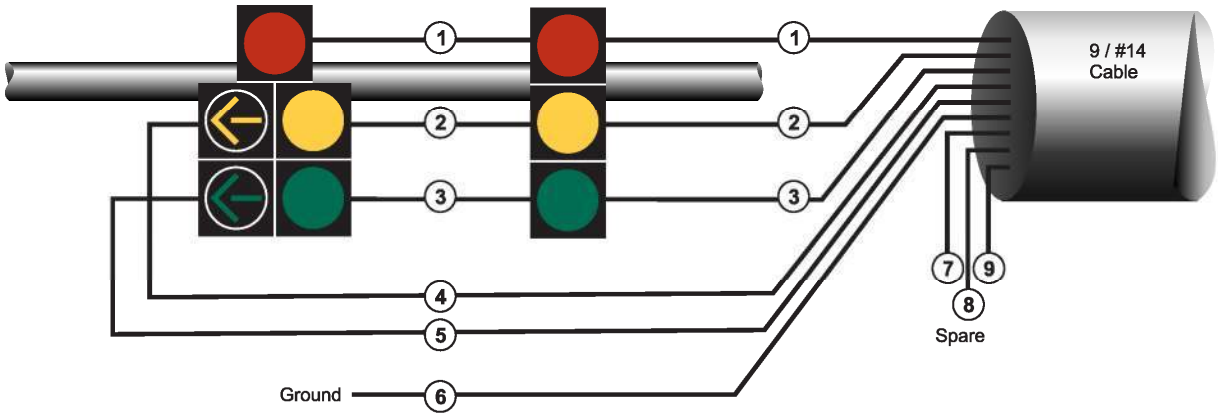


Figure 1. Example Wiring for Signal Heads

The example shown above will need a minimum of 6/#14 to accommodate all heads. However, to allow for wire failures and the addition of signal heads in the future, a 9/#14 should be used for this installation.

APPENDIX O

Soil Boring Request Form Sample

Note: This form will be regularly updated. View most recent version online.

Delaware Department of Transportation
Soil Boring Request Sheet

Contract Information	
Contract Number:	T201904001
Contract Name:	Intersection Improvements
Is this request funded with State or Federal Funds?	Federal

M&R Contact	Traffic Systems Design Contact
Hany Fekry, P.E.	Max Saintil, P.E.
Phone: 302-760-2551	Phone: 302-659-4078
Email: Hany.Fekry@delaware.gov	Email: Max.Saintil@delaware.gov

Individual Boring Information - Refer to the Column Headers for Comments Pertaining to Completing This Form

Boring No.	Structure and / or Location Description	Northing	Easting	Total Boring Depth (FT)	AASHTO T206 Continuous Depth / SPT (FT)	Infiltration Test (Y/N)	Coordination (PM/MR)				Notes	Rock Coring (FT)	Structural Related AASHTO Testing				
							Prop. Owner	DNREC	Town	USACE			T288 & T289 pH / Corrosion (Y/N)	T99 or T180 Standard Proctor (Y/N)	T216-07 Consolidation Test (Y/N)	T236 Direct Shear (Y/N)	T297 CU Triaxial (Y/N)
BO-1	SR 41 @ Loveville Rd (SE Corner)	642319.4020	587011.9897	30	20	N					1		N	N	N	N	N
BO-2	SR 41 @ McKennans Church Rd (NW Corner)	642289.4808	586913.2174	30	20	N					1		N	N	N	N	N

Notes - Enter boring specific notes on individual lines and reference the note(s) in the table above.

Note No.	Note Description
1	Refer to the DelDOT Bridge Design Manual, Section 105.4.1.2, Depth of Structural Borings for termination criteria.
2	
3	
4	
5	
6	

For Developer and Traffic-Only projects soil boring requests should be coordinated with the Traffic Systems Design Manager. For all other projects requests should be coordinated with both the Project Manager and Group Engineer. All requests should be directed to the Materials & Research Manager and Geotechnical Engineer.

Sheet Last Modified on: December 10th, 2014

APPENDIX P

Design Criteria for Overhead Mounted Street Name Signs

STATE OF DELAWARE

DEPARTMENT OF TRANSPORTATION

DESIGN CRITERIA

Overhead Mounted Street Name Signs

1. All new traffic control signals, and traffic control signals that are undergoing significant retrofits, should include overhead Street Name Signs (SNS) unless otherwise noted in this document, or other valid engineering or community involvement reasons are documented (i.e., DelDOT and a municipality agree that overhead SNSs are not needed in a specific low speed, downtown area due to aesthetic concerns).

2. All SNSs on span wires and on mast arms should have the following characteristics:

    a. Be dual-sided (except for one-way streets)
    b. Be hung below the span wire or mast arm
    c. Have a maximum width of 120 inches (10 feet)
    d. Have an initial upper-case height of eight inches (8”), and a lower-case height of six inches (6”), Highway Gothic D Lettering
    e. Have 17 feet minimum clearance from roadway surface to bottom of the sign
    f. Be installed only when the angle of the mast arm or span wire perpendicular to the direction of travel is less than 30 degrees. Regulatory signs can be hung with a pivot bracket.

3. Overhead SNSs conforming to the design criteria outlined above may incorporate a route shield when the roadway meets the conditions set out in the **DE MUTCD Section 2D.43 Paragraph 02**. State Route and US Route markers can be added to the left portion of the SNS but shall not extend the length beyond 120 inches or increase the height of the sign. The symbol should be proportioned on the sign, so as not to distort the State Route or US Route symbol. If the length of the road name is so long that the 120 inches maximum width will be exceeded, the state or US route shield with the GREEN border measuring 18” X 18” overall, may be used without the street name (see page 5).

4. The designer should avoid overhead street name signs with two lines of lettering. Typically, if a cross street has different names on either side of the intersection; two separate one-line signs should be used.

5. SNSs should not be tethered.

6. Note that regulatory signs mounted on mast arms should be rigid mounted to the mast arm (not hanging). Proposed new hardware should be used to mount regulatory signs mounted on span wires. Such span-mount signs will not be tethered unless special circumstances, such as size, dictate so.

7. The combination of possible geometric intersection designs (i.e., number of approaches, skew angles, etc.) and signal designs (e.g., “box” design, “suspended box” design, “twin” mast arm, diagonal design, alternative designs, etc.) make it impractical to develop a specific policy that will show exactly where every overhead sign should be located. The following principles should be followed:

a. Avoid placing the SNS between traffic signal heads. Generally, place overhead SNSs to the right of the far-right traffic signal head, e.g., over the paved shoulder

b. For an undivided roadway with good visibility in both directions (e.g., not a skewed intersection), generally only one SNS is needed which can serve both directions of travel. So, for the intersection of two undivided roadways that do not change names at the intersection, intersecting at a 90-degree angle without other site obstructions, typically only two SNSs are needed – one for each roadway. Sometimes even if the intersection is skewed, one sign may be visible from both directions if properly placed.

c. When the cross street has different names on either side of the intersection, or if one SNS does not result in good visibility in both directions, two signs for the roadway may be needed. If possible, the first option is to place the SNSs on the far-side right and rear-side left. The next option is near-side right and/or far-side left. The road to the right is shown on both sides (forward and reverse) on the right side SNS (whether far- or near-side), and the road to the left is shown on the left side SNS. Arrows should be included to indicate the direction in which the road name is valid

d. Divided highways should typically have one SNS for each direction of travel, generally following the placement guidelines noted in (c) above. Arrows should not be used if the cross-street name is the same on either side.

e. For Installations where the vertical support is on the right AND is in proximity to the edge of the roadway AND the SNS would conflict with signal heads on the mast arm or span wire, the SNS may be mounted on the vertical support. If any portion of the SNS will extend over the roadway, the 17 feet minimum clearance will apply.

f. If overhead SNSs properly convey all street names at an intersection, then ground mount SNSs should be omitted or, if existing, removed. If one or more streets cannot feasibly be signed with overhead SNSs, then all streets should be designated with ground mount SNSs (even if one street has redundant overhead and ground mounted SNSs).

8. Before the Project Process Meeting, the designer shall confirm the official street names for all SNSs:

a. New Castle County – https://arcg.is/CD5XO

b. Kent County – http://www.co.kent.de.us/Apps/KentCountyMapping/

c. Sussex County – https://maps.sussexcountyde.gov/OnlineMap/Map.html

d. Statewide Administrator at 302-744-2682

APPENDIX Q

Yellow Trap Guidelines

Main Street Operations:

Scenario 1:
Protected left-turns {normally Ø1 & Ø5}

- No trap possible, no special sequence omit necessary
- Preempt settings:
  - Emergency = Ø1+ Ø6 or Ø2+ Ø5
  - Transit = Ø2+Ø6

Scenario 2:
Permissive left-turns using flashing red arrow, current operation

- No trap possible, no special sequence omit necessary
- Preempt settings:
  - Emergency = Ø1+ Ø6 or Ø2+ Ø5
  - Transit = Ø2+Ø6

Scenario 3:
Permissive left-turns (5-section display) both directions {normally Ø1 & Ø5}

- Special sequence omit needed to prevent yellow trap for Ø1 & Ø5
  - Special sequence omit for Ø1 to be set to Ø2
  - Special sequence omit for Ø5 to be set to Ø6
  - OCAL function is available for special circumstances
- Preempt settings:
  - Emergency = Ø2+Ø6
  - Transit = Ø2+Ø6

Scenario 4:
One protected left-turn & one permissive left-turn (5-section display) {Ø1 protected and Ø5 permissive}

- Special sequence omit needed to prevent yellow trap for phase 5
  - Special sequence omit for Ø1 to be set to Ø2
  - OCAL for Ø1 to be set to phase 4 (or the last phase used in Ring 1)
- Preempt settings:
  - Emergency = Ø2+Ø6 (for protected direction); Ø2+Ø5 for permissive direction
  - Transit = Ø2+Ø6

Scenario 5:
One protected left-turn & one permissive left-turn (5-section display) {Ø5 protected and Ø1 permissive}

- Special sequence omit needed to prevent yellow trap for phase 1
  - Special sequence omit for Ø5 to be set to Ø6
  - OCAL for Ø5to be set to phase 4 (or the last phase used in Ring 1)
- Preempt settings:
  - Emergency = Ø2+Ø6 (for protected direction); Ø1+Ø6 for permissive direction
  - Transit = Ø2+Ø6

Scenario 6:
One permissive left-turn & one un-signalized permissive left-turn (left-turn from through movement) {Ø1 signalized permissive left-turn (5-section)}

- Special sequence omit needed to prevent yellow trap for un-signalized movement
  - Special sequence omit Ø1 to be set to Ø2
  - If no side street, OCAL to dummy phase may be necessary
- Preempt settings:
  - Emergency = Ø2+Ø6
  - Transit = Ø2+Ø6

Main Street Operations (continued):

Scenario 7:
One permissive left-turn & one un-signalized permissive left-turn (left-turn from through movement)
{Ø5 signalized permissive left-turn (5-section)}

- Special sequence omit needed to prevent yellow trap for un-signalized movement
  - Special sequence omit Ø5 to be set to Ø6
  - If no side street, OCAL to dummy phase may be necessary
- Preempt settings:
  - Emergency = Ø2+Ø6
  - Transit = Ø2+Ø6

Scenario 8:
One protected left-turn & one un-signalized permissive left-turn (left-turn from through movement)
{Ø1 signalized protected left-turn}

- Trap possible for un-signalized movement
  - Special Sequence omit Ø1 to be set to Ø2
  - OCAL for Ø1 to be set to phase 4 (or last phase in Ring 1)
- Preempt settings:
  - Emergency = Ø2+Ø6
  - Transit = Ø2+Ø6

Scenario 9:
One protected left-turn & one un-signalized permissive left-turn (left-turn from through movement)
{Ø5 signalized protected left-turn}

- Trap possible for un-signalized movement
  - Special Sequence omit Ø5 to be set to Ø6
  - OCAL for Ø5 to be set to phase 4 (or last phase in Ring 1)
- Preempt settings:
  - Emergency = Ø2+Ø6
  - Transit = Ø2+Ø6

LEAD/LAG Operations:

Scenario 10: (LEAD/LAG operations)
Protected left-turns in both directions {phases unknown}

- No trap possible, no special sequence omit necessary
- Preempt settings:
  - Emergency = main street through phase and associated left-turn phase for each direction
  - Transit = main street through phases only

Scenario 11: (LEAD/LAG operations)
Permissive left-turns (5-section display) both directions {phases unknown}

- Must hang sign for LEAD left-turn *"ON COMING TRAFFIC MAY HAVE EXTENDED GREEN"*
- Special Sequence omit LEAD left turn phase to be omitted by opposite through movement phase
- Preempt settings:
  - Emergency = main street through phases only
  - Transit = main street through phases only
- OCAL function is available for special circumstances

Scenario 12: (LEAD/LAG operations)
Protected left-turn LEAD / permissive left-turn LAG (5-section) {phases unknown}

- Special Sequence omit LEAD left-turn phase to be omitted by opposite through movement phase
  - OCAL for LEAD left-turn phase to be set to last phase in Ring 1
- Preempt settings:
  - Emergency = main street through phase for approach with protected left-turn phase; main street through plus left for approach with permissive left-turn phase
  - Transit = main street through phase

Scenario 13: (LEAD/LAG operations)
Permissive left-turn LEAD (5-section) / protected left-turn LAG {phases unknown}

- Must hang sign for LEAD left-turn *"ON COMING TRAFFIC MAY HAVE EXTENDED GREEN"*
- Preempt settings:
  - Emergency = main street through phase and associated left-turn phase for each direction
  - Transit = main street through phase

Scenario 14: (LAG Operation)
One LAG permissive left-turn & one un-signalized permissive left-turn (left-turn from through movement)

- Must hang sign for un-signalized left-turn *"ON COMING TRAFFIC MAY HAVE EXTENDED GREEN"*
- Preempt setting:
  - Emergency = main street through phase
  - Transit = main street through phase

Side Street Operations:

Scenario 1:

Protected left-turns {normally Ø3 & Ø7}

- No trap possible, no special sequence omit necessary
- Preempt settings:
  - Emergency = Ø3+ Ø8 or Ø4+ Ø7
  - Transit = Ø4+Ø8

Scenario 2:

Permissive left-turns (5-section display) {normally Ø3 & Ø7}

- Trap possible in preemption only due to main street recalls
- Preempt settings:
  - Emergency = Ø4+ Ø8
  - Transit = Ø4+Ø8

Scenario 3:

One protected left-turn & one permissive left-turn (5-section display) {Ø3 protected and Ø7 permissive}

- Trap possible in preemption only due to main street recalls
- Preempt settings:
  - Emergency = Ø4+Ø8 (for protected direction); Ø4+Ø7 for permissive direction
  - Transit = Ø4+Ø8

Scenario 4:

One protected left-turn & one permissive left-turn (5-section display) {Ø7 protected and Ø3 permissive}

- Trap possible in preemption only due to main street recalls
- Preempt settings:
  - Emergency = Ø4+Ø8 (for protected direction); Ø3+Ø8 for permissive direction
  - Transit = Ø4+Ø8

Scenario 5:

One permissive left-turn & one un-signalized permissive left-turn (left-turn from through movement) {Ø3 signalized permissive left-turn}

- Trap possible in preemption only due to main street recalls
- Preempt settings:
  - Emergency = Ø4+Ø8
  - Transit = Ø4+Ø8

Scenario 6:

One permissive left-turn & one un-signalized permissive left-turn (left-turn from through movement) {Ø7 signalized permissive left-turn}

- Trap possible in preemption only due to main street recalls
- Preempt settings:
  - Emergency = Ø4+Ø8
  - Transit = Ø4+Ø8

Scenario 7:

One protected left-turn & one un-signalized permissive left-turn (left-turn from through movement) {Ø3 signalized protected left-turn}

- Trap possible in preemption only due to main street recalls
- Preempt settings:
  - Emergency = Ø4+Ø8
  - Transit = Ø4+Ø8

Side Street Operations (continued):

Scenario 8:
One protected left-turn & one un-signalized permissive left-turn (left-turn from through movement)
{Ø7 signalized protected left-turn}

- Trap possible in preemption only due to main street recalls
- Preempt settings:
  - Emergency = Ø4+Ø8
  - Transit = Ø4+Ø8

APPENDIX R

Traffic Signal Preemption at Highway-Rail Grade Crossings Guidance

INSTRUCTIONS

for the

Texas Department of Transportation

GUIDE FOR DETERMINING TIME REQUIREMENTS FOR TRAFFIC SIGNAL PREEMPTION AT HIGHWAY-RAIL GRADE CROSSINGS

USING THESE INSTRUCTIONS

The purpose of these instructions is to assist TxDOT personnel in completing the *2017 Guide For Determining Time Requirements For Traffic Signal Preemption At Highway-Rail Grade Crossings*, also known as the Preemption Worksheet. The main purpose of the Preemption Worksheet is to determine if additional time (advance preemption) is required for the traffic signal to move stationary vehicles out of the crossing before the arrival of the train.

If you have any questions about completing the Preemption Worksheet, please contact Mr. David Valdez in the Traffic Safety Division at telephone 512-416-2642 or email **DAVID.VALDEZ@TXDOT.GOV** or Alexander Choy by phone at 512-913-7651 or email **ALEXANDER.CHOY@TXDOT.GOV**.

All values shown in red boxes on the Preemption Worksheet require user inputs. Otherwise, the form auto-calculates all values.

After approval by the District, a copy of the Preemption Worksheet, along with the traffic signal design sheets and the phasing diagrams for normal and preempted operation, shall be placed in the traffic signal cabinet.

Note that the Preemption Worksheet may not suffice in all types of road/rail geometries. For example, a separate analysis is required in situations where the rail crosses 2 legs of the intersection or when the rail crosses the roadway through the center of an intersection.

SITE DESCRIPTIVE INFORMATION:

Enter the location for the highway-rail grade crossing including the (nearest) **City**, the **County** in which the crossing is located, and the Texas Department of Transportation (TxDOT) **District** name. When entering the District name, do not use the dated district numbering schema; use the actual district name.

Next, enter the **CSJ** (Control Section Job) of the project, if applicable.

Next, enter the **Date** the analysis was performed, your (the analyst's) name next to "**Completed by**," and the status of the **District Approval** for this crossing.

To complete the reference schematic for this site, place a **North Arrow** in the provided circle to correctly orient the crossing and roadway. Record the name of the **Parallel Street** and the **Crossing Street** in the spaces provided, and remember to include any "street sign"/local name for the streets as well as any state/US/Interstate designation (i.e., "FM 1826," "SH 71," "US 290," "Interstate 35 [frontage]"). You may wish to note other details on the intersection/crossing diagram as well, including the number of lanes and/or turn bays on the intersection approach crossing the tracks and any adjacent land use.

Enter the **Railroad** name, **Railroad Contact** person's name, and **Phone** number for the responsible railroad company. Finally, record the unique 7-character **Crossing DOT#** (6 numeric plus one alphanumeric characters) for the crossing.

SECTION 1: GEOMETRIC DATA & DEFAULTS

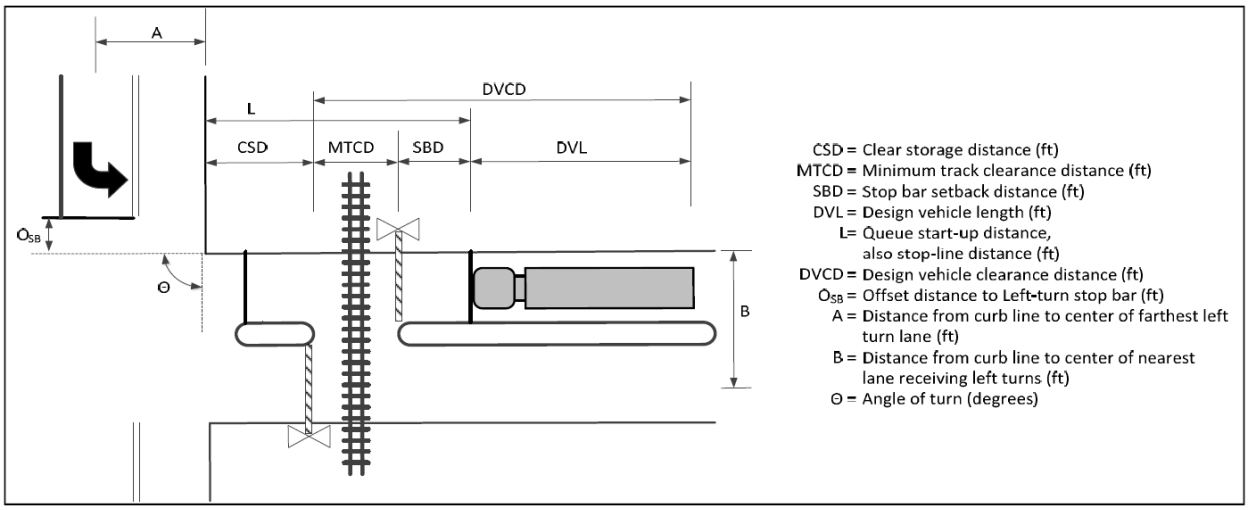


Figure 1. Geometric Data at the Grade Crossing.

GEOMETRIC DATA FOR CROSSING

Line 1. Record the **Clear storage distance** (CSD in Figure 1), in feet, as the shortest distance along the crossing street between the edge of the grade crossing nearest the signalized intersection—identified by a line parallel to the rail 6 feet (2 m) from the rail nearest to the intersection—and the edge of the street or shoulder of street that parallels the tracks. If the normal stopping point on the crossing street is significantly different from the edge or shoulder of parallel street, measure the distance to the normal stopping point. For angled (i.e., non-perpendicular) railroad crossings, always measure the distance along the inside (centerline) edge of the leftmost lane or the distance along the outside (shoulder) edge of the rightmost lane, as appropriate, to determine the shortest clear storage distance and record that value.

Line 2. Minimum track clearance distance (MTCD in Figure 1), in feet, is the length along the highway at one or more railroad tracks, measured from the portion of the railroad crossing automatic gate arm farthest from the near rail to 6 feet (2 m) beyond the tracks measured perpendicular to the far rail. For angled (i.e., non-perpendicular) railroad crossings, always measure the distance along the inside (centerline) edge of the leftmost lane or the distance along the outside (shoulder) edge of the rightmost lane, as appropriate, to determine the longest minimum track clearance distance and record that value. Where flashing light signals are used without automatic gates or where passive traffic control devices are used, the MTCD is measured from the railroad stop line.

Line 3. Stop bar setback distance (SBD in Figure 1) is the distance from the railroad warning device to the stop bar installed on the lanes approaching the crossing. If no stop bar is present, a value of zero (0) should be entered in the worksheet. The default value is 8' as per *Texas Manual on Uniform Traffic Control Devices (TMUTCD)* Section 8B.28, Para. 3.

Line 4. Width of receiving approach (B in Figure 1) is the distance from the curb or edge of the roadway for the track phase and the mid-point of the inside lane (centerline) into which vehicles turn from the roadway parallel to the tracks.

Line 5. Offset distance of left turn stop bar (O_{SB} in Figure 1) is the distance between the line extended from the curb or edge of the roadway for the track phase and the stop bar of the nearest turn lane that is used by left turning vehicles to turn onto the tracks.

Line 6. Approach grade (0 if approach is on downgrade) is the percent grade of the track phase approach. The grade is typically an average of grade measurements taken at the stop bar, 30' from the stop bar, and

60’ from the stop bar on the side of the tracks opposite of the signalized intersection. See tractor-trailer location in Figure 1.

Line 7. Angle of turn at Intersection is the angle (Φ in Figure 1) that a vehicle turning left towards the tracks has to make to make the left turn maneuver. This is an approximate value and can be assumed to be 90 degrees for intersections that are nearly perpendicular.

DESIGN VEHICLE DATA

Line 8. Select Design Vehicle: The form selects the Interstate Semi-Truck as the default design vehicle. This design vehicle is recommended for all non-residential locations. For selecting a different design vehicle, check the appropriate box.

Line 9. Design vehicle length, in feet, is the length of the design vehicle, the longest vehicle permitted by road authority statute on the subject roadway. The worksheet has a default value of 75 feet based on the selection of the Interstate Semi-Truck as the default design vehicle. Selection of a different design vehicle will autofill the appropriate design vehicle length as noted in Table 1 as stated by the *AASHTO Green Book (A Policy on Geometric Design of Highways and Streets)*. The use of the Interstate Semi-Truck is recommended for non-residential locations. Note that additional truck length may be added on line 9a for special circumstances where a 75 foot vehicle is not sufficient.

Table 1. AASHTO Design vehicle lengths and heights.

DESIGN VEHICLE TYPE	**Symbol**	**Length (ft)**
School Bus	S-BUS 40	40
Intermediate Truck	WB-50	55
Interstate Semi-Truck	WB-67	75

Line 10. Total Design vehicle length (DVL in Figure 1), in feet, is the total length of the vehicle and is obtained by adding Line 9 and Line 9a if used.

Line 11. Centerline turning radius of design vehicle: This is the radius of the design vehicle which is auto filled based on the selection of the design vehicle.

Line 12. Passenger car vehicle length. This value is auto filled (19 feet) and is used in calculations for Line 31.

SECTION 2: RIGHT-OF-WAY TRANSFER TIME CALCULATION

Preempt Verification and Response Time

Line 13. The **preempt delay time** is the amount of time, in seconds, that the traffic signal controller is programmed to wait from the initial receipt of a preempt call until the call is “verified” and considered a viable request for transfer into preemption mode. Preempt delay time should be a whole number value entered into the controller unit for purposes of preempt call validation, and may not be available on all manufacturer’s controllers.

Line 14. Unlike preempt delay time (Line 13), which is a value entered into the controller timing parameters, **controller response time to preempt** is the time that elapses while the controller unit electronically registers the preempt call. The controller manufacturer should be consulted to find the correct value (in seconds) for use here. Record the controller manufacturer and firmware version to the right.

Line 15. The sum of Line 13 and Line 14 is the **preempt verification and response time**, in seconds. It

represents the number of seconds between the receipt at the controller unit of a preempt call issued by the railroad's grade crossing warning equipment and the time the controller software actually begins to respond to the preempt call (i.e., by transitioning into preemption mode).

WORST-CASE CONFLICTING VEHICLE TIME

Line 16. Minimum green time during right-of-way transfer is the minimum number of seconds that any existing phase will display a green indication before the controller unit will terminate the phase through its yellow change and red clearance intervals and transition to the track clearance green interval. A default value of 5 seconds is provided to meet driver expectations and reduce the chance of a rear end collision at the intersection, but may be reduced if necessary. Note that this value is not the same as a minimum green value during normal operation; it only comes into play when a preempt call is received from the railroad. The TMUTCD allows for this minimum green time to be set as low as 0 for cases where the preemption time required from the railroad needs to be reduced.

If the current phase is green when a preempt call is received from the railroad, the amount of green time already displayed is subtracted from the minimum green time during right-of-way transfer. For example, if a phase has already been green for 3 seconds when the preempt call is processed from the railroad, the indication will stay green for 2 additional seconds (assuming a minimum green right-of-way transfer time of 5 seconds). Or, if the existing phase has been green for 5 seconds or more, the controller will terminate the green immediately (assuming a minimum green right-of-way transfer time of 5 seconds).

Line 17. If any additional green time is preserved beyond the preempt minimum green time for the worst-case vehicle phase, it should be entered here as **Other green time during right-of-way transfer**. Given the time-critical nature of the transition to the track clearance green interval during preempted operation, this value is usually zero except in unusual circumstances. One situation where other green time may be present is when a trailing green overlap is used on the worst-case vehicle phase, and the controller unit is set up to time out the trailing green overlap on entry into preemption.

Line 18. Yellow change time is the required yellow change interval time during right-of-way transfer prior to the track clearance. Section 4D.13 of the *TMUTCD* states that the normal yellow change interval shall not be shortened or omitted during the transition into preemption control. Since most controller manufacturers require one input value for yellow change time during right-of-way transfer, the highest yellow change time value for all normal phases is recommended.

Line 19. Red clearance time is the required red clearance interval time during right-of-way transfer prior to transition to track clearance. Section 4D.13 of the *TMUTCD* states that the normal red clearance interval shall not be shortened or omitted during the transition into preemption control. Since most controller manufacturers require one input value for red clearance time during right-of-way transfer, the highest red clearance time value for all normal phases is recommended.

Line 20. Worst-case conflicting vehicle time is the sum of lines 16 through 19. It will be compared with the worst-case conflicting pedestrian time to determine which of vehicle or pedestrian phase times are most critical in their impact on warning time requirements during the transition to the track clearance green interval.

Worst-case Conflicting Pedestrian Time

Line 21. Minimum walk time during right-of-way transfer (seconds) is the minimum pedestrian walk indication time. The *TMUTCD* permits the shortening (i.e. truncation) or complete omission of the pedestrian walk interval. A default value of 0 is inserted on the form and is recommended.

Line 22. Pedestrian clearance time during right-of-way transfer (seconds) is the clearance (i.e., flashing don't walk indication) time. The *TMUTCD* permits the shortening (i.e. truncation) or complete omission of the pedestrian clearance interval. A zero value allows for the most rapid transition to the track clearance green interval. See the Appendix for recommendations for pedestrian clearance time.

Line 23. Enter a **Yellow change time** if the pedestrian clearance interval does not time simultaneously with the yellow change interval of the corresponding vehicular phase; enter zero if does. Also, note than not all traffic signal controllers allow simultaneous timing of the pedestrian clearance interval and the yellow change time. Simultaneous timing of the pedestrian clearance interval and the yellow change interval (i.e. a zero value on line 23) allows for the most rapid transition to the track clearance green interval. If a non-zero value is entered, make sure to enter the yellow change time of the vehicular phase associated with your worst-case pedestrian phase. This value may not be the same value you enter on Line 18, since the worst-case pedestrian phase may not be the same as the worst-case vehicular phase.

Line 24. Enter a **Red clearance time** if the pedestrian clearance interval does not time simultaneously with the red clearance interval of the vehicular phase associated with your worst-case pedestrian phase; enter zero if does. Local policies will determine if this is allowed. Also, note than not all traffic signal controllers allow simultaneous timing of the pedestrian clearance interval and the red clearance interval. Simultaneous timing of the pedestrian clearance interval and the red clearance interval (i.e. a zero value on line 24) allows for the most rapid transition to the track clearance green interval. If a non-zero value is entered, make sure to enter the red clearance time of the vehicular phase associated with your worst-case pedestrian phase. This value may not be the same value you enter on Line 19, since the worst-case pedestrian phase may not be the same as the worst-case vehicular phase.

Line 25. Add lines 21 through 24 to calculate your **Worst-case conflicting pedestrian time**. This value will be compared to the worst-case conflicting vehicle time to determine whether vehicle or pedestrian phase times are the most critical in their impact on warning time requirements during the transition to the track clearance green interval.

Worst-case Conflicting Vehicle or Pedestrian Time

Line 26. The **Worst-case conflicting vehicle or pedestrian time** (in seconds) is computed in the worksheet by comparing lines 20 and 25 and filling in the larger of the two values.

Line 27. Calculate the **Right-of-way transfer time** by adding lines 15 and 26. The right-of-way transfer time is the maximum amount of time needed for the worst case condition, prior to display of the track clearance green interval.

SECTION 3: QUEUE CLEARANCE TIME CALCULATION

This section calculates the time required to clear the queue off the tracks before the arrival of the train. This time is impacted by the time required by a truck turning left from the street parallel to the tracks and potentially impeding the first vehicle in the queue to start moving upon the onset of the track phase. The time to clear the vehicles off the tracks is then determined by calculating the time required for the design vehicle to start moving and then moving through the design vehicle clearance distance. The section starts by asking the user if the preemption timing should account for a left turn design vehicle turning left onto the tracks.

Line 28. Are there left-turns towards the tracks?: The user has to select a box 'Yes' or 'No' to indicate whether to consider a left turn design vehicle turning left onto the tracks. If the user selects 'Yes', values for boxes 29, 31, and 32 are automatically calculated and filled in. In some cases, a value of 'No' may be selected in order to minimize the amount of preemption time requested from the railroad.

Line 29. Distance travelled by the truck during left-turn towards the tracks: This is the distance (LTL) travelled by the truck while making the turn. This calculation is used later in Line 31 and is a function of the centerline turning radius of the left turn design vehicle and the angle of the street from which the left turn design vehicle is making the left turn and is illustrated in the equation below and in Figure 2:

$$LTL = \pi R\theta/180$$

Where:
R = the centerline turning radius of the left turning design vehicle (line 11), and
Θ = angle of the street from which the left turn design vehicle is making the left turn (line 7)

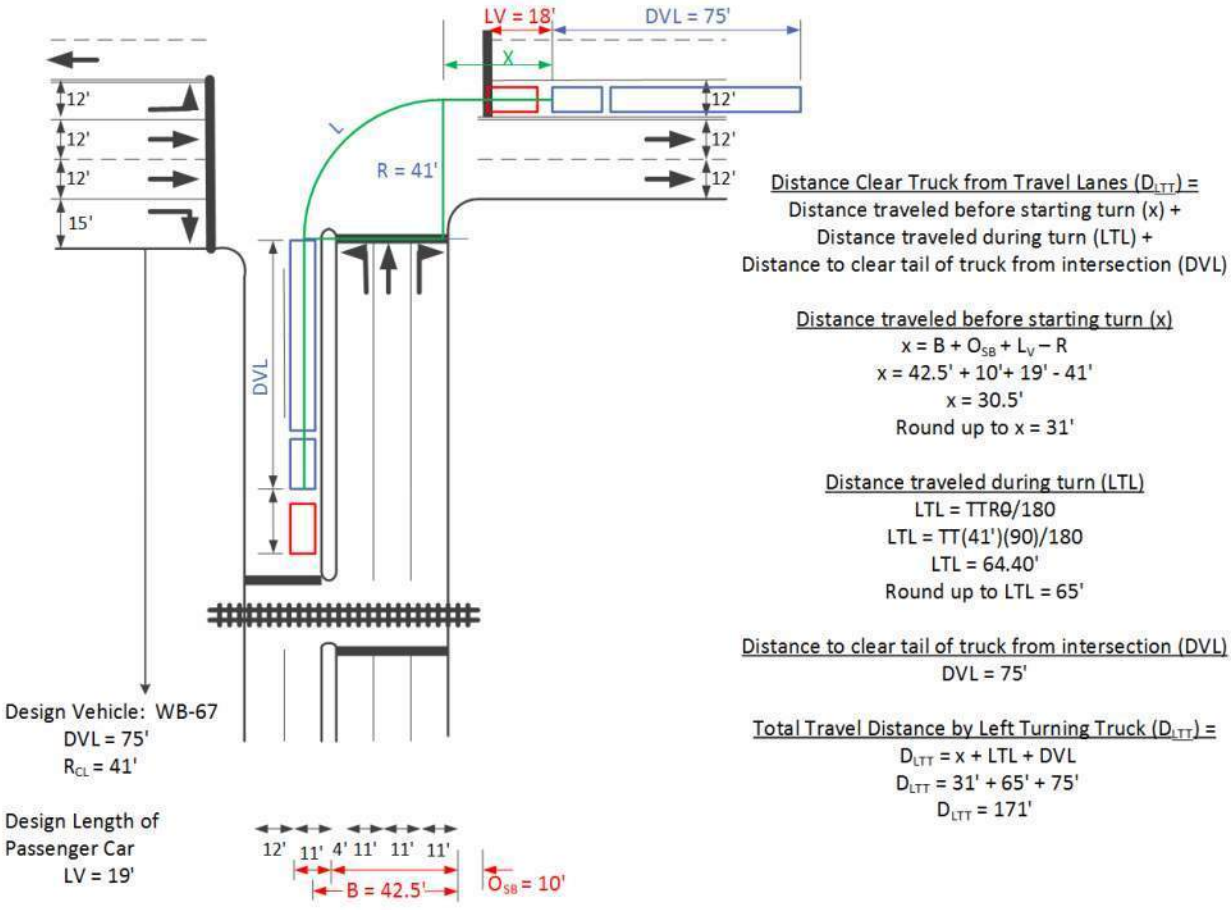


Figure 2. Sample calculation of the distance required to clear left-turning truck from travel lanes on track clearance phase.

Line 30. Travel speed of left turning truck: This is the default speed of the left turn design vehicle turning left to cross the tracks, assumed to be 10 mph.

Line 31. Distance required to clear left-turning truck from travel lanes on track clearance approach (feet): This distance is calculated from the section on geometric data and section on design vehicle. This is the distance travelled by the truck, assumed to be the same length as the design vehicle, making a left turn. The formula used is as follows:

$$Distance\ required = (Line\ 4 + Line\ 5 + Line\ 12 - Line\ 11) + Line\ 29 + Line\ 10$$

Where:

Line 4 =	Width of receiving approach (feet)
Line 5 =	Offset distance of left turn stop bar (feet)
Line 12 =	Passenger car length (feet)
Line 11 =	Centerline turning radius of design vehicle (feet)

Line 29 = Distance travelled by the truck during the left turn (feet)
Line 10 = Total design vehicle length (feet)

Line 32. Additional time required to clear left-turning truck from travel lanes on track clearance approach (seconds): This is the time required to travel the distance calculated in Line 31 for the expected speed stated in Line 30. The duration of yellow and red clearance timings during right-of-way transfer (Lines 18 and 19) are subtracted out, under the assumption the left turn movement began at the onset of the yellow change interval. The time required is calculated as follows:

$$Additional\ time\ required = [\frac{(line\ 31 * 3600)}{(line\ 30 * 5280)} - line\ 18 - Line\ 19]$$

Line 33. Worst-case Left Turning Truck time (seconds): This presents the impact of a left turning truck on the clearance of queue during the track phase. This value is automatically calculated and is set to '0' if 'No' is selected on line 28.

Line 34. Queue start-up distance (L in Figure 1), in feet, is the maximum length over which a queue of vehicles stopped for a red signal indication at an intersection downstream of the crossing must get in motion so that the design vehicle can move out of the railroad crossing prior to the train's arrival. It is automatically calculated by the following formula:

$$L = Line\ 1 + Line\ 2 + Line\ 3$$

Line 35. Time required for the design vehicle to start moving (seconds) is the time elapsed between either (a) the time the left turning vehicle completes its turn so it is not blocking track clearance if 'Yes' is checked on line 28 or (b) the beginning of track clearance green if 'No' is checked on line 28, and the time the design vehicle, which is located at the stop bar of the railroad crossing on the opposite side from the signalized intersection, begins to move. This elapsed time is based on a "shock wave" speed of 20 feet per second and a 2 second start-up time (the additional time for the first driver to recognize the signal is green and move his/her foot from the brake to the accelerator). The time required for the design vehicle to start moving is calculated, in seconds, as 2 plus the queue start-up distance, L (Line 34) divided by the wave speed of 20 feet per second. The time required for the design vehicle to start moving is a conservative value taking into account the worst-case vehicle mix in the queue in front of the design vehicle as well as a limited level of drive inattentiveness. This value may be overridden by local observation, but care must be taken to identify the worst-case (longest) time required for the design vehicle to start moving.

Line 36. Design vehicle clearance distance (DVCD in Figure 1) is the length, in feet, which the design vehicle must travel in order to enter and completely pass through the railroad crossing's minimum track clearance distance (MTCD). It is the sum of the minimum track clearance distance (Line 2), stop bar setback distance (Line 3), and the total design vehicle's length (Line 10).

Line 37. The **Time for design vehicle to accelerate through the design vehicle clearance distance (DVCD) on level terrain**: This is the amount of time required for the design vehicle to accelerate from a stop and travel the complete design vehicle clearance distance over a level approach. This time value, in seconds, is automatically calculated by the worksheet and filled in. The formulae used for these calculations are represented by graphs in Figure 3.

Line 38. Factor to account for slower acceleration on uphill grade: If the approach over which the design vehicle has to accelerate over DVCD is an uphill grade, a factor is automatically calculated by the worksheet based on the entry in Line 6. The calculation for this factor is based on the formulae used to generate the factors in Table 2. For example, with a DVCD of 80 feet and a WB-50 intermediate truck design vehicle on a 4% uphill, the (interpolated) factor from Table 2 is 1.30. Therefore, the estimated time required for the design vehicle to accelerate through the DVCD will be 12.2 x 1.30 = 15.86 seconds, or 15.9 seconds rounded up to the next higher tenth of a second.

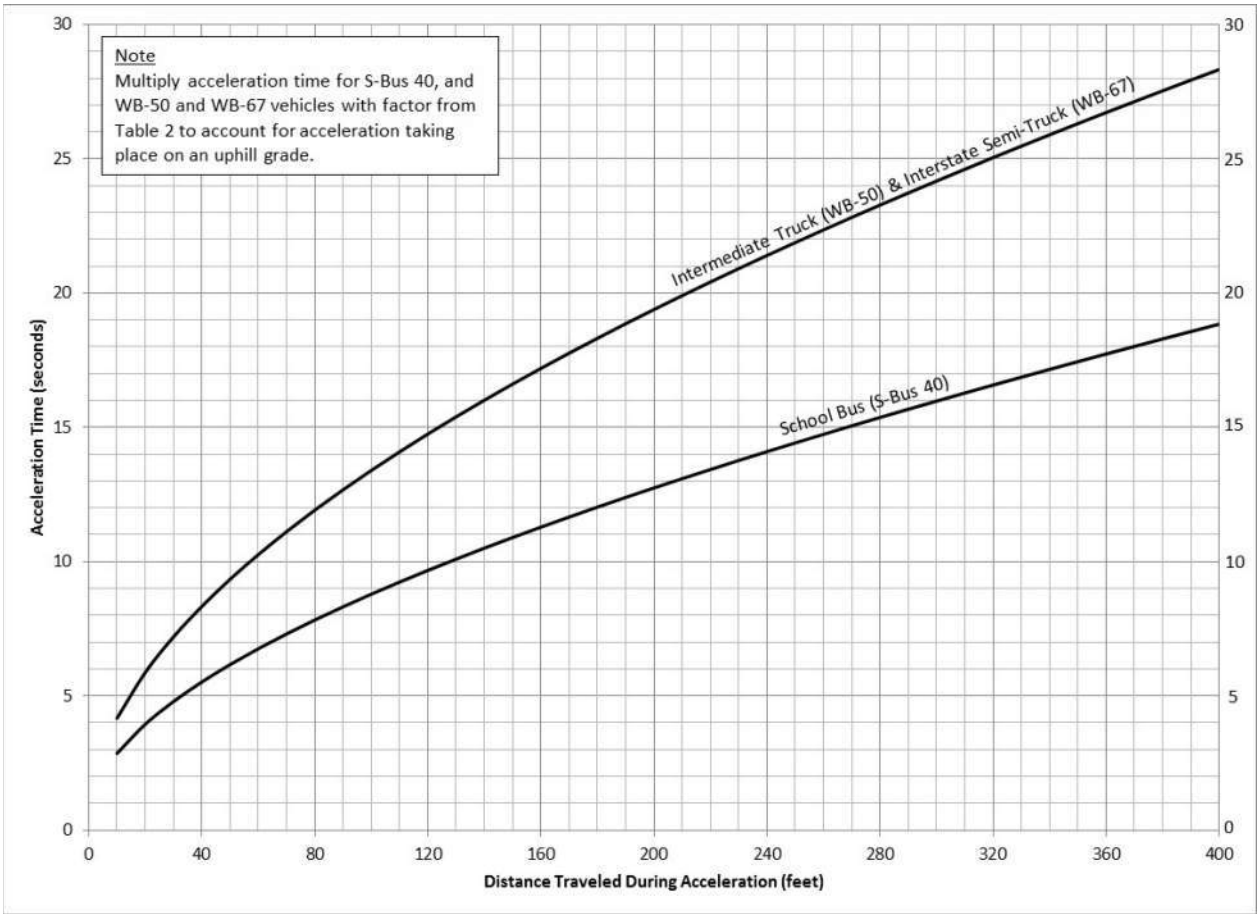


Figure 3. Acceleration time over a fixed distance on a level surface.

Table 2. Factors to account for slower acceleration on uphill grades

Acceleration Distance (ft)	Design Vehicle and Percentage Uphill Grade									
	School Bus (S-BUS 40)					Intermediate Truck (WB-50) and Interstate Semi-Truck (WB-67)				
	0-1%	2%	4%	6%	8%	0%	2%	4%	6%	8%
25	1.00	1.01	1.10	1.19	1.28	1.00	1.09	1.27	1.42	1.55
50	1.00	1.01	1.12	1.21	1.30	1.00	1.10	1.28	1.44	1.58
75	1.00	1.02	1.13	1.23	1.33	1.00	1.11	1.30	1.47	1.61
100	1.00	1.02	1.14	1.25	1.35	1.00	1.11	1.31	1.48	1.64
125	1.00	1.03	1.15	1.26	1.37	1.00	1.12	1.32	1.50	1.66
150	1.00	1.03	1.16	1.28	1.40	1.00	1.12	1.33	1.52	1.68
175	1.00	1.03	1.17	1.29	1.42	1.00	1.12	1.34	1.53	1.70
200	1.00	1.04	1.17	1.30	1.43	1.00	1.13	1.35	1.54	1.72
225	1.00	1.04	1.18	1.32	1.45	1.00	1.13	1.35	1.56	1.74
250	1.00	1.04	1.19	1.33	1.47	1.00	1.13	1.36	1.57	1.76
275	1.00	1.05	1.20	1.34	1.49	1.00	1.14	1.37	1.58	1.77
300	1.00	1.05	1.20	1.35	1.50	1.00	1.14	1.37	1.59	1.79
325	1.00	1.05	1.21	1.36	1.52	1.00	1.14	1.38	1.60	1.81
350	1.00	1.05	1.22	1.37	1.54	1.00	1.15	1.39	1.61	1.82
375	1.00	1.06	1.22	1.38	1.55	1.00	1.15	1.39	1.62	1.84
400	1.00	1.06	1.23	1.40	1.57	1.00	1.15	1.40	1.63	1.85

Line 39. Time for design vehicle to accelerate through DVCD (seconds) adjusted for grade: This value is calculated by multiplying the time for the design vehicle to accelerate through DVCD with the factor to account for the uphill grade (i.e. multiply Line 37 with Line 38).

Line 40. Queue clearance time is the total amount of time required (after the right-of-way transfer time) to begin moving a queue of vehicles through the queue start-up distance (L, Line 34) and then move the design vehicle from a stopped position at the far side of the crossing completely through the minimum track clearance distance (MTCD, Line 2). This value is the sum of the time required for the worst-case left turning truck to complete the turn movement (Line 33), the time for the design vehicle to start moving (Line 35), and the time for design vehicle to accelerate through the design vehicle clearance distance (Line 39).

SECTION 4: MAXIMUM PREEMPTION TIME CALCULATION

Line 41. Right-of-way transfer time, in seconds, recorded on Line 27. The right-of-way transfer time is the maximum amount of time needed for the worst case condition, prior to display of the track clearance green interval.

Line 42. Queue clearance time, in seconds, recorded on Line 40. Queue clearance time starts simultaneously with the track clearance green interval (i.e. after right-of-way transfer), and is the time required for the design vehicle to start up and move completely out of the minimum track clearance distance.

Line 43. Desired minimum separation time is a time "buffer" between the departure of the last vehicle (the design vehicle) from the railroad crossing (as defined by the minimum track clearance distance) and the arrival of the train. Separation time is added for safety reasons and to avoid driver discomfort. If no separation time is provided, a vehicle could potentially leave the crossing at exactly the same time the train arrives, which would certainly lead to severe driver discomfort and potential unsafe behavior. The recommended value of four (4) seconds is a based on the minimum recommended value found in the Institute of Transportation Engineer's *ITE Journal* (in an article by Marshall and Berg in February 1997). Note that this value may be reduced to as low as 0 seconds if the necessary warning time is not available.

Line 44. Maximum preemption time is the total amount of time required after the preempt is initiated by the railroad warning equipment to complete right-of-way transfer to the track clearance green interval, initiate the track clearance phase(s), move the design vehicle out of the crossing's minimum track clearance distance, and provide a separation time "buffer" before the train arrives at the crossing. It is the sum of the right-of-way transfer time (Line 27), the queue clearance time (Line 40), and the desired minimum separation time (Line 43).

SECTION 5: SUFFICIENT WARNING TIME CHECK

Line 45. Required Minimum Time, MT (seconds) is the least amount of time active warning devices shall operate prior to the arrival of a train at a highway-rail grade crossing. Section 8D.06 of the *TMUTCD* requires that flashing-light signals shall operate for at least 20 seconds before the arrival of any train, except on tracks where all trains operate at less than 32 km/h (20 mph) and where flagging is performed by an employee on the ground. The worksheet has a default value of 20 seconds filled in.

Line 46. Clearance time (seconds), typically known as CT, is the additional time that may be provided by the railroad to account for longer crossing time at wide (i.e., multi-track crossings) or skewed-angle crossings. In cases where the minimum track clearance distance (Line 2) exceeds 35 feet, the railroads' *AREMA Manual* requires clearance time of one second be provided for each additional 10 feet, or portions thereof, over 35 feet. Additional clearance time may also be provided to account for site-specific needs. Examples of extra clearance time include cases where additional time is provided for simultaneous preemption (where the preemption notification is sent to the signal controller unit simultaneously with the activation of the railroad crossing's active warning devices), instead of providing advance preemption time.

Line 47. Total Minimum Warning Time, MWT (seconds) is the sum of the minimum time (Line 45) and the clearance time (Line 46). This value is the actual minimum time that active warning devices can be expected to operate at the crossing prior to the arrival of the train under normal, through-train conditions. The term "through-train" refers to the case where trains do not stop or start moving while near or at the crossing. Note that the minimum warning time does not include buffer time (BT) or equipment response time. Buffer time is added by the railroad to ensure that the minimum warning time is always provided despite inherent variations in warning times; however, it is not consistently provided and cannot be relied upon by the traffic engineer for signal preemption and/or warning time calculations. Equipment response time is utilized up front by the railroad's constant warning technology to determine the approach speed of the train and send the preemption call to the traffic signal controller at the appropriate time.

Line 48. Required advance preemption time (APT) from railroad (seconds): This value is calculated by subtracting the total minimum warning time (MWT) in line 47 from the maximum preemption time for queue

clearance in Line 44.

Line 49. APT currently provided by railroad (seconds), if provided, is the period of time that the notification of an approaching train is currently forwarded to the highway traffic signal controller unit or assembly prior to activating the railroad active warning devices. Only enter advance preemption time if you can verify from the railroad that advance preemption time is already being provided for your site. For new crossings or signals, a value of 0 seconds is entered.

SECTION 6: TRACK CLEARANCE GREEN TIME CALCULATION (IF NO GATE DOWN CIRCUIT PROVIDED)

Preempt Trap Check

Line 50. Warning Time Variability: Although the railroad guarantees a minimum duration for the APT, it is probable that in most cases the actual duration of the APT will be longer than the guaranteed duration. This variability in APT occurs due to "train handling", which is a term that describes the acceleration and deceleration of trains on their approach to the crossing. If a train accelerates or decelerates while approaching to the crossing, the railroad warning system cannot estimate the arrival time of the train at the crossing accurately, resulting in variation in the actual duration of APT provided. This variation needs to be taken into account to ensure safe operation.

To make sure that the preempt trap does not occur we need to determine the maximum value of the APT so that a sufficiently long track clearance green interval can be provided to ensure that the gates block access to the crossing before the track clearance green ends. In the case where APT is provided, the difference between the minimum and maximum values of APT is termed excess APT. Excess APT usually occurs when the train decelerates on the approach to the crossing, or where train handling affects the accuracy of the estimated time of train arrival at the crossing so that the preempt sequence is activated earlier than expected. The amount of excess APT is increased by the following conditions:

Increased variation in train speeds, since more trains will be speeding up and slowing down;

Lower train speeds, since a fixed deceleration rate has a greater effect on travel time at low speeds than at higher speeds; and

Longer warning times, because more time is available for the train to decelerate on the approach to the crossing.

The accuracy of the warning time provided by the railroad depends on many factors. These include: the duration of APT if provided, the presence of any shunting yards or stations nearby, and whether the grade crossing is near the edges of towns or cities. The longer the APT required at a grade crossings, the greater the likelihood of variability in providing the expected warning time as there is a greater impact of a change in train speed on the warning time. The presence of shunting yards and stations near the crossings, results in trains slowing down or speeding up while on the track circuit, resulting in a variability in the warning time. Finally, grade crossings that are at the borders of towns or cities frequently have restrictions on train noise and require reduced train speeds within the cities. Hence, trains start slowing on the outskirts of cities resulting in greater variability in the warning time. The analyst must assess the variability of train warning times and select either consistent warning times, low warning time variability, or high warning time variability. Selection of one of these options generates a multiplier in Line 52.

Line 51. Advance preemption time required or provided is the duration (in seconds) the preempt sequence is active in the highway traffic signal controller before the activation of the railroad active warning devices. The larger of Line 48 (required APT) and Line 49 (APT currently provided by railroad) is automatically filled in the box.

Line 52. Multiplier for maximum APT due to train handling: The multiplier for maximum APT can be estimated as 1.60 if warning time variability is high, 1.25 if warning time variability is low, or 1.00 for consistent warning times. High warning time variability can typically be expected in the vicinity of switching yards, branch lines, or anywhere low-speed switching maneuvers takes place. These values are automatically filled in based on the option selected in Line 50.

Line 53. Maximum APT is largest value (in seconds) of the advance preemption time that can typically be expected, which corresponds to the earliest possible time the preemption sequence in the traffic signal controller will be activated before the activation of the railroad grade crossing warning system (flashing lights and gates). It is the calculated by multiplying the APT required or provided by the railroad (Line 51)

with the multiplier for maximum APT due to train handling (Line 52).

Line 54. Minimum duration for the track clearance green is the minimum duration (in seconds) of the track clearance green interval to ensure that the gates block access to the crossing before the track clearance green expires in the case where no advance preemption time is provided. It is necessary to block access to the crossing before the track clearance green expires to ensure that vehicles do not enter the crossing after the expiration of the track clearance green and so be subject to the preempt trap.

The 15 seconds minimum duration for the track clearance green interval is calculated from Federal regulations and requirements of the *TMUTCD*. Section 8D.06 of the *TMUTCD* requires that flashing-light signals shall operate for at least 20 seconds before the arrival of any train (with certain exceptions), while Section 8D.04 requires that the gate arm shall reach its horizontal position at least 5 seconds before the arrival of the train. For simultaneous (non-advance) preemption, the preemption sequence starts at the same time as the flashing-light signals, so to ensure that the preempt trap does not occur, a track clearance green interval of at least 15 seconds is required.

Line 55. Track clearance green time to avoid Preempt Trap: This is calculated by the form by adding the Maximum APT (Line 53) with the minimum duration of the track clearance green (Line 54). This yields the minimum time that the track clearance green interval has to be active to avoid the preempt trap.

Clearing of Clear Storage Distance

This section calculates the track clearance green and considers the time required from clearing of the design vehicle based on the geometry of the crossing.

Line 56. Time waiting on left-turn truck (seconds): This is the time needed by a truck that is turning left from the street parallel to the tracks and can potentially block the vehicle on the track phase to start moving after the onset of the track clearance phase. This is the value in Line 33.

Line 57. Time required for design vehicle to start moving, recorded on Line 35, is the number of seconds that elapses between either (a) the time the left turning vehicle completes its turn so it is not blocking track clearance if 'Yes' is checked on line 28 or (b) the beginning of track clearance green if 'No' is checked on line 28 and the time the design vehicle, which is located at the stop bar of the railroad crossing on the opposite side from the signalized intersection, begins to move.

Line 58. Design vehicle clearance distance (DVCD in Figure 1) is the length, in feet, which the design vehicle must travel in order to enter and completely pass through the railroad crossing's minimum track clearance distance (MTCD). This is the same value as recorded on Line 36.

Line 59. Portion of CSD to clear during track clearance, This is the portion of the clear storage distance (CSD), in feet, that must be cleared of vehicles before the track clearance green interval ends. The worksheet automatically enters the value of CSD for this field based on user inputs on 2 questions before line 59.

If the CSD is smaller than the design vehicle, i.e., the spacing between the tracks and the curb is smaller than the length of the design vehicle, it is essential that the design vehicle must clear through the entire CSD before the track clearance green terminates. Hence, the CSD will be entered in Line 59.

If however the CSD is larger than the length of the design vehicle, the analyst has to decide whether to clear the design vehicle through the entire CSD or to clear the design through just the design vehicle length. If the vehicle has to clear through CSD, the CSD will be entered in Line 59. However, if the vehicle just has to clear the design vehicle length, Line 59 will be equal to DVL. For intersections with a CSD greater than approximately 150 feet it is desirable—but not necessary—to clear the full CSD during the track clearance green interval. In other words, it is desirable to set Line 59 to the full value of CSD (Line 1). If the full CSD is not cleared, however, vehicles will be stopped in the CSD during the preempt dwell period, and if not serviced during the preempt dwell period, will be subject to unnecessary delays which may result in unsafe behavior. For CSD values less than 150 feet the full CSD is typically cleared to avoid the driver task of

crossing the tracks followed immediately by the decision to stop or go when presented by a yellow signal as the track clearance green interval terminates.

Line 60. Design vehicle relocation distance is the distance, in feet, that the design vehicle must accelerate through during the track clearance green interval. It is the sum of the design vehicle clearance distance (Line 36) and the portion of CSD to clear during the track clearance green interval (Line 59).

Line 61. The **Time required for design vehicle to accelerate through DVRD**, **Level Terrain**: is the amount of time required for the design vehicle to accelerate from a stop and travel the complete design vehicle relocation distance (DVRD). This time value, in seconds, is calculated by the worksheet and entered in Line 61.

Line 62. Factor to account for slower acceleration on uphill grade: This is a value automatically calculated based on the grade entered in Line 6.

Line 63. Time required to accelerate design vehicle through DVRD adjusted for grade: This value is automatically calculated by multiplying Line 61 and 62.

Line 64. Time to clear portion of clear storage distance, in seconds, is the total amount of time required (after the right-of-way transfer time ends), for the left turning vehicle to get out of the way of the vehicles on the track phase (Line 56), the time required for the design vehicle to start moving (Line 57), and the time required for the design vehicle to move through the DVRD adjusted for grade (Line 63).

Line 65. The **Track clearance green interval** is the time required, in seconds, for the track clearance green interval to avoid the occurrence of the preempt trap and to provide enough time for the design vehicle to clear the portion of the clear storage distance specified on Line 59. The track clearance green interval time is the maximum of the track clearance green time to avoid a preempt trap (Line 55) and the track clearance green time required to clear a portion of clear storage distance (Line 64). Note that this value corresponds to a design that does not include use of a separate gate down circuit preempt.

Maximum Duration of Track Clearance Green after the gates are down (in the absence of a gate down circuit)

This section calculates the estimated duration of the track clearance green indication due to the onset of preemption after the gates are down if a separate gate down circuit preempt is not used. It is possible for a preempt to occur in any state of the traffic signal. When preempt occurs such that the right-of-way-transfer time is the maximum, it is highly likely that the track phase will continue to display the green indication after the gates are down. How long this is depends on the duration of the track clearance interval. This value will provide the analyst a tool in deciding whether or not to incorporate a gate down circuit into the preemption design. A gate down circuit, in addition to eliminating a preempt trap, provides an additional operational benefit of reducing unnecessary track clearance green time after the train has arrived at the crossing. Gate down circuits may be recommended when the value on line 68 exceeds 30 s, train counts are high, or traffic volumes on the route parallel to the tracks are high.

Line 66. Time to complete track clearance green (seconds): This is the amount of time that passes from the onset of the preemption call until the track clearance green terminates and is calculated by adding the right-of-way transfer time (Line 27) with the track clearance green interval (Line 65).

Line 67. Total time before gates are down (seconds): This is the duration for the gates to come down after the onset of preemption and is calculated by subtracting 5 seconds (the gates have to be down 5 seconds the arrival of the train) from the maximum preemption time for queue clearance (Line 44)

Line 68. Maximum Duration of Track Clearance Green after the gates are down (seconds): This value is obtained by subtracting Line 67 from Line 66 and indicates how long the track clearance indication can be green after the gates are down. The larger this value is, the more inefficient the signal operations will be. It is to be noted that this scenario would only occur when the right-of-way transfer is at its maximum value, (i.e., a green indication happens to just be starting when the preempt call is processed by the traffic

signal controller). The train is assumed to travel at constant speed on the approach to the crossing.

SECTION 7: SUMMARY OF CONTROLLER PREEMPTION SETTINGS

This section summarizes in one place all the controller timings that are determined by the analysis of the Preemption Worksheet. All units are in seconds. This section should be used by the traffic signal technician when programming the controller and for field verification in the future.

Line 69. Duration Time: This value is set at 0 as a default value to ensure a preempt call is not dropped unnecessarily.

Line 70. Preemption Delay Time: This value is based on Line 13.

Right of Way Transfer Phase

Note that some traffic signal controllers may refer to this phase as 'Selective', 'Entrance', 'Enter' or 'Begin' phase.

Line 71. Minimum Green Interval: This value is based on Line 16.

Line 72. Pedestrian Walk Interval: This value is based on Line 21.

Line 73. Pedestrian Clearance Interval: This value is based on Line 22.

Line 74. Yellow Change Interval: This value is based on Line 18.

Line 75. All Red Vehicle Clearance: This value is based on Line 19.

Track Clearance Phase

Line 76. Green Interval (in the absence of gate down circuit): This value is based on Line 65.

Line 77. Green Interval (with gate down circuit): This value is based on Line 40 (queue clearance time). When using a gate down preempt circuit, only the queue clearance time is required to ensure the design vehicle sufficiently clears the tracks.

Line 78. Yellow Change Interval: This value is based on Line 18.

Line 79. All Red Vehicle Clearance: This value is based on Line 19.

Exit Phase

Note that some traffic signal controllers may refer to this phase as a 'Return' phase.

Line 80. Dwell/Cycle Minimum Green Time: This value is set to 0 as a recommendation to ensure that the traffic signal re-enters preemption as soon as possible in the event of a 2nd train.

Line 81. Yellow Change Interval: This value is based on Line 18.

Line 82. All Red Vehicle Clearance: This value is based on Line 19.

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American Railway Engineering and Maintenance-of-Way Association (AREMA). *Manual of Recommended Practices-Signals*. 2000.

Engelbrecht, R.J., S. Sunkari, T. Urbanik, and K. Balke. *The Preempt Trap: How to Make Sure You do Not Have One*. Texas Department of Transportation Project Bulletin 1752-9, October, 2000. On the Internet at http://tti.tamu.edu/product/catalog/reports/1752-9.pdf. Link valid May 2003.

APPENDIX

GENERAL GUIDELINES FOR WHEN TO TRUNCATE PEDESTRIAN CLEARANCE INTERVALS DURING PREEMPTION EVENTS AT HIGHWAY-RAIL GRADE CROSSINGS

The Texas *Manual on Uniform Traffic Control Devices* (TMUTCD) indicates that "During the transition into preemption control … The shortening or omission of any pedestrian walk interval and/or pedestrian change interval shall be permitted." The following is intended to provide general guidance to assist local transportation officials when it *may* be appropriate to truncate the pedestrian clearance interval in the presence of preemption call at a railroad grade crossing.

The decision on whether or not to truncate the pedestrian clearance interval rests solely with the local transportation officials, in consultation with the railroad Diagnostic Team, and should be based on an engineering study of the crossing that considers the following:

Pedestrian volumes: lower pedestrian volumes reduces the probability of a pedestrian event conflicting with a train event

Frequency of preemption events: less frequent preemption events result in fewer pedestrian clearance interval/time truncations or omissions

Signal timing: if pedestrian movements are active only during a small portion of the cycle, there is less chance that a pedestrian clearance interval will be truncated or omitted

Intersection geometry: Wider crosswalks require longer pedestrian clearance intervals that are more susceptible to truncation

Full pedestrian clearance protection should be considered at signalized intersections located on established Safe Routes to School or crossings located near a school (elementary, middle, and/or high school) facility; or at pedestrian crossings frequented by less mobile, or mobility/sight impaired pedestrian groups.

Full truncation or Intermediate truncation may be appropriate at intersections where the width of the pedestrian crossing is less than 40 feet, or where the pedestrian clearance interval is approximately equal to the maximum vehicle change (yellow) and clearance (all-red) intervals at the intersection. Table 3 provides guidance for when to use different truncation strategies at an intersection where the maximum roadway width to be crossed by pedestrians is less than 40 feet. The following provides a general guidance that can be used to determine the pedestrian condition present at the crossing:

- **Very Light** – This is intended to represent conditions where pedestrians crossing at the intersection are rare. These intersections would be generally located in rural areas or lightly developed areas. These would include intersections where the Diagnostic Team and local transportation officials agree that very little pedestrian traffic exists or where no pedestrian traffic was observed during the Diagnostic Team review. As general guidance, these would be intersections where one cycle out of every 20 or more cycles was used to cross pedestrians during the heaviest pedestrian times.

- **Light** – This is intended to represent conditions where pedestrians crossing at an intersection occur, but only occasionally. These intersections might be located generally in lightly developed areas, industrial or warehouse areas, or small urban communities. These would include intersections where the Diagnostic Team and local transportation officials agree that pedestrian traffic is "light" or where during a site visit, the Diagnostic Team observes several pedestrians in the area (but not necessarily using the intersection). As general guidance, pedestrian volumes at these intersections are such that a pedestrian is likely to cross any approach at an intersection 1 cycle every 10 to 20 cycles.

- **Moderate** – This is intended to represent conditions where pedestrians crossing at an intersection occur with regular frequency, but not all the time. These intersections might be located generally

in more densely developed areas, including areas with residential, retail, and commercial developments. These would include intersections where the Diagnostic Team and local transportation officials agree that pedestrian traffic is moderate or where during a site visit, the Diagnostic Team observes individual or small groups of pedestrians using the intersection, but not every cycle. As general guidance, pedestrian volumes at these intersections are such that a pedestrian is likely to cross any approach at an intersection 1 cycle every 4 to 10 cycles.

- **Frequent** – This is intended to represent conditions where pedestrian are frequent users of the intersection. These might be intersections where a pedestrian crosses the intersection 1 cycle out of every 1 to 3 cycles. This is also intended to represent crossings where large groups of pedestrians may use the intersection. Under this condition, the Diagnostic Team might observe the intersection being used by pedestrians almost every cycle or every other cycle. This type of condition might be found in highly developed areas with significant residential, retail, or commercial development.

- **School Crossings/Crossing Frequented by Less Mobile (Elderly) or Mobility and/or Visually Impaired Pedestrians** – This is intended to represent conditions where the intersection is located near a school and where there are significant number of school-aged children crossing the intersection. This category of crossing also applies where less mobile populations (elderly) and mobility/visually impaired pedestrians using the pedestrian crossing. These crossings include any grade crossings found along a school's Safe Routes to School walking path(s).

Table 3. Suggested Pedestrian Clearance Strategies to be used under Different Levels of Preemption Event Frequencies and Pedestrian Conditions where the Largest Pedestrian Crossing Width is less than 40 feet.

Pedestrian Conditions	Preemption Events			
	Very Light (0-5 preemption events per day)	**Light (5-10 preemption events per day)**	**Moderate (10-20 preemption events per day)**	**Frequent (> 20 preemption events per day)**
Very Light (1 cycle out of every 20 cycles or more is used to cross pedestrians)	Full Truncation	Full Truncation	Full Truncation	Full Truncation
Light (1 cycle out of every 10 to 20 cycles is used to cross pedestrians)	Full Truncation	Full Truncation	Full Truncation	Intermediate Truncation
Moderate (1 cycle out of every 4 to 10 cycles is used to cross pedestrians)	Full Truncation	Full Truncation	Intermediate Truncation	Intermediate Truncation

Frequent (1 cycle out of every 1 to 3 cycles is used to cross pedestrians)	Intermediate Truncation	Intermediate Truncation	Intermediate Truncation	Intermediate Truncation
School Crossings/Crossing Frequented by Less Mobile (Elderly) or Mobility and/or Visually Impaired Pedestrians	Full Pedestrian Clearance			

For wide intersections (40 feet or more), Table 4 provides guidance for when to use different truncation strategies at an intersection where the minimum roadway width to be crossed by pedestrians is more than 40 feet.

Table 4. Suggested Pedestrian Clearance Strategies to be used under Different Levels of Preemption Event Frequencies and Pedestrian Conditions where the Largest Pedestrian Crossing Width is 40 feet or more.

Pedestrian Conditions	**Preemption Events**			
	Very Light (0-5 preemption events per day)	**Light (5-10 preemption events per day)**	**Moderate (10-20 preemption events per day)**	**Frequent (> 20 preemption events per day)**
Very Light (1 cycle out of every 20 cycles or more is used to cross pedestrians)	Full Truncation	Full Truncation	Full Truncation	Intermediate Truncation
Light (1 cycle out of every 10 to 20 cycles is used to cross pedestrians)	Full Truncation	Intermediate Truncation	Intermediate Truncation	Partial Truncation
Moderate (1 cycle out of every 4 to 10 cycles is used to cross pedestrians)	Intermediate Truncation	Partial Truncation	Partial Truncation	Full Pedestrian Clearance
Frequent (1 cycle out of every 1 to 3 cycles is used to cross	Partial Truncation	Partial Truncation	Full Pedestrian	Full Pedestrian

pedestrians)			Clearance	Clearance
School Crossings/Crossing Frequented by Less Mobile (Elderly) or Mobility and/or Visually Impaired Pedestrians	Full Pedestrian Clearance			

The preferred locations of crossing pedestrians at all newly installed traffic signals near railroad grade crossings is shown in Figure 4. In cases where the decision is to eliminate or truncate the pedestrian clearance intervals, agencies should consider relocating crosswalks as shown in Figure 4, where practical and where pedestrian crossing behavior permits. Relocating the crosswalks to these locations will increase the conspicuity of pedestrian that might be located in the crossing to vehicles using the track clearance phase. It allows track clearance vehicles to wait in the intersection (as opposed to on the approach) for pedestrians to finish clearing the intersection.

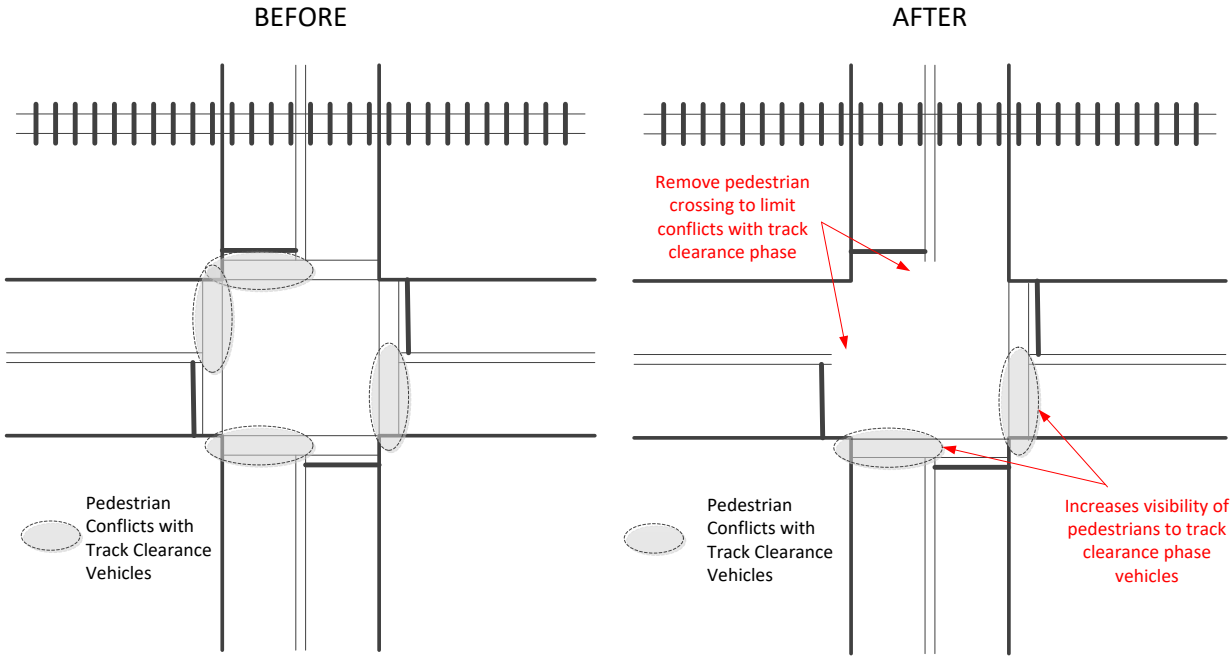


Figure 4. Recommendations for Relocating Pedestrian Crosswalks at Intersections with nearby Highway Rail Grade Crossings

The following provides a description of the different types of pedestrian clearance truncation strategies listed in Table 3 and Table 4. Truncation time (pedestrian clearance interval) is calculated by dividing the distance by 3 ft/s.

With **Full Truncation**, the entire duration of the pedestrian clearance interval may be omitted before transitioning to the track clearance phase. Pedestrian protection is only provided during the vehicle change (yellow) and clearance (all-red) intervals of the right-of-way transition phase.

Under the **Intermediate Truncation** strategy, the duration of the pedestrian clearance interval should be

sufficient to get the pedestrian crossing from A to B and from A to D to the middle of the farthest travel lane in the pedestrian conflict zones closest to the grade crossing (see Figure 5).

With the **Partial Truncation** strategy, sufficient time should be provided after terminating the "WALK" interval to get pedestrians crossings from B to C and crossing from C to D to the middle of the pedestrian conflict zones farthest for the grade crossing (as shown in Figure 5) to increase their conspicuity to motorists exiting the track clearance phase.

With **Full Pedestrian Clearance**, the full amount of pedestrian clearance interval is provided after terminating the "WALK" interval before transitioning to the track clearance phase.

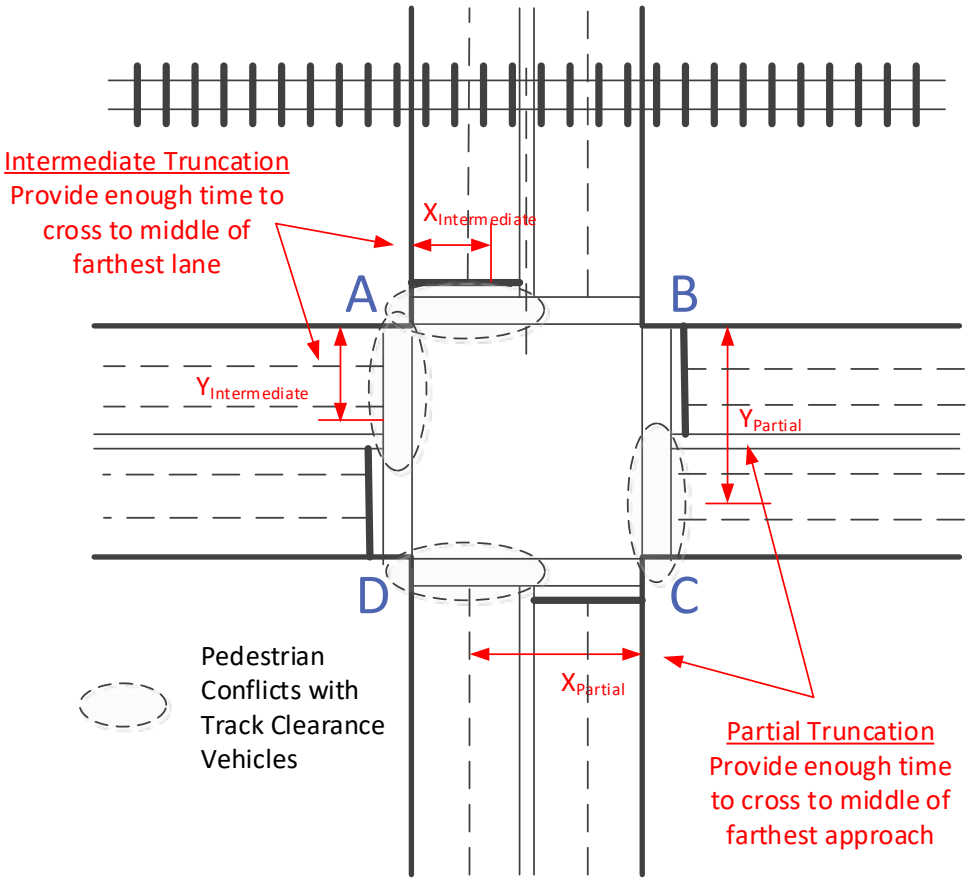


Figure 5. Crossing Distance during Truncated Pedestrian Clearance Intervals

APPENDIX S

Timing Guidelines for Countdown Pedestrian Signals

INTERSECTION TIMING STANDARD:
PEDESTRIAN CROSSWALKS

The MUTCD requires as a "shall condition" any signalized crosswalk using a countdown display cannot display a flashing don't walk indication during the yellow change interval; however, the yellow change and red clearance interval may be used as part of the overall pedestrian clearance time. This restriction could result in short countdown intervals displayed to the public and could create public concern over a short countdown time displayed to a pedestrian in a crosswalk. The Department will adopt a standard that will display a minimum countdown interval of 7 seconds. The table below reflects the minimum crosswalk distance the standard will cover utilizing the yellow change and red clearance intervals:

Minimum Countdown Display	Yellow Change Interval	Red Clearance Interval (2.0 sec)	Crosswalk Distance (in feet)
7 seconds	3.0 seconds	2.0 seconds	42
7 seconds	4.0 seconds	2.0 seconds	45.5
7 seconds	5.0 seconds	2.0 seconds	49
7 seconds	5.5 seconds	2.0 seconds	50.75
Minimum Countdown Display	Yellow Change Interval	Red Clearance Interval (3.0 sec)	Crosswalk Distance (in feet)
7 seconds	3.0 seconds	3.0 seconds	45.5
7 seconds	4.0 seconds	3.0 seconds	49
7 seconds	5.0 seconds	3.0 seconds	52.5
7 seconds	5.5 seconds	3.0 seconds	54.25

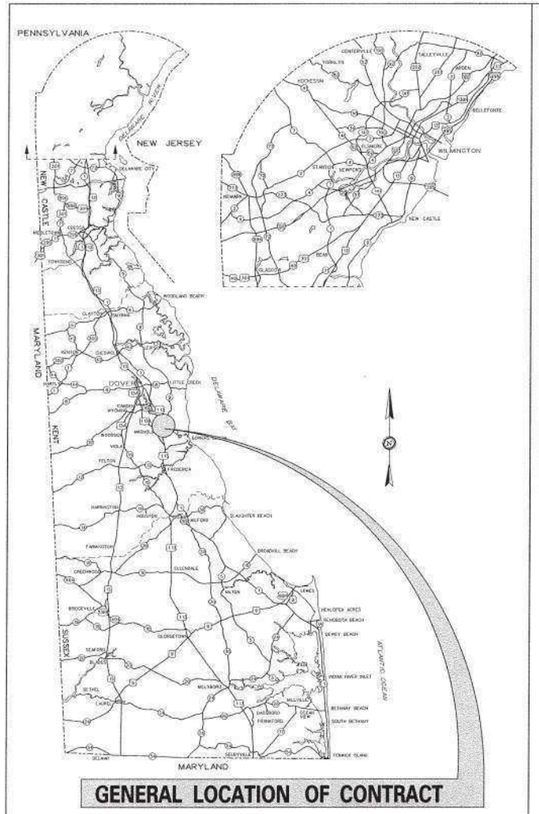
The pedestrian timing can be reflected as follows:

Walk Display	Flashing Don't Walk	Yellow Change	Red Clearance
Walk Interval 7"	Pedestrian Clearance time (curb to curb)		

Crosswalks longer than those noted in the table above will display countdown indications equal to the pedestrian clearance time minus the yellow change and red clearance intervals.

APPENDIX T

Sample Plan – Fiber Pathway



GENERAL LOCATION OF CONTRACT

U.S. CUSTOMARY UNITS

THE STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION

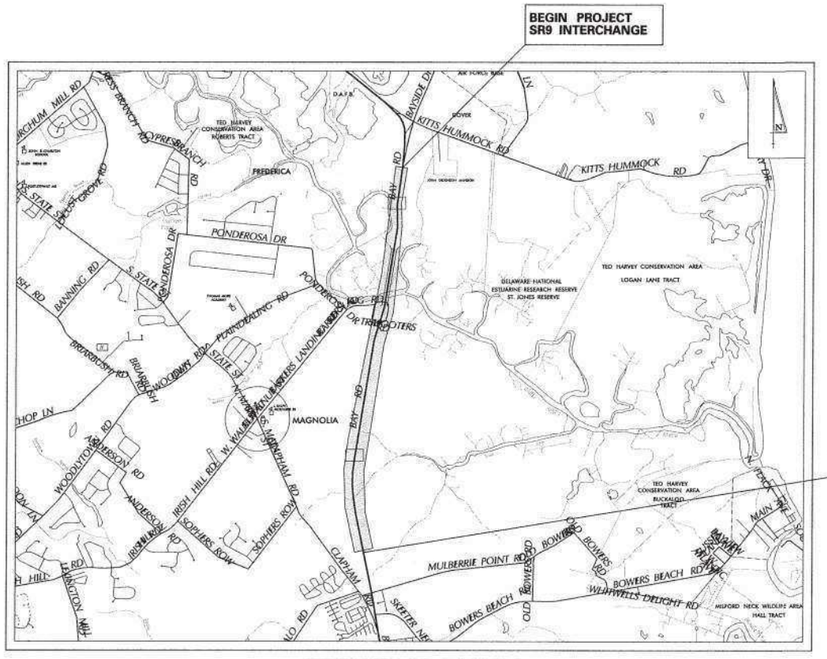
CONSTRUCTION PLANS FOR:

ITMS INTERCONNECT
SR1, SR9 TO LITTLE HEAVEN

CENTURY AGREEMENT NUMBER: 1486

CONTRACT NUMBER: T2012047404

ROADWAY LENGTH: 12,419± **FEET =** 2.35± **MILES**



PROJECT LOCATION
NOT TO SCALE

INDEX OF SHEETS

SHEET Nº	TABLE OF CONTENTS
1	TITLE SHEET
2	GENERAL NOTES
3	PLAN SHEET INDEX
4-8	ITMS CONDUIT PLANS
9	BRIDGE CROSSING DETAIL
10	PARAPET DETAIL

TOTAL SHEETS: 10

APPROVED DESIGN EXCEPTIONS

DESIGN PARAMETER	REQUIRED	PROVIDED	DATE

ADDENDA & REVISIONS

DESCRIPTION	NAME & DATE

PREPARED BY
THE CONSULTING FIRM OF

CENTURY ENGINEERING, INC.
4134 N. DUPONT HWY.
DOVER, DE 19901
(302) 734-9188

RECOMMENDED — 10/11/2011 DATE

RECOMMENDED

TRAFFIC DESIGNER — DATE

ASSISTANT CHIEF TRAFFIC ENGINEER — 10/13/11 DATE

CHIEF TRAFFIC ENGINEER — 10/13/11 DATE

FINAL PLANS
OCTOBER 2011

GENERAL NOTES:

1. ALL CONSTRUCTION AND MATERIALS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DELAWARE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION DATED AUGUST 2001 AND ANY ADDENDA THERETO AND THE MOST CURRENT VERSION OF THE DELDOT MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).

2. ALL DISTURBED AREAS WITHIN THE STATE RIGHT-OF-WAY, BUT NOT IN THE PAVEMENT, SHALL BE TOPSOILED (6" MINIMUM), FERTILIZED, SEEDED AND MULCHED.

3. MISS UTILITY OF DELMARVA SHALL BE NOTIFIED THREE (3) CONSECUTIVE WORKING DAYS PRIOR TO EXCAVATION, AT 1-800-282-8555.

4. EXISTING UTILITIES ARE SHOWN IN ACCORDANCE WITH THE BEST AVAILABLE INFORMATION. COMPLETENESS OR CORRECTNESS THEREOF IS NOT GUARANTEED. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE UTILITY COMPANIES INVOLVED IN ORDER TO SECURE THE MOST ACCURATE INFORMATION AVAILABLE AS TO UTILITY LOCATION AND ELEVATION. NO CONSTRUCTION AROUND OR ADJACENT TO UTILITIES SHALL BEGIN WITHOUT NOTIFYING THEIR OWNERS AT LEAST 48 HOURS IN ADVANCE. THE CONTRACTOR SHALL TAKE THE NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND MAINTAIN UNINTERRUPTED SERVICE AND ANY DAMAGE DONE TO THEM DUE TO HIS/HER NEGLIGENCE SHALL BE IMMEDIATELY AND COMPLETELY REPAIRED AT THE CONTRACTOR'S EXPENSE. TO LOCATE EXISTING UTILITIES IN THE FIELD PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL CONTACT MISS UTILITY OF DELMARVA (SEE NOTE *3).

5. ANY DAMAGE TO ITEMS THAT ARE REQUIRED TO BE RELOCATED OR RESET BY THE CONTRACTOR SHALL BE REPAIRED AND/OR REPLACED IN KIND AT THE CONTRACTOR'S EXPENSE.

6. IF THIS PROJECT EXTENDS OVER A WINTER PERIOD ANY SNOW REMOVAL ALONG THE STATE MAINTAINED ROAD WILL BE HANDLED BY STATE FORCES. FOLLOWING THE SNOW REMOVAL OPERATION, ANY MAINTENANCE OF TRAFFIC CONTROL DEVICES SHALL BE PERFORMED BY THE CONTRACTOR.

7. POLE BASES, CABINET BASE AND CONDUIT JUNCTION WELLS TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER.

8. ALL PROPOSED MAIN LINE TRENCHED CONDUIT SHALL BE 4 INCH PVC WITH 4-1" SMOOTH WALL HDPE. ALL BORING SHALL BE 4" HDPE.

9. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND /OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.

10. ROADWAY GEOMETRY IS BASED OFF AERIAL PHOTOS. A DETAILED FIELD SURVEY WAS NOT CONDUCTED.

11. CONDUIT SHALL BE A MINIMUM OF 24 INCHES BELOW GRADE.

12. TYPE 4 JUNCTION WELLS SHALL BE NO MORE THAN 600 FEET APART, TYPE 7 JUNCTION WELLS SHALL BE NO MORE THAN 2,400 FEET APART.

13. WORK SHALL BE PERFORMED IN A MANNER THAT WILL ENSURE THE LEAST PRACTICAL OBSTRUCTION TO THE TRAVELING PUBLIC, CONSISTENT WITH SAFETY STANDARDS AND SHALL COMPLY WITH THE REQUIREMENTS OF THE 2007 DELAWARE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) PART 6, HEREIN REFERRED TO AS THE TRAFFIC CONTROL MANUAL (INCLUDING REVISIONS IN EFFECT AT THE TIME OF THE ADVERTISEMENTS OF BIDS).

14. MAINTENANCE OF TRAFFIC DURING LANE CLOSURES AND LANE SHIFTS SHALL CONFORM TO CASE 3 OF THE TRAFFIC CONTROL MANUAL.

15. ACCESS TO ALL BUSINESSES AND RESIDENCES WITHIN THE PROJECT LIMITS SHALL BE MAINTAINED THROUGHOUT THE DURATION OF THIS CONTRACT. ANY TEMPORARY CLOSURE OF A DRIVEWAY FOR TIE-IN PURPOSES SHALL BE COORDINATED WITH THE ENGINEER AND/OR PROPERTY OWNER IN ADVANCE OF THE CLOSURE.

16. ALL SIGNING AND MAINTENANCE OF TRAFFIC IS THE CONTRACTOR'S RESPONSIBILITY AND SHALL FOLLOW THE GUIDELINES SHOWN IN DELAWARE DEPARTMENT OF TRANSPORTATION MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR STREETS AND HIGHWAYS.

17. ALL TRAFFIC CONTROL DEVICES SHALL BE IN NEW OR REFURBISHED CONDITION, SHALL COMPLY WITH THE TRAFFIC CONTROL MANUAL, AND SHALL BE NCHRP-350 APPROVED AND SHALL BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION. TRAFFIC CONTROL DEVICES SHALL BE MAINTAINED IN GOOD CONDITION FOR DURATION OF USE.

18. WITHIN THE CONSTRUCTION AREA, UTILITY WORK - 1500FT, 1000FT, 500FT AND END OF WORK PERMANENT SIGNS SHALL BE PLACED WHENEVER POSSIBLE. IF THE ABOVE DISTANCES ARE NOT APPLICABLE, A "UTILITY WORK AHEAD" PERMANENT SIGN SHALL BE PLACED, AS DIRECTED BY THE SOUTH DISTRICT INSPECTOR. AN "END OF UTILITY WORK" PERMANENT SIGN SHALL BE PLACED ON THE RIGHT SIDE, 500FT FROM THE WORK ZONE. ALL DIMENSIONS ARE APPROXIMATE AND MAY BE ADJUSTED TO MEET FIELD CONDITIONS AS APPROVED BY THE DISTRICT INSPECTOR . ALL PERMANENT TRAFFIC CONTROL SIGNS SHALL BE SEVEN FEET FROM THE BOTTOM OF THE SIGN TO THE TOP OF THE GROUND.

19. MAINTENANCE OF TRAFFIC MAY BE REQUIRED FOR THE INSTALLATION OF CONDUIT, FIBER OR DEVICES. TRAFFIC CONTROLS FOR STREET AND HIGHWAY CONSTRUCTION, DELDOT MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES SHALL BE ADHERED TO FOR THE SHOULDER CLOSURE MAINTENANCE OF TRAFFIC OPERATION (CONTRACTOR SHALL COORDINATE WITH SAFETY OFFICER).

10/11/2011
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DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS	

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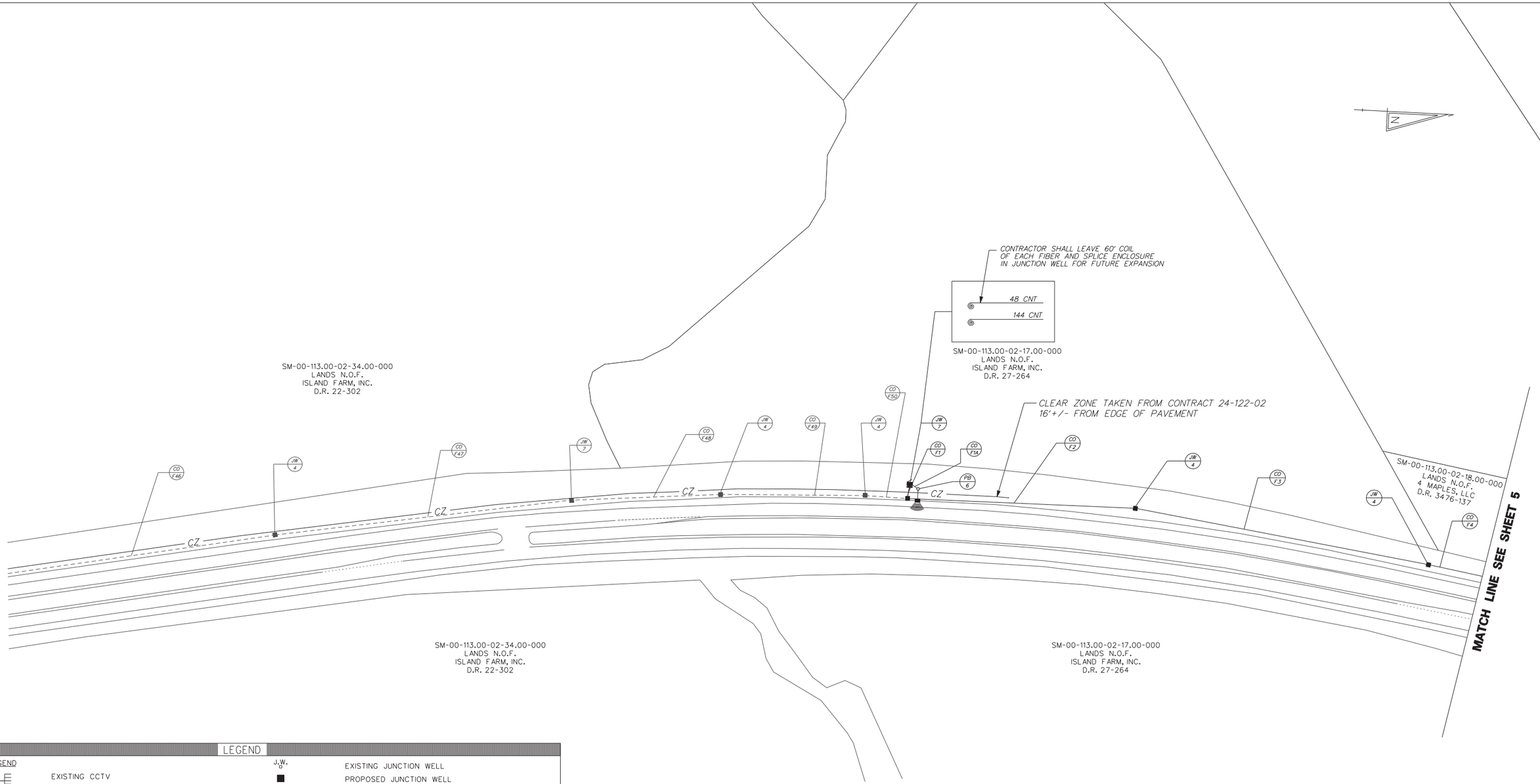
ITMS INTERCONNECT
(SR1, SR9 TO LITTLE HEAVEN)

CONTRACT NO.	PERMIT NO.	-
T201204704	DESIGNED BY:	DLD
COUNTY		
KENT	CHECKED BY:	BAM

ITMS INDEX PLAN

SHEET NO.	3
TOTAL SHTS.	10

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LEGEND

LEGEND		J.W.	
	EXISTING CCTV	■	EXISTING JUNCTION WELL
	PROPOSED CCTV	■	PROPOSED JUNCTION WELL
		■	PROPOSED JUNCTION WELL FROM PREVIOUS CONTRACT
		- - - - - - - - - - - - - - -	PROPOSED CONDUIT RUN FROM PREVIOUS CONTRACT
JW x	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	JW x	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
CO x	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	CO x	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)
	EXISTING RIGHT OF WAY LINE	= = = = = = = = = = = = = = =	STORM SEWER
	EXISTING PROPERTY LINE	CNT SM	COUNT, SINGLEMODE FIBER OPTICS
	EXISTING MICROWAVE DETECTION		EXISTING ROAD WEATHER INFORMATION SYSTEM (RWIS) PUCK SENSOR
	PROPOSED MICROWAVE DETECTION		PROPOSED ROAD WEATHER INFORMATION SYSTEM (RWIS) PUCK SENSOR
			EXISTING GUARDRAIL
	PROPOSED POLE (TYPE 6)		
	PROPOSED CABINET (TYPE M)		

ITMS GENERAL NOTES:

1. *CONDUIT RUNS F46, F47, F48, F49, F50 AND ASSOCIATED JUNCTION WELLS OBTAINED FROM CONTRACT NO. 24-122-02, SR1 LITTLE HEAVEN GRADE SEPARATED INTERSECTION, FISCAL YEAR 2015.*
2. *POLE BASE, 32' POLE AND RADAR SHALL BE INSTALLED UNDER THIS CONTRACT.*
3. *INITIAL POWER FOR THE PROPOSED MICROWAVE DETECTION TO BE SOLAR. POWER WILL BE ESTABLISHED THROUGH CONTRACT NO. 24-122-02.*
4. *DETECTION UNIT TO BE MOUNTED AT MIN MOUNTING HEIGHT OF 20' AND MAX MOUNTING HEIGHT OF 41' WITH A MANUFACTURER RECOMMENDED MOUNTING HEIGHT OF 30'. FIELD ADJUST MOUNTING HEIGHT AS REQUIRED TO ACHIEVE MAXIMUM DATA OUTPUT. DETECTOR WILL COMMUNICATE WITH THE TMC VIA A CDMA WIRELESS CONNECTION.*

CONDUIT RUN SCHEDULE

CO#	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/WIRE
F1	1	4.0"	20'	T	12 CNT SINGLE MODE
F1A	1	4.0"	15'	T	12 CNT SM
F2	1	4.0"	508'	T	144 CNT SM,48 CNT SM
F3	1	4.0"	600'	T	144 CNT SM,48 CNT SM
F4	1	4.0"	110'	T	144 CNT SM,48 CNT SM

* DENOTES EXISTING

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

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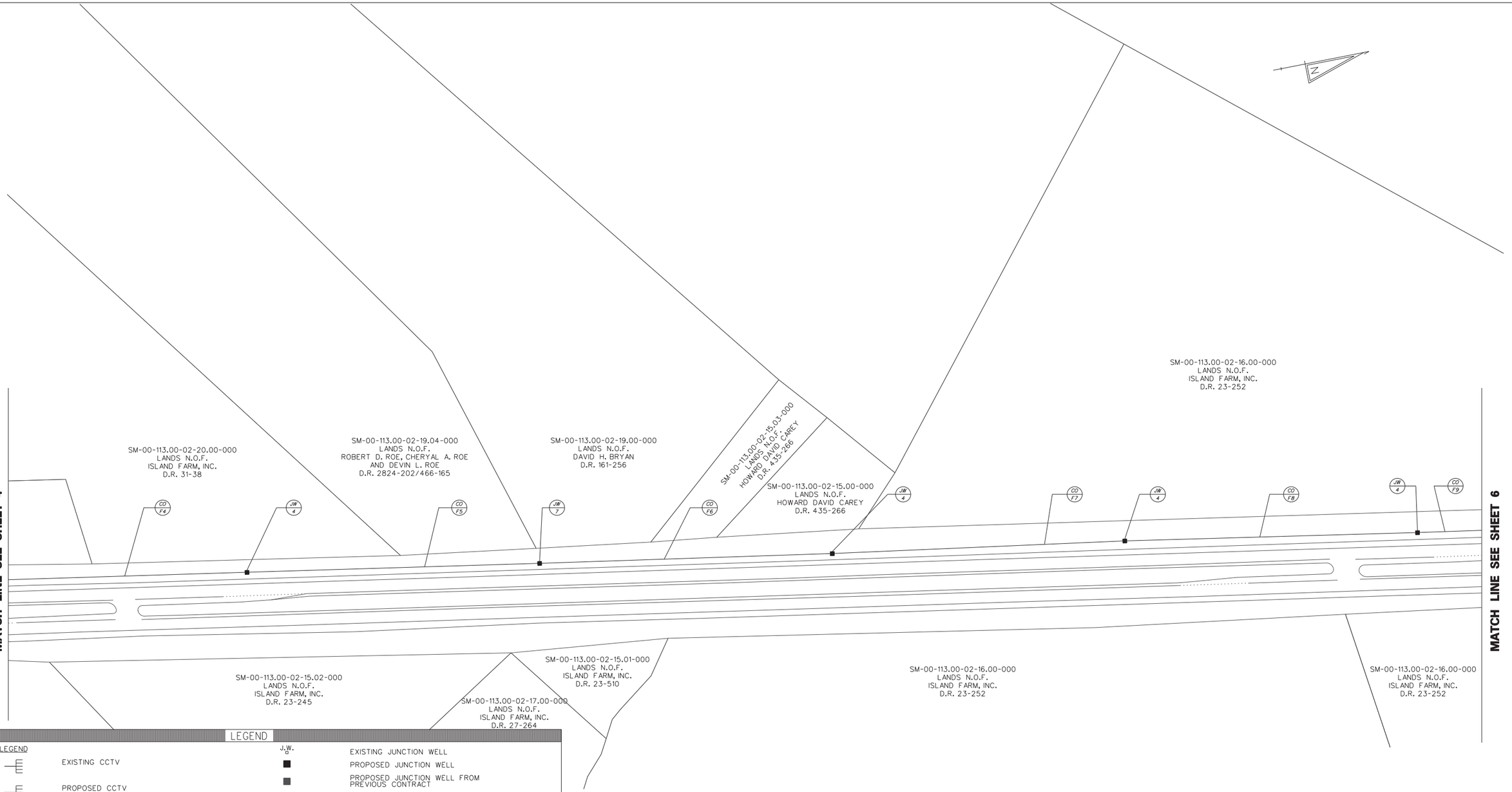
ITMS INTERCONNECT (SR1, SR9 TO LITTLE HEAVEN)

CONTRACT NO.	PERMIT NO.	-
T201204704	DESIGNED BY:	DLD
COUNTY	CHECKED BY:	BAM
KENT		

ITMS CONDUIT PLAN

SHEET NO.
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TOTAL SHTS.
10

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LEGEND

LEGEND		J.W.	
	EXISTING CCTV		EXISTING JUNCTION WELL
	PROPOSED CCTV		PROPOSED JUNCTION WELL
			PROPOSED JUNCTION WELL FROM PREVIOUS CONTRACT
			PROPOSED CONDUIT RUN FROM PREVIOUS CONTRACT
JW x	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	JW x	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
CO x	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	CO x	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)
			STORM SEWER
	EXISTING RIGHT OF WAY LINE	CNT SM	COUNT, SINGLEMODE FIBER OPTICS
	EXISTING PROPERTY LINE		EXISTING ROAD WEATHER INFORMATION SYSTEM (RWIS) PUCK SENSOR
	EXISTING MICROWAVE DETECTION		PROPOSED ROAD WEATHER INFORMATION SYSTEM (RWIS) PUCK SENSOR
	PROPOSED MICROWAVE DETECTION		EXISTING GUARDRAIL
	PROPOSED POLE (TYPE 6)		
	PROPOSED CABINET (TYPE M)		

CONDUIT RUN SCHEDULE

CR#	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/WIRE
F4	1	4.0"	490'	T	144 CNT SINGLE MODE,48 CNT SINGLE MODE
F5	1	4.0"	600'	T	144 CNT SM,48 CNT SM
F6	1	4.0"	600'	T	144 CNT SM,48 CNT SM
F7	1	4.0"	600'	T	144 CNT SM,48 CNT SM
F8	1	4.0"	600'	T	144 CNT SM,48 CNT SM
F9	1	4.0"	132'	T	144 CNT SM,48 CNT SM

* DENOTES EXISTING

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

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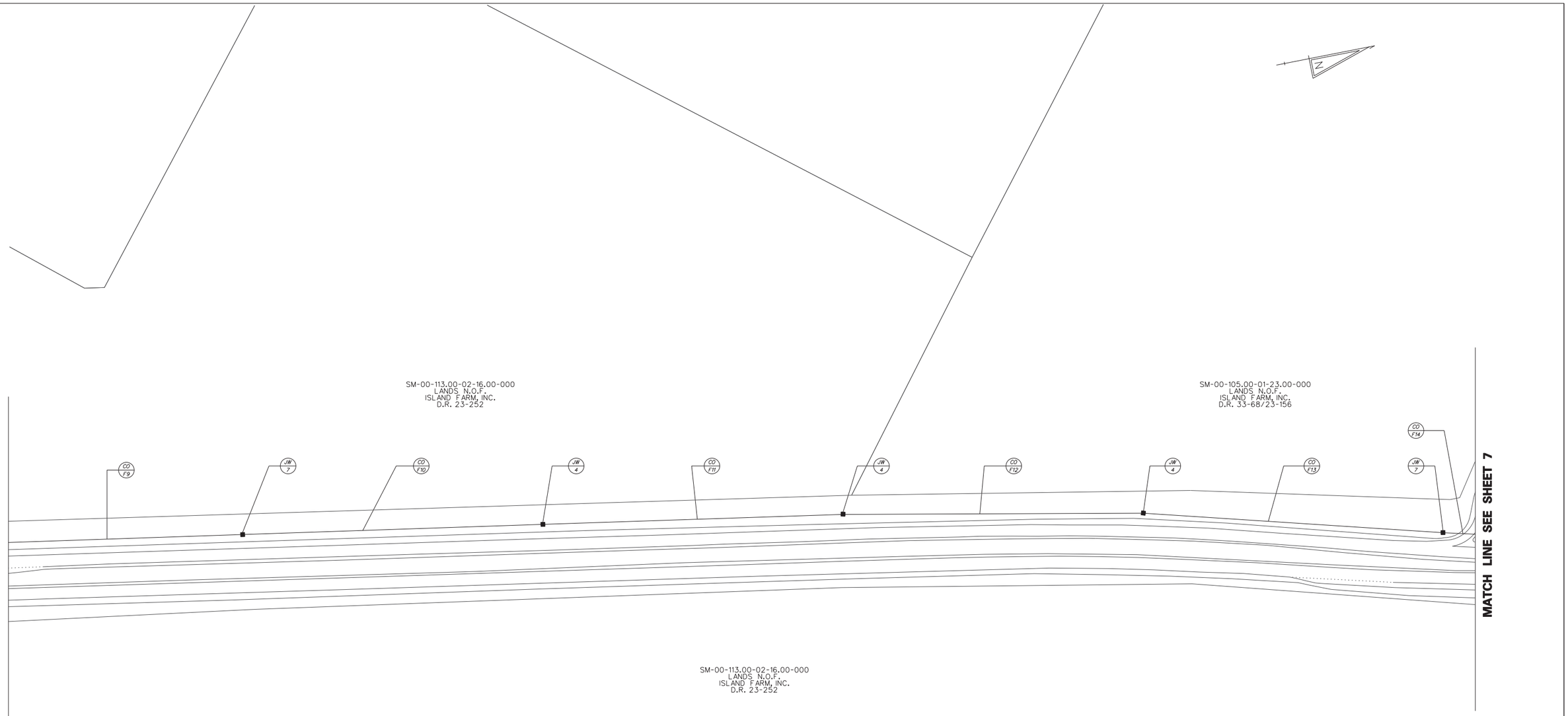
ITMS INTERCONNECT
(SR1, SR9 TO LITTLE HEAVEN)

CONTRACT NO.	PERMIT NO.	-
T201204704	DESIGNED BY:	DLD
COUNTY		
KENT	CHECKED BY:	BAM

ITMS CONDUIT PLAN

SHEET NO.
5
TOTAL SHTS.
10

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LEGEND

EXISTING CCTV	EXISTING JUNCTION WELL
PROPOSED CCTV	PROPOSED JUNCTION WELL
PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PROPOSED JUNCTION WELL FROM PREVIOUS CONTRACT
PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	PROPOSED CONDUIT RUN FROM PREVIOUS CONTRACT
EXISTING RIGHT OF WAY LINE	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
EXISTING PROPERTY LINE	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)
EXISTING MICROWAVE DETECTION	STORM SEWER
PROPOSED MICROWAVE DETECTION	CNT SM — COUNT, SINGLEMODE FIBER OPTICS
PROPOSED POLE (TYPE 6)	EXISTING ROAD WEATHER INFORMATION SYSTEM (RWIS) PUCK SENSOR
PROPOSED CABINET (TYPE M)	PROPOSED ROAD WEATHER INFORMATION SYSTEM (RWIS) PUCK SENSOR
	EXISTING GUARDRAIL

CONDUIT RUN SCHEDULE

CO#	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/WIRE
F9	1	4.0"	468'	T	144 CNT SINGLE MODE,48 CNT SINGLE MODE
F10	1	4.0"	600'	T	144 CNT SM,48 CNT SM
F11	1	4.0"	600'	T	144 CNT SM,48 CNT SM
F12	1	4.0"	600'	T	144 CNT SM,48 CNT SM
F13	1	4.0"	600'	T	144 CNT SM,48 CNT SM
F14	1	4.0"	65'	B	144 CNT SM,48 CNT SM

* DENOTES EXISTING

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

SCALE: 0 100 200 300 FEET

ITMS INTERCONNECT (SR1, SR9 TO LITTLE HEAVEN)

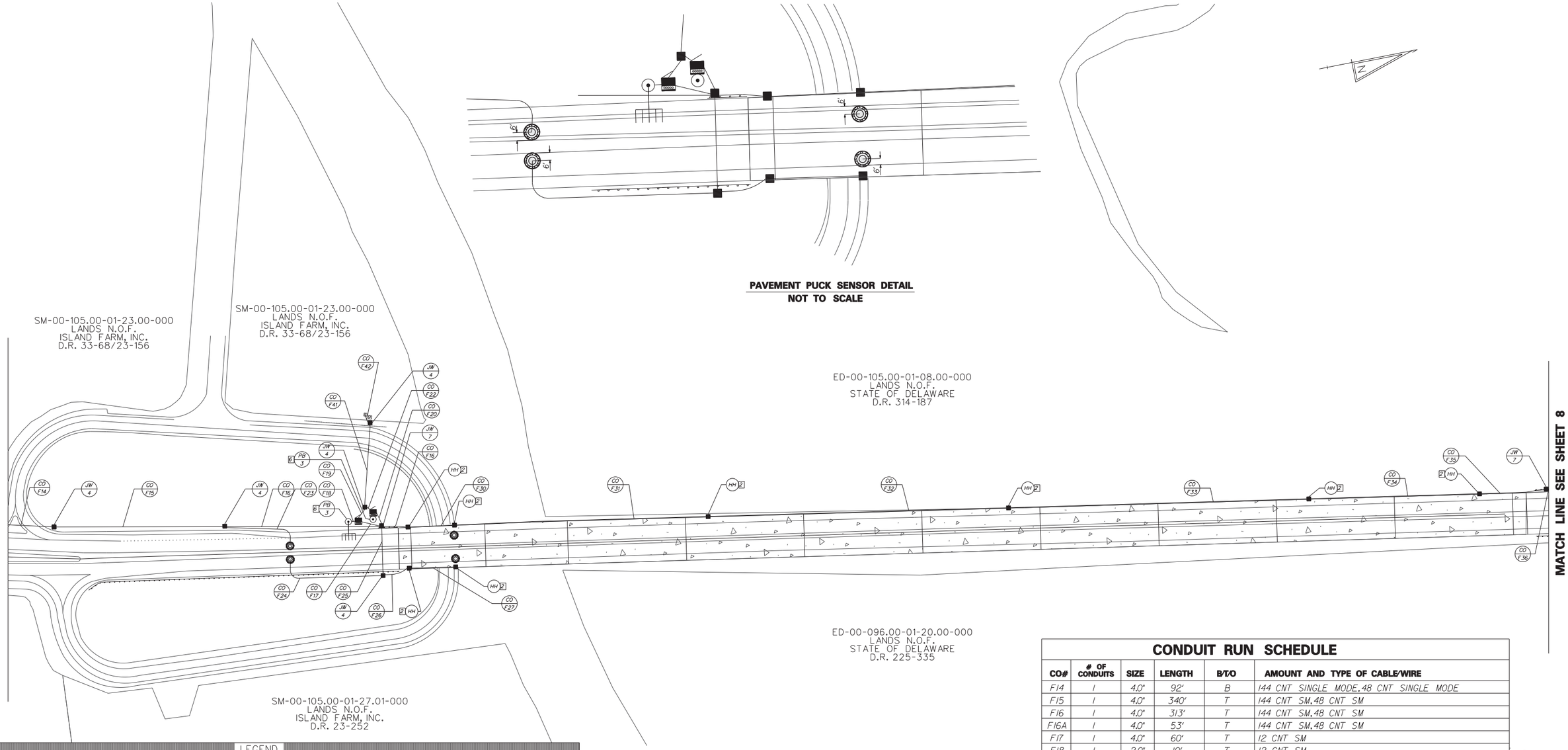
CONTRACT NO.	T201204704	PERMIT NO.	-
COUNTY	KENT	DESIGNED BY:	DLD
		CHECKED BY:	BAM

ITMS CONDUIT PLAN

SHEET NO.	6
TOTAL SHTS.	10

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PAVEMENT PUCK SENSOR DETAIL
NOT TO SCALE



LEGEND

LEGEND		J.W.	EXISTING JUNCTION WELL
	EXISTING CCTV	■	PROPOSED JUNCTION WELL
	PROPOSED CCTV	■	PROPOSED JUNCTION WELL FROM PREVIOUS CONTRACT
JW x	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	- - - - - - - - - - - - - - -	PROPOSED CONDUIT RUN FROM PREVIOUS CONTRACT
CO x	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	JW x	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	EXISTING RIGHT OF WAY LINE	CO x	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)
	EXISTING PROPERTY LINE	= = = = = = = = = = = = = =	STORM SEWER
	EXISTING MICROWAVE DETECTION	CNT SM	COUNT, SINGLEMODE FIBER OPTICS
	PROPOSED MICROWAVE DETECTION		EXISTING ROAD WEATHER INFORMATION SYSTEM (RWIS) PUCK SENSOR
	PROPOSED POLE (TYPE 6)		PROPOSED ROAD WEATHER INFORMATION SYSTEM (RWIS) PUCK SENSOR
	PROPOSED CABINET (TYPE M)		EXISTING GUARDRAIL

ITMS GENERAL NOTES

1. *CCTV AND RWIS STATION SERVICE FEED SHALL BE COORDINATED WITH LOCAL ELECTRIC COMPANY.*
2. *3'x3'x6" HAND HOLE ATTACHED TO THE PARAPET WALL.*
3. *ALL PAVEMENT PUCK SENSORS SHALL BE INSTALLED APPROXIMATELY 4 FEET FROM THE EDGE OF THE TRAVEL LANE AS SHOWN (SEE DETAIL THIS SHEET).*
4. *SENSOR CABLE TYPE 11A SHALL BE INSTALLED IN ½" x 1 ½" SAWCUT IN PAVEMENT. THE SAWCUT SHALL BE FILLED WITH 3M LOOP DETECTOR SEALANT.*
5. *ALL PAVEMENT PUCK SENSOR HEADS SHALL BE INSTALLED FLUSH WITH FINISHED PAVEMENT SURFACE.*
6. *POLE BASE TYPE 3 SHALL BE A 75' POLE FOR CAMERA AND 25' FOR WEATHER.*
7. *RWIS ASSEMBLY SHALL BE MOUNTED ON THE RWIS POLE.*
8. *THE COMMUNICATION MEDIA FOR THE RWIS ASSEMBLY SHALL BE FIBER OPTIC. (CDMA COMMUNICATIONS SHALL BE USED IF FIBER IS NOT ACTIVATED PRIOR TO COMPLETION OF THE PROJECT).*

CONDUIT RUN SCHEDULE

CO#	# OF CONDUITS	SIZE	LENGTH	B/TO	AMOUNT AND TYPE OF CABLE/WIRE
F14	1	4.0"	92'	B	144 CNT SINGLE MODE,48 CNT SINGLE MODE
F15	1	4.0"	340'	T	144 CNT SM,48 CNT SM
F16	1	4.0"	313'	T	144 CNT SM,48 CNT SM
F16A	1	4.0"	53'	T	144 CNT SM,48 CNT SM
F17	1	4.0"	60'	T	12 CNT SM
F18	1	2.0"	10'	T	12 CNT SM
F19	1	4.0"	25'	T/B	2/#8 U.F.w/GROUND
F20	1	4.0"	25'	T	(6) SENSOR HOMERUN CABLE
F22	1	2.0"	10'	T/B	2/#8 U.F.w/GROUND
F23	1	4.0"	85'	T	(1) SENSOR HOMERUN CABLE
F24	1	4.0"	30'	B	(1) SENSOR HOMERUN CABLE
F25	1	4.0"	95'	T	(5) SENSOR HOMERUN CABLE
F26	1	4.0"	50'	T	(4) SENSOR HOMERUN CABLE
F27	1	4.0"	85'	**	(4) SENSOR HOMERUN CABLE
F30	1	4.0"	85'	**	144 CNT SM,48 CNT SM,(1) SENSOR HOMERUN CABLE
F31	1	4.0"	500'	**	144 CNT SM,48 CNT SM
F32	1	4.0"	600'	**	144 CNT SM,48 CNT SM
F33	1	4.0"	600'	**	144 CNT SM,48 CNT SM
F34	1	4.0"	341'	**	144 CNT SM,48 CNT SM
F35	1	4.0"	134'	**	144 CNT SM,48 CNT SM
F36	1	4.0"	1'	T	144 CNT SM,48 CNT SM
F41	1	2.0"	165'	T/B	2/#8 U.F.w/GROUND
F42	1	2.0"	15'	T	2/#8 U.F.w/GROUND

* DENOTES EXISTING
** DENOTES ATTACHMENT TO BRIDGE

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

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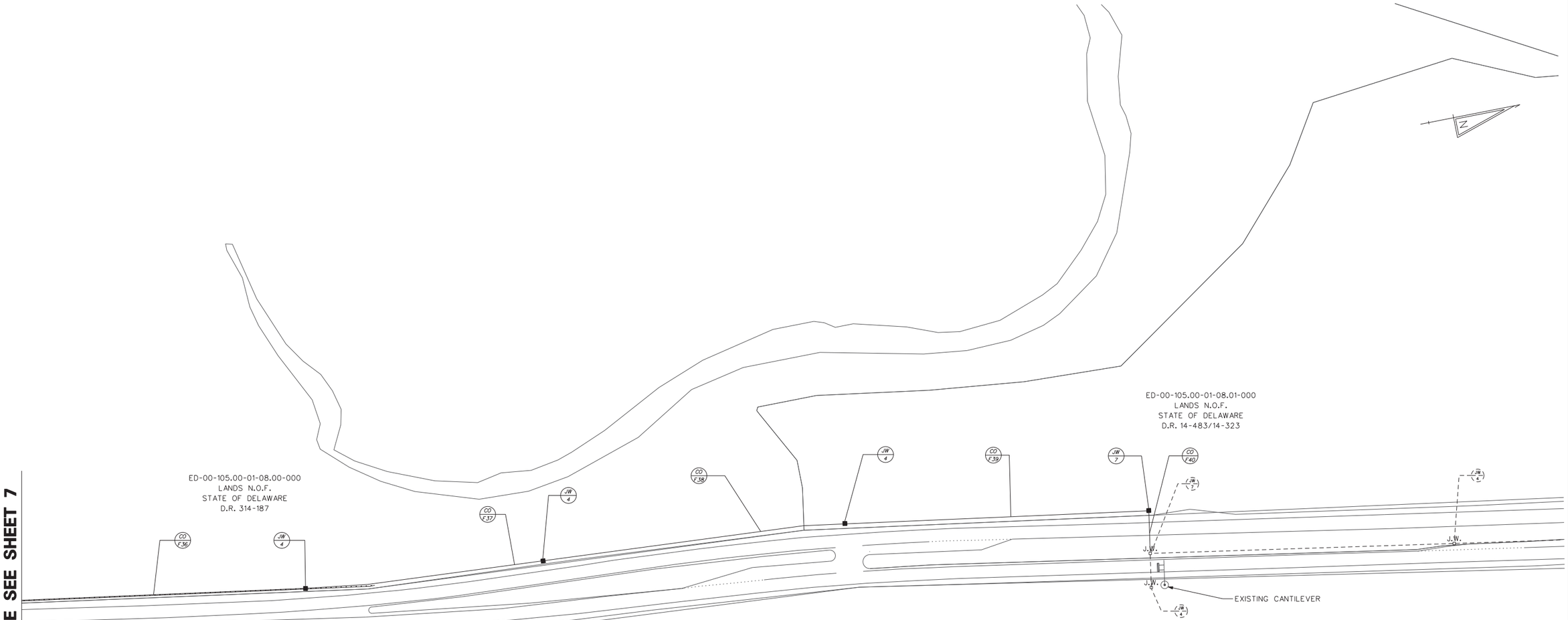
ITMS INTERCONNECT (SR1, SR9 TO LITTLE HEAVEN)

CONTRACT NO.	T201204704	PERMIT NO.	-
COUNTY	KENT	DESIGNED BY:	DLD
		CHECKED BY:	BAM

ITMS CONDUIT PLAN

SHEET NO.	7
TOTAL SHTS.	10

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LEGEND

LEGEND		J.W.	EXISTING JUNCTION WELL
	EXISTING CCTV		PROPOSED JUNCTION WELL
	PROPOSED CCTV		PROPOSED JUNCTION WELL FROM PREVIOUS CONTRACT
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)		PROPOSED CONDUIT RUN FROM PREVIOUS CONTRACT
CO X	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
	EXISTING RIGHT OF WAY LINE	CO X	EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)
	EXISTING PROPERTY LINE		STORM SEWER
	EXISTING MICROWAVE DETECTION	CNT SM	COUNT, SINGLEMODE FIBER OPTICS
	PROPOSED MICROWAVE DETECTION		EXISTING ROAD WEATHER INFORMATION SYSTEM (RWIS) PUCK SENSOR
	PROPOSED POLE (TYPE 6)		PROPOSED ROAD WEATHER INFORMATION SYSTEM (RWIS) PUCK SENSOR
	PROPOSED CABINET (TYPE M)		EXISTING GUARDRAIL

GENERAL NOTE:

1. *EXISTING JUNCTION WELLS AND CONDUIT RUNS OBTAINED FROM CONTRACT NO. 24-122-04, SR1, SR9 GRADE SEPARATED INTERSECTION.*

CONDUIT RUN SCHEDULE

CO#	# OF CONDUITS	SIZE	LENGTH	B/TO	AMOUNT AND TYPE OF CABLE/WIRE
F36	1	4.0"	565'	T	144 CNT SINGLE MODE,48 CNT SINGLE MODE
F37	1	4.0"	472'	T	144 CNT SM,48 CNT SM
F38	1	4.0"	600'	T	144 CNT SM,48 CNT SM
F39	1	4.0"	600'	T	144 CNT SM,48 CNT SM
F40	1	4.0"	134'	B	144 CNT SM,48 CNT SM

* DENOTES EXISTING

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

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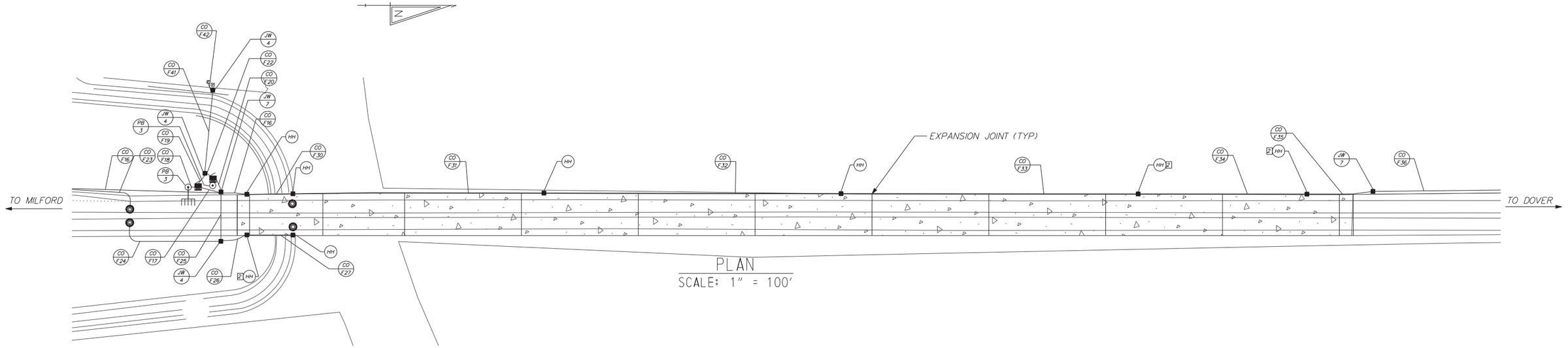
ITMS INTERCONNECT (SR1, SR9 TO LITTLE HEAVEN)

CONTRACT NO.	PERMIT NO.	-
T201204704	DESIGNED BY:	DLD
COUNTY	CHECKED BY:	BAM
KENT		

ITMS CONDUIT PLAN

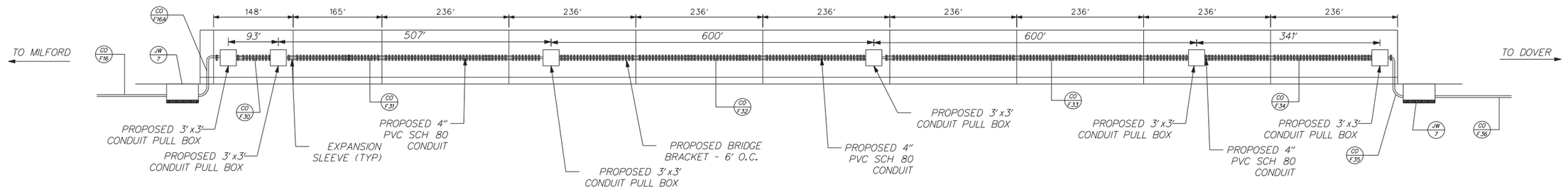
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TOTAL SHTS.
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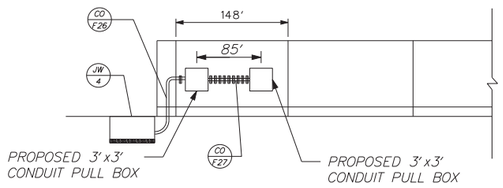
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BRIDGE ELEVATION - SOUTH BOUND SIDE

SCALE: N.T.S.

(MIRROR IMAGE OF SECTION USED FOR INSTALLATION CLARITY)



BRIDGE ELEVATION - NORTH BOUND SIDE

SCALE: N.T.S.

NOTE:

1. *PVC CONDUIT THAT WILL BE EXPOSED TO ELEMENTS (INSTALLED ON PARAPET WALL) WILL BE INSTALLED WITH EXPANSION SLEEVES. THE CONTRACTOR SHALL ENSURE THE PLACEMENT OF EXPANSION SLEEVES AT A MAXIMUM OF 100 FEET.*
2. *ALL CONDUIT SWEEPS INTO BRIDGE PARAPET SHALL BE A MINIMUM OF 24" RADIUS.*

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS	

SCALE: 0 100 200 300 FEET

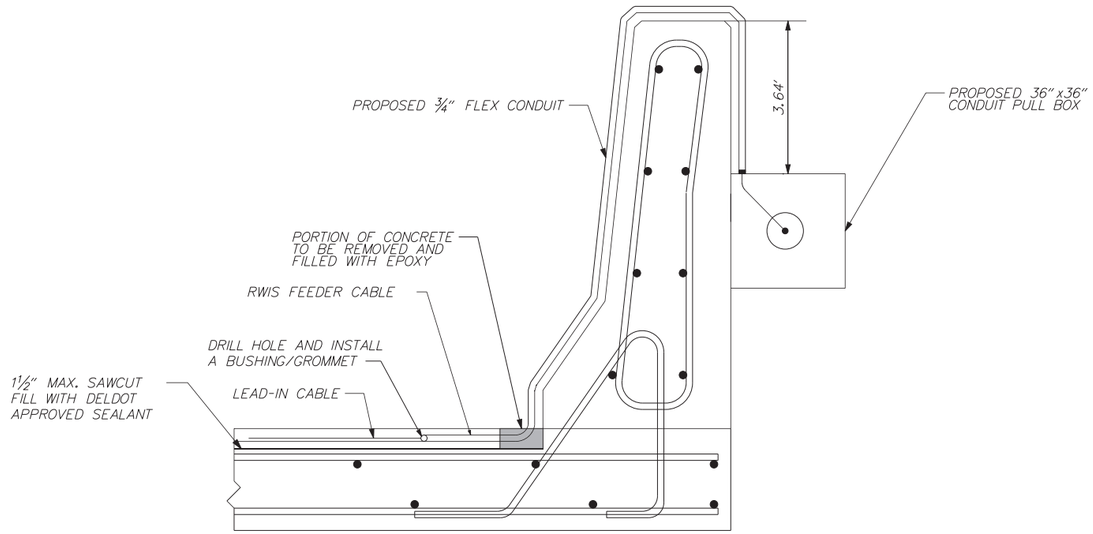
ITMS INTERCONNECT (SR1, SR9 TO LITTLE HEAVEN)

CONTRACT NO.	PERMIT NO.	-
T201204704	DESIGNED BY:	DLD
COUNTY	CHECKED BY:	BAM
KENT		

ITMS CONDUIT PLAN

SHEET NO.
9
TOTAL SHTS.
10

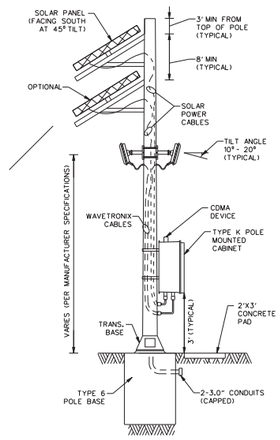
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TYPICAL PARAPET CONDUIT DETAILS (N.T.S.)

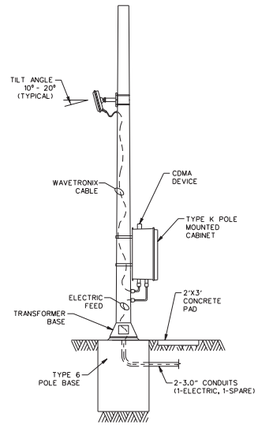
SOLAR INSTALLATION WITH 2 DETECTOR SYSTEM

CDMA COMMUNICATION



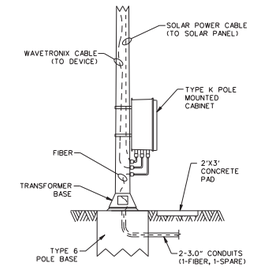
ELECTRIC INSTALLATION

CDMA COMMUNICATION



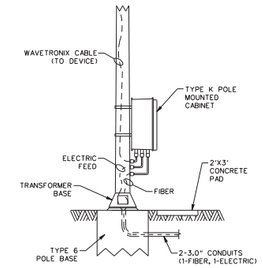
SOLAR INSTALLATION

FIBER COMMUNICATION



ELECTRIC INSTALLATION

FIBER COMMUNICATION



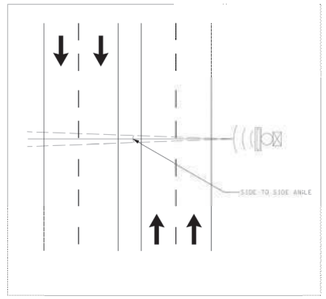
NOTES:
1. SEE PLAN SHEETS FOR DETECTOR MOUNTING HEIGHTS.
2. CONDUIT BODIES USED FOR POLE TO CABINET CONNECTIONS SHALL BE LIQUID TIGHT.
3. DETECTOR POLE SHALL HAVE A HEIGHT OF 40'.
4. CONTRACTOR SHALL INSTALL A 2'X 3' CONCRETE PAD IN FRONT OF CABINET DOOR TO FACILITATE CABINET ACCESS. CONCRETE PAD SHALL BE PAID FOR UNDER ITEM 705001.
5. CABINET SHALL BE PROVIDED WITH SURGE PROTECTOR, CDMA/FIBER COMMUNICATION (AS REQUIRED) AND SOLAR/ELECTRIC EQUIPMENT (AS REQUIRED).
6. BATTERY BACKUP FOR SOLAR INSTALLATIONS SHALL CONSIST OF 4-12V BATTERIES CONNECTED IN PARALLEL.
7. FOR NON-ELECTRIC 2 DETECTOR SYSTEMS, DEVICES SHALL BE POWERED BY 2 SOLAR PANELS.

MICROWAVE DETECTOR TYPICAL

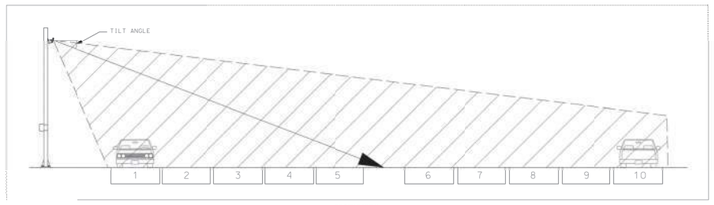
Detector Mounting Height Guidelines

Offset From First Detection Lane (feet)	Recommended Mounting Height (feet)	Minimum Mounting Height (feet)	Maximum Mounting Height (feet)
6	12	9	19
7	12	9	19
8	12	9	20
9	12	9	21
10	12	9	22
11	12	9	23
12	13	10	24
13	13	11	25
14	14	11	26
15	15	12	26
16	15	12	27
17	16	13	28
18	17	14	29
19	17	14	30
20	16	15	30
21	19	15	31
22	20	16	31
23	22	16	32
24	24	16	33
25	26	17	33
26	26	17	34
27	27	18	35
28	27	18	35
29	27	18	36
30	29	19	37
31	29	19	37
32	29	19	38
33	30	19	39
34	30	19	39
35	30	20	40
36	30	20	41
37	31	20	41
38	31	21	42
39	33	21	43
40	33	22	43
41	34	22	44
42	34	22	44
43	35	22	45
44	35	23	46
45	36	23	46
46	36	23	47
47	36	24	48
48	38	24	48
49	38	24	49
50-230	39	25	Must be ≤ Offset

RECOMENDED OFFSETS



PLAN VIEW



PROFILE VIEW

10/12/2011
C:\PROJECTS\095007.00 (Traffic Engineering)\095007.01 (SR1 - US9 to LH Fiber)\CADD FILES\Sheets\ut_11.dgn
10:45:00 AM

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

SCALE 0 100 200 300 FEET

ITMS INTERCONNECT (SR1, SR9 TO LITTLE HEAVEN)

CONTRACT NO.	PERMIT NO.	-
T201204704	DESIGNED BY:	DLD
COUNTY	CHECKED BY:	BAM
KENT		

PARAPET DETAIL

SHEET NO.
10
TOTAL SHTS.
10

APPENDIX U

Sample Plan – RTMS Design

LEGEND

PB / JB	PROPOSED POLE BASE IDENTIFIER		PROPOSED MICROWAVE DETECTION DEVICE WITH POLE MOUNTED CONTROL CABINET
CA / K	PROPOSED CABINET IDENTIFIER		EXISTING LUMINARE
JW / X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)		EXISTING UTILITY POLE
OH / X	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)		PROPOSED JUNCTION WELL
CO / X	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	P	PROPOSED SERVICE PEDESTAL
D	PROPOSED DISCONNECT SWITCH		

CONDUIT RUN SCHEDULE

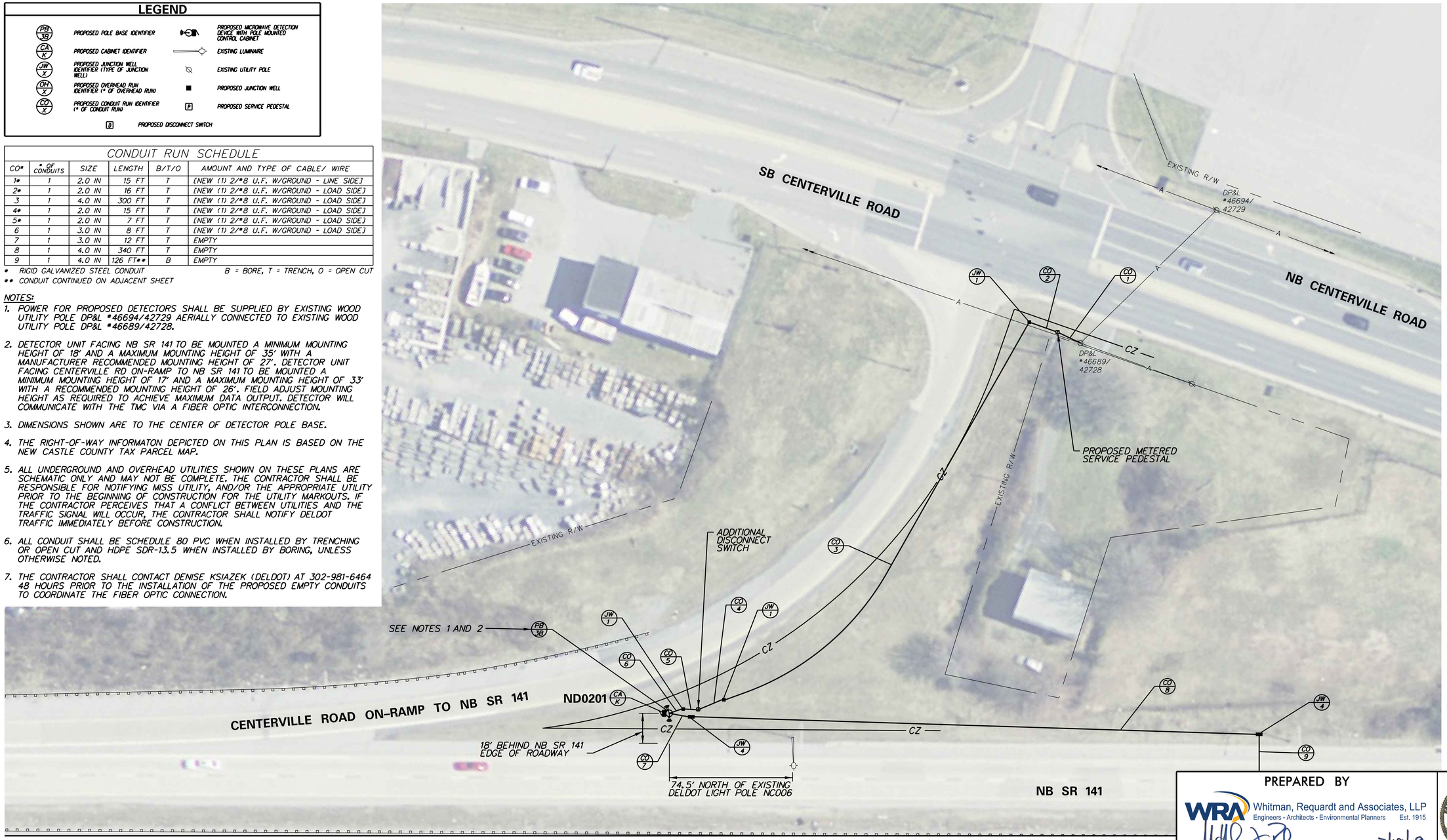
CO*	* OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
1*	1	2.0 IN	15 FT	T	[NEW (1) 2/*8 U.F. W/GROUND - LINE SIDE]
2*	1	2.0 IN	16 FT	T	[NEW (1) 2/*8 U.F. W/GROUND - LOAD SIDE]
3	1	4.0 IN	300 FT	T	[NEW (1) 2/*8 U.F. W/GROUND - LOAD SIDE]
4*	1	2.0 IN	15 FT	T	[NEW (1) 2/*8 U.F. W/GROUND - LOAD SIDE]
5*	1	2.0 IN	7 FT	T	[NEW (1) 2/*8 U.F. W/GROUND - LOAD SIDE]
6	1	3.0 IN	8 FT	T	[NEW (1) 2/*8 U.F. W/GROUND - LOAD SIDE]
7	1	3.0 IN	12 FT	T	EMPTY
8	1	4.0 IN	340 FT	T	EMPTY
9	1	4.0 IN	126 FT**	B	EMPTY

* RIGID GALVANIZED STEEL CONDUIT — B = BORE, T = TRENCH, O = OPEN CUT

** CONDUIT CONTINUED ON ADJACENT SHEET

NOTES:

1. POWER FOR PROPOSED DETECTORS SHALL BE SUPPLIED BY EXISTING WOOD UTILITY POLE DP&L #46694/42729 AERIALLY CONNECTED TO EXISTING WOOD UTILITY POLE DP&L #46689/42728.
2. DETECTOR UNIT FACING NB SR 141 TO BE MOUNTED A MINIMUM MOUNTING HEIGHT OF 18' AND A MAXIMUM MOUNTING HEIGHT OF 35' WITH A MANUFACTURER RECOMMENDED MOUNTING HEIGHT OF 27'. DETECTOR UNIT FACING CENTERVILLE RD ON-RAMP TO NB SR 141 TO BE MOUNTED A MINIMUM MOUNTING HEIGHT OF 17' AND A MAXIMUM MOUNTING HEIGHT OF 33' WITH A RECOMMENDED MOUNTING HEIGHT OF 26'. FIELD ADJUST MOUNTING HEIGHT AS REQUIRED TO ACHIEVE MAXIMUM DATA OUTPUT. DETECTOR WILL COMMUNICATE WITH THE TMC VIA A FIBER OPTIC INTERCONNECTION.
3. DIMENSIONS SHOWN ARE TO THE CENTER OF DETECTOR POLE BASE.
4. THE RIGHT-OF-WAY INFORMATON DEPICTED ON THIS PLAN IS BASED ON THE NEW CASTLE COUNTY TAX PARCEL MAP.
5. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.
6. ALL CONDUIT SHALL BE SCHEDULE 80 PVC WHEN INSTALLED BY TRENCHING OR OPEN CUT AND HDPE SDR-13.5 WHEN INSTALLED BY BORING, UNLESS OTHERWISE NOTED.
7. THE CONTRACTOR SHALL CONTACT DENISE KSIAZEK (DELDOT) AT 302-981-6464 48 HOURS PRIOR TO THE INSTALLATION OF THE PROPOSED EMPTY CONDUITS TO COORDINATE THE FIBER OPTIC CONNECTION.



MATCH LINE – SEE SHEET 2

NEW

PREPARED BY

Whitman, Requardt and Associates, LLP
Engineers • Architects • Environmental Planners Est. 1915

3/18/19
DATE

THIS SEAL APPLIES TO ALL SHEETS BEARING THE "WRA" SECTION DESIGNATION.

MATTHEW A. BUCKLEY — No. 16224 — PROFESSIONAL ENGINEER

SEAL

APPROVED FOR INSTALLATION

CHIEF TRAFFIC ENGINEER — 3/19/19 DATE

ADDENDA / REVISIONS	

SCALE 0 30 60 90 FEET

ADVANCED TRAFFIC MITIGATION FOR I-95 VIADUCT AND BRANDYWINE RIVER BRIDGE

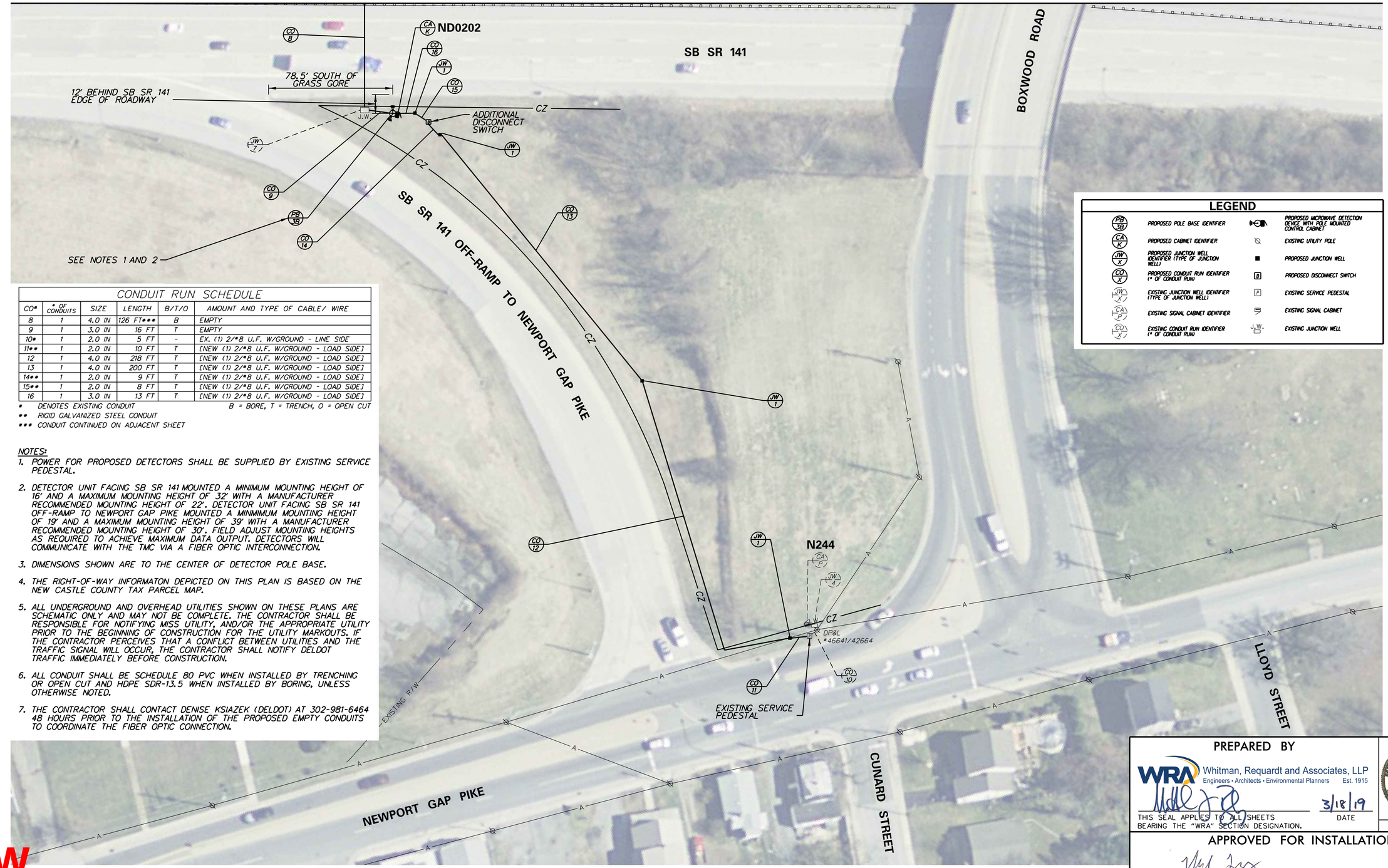
CONTRACT	PERMIT NO.	ND0201
T201704105	DESIGNED BY: K.M.K. (WRA)	
COUNTY	CHECKED BY: M.J.B. (WRA)	
NEW CASTLE		

WAVETRONIX PLAN NB SR 141 @ CENTERVILLE ROAD ON-RAMP

SECTION
WRA
SHEET NO.
1

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MATCH LINE – SEE SHEET 1



CONDUIT RUN SCHEDULE

CO*	* OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
8	1	4.0 IN	126 FT***	B	EMPTY
9	1	3.0 IN	16 FT	T	EMPTY
10*	1	2.0 IN	5 FT	-	EX. (1) 2/#8 U.F. W/GROUND - LINE SIDE
11**	1	2.0 IN	10 FT	T	(NEW (1) 2/#8 U.F. W/GROUND - LOAD SIDE)
12	1	4.0 IN	218 FT	T	(NEW (1) 2/#8 U.F. W/GROUND - LOAD SIDE)
13	1	4.0 IN	200 FT	T	(NEW (1) 2/#8 U.F. W/GROUND - LOAD SIDE)
14**	1	2.0 IN	9 FT	T	(NEW (1) 2/#8 U.F. W/GROUND - LOAD SIDE)
15**	1	2.0 IN	8 FT	T	(NEW (1) 2/#8 U.F. W/GROUND - LOAD SIDE)
16	1	3.0 IN	13 FT	T	(NEW (1) 2/#8 U.F. W/GROUND - LOAD SIDE)

* DENOTES EXISTING CONDUIT
** RIGID GALVANIZED STEEL CONDUIT
*** CONDUIT CONTINUED ON ADJACENT SHEET
B = BORE, T = TRENCH, O = OPEN CUT

NOTES:

1. POWER FOR PROPOSED DETECTORS SHALL BE SUPPLIED BY EXISTING SERVICE PEDESTAL.
2. DETECTOR UNIT FACING SB SR 141 MOUNTED A MINIMUM MOUNTING HEIGHT OF 16' AND A MAXIMUM MOUNTING HEIGHT OF 32' WITH A MANUFACTURER RECOMMENDED MOUNTING HEIGHT OF 22'. DETECTOR UNIT FACING SB SR 141 OFF-RAMP TO NEWPORT GAP PIKE MOUNTED A MINIMUM MOUNTING HEIGHT OF 19' AND A MAXIMUM MOUNTING HEIGHT OF 39' WITH A MANUFACTURER RECOMMENDED MOUNTING HEIGHT OF 30'. FIELD ADJUST MOUNTING HEIGHTS AS REQUIRED TO ACHIEVE MAXIMUM DATA OUTPUT. DETECTORS WILL COMMUNICATE WITH THE TMC VIA A FIBER OPTIC INTERCONNECTION.
3. DIMENSIONS SHOWN ARE TO THE CENTER OF DETECTOR POLE BASE.
4. THE RIGHT-OF-WAY INFORMATON DEPICTED ON THIS PLAN IS BASED ON THE NEW CASTLE COUNTY TAX PARCEL MAP.
5. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.
6. ALL CONDUIT SHALL BE SCHEDULE 80 PVC WHEN INSTALLED BY TRENCHING OR OPEN CUT AND HDPE SDR-13.5 WHEN INSTALLED BY BORING, UNLESS OTHERWISE NOTED.
7. THE CONTRACTOR SHALL CONTACT DENISE KSIAZEK (DELDOT) AT 302-981-6464 48 HOURS PRIOR TO THE INSTALLATION OF THE PROPOSED EMPTY CONDUITS TO COORDINATE THE FIBER OPTIC CONNECTION.

LEGEND

PB/36	PROPOSED POLE BASE IDENTIFIER		PROPOSED MICROWAVE DETECTION DEVICE WITH POLE MOUNTED CONTROL CABINET
CA/K	PROPOSED CABINET IDENTIFIER		EXISTING UTILITY POLE
JW/X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)		PROPOSED JUNCTION WELL
CO/X	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	D	PROPOSED DISCONNECT SWITCH
JW/X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	P	EXISTING SERVICE PEDESTAL
CA/P	EXISTING SIGNAL CABINET IDENTIFIER		EXISTING SIGNAL CABINET
CO/X	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	J.W.	EXISTING JUNCTION WELL

NEW

PREPARED BY

WRA Whitman, Requardt and Associates, LLP
Engineers • Architects • Environmental Planners Est. 1915

THIS SEAL APPLIES TO ALL SHEETS BEARING THE "WRA" SECTION DESIGNATION.

3/18/19 DATE

MATTHEW J.A. BUCKLEY LICENSE No. 18224 PROFESSIONAL ENGINEER

SEAL

APPROVED FOR INSTALLATION

CHIEF TRAFFIC ENGINEER

3/19/19 DATE

ADDENDA / REVISIONS	

SCALE 0 30 60 90 FEET

ADVANCED TRAFFIC MITIGATION FOR I-95 VIADUCT AND BRANDYWINE RIVER BRIDGE

CONTRACT	PERMIT NO.	ND0202
T201704105	DESIGNED BY: K.M.K. (WRA)	
COUNTY	CHECKED BY: M.J.B. (WRA)	
NEW CASTLE		

WAVETRONIX PLAN SB SR 141 @ BOXWOOD ROAD OFF-RAMP

SECTION	
WRA	
SHEET NO.	
2	

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LEGEND

PB / JB	PROPOSED POLE BASE IDENTIFIER	J.W.	EXISTING JUNCTION WELL
CA / S	PROPOSED SOLAR CABINET IDENTIFIER		EXISTING LUMINAIRE
CO / X	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)		PROPOSED JUNCTION WELL
JW / X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)		PROPOSED MICROWAVE DETECTION DEVICE WITH POLE MOUNTED CONTROL CABINET

CONDUIT RUN SCHEDULE

CO*	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
1	1	3.0 IN	88 FT	T	EMPTY
2	1	3.0 IN	109 FT	T	EMPTY
3	1	4.0 IN	308 FT	T	EMPTY
4	1	4.0 IN	316 FT*	T	EMPTY

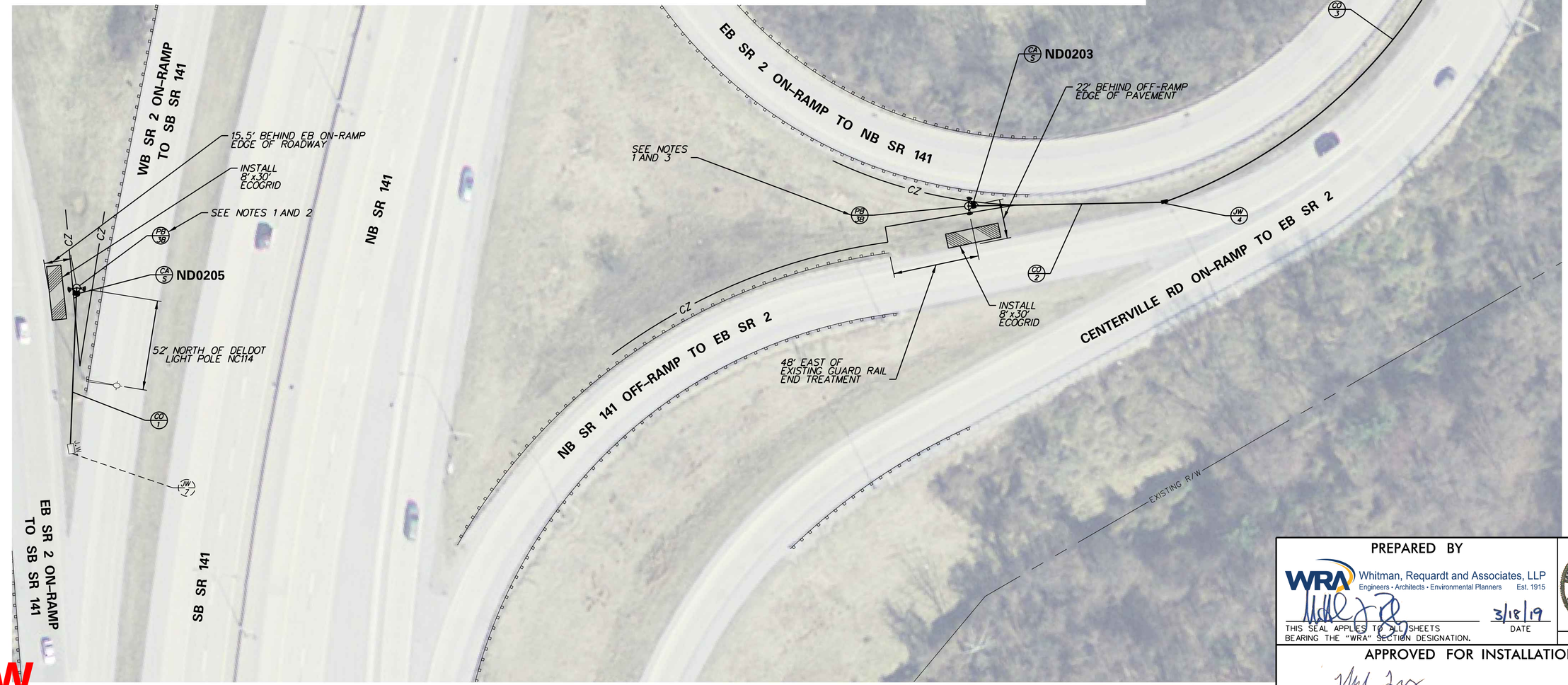
* CONDUIT CONTINUED ON ADJACENT SHEET

B = BORE, T = TRENCH, O = OPEN CUT

NOTES:

1. POWER FOR PROPOSED DETECTORS SHALL BE SUPPLIED VIA SOLAR POWER WITH A BATTERY BACKUP. CONTRACTOR SHALL INSTALL SOLAR PANEL NEAR TOP OF PROPOSED DETECTOR POLES.
2. DETECTOR UNIT FACING WB SR 2 ON-RAMP TO SB SR 141 TO BE MOUNTED A MINIMUM MOUNTING HEIGHT OF 22' AND A MAXIMUM MOUNTING HEIGHT OF 38' WITH A MANUFACTURER RECOMMENDED MOUNTING HEIGHT OF 31'. DETECTOR UNIT FACING EB SR 2 ON-RAMP TO SB SR 141 TO BE MOUNTED A MINIMUM MOUNTING HEIGHT OF 15' AND A MAXIMUM MOUNTING HEIGHT OF 31' WITH A MANUFACTURER RECOMMENDED MOUNTING HEIGHT OF 19'. FIELD ADJUST MOUNTING HEIGHTS AS REQUIRED TO ACHIEVE MAXIMUM DATA OUTPUT. DETECTOR WILL COMMUNICATE WITH THE TMC VIA A FIBER OPTIC INTERCONNECTION.
3. DETECTOR UNIT FACING EB SR 2 ON-RAMP TO NB SR 141 TO BE MOUNTED A MINIMUM MOUNTING HEIGHT OF 14' AND A MAXIMUM MOUNTING HEIGHT OF 27' WITH A MANUFACTURER RECOMMENDED MOUNTING HEIGHT OF 17'. DETECTOR UNIT FACING NB SR 141 OFF-RAMP TO EB SR 2 TO BE MOUNTED A MINIMUM MOUNTING HEIGHT OF 21' AND A MAXIMUM MOUNTING HEIGHT OF 37' WITH A MANUFACTURER RECOMMENDED MOUNTING HEIGHT OF 29'. FIELD ADJUST MOUNTING HEIGHTS AS REQUIRED TO ACHIEVE MAXIMUM DATA OUTPUT. DETECTOR WILL COMMUNICATE WITH THE TMC VIA A FIBER OPTIC INTERCONNECTION.
4. DIMENSIONS SHOWN ARE TO THE CENTER OF DETECTOR POLE BASES.
5. THE RIGHT-OF-WAY INFORMATION DEPICTED ON THIS PLAN IS BASED ON THE NEW CASTLE COUNTY TAX PARCEL MAP.
6. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.
7. ALL CONDUIT SHALL BE SCHEDULE 80 PVC WHEN INSTALLED BY TRENCHING OR OPEN CUT AND HDPE SDR-13.5 WHEN INSTALLED BY BORING, UNLESS OTHERWISE NOTED.
8. THE CONTRACTOR SHALL CONTACT DENISE KSIAZEK (DELDOT) AT 302-981-6464 48 HOURS PRIOR TO THE INSTALLATION OF THE PROPOSED EMPTY CONDUITS TO COORDINATE THE FIBER OPTIC CONNECTION.

MATCH LINE – SEE SHEET 4



NEW

PREPARED BY

WRA Whitman, Requardt and Associates, LLP
Engineers • Architects • Environmental Planners Est. 1915

THIS SEAL APPLIES TO ALL SHEETS BEARING THE "WRA" SECTION DESIGNATION.

3/18/19 DATE

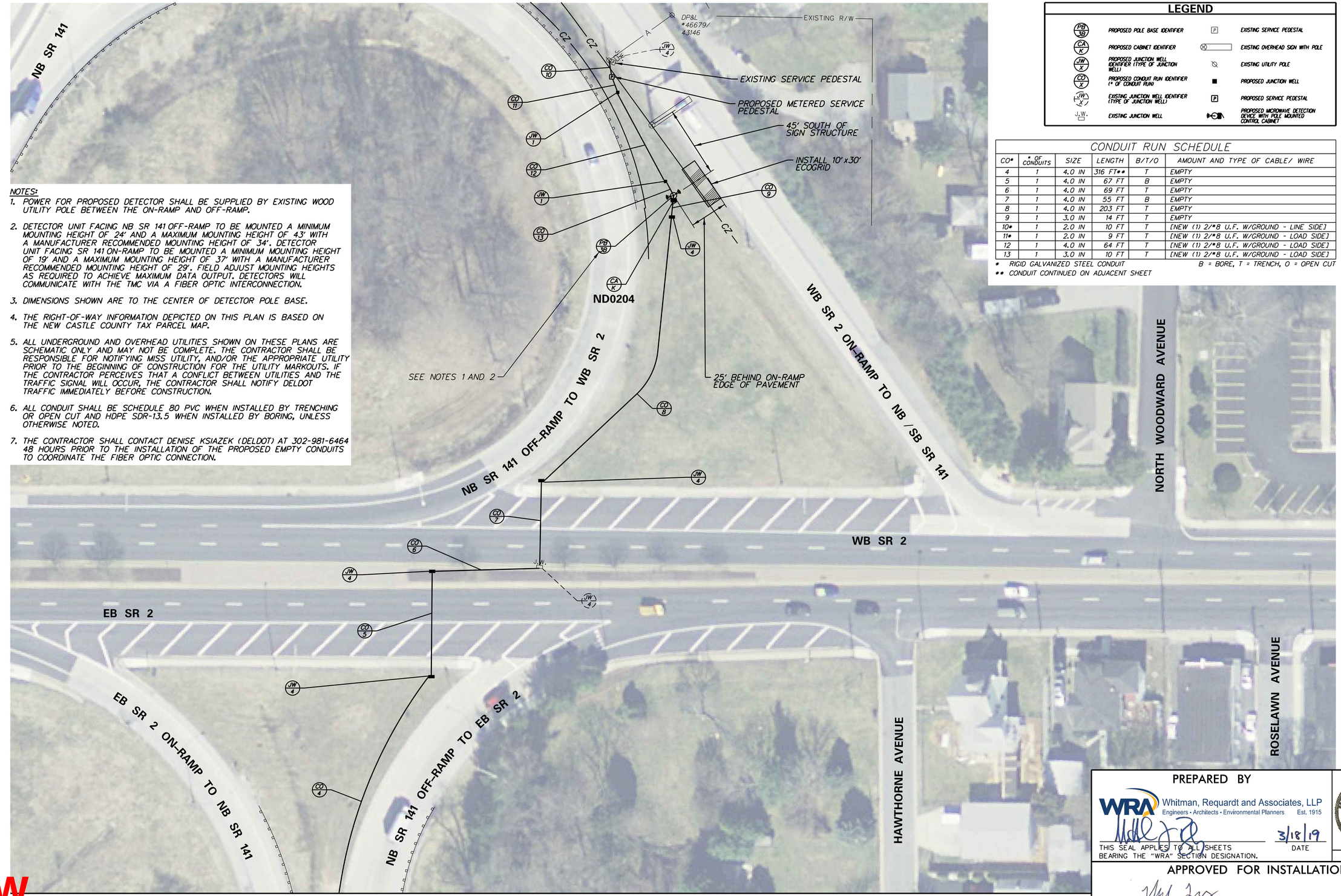
MATTHEW J.J. BUCKLEY LICENSED No. 16234 PROFESSIONAL ENGINEER — SEAL

APPROVED FOR INSTALLATION

CHIEF TRAFFIC ENGINEER 3/19/19 DATE

ADDENDA / REVISIONS		SCALE	ADVANCED TRAFFIC MITIGATION FOR I-95 VIADUCT AND BRANDYWINE RIVER BRIDGE	CONTRACT	PERMIT NO. ND0203, ND0205	WAVETRONIX PLAN SR 141 @ SR 2 INTERCHANGE	SECTION
		0 30 60 90 FEET		T201704105	DESIGNED BY: K.M.K. (WRA)		WRA
				COUNTY NEW CASTLE	CHECKED BY: M.J.B. (WRA)		SHEET NO. 3

N:\31987-004\Cont\pdt_I-95\CADD\TMS off alignment work ahead of viaduct\SG03_141Wave.dgn
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NOTES:

1. POWER FOR PROPOSED DETECTOR SHALL BE SUPPLIED BY EXISTING WOOD UTILITY POLE BETWEEN THE ON-RAMP AND OFF-RAMP.
2. DETECTOR UNIT FACING NB SR 141 OFF-RAMP TO BE MOUNTED A MINIMUM MOUNTING HEIGHT OF 24' AND A MAXIMUM MOUNTING HEIGHT OF 43' WITH A MANUFACTURER RECOMMENDED MOUNTING HEIGHT OF 34'. DETECTOR UNIT FACING SR 141 ON-RAMP TO BE MOUNTED A MINIMUM MOUNTING HEIGHT OF 19' AND A MAXIMUM MOUNTING HEIGHT OF 37' WITH A MANUFACTURER RECOMMENDED MOUNTING HEIGHT OF 29'. FIELD ADJUST MOUNTING HEIGHTS AS REQUIRED TO ACHIEVE MAXIMUM DATA OUTPUT. DETECTORS WILL COMMUNICATE WITH THE TMC VIA A FIBER OPTIC INTERCONNECTION.
3. DIMENSIONS SHOWN ARE TO THE CENTER OF DETECTOR POLE BASE.
4. THE RIGHT-OF-WAY INFORMATION DEPICTED ON THIS PLAN IS BASED ON THE NEW CASTLE COUNTY TAX PARCEL MAP.
5. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.
6. ALL CONDUIT SHALL BE SCHEDULE 80 PVC WHEN INSTALLED BY TRENCHING OR OPEN CUT AND HDPE SDR-13.5 WHEN INSTALLED BY BORING, UNLESS OTHERWISE NOTED.
7. THE CONTRACTOR SHALL CONTACT DENISE KSIAZEK (DELDOT) AT 302-981-6464 48 HOURS PRIOR TO THE INSTALLATION OF THE PROPOSED EMPTY CONDUITS TO COORDINATE THE FIBER OPTIC CONNECTION.

LEGEND

PB JB	PROPOSED POLE BASE IDENTIFIER	P	EXISTING SERVICE PEDESTAL
CA K	PROPOSED CABINET IDENTIFIER	⊗	EXISTING OVERHEAD SIGN WITH POLE
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	⊘	EXISTING UTILITY POLE
CO X	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUNS)	■	PROPOSED JUNCTION WELL
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	P	PROPOSED SERVICE PEDESTAL
J.W.	EXISTING JUNCTION WELL		PROPOSED MICROWAVE DETECTION DEVICE WITH POLE MOUNTED CONTROL CABINET

N

CONDUIT RUN SCHEDULE

CO#	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
4	1	4.0 IN	316 FT**	T	EMPTY
5	1	4.0 IN	67 FT	B	EMPTY
6	1	4.0 IN	69 FT	T	EMPTY
7	1	4.0 IN	55 FT	B	EMPTY
8	1	4.0 IN	203 FT	T	EMPTY
9	1	3.0 IN	14 FT	T	EMPTY
10*	1	2.0 IN	10 FT	T	(NEW (1) 2/*8 U.F. W/GROUND - LINE SIDE)
11*	1	2.0 IN	9 FT	T	(NEW (1) 2/*8 U.F. W/GROUND - LOAD SIDE)
12	1	4.0 IN	64 FT	T	(NEW (1) 2/*8 U.F. W/GROUND - LOAD SIDE)
13	1	3.0 IN	10 FT	T	(NEW (1) 2/*8 U.F. W/GROUND - LOAD SIDE)

* RIGID GALVANIZED STEEL CONDUIT
** CONDUIT CONTINUED ON ADJACENT SHEET
B = BORE, T = TRENCH, O = OPEN CUT

NEW

MATCH LINE – SEE SHEET 3

PREPARED BY

Whitman, Requardt and Associates, LLP
Engineers • Architects • Environmental Planners Est. 1915

THIS SEAL APPLIES TO ALL SHEETS BEARING THE "WRA" SECTION DESIGNATION.

3/18/19 DATE

MATTHEW J.A. BURKLEY — No. 18224 — PROFESSIONAL ENGINEER — SEAL

APPROVED FOR INSTALLATION

CHIEF TRAFFIC ENGINEER

3/19/19 DATE

ADDENDA / REVISIONS	

SCALE 0 30 60 90 FEET

ADVANCED TRAFFIC MITIGATION FOR I-95 VIADUCT AND BRANDYWINE RIVER BRIDGE

CONTRACT	PERMIT NO.	ND0204
T201704105	DESIGNED BY: K.M.K. (WRA)	
COUNTY	CHECKED BY: M.J.B. (WRA)	
NEW CASTLE		

WAVETRONIX PLAN WB SR 2 @ SR 141 INTERCHANGE

SECTION	
WRA	
SHEET NO.	
4	

N:\31987-00A\Contract_I-95\CADD\TMS of I of alignment work ahead of viaduct\SG04_141Wave.dgn
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NOTES:

1. POWER FOR PROPOSED DETECTORS SHALL BE SUPPLIED VIA SOLAR POWER WITH A BATTERY BACKUP. CONTRACTOR SHALL INSTALL SOLAR PANEL NEAR TOP OF PROPOSED DETECTOR POLES.
2. DETECTOR UNIT FACING SB SR 52 ON-RAMP TO SB SR 141 TO BE MOUNTED A MINIMUM MOUNTING HEIGHT OF 21' AND A MAXIMUM MOUNTING HEIGHT OF 35' WITH A MANUFACTURER RECOMMENDED MOUNTING HEIGHT OF 23'. DETECTOR UNIT FACING SB SR 141 TO BE MOUNTED A MINIMUM MOUNTING HEIGHT OF 10' AND A MAXIMUM MOUNTING HEIGHT OF 24' WITH A MANUFACTURER RECOMMENDED MOUNTING HEIGHT OF 13'. FIELD ADJUST MOUNTING HEIGHTS AS REQUIRED TO ACHIEVE MAXIMUM DATA OUTPUT. DETECTORS WILL COMMUNICATE WITH THE TMC VIA A FIBER OPTIC INTERCONNECTION.
3. DETECTOR UNIT FACING NB SR 141 OFF-RAMP TO SB SR 52 TO BE MOUNTED A MINIMUM MOUNTING HEIGHT OF 30' AND A MAXIMUM MOUNTING HEIGHT OF 50' WITH A MANUFACTURER RECOMMENDED MOUNTING HEIGHT OF 41'. DETECTOR UNIT FACING NB SR 141 TO BE MOUNTED A MINIMUM MOUNTING HEIGHT OF 17' AND A MAXIMUM MOUNTING HEIGHT OF 33' WITH A MANUFACTURER RECOMMENDED MOUNTING HEIGHT OF 26'. FIELD ADJUST MOUNTING HEIGHTS AS REQUIRED TO ACHIEVE MAXIMUM DATA OUTPUT. DETECTORS WILL COMMUNICATE WITH THE TMC VIA A FIBER OPTIC INTERCONNECTION.
4. DIMENSIONS SHOWN ARE TO THE CENTER OF DETECTOR POLE BASES.
5. THE RIGHT-OF-WAY INFORMATION DEPICTED ON THIS PLAN IS BASED ON THE NEW CASTLE COUNTY TAX PARCEL MAP.
6. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.
7. ALL CONDUIT SHALL BE SCHEDULE 80 PVC WHEN INSTALLED BY TRENCHING OR OPEN CUT AND HDPE SDR-13.5 WHEN INSTALLED BY BORING, UNLESS OTHERWISE NOTED.
8. THE CONTRACTOR SHALL CONTACT DENISE KSIAZEK (DELDOT) AT 302-981-6464 48 HOURS PRIOR TO THE INSTALLATION OF THE PROPOSED EMPTY CONDUITS TO COORDINATE THE FIBER OPTIC CONNECTION.

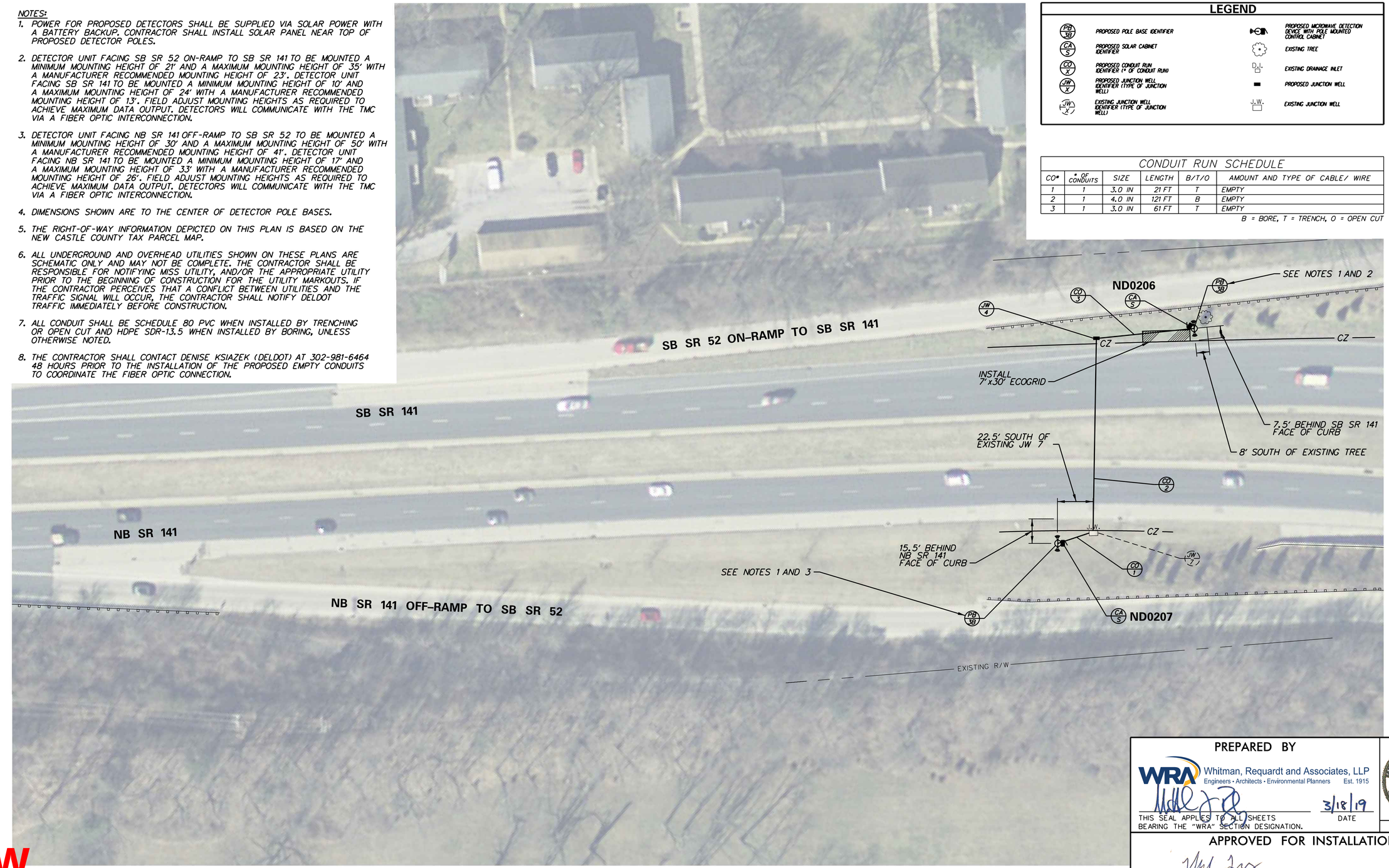
LEGEND

PB / JB	PROPOSED POLE BASE IDENTIFIER		PROPOSED MICROWAVE DETECTION DEVICE WITH POLE MOUNTED CONTROL CABINET
CA / S	PROPOSED SOLAR CABINET IDENTIFIER		EXISTING TREE
CO / X	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUNS)	D.I.	EXISTING DRAINAGE INLET
JW / X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)		PROPOSED JUNCTION WELL
JW / X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	J.W.	EXISTING JUNCTION WELL

CONDUIT RUN SCHEDULE

CO#	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
1	1	3.0 IN	21 FT	T	EMPTY
2	1	4.0 IN	121 FT	B	EMPTY
3	1	3.0 IN	61 FT	T	EMPTY

B = BORE, T = TRENCH, O = OPEN CUT



NEW

PREPARED BY

Whitman, Requardt and Associates, LLP
Engineers • Architects • Environmental Planners Est. 1915

3/18/19
DATE

THIS SEAL APPLIES TO ALL SHEETS BEARING THE "WRA" SECTION DESIGNATION.

MATTHEW J.A. BUCKLEY — DELAWARE — No. 18224 — PROFESSIONAL ENGINEER

SEAL

APPROVED FOR INSTALLATION

CHIEF TRAFFIC ENGINEER

3/19/19
DATE

ADDENDA / REVISIONS	

SCALE
0 30 60 90
FEET

ADVANCED TRAFFIC MITIGATION FOR I-95 VIADUCT AND BRANDYWINE RIVER BRIDGE

CONTRACT	T201704105
COUNTY	NEW CASTLE
PERMIT NO.	ND0206, ND0207
DESIGNED BY: K.M.K. (WRA)	
CHECKED BY: M.J.B. (WRA)	

WAVETRONIX PLAN SR 141 @ SB SR 52 RAMPS

SECTION	WRA
SHEET NO.	5

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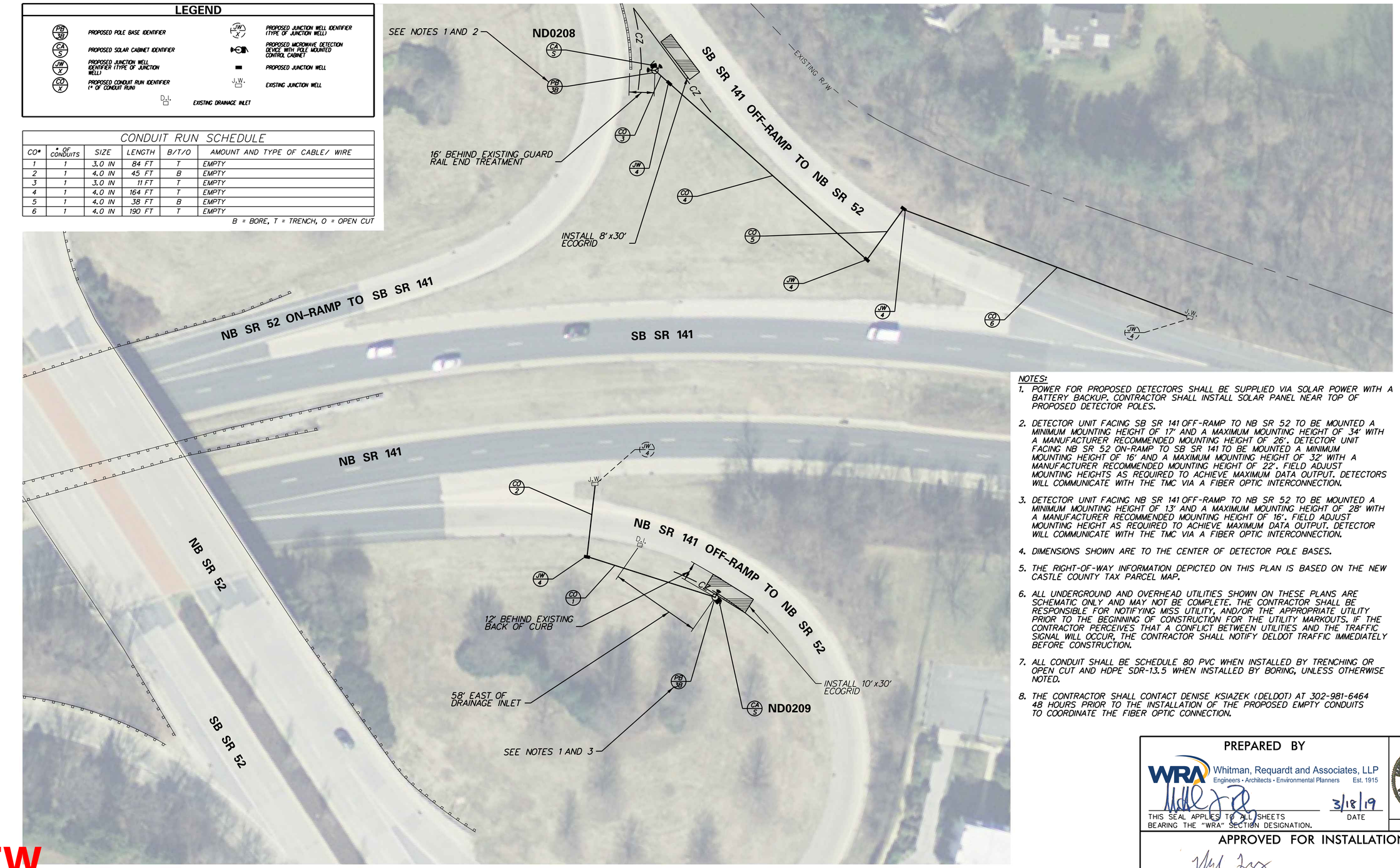
LEGEND

PB / XB	PROPOSED POLE BASE IDENTIFIER	JW / X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
CA / S	PROPOSED SOLAR CABINET IDENTIFIER		PROPOSED MICROWAVE DETECTION DEVICE WITH POLE MOUNTED CONTROL CABINET
JW / X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)		PROPOSED JUNCTION WELL
CO / X	PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)	J.W.	EXISTING JUNCTION WELL
		D.I.	EXISTING DRAINAGE INLET

CONDUIT RUN SCHEDULE

CO#	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
1	1	3.0 IN	84 FT	T	EMPTY
2	1	4.0 IN	45 FT	B	EMPTY
3	1	3.0 IN	11 FT	T	EMPTY
4	1	4.0 IN	164 FT	T	EMPTY
5	1	4.0 IN	38 FT	B	EMPTY
6	1	4.0 IN	190 FT	T	EMPTY

B = BORE, T = TRENCH, O = OPEN CUT



NEW

NOTES:

1. POWER FOR PROPOSED DETECTORS SHALL BE SUPPLIED VIA SOLAR POWER WITH A BATTERY BACKUP. CONTRACTOR SHALL INSTALL SOLAR PANEL NEAR TOP OF PROPOSED DETECTOR POLES.
2. DETECTOR UNIT FACING SB SR 141 OFF-RAMP TO NB SR 52 TO BE MOUNTED A MINIMUM MOUNTING HEIGHT OF 17' AND A MAXIMUM MOUNTING HEIGHT OF 34' WITH A MANUFACTURER RECOMMENDED MOUNTING HEIGHT OF 26'. DETECTOR UNIT FACING NB SR 52 ON-RAMP TO SB SR 141 TO BE MOUNTED A MINIMUM MOUNTING HEIGHT OF 16' AND A MAXIMUM MOUNTING HEIGHT OF 32' WITH A MANUFACTURER RECOMMENDED MOUNTING HEIGHT OF 22'. FIELD ADJUST MOUNTING HEIGHTS AS REQUIRED TO ACHIEVE MAXIMUM DATA OUTPUT. DETECTORS WILL COMMUNICATE WITH THE TMC VIA A FIBER OPTIC INTERCONNECTION.
3. DETECTOR UNIT FACING NB SR 141 OFF-RAMP TO NB SR 52 TO BE MOUNTED A MINIMUM MOUNTING HEIGHT OF 13' AND A MAXIMUM MOUNTING HEIGHT OF 28' WITH A MANUFACTURER RECOMMENDED MOUNTING HEIGHT OF 16'. FIELD ADJUST MOUNTING HEIGHT AS REQUIRED TO ACHIEVE MAXIMUM DATA OUTPUT. DETECTOR WILL COMMUNICATE WITH THE TMC VIA A FIBER OPTIC INTERCONNECTION.
4. DIMENSIONS SHOWN ARE TO THE CENTER OF DETECTOR POLE BASES.
5. THE RIGHT-OF-WAY INFORMATION DEPICTED ON THIS PLAN IS BASED ON THE NEW CASTLE COUNTY TAX PARCEL MAP.
6. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.
7. ALL CONDUIT SHALL BE SCHEDULE 80 PVC WHEN INSTALLED BY TRENCHING OR OPEN CUT AND HDPE SDR-13.5 WHEN INSTALLED BY BORING, UNLESS OTHERWISE NOTED.
8. THE CONTRACTOR SHALL CONTACT DENISE KSIAZEK (DELDOT) AT 302-981-6464 48 HOURS PRIOR TO THE INSTALLATION OF THE PROPOSED EMPTY CONDUITS TO COORDINATE THE FIBER OPTIC CONNECTION.

PREPARED BY

WRA Whitman, Requardt and Associates, LLP
Engineers • Architects • Environmental Planners Est. 1915

3/18/19
DATE

THIS SEAL APPLIES TO ALL SHEETS BEARING THE "WRA" SECTION DESIGNATION.

MATTHEW J.A. BURKLEY LICENSE No. 18224 PROFESSIONAL ENGINEER

SEAL

APPROVED FOR INSTALLATION

CHIEF TRAFFIC ENGINEER

3/19/19
DATE

ADDENDA / REVISIONS	

SCALE
0 30 60 90
FEET

ADVANCED TRAFFIC MITIGATION FOR I-95 VIADUCT AND BRANDYWINE RIVER BRIDGE

CONTRACT	PERMIT NO.	ND0208, ND0209
T201704105	DESIGNED BY: K.M.K. (WRA)	
COUNTY	CHECKED BY: M.J.B. (WRA)	
NEW CASTLE		

WAVETRONIX PLAN SR 141 @ NB SR 52 RAMPS

SECTION	
WRA	
SHEET NO.	
6	

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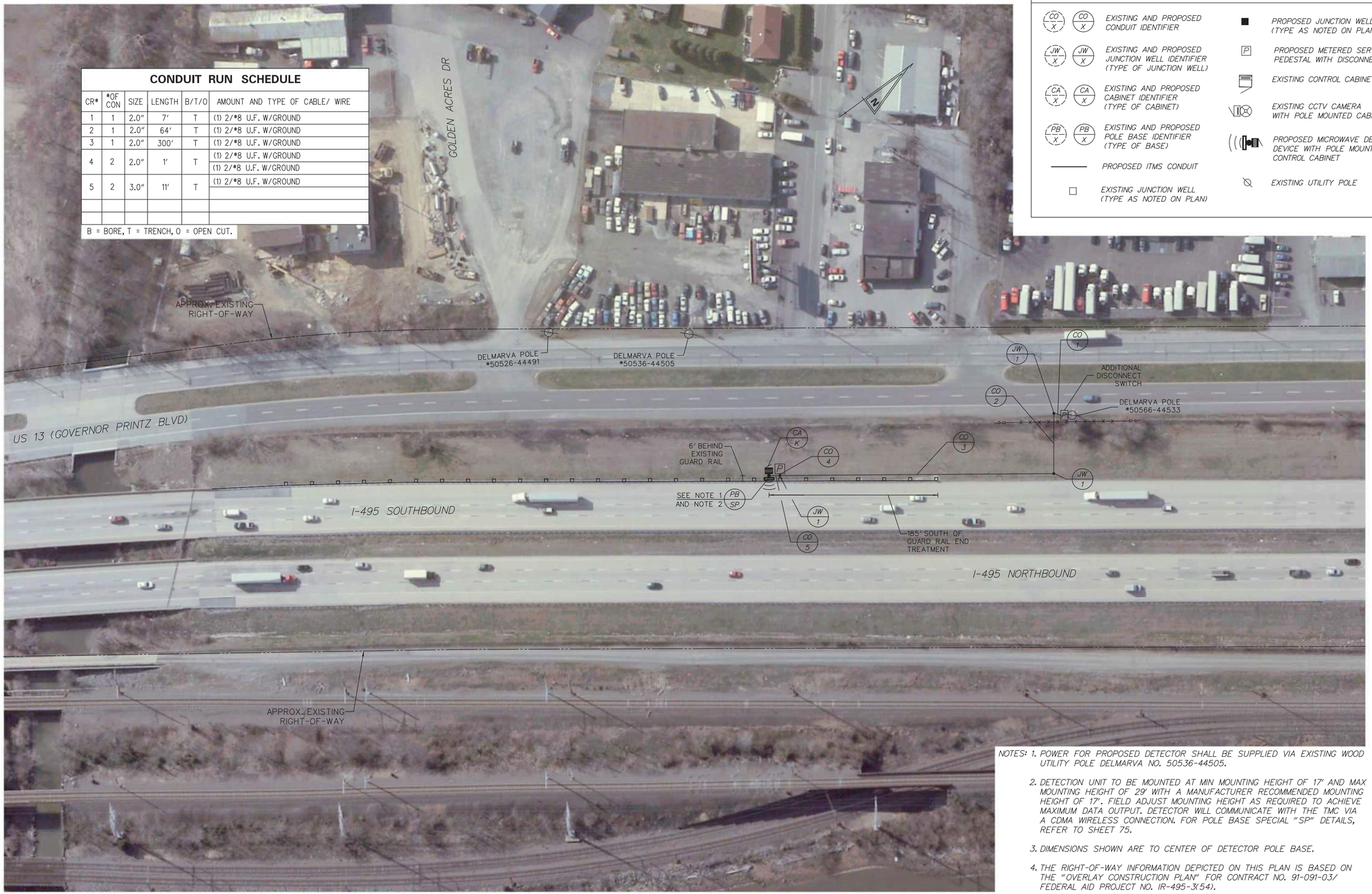
CONDUIT RUN SCHEDULE

CR#	#OF CON	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
1	1	2.0"	7'	T	(1) 2/#8 U.F. W/GROUND
2	1	2.0"	64'	T	(1) 2/#8 U.F. W/GROUND
3	1	2.0"	300'	T	(1) 2/#8 U.F. W/GROUND
4	2	2.0"	1'	T	(1) 2/#8 U.F. W/GROUND
					(1) 2/#8 U.F. W/GROUND
5	2	3.0"	11'	T	(1) 2/#8 U.F. W/GROUND

B = BORE, T = TRENCH, O = OPEN CUT.

LEGEND

- EXISTING AND PROPOSED CONDUIT IDENTIFIER (CO X / CO X)
- EXISTING AND PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL) (JW X / JW X)
- EXISTING AND PROPOSED CABINET IDENTIFIER (TYPE OF CABINET) (CA X / CA X)
- EXISTING AND PROPOSED POLE BASE IDENTIFIER (TYPE OF BASE) (PB X / PB X)
- PROPOSED ITMS CONDUIT
- EXISTING JUNCTION WELL (TYPE AS NOTED ON PLAN)
- PROPOSED JUNCTION WELL (TYPE AS NOTED ON PLAN)
- PROPOSED METERED SERVICE PEDESTAL WITH DISCONNECT SWITCH (P)
- EXISTING CONTROL CABINET
- EXISTING CCTV CAMERA WITH POLE MOUNTED CABINET
- PROPOSED MICROWAVE DETECTION DEVICE WITH POLE MOUNTED CONTROL CABINET
- EXISTING UTILITY POLE



NOTES:

1. POWER FOR PROPOSED DETECTOR SHALL BE SUPPLIED VIA EXISTING WOOD UTILITY POLE DELMARVA NO. 50536-44505.
2. DETECTION UNIT TO BE MOUNTED AT MIN MOUNTING HEIGHT OF 17' AND MAX MOUNTING HEIGHT OF 29' WITH A MANUFACTURER RECOMMENDED MOUNTING HEIGHT OF 17'. FIELD ADJUST MOUNTING HEIGHT AS REQUIRED TO ACHIEVE MAXIMUM DATA OUTPUT. DETECTOR WILL COMMUNICATE WITH THE TMC VIA A CDMA WIRELESS CONNECTION. FOR POLE BASE SPECIAL "SP" DETAILS, REFER TO SHEET 75.
3. DIMENSIONS SHOWN ARE TO CENTER OF DETECTOR POLE BASE.
4. THE RIGHT-OF-WAY INFORMATION DEPICTED ON THIS PLAN IS BASED ON THE "OVERLAY CONSTRUCTION PLAN" FOR CONTRACT NO. 91-091-03/ FEDERAL AID PROJECT NO. IR-495-3(54).

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

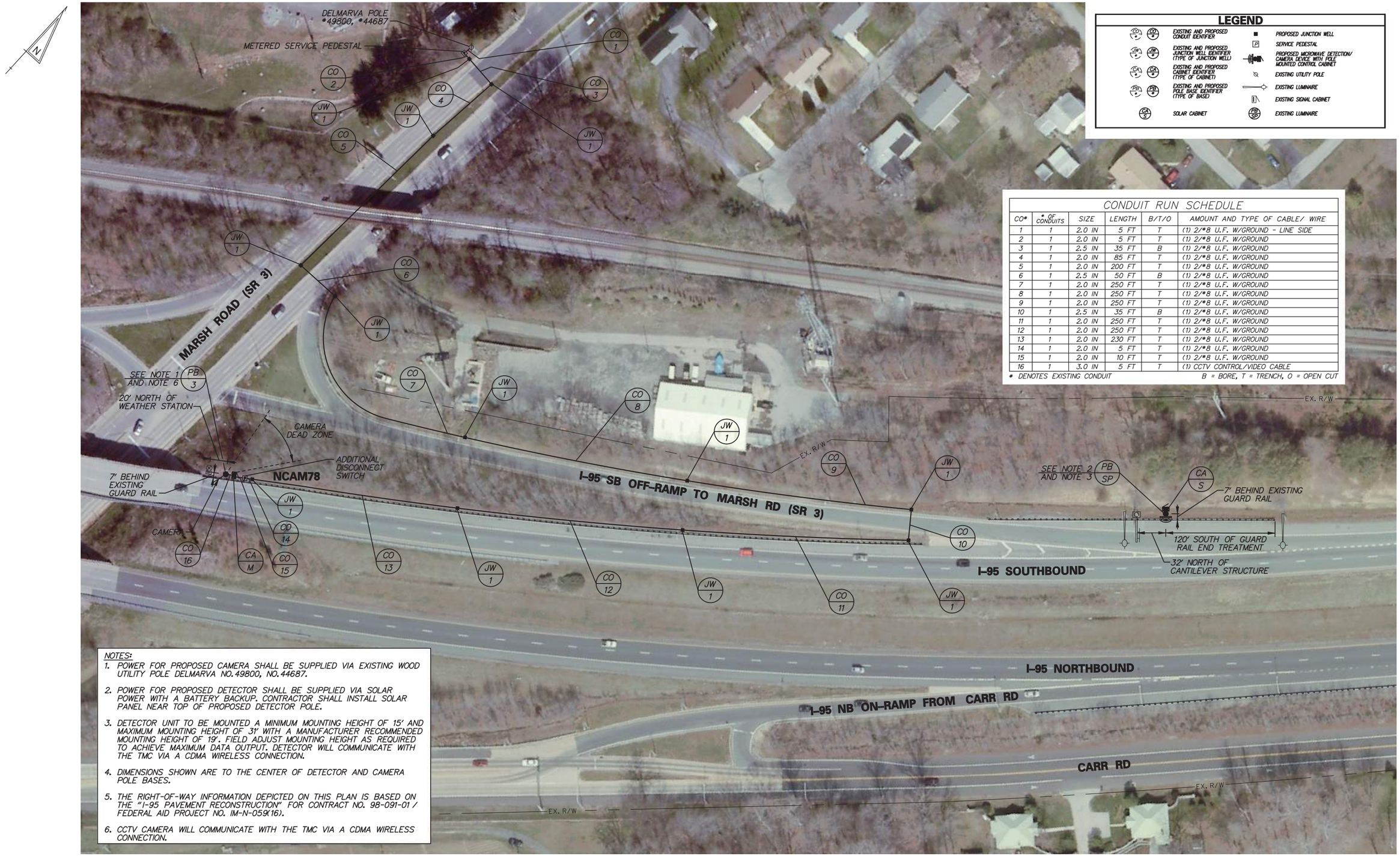
SCALE 0 50 100 150 FEET

FREEWAY DETECTION INSTALLATION PROJECT

CONTRACT	DETECTOR NO.	ND0138	SHEET NO.
T201204701	DESIGNED BY: SM		17
COUNTY			TOTAL SHTS.
NEW CASTLE	CHECKED BY: JCR		75

SITE #16

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LEGEND

- EXISTING AND PROPOSED CONDUIT IDENTIFIER
- EXISTING AND PROPOSED JUNCTION WELL IDENTIFIER, (TYPE OF JUNCTION WELL)
- EXISTING AND PROPOSED CABINET IDENTIFIER, (TYPE OF CABINET)
- EXISTING AND PROPOSED POLE BASE IDENTIFIER (TYPE OF BASE)
- SOLAR CABINET
- PROPOSED JUNCTION WELL
- SERVICE PEDESTAL
- PROPOSED MICROWAVE DETECTION/ CAMERA DEVICE WITH POLE MOUNTED CONTROL CABINET
- EXISTING UTILITY POLE
- EXISTING LUMINAIRE
- EXISTING SIGNAL CABINET
- EXISTING LUMINAIRE

CONDUIT RUN SCHEDULE

CO*	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
1	1	2.0 IN	5 FT	T	(1) 2/#8 U.F. W/GROUND - LINE SIDE
2	1	2.0 IN	5 FT	T	(1) 2/#8 U.F. W/GROUND
3	1	2.5 IN	35 FT	B	(1) 2/#8 U.F. W/GROUND
4	1	2.0 IN	85 FT	T	(1) 2/#8 U.F. W/GROUND
5	1	2.0 IN	200 FT	T	(1) 2/#8 U.F. W/GROUND
6	1	2.5 IN	50 FT	B	(1) 2/#8 U.F. W/GROUND
7	1	2.0 IN	250 FT	T	(1) 2/#8 U.F. W/GROUND
8	1	2.0 IN	250 FT	T	(1) 2/#8 U.F. W/GROUND
9	1	2.0 IN	250 FT	T	(1) 2/#8 U.F. W/GROUND
10	1	2.5 IN	35 FT	B	(1) 2/#8 U.F. W/GROUND
11	1	2.0 IN	250 FT	T	(1) 2/#8 U.F. W/GROUND
12	1	2.0 IN	250 FT	T	(1) 2/#8 U.F. W/GROUND
13	1	2.0 IN	230 FT	T	(1) 2/#8 U.F. W/GROUND
14	1	2.0 IN	5 FT	T	(1) 2/#8 U.F. W/GROUND
15	1	2.0 IN	10 FT	T	(1) 2/#8 U.F. W/GROUND
16	1	3.0 IN	5 FT	T	(1) CCTV CONTROL/VIDEO CABLE

* DENOTES EXISTING CONDUIT

B = BORE, T = TRENCH, O = OPEN CUT

NOTES:

1. POWER FOR PROPOSED CAMERA SHALL BE SUPPLIED VIA EXISTING WOOD UTILITY POLE DELMARVA NO. 49800, NO. 44687.
2. POWER FOR PROPOSED DETECTOR SHALL BE SUPPLIED VIA SOLAR POWER WITH A BATTERY BACKUP. CONTRACTOR SHALL INSTALL SOLAR PANEL NEAR TOP OF PROPOSED DETECTOR POLE.
3. DETECTOR UNIT TO BE MOUNTED A MINIMUM MOUNTING HEIGHT OF 15' AND MAXIMUM MOUNTING HEIGHT OF 31' WITH A MANUFACTURER RECOMMENDED MOUNTING HEIGHT OF 19'. FIELD ADJUST MOUNTING HEIGHT AS REQUIRED TO ACHIEVE MAXIMUM DATA OUTPUT. DETECTOR WILL COMMUNICATE WITH THE TMC VIA A CDMA WIRELESS CONNECTION.
4. DIMENSIONS SHOWN ARE TO THE CENTER OF DETECTOR AND CAMERA POLE BASES.
5. THE RIGHT-OF-WAY INFORMATION DEPICTED ON THIS PLAN IS BASED ON THE "I-95 PAVEMENT RECONSTRUCTION" FOR CONTRACT NO. 98-091-01 / FEDERAL AID PROJECT NO. IM-N-059(16).
6. CCTV CAMERA WILL COMMUNICATE WITH THE TMC VIA A CDMA WIRELESS CONNECTION.

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DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

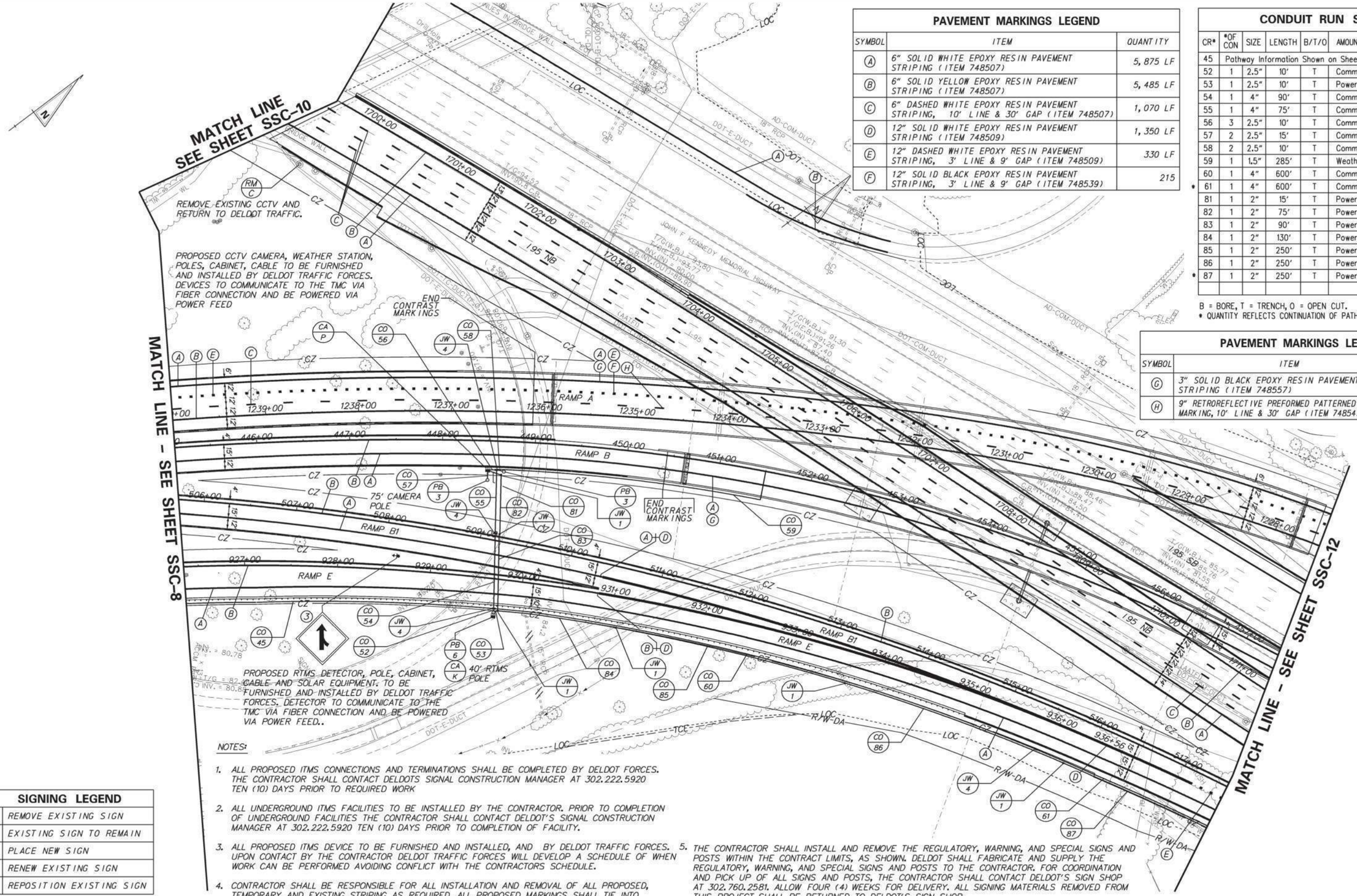
SCALE 0 50 100 150 FEET

FREEWAY DETECTION INSTALLATION PROJECT

CONTRACT	DETECTOR NO.	ND0096
T201204701	DESIGNED BY: L.F.W. (WR&A)	
COUNTY	CHECKED BY: N.M.L. (WR&A)	
NEW CASTLE		

SITE H

SHEET NO.
53
TOTAL SHTS.
75



PAVEMENT MARKINGS LEGEND

SYMBOL	ITEM	QUANTITY
(A)	6" SOLID WHITE EPOXY RESIN PAVEMENT STRIPING (ITEM 748507)	5,875 LF
(B)	6" SOLID YELLOW EPOXY RESIN PAVEMENT STRIPING (ITEM 748507)	5,485 LF
(C)	6" DASHED WHITE EPOXY RESIN PAVEMENT STRIPING, 10' LINE & 30' GAP (ITEM 748507)	1,070 LF
(D)	12" SOLID WHITE EPOXY RESIN PAVEMENT STRIPING (ITEM 748509)	1,350 LF
(E)	12" DASHED WHITE EPOXY RESIN PAVEMENT STRIPING, 3' LINE & 9' GAP (ITEM 748509)	330 LF
(F)	12" SOLID BLACK EPOXY RESIN PAVEMENT STRIPING, 3' LINE & 9' GAP (ITEM 748539)	215

CONDUIT RUN SCHEDULE

CR*	*OF CON	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
45	Pathway Information Shown on Sheet SSC-8				
52	1	2.5"	10'	T	Comm. Cable
53	1	2.5"	10'	T	Power
54	1	4"	90'	T	Comm. Cable
55	1	4"	75'	T	Comm. Cable
56	3	2.5"	10'	T	Comm. Cable
57	2	2.5"	15'	T	Comm. Cable
58	2	2.5"	10'	T	Comm. Cable
59	1	1.5"	285'	T	Weather Sensor
60	1	4"	600'	T	Comm. Cable
* 61	1	4"	600'	T	Comm. Cable
81	1	2"	15'	T	Power
82	1	2"	75'	T	Power
83	1	2"	90'	T	Power
84	1	2"	130'	T	Power
85	1	2"	250'	T	Power
86	1	2"	250'	T	Power
* 87	1	2"	250'	T	Power

B = BORE, T = TRENCH, O = OPEN CUT.
* QUANTITY REFLECTS CONTINUATION OF PATHWAY SHOWN ON SHEET SSC-12

PAVEMENT MARKINGS LEGEND

SYMBOL	ITEM	QUANTITY
(G)	3" SOLID BLACK EPOXY RESIN PAVEMENT STRIPING (ITEM 748557)	850 LF
(H)	9" RETROREFLECTIVE PREFORMED PATTERNED CONTRAST MARKING, 10' LINE & 30' GAP (ITEM 748547)	215 LF

SIGNING LEGEND

(1)	REMOVE EXISTING SIGN
(2)	EXISTING SIGN TO REMAIN
(3)	PLACE NEW SIGN
(4)	RENEW EXISTING SIGN
(5)	REPOSITION EXISTING SIGN

SIGN NOTE:

ALL EXISTING REGULATORY, WARNING, AND SPECIAL SIGNS ASSUMED TO BE REMOVED UNLESS OTHERWISE NOTED.

NOTES:

1. ALL PROPOSED ITMS CONNECTIONS AND TERMINATIONS SHALL BE COMPLETED BY DELDOT FORCES. THE CONTRACTOR SHALL CONTACT DELDOTS SIGNAL CONSTRUCTION MANAGER AT 302.222.5920 TEN (10) DAYS PRIOR TO REQUIRED WORK
2. ALL UNDERGROUND ITMS FACILITIES TO BE INSTALLED BY THE CONTRACTOR. PRIOR TO COMPLETION OF UNDERGROUND FACILITIES THE CONTRACTOR SHALL CONTACT DELDOT'S SIGNAL CONSTRUCTION MANAGER AT 302.222.5920 TEN (10) DAYS PRIOR TO COMPLETION OF FACILITY.
3. ALL PROPOSED ITMS DEVICE TO BE FURNISHED AND INSTALLED, AND BY DELDOT TRAFFIC FORCES. UPON CONTACT BY THE CONTRACTOR DELDOT TRAFFIC FORCES WILL DEVELOP A SCHEDULE OF WHEN WORK CAN BE PERFORMED AVOIDING CONFLICT WITH THE CONTRACTORS SCHEDULE.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL INSTALLATION AND REMOVAL OF ALL PROPOSED, TEMPORARY AND EXISTING STRIPING AS REQUIRED. ALL PROPOSED MARKINGS SHALL TIE INTO EXISTING MARKINGS IN ACCORDANCE WITH THE MUTCD AND AS DIRECTED BY THE DELDOT'S CONSTRUCTION ENGINEER.
5. THE CONTRACTOR SHALL INSTALL AND REMOVE THE REGULATORY, WARNING, AND SPECIAL SIGNS AND POSTS WITHIN THE CONTRACT LIMITS, AS SHOWN. DELDOT SHALL FABRICATE AND SUPPLY THE REGULATORY, WARNING, AND SPECIAL SIGNS AND POSTS TO THE CONTRACTOR. FOR COORDINATION AND PICK UP OF ALL SIGNS AND POSTS, THE CONTRACTOR SHALL CONTACT DELDOT'S SIGN SHOP AT 302.760.2581. ALLOW FOUR (4) WEEKS FOR DELIVERY. ALL SIGNING MATERIALS REMOVED FROM THIS PROJECT SHALL BE RETURNED TO DELDOT'S SIGN SHOP.
6. CONTRACTOR SHALL INSTALL RAISED PAVEMENT MARKERS IN ACCORDANCE WITH THE MUTCD.

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DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS
ADDENDUM NO. 2 THIS SHEET 721A
REPLACES VOIDED SHEET 721
02/18/2011, JCR

SCALE 0 50 100 150 FEET

SR1 / I-95 INTERCHANGE

CONTRACT 28-090-03
COUNTY NEW CASTLE
BRIDGE NO.
DESIGNED BY: RK&K
CHECKED BY: JCR

SIGNING, STRIPING & CONDUIT PLAN

SSC-11
SHEET NO. 721A
TOTAL SHTS. 803

APPENDIX V

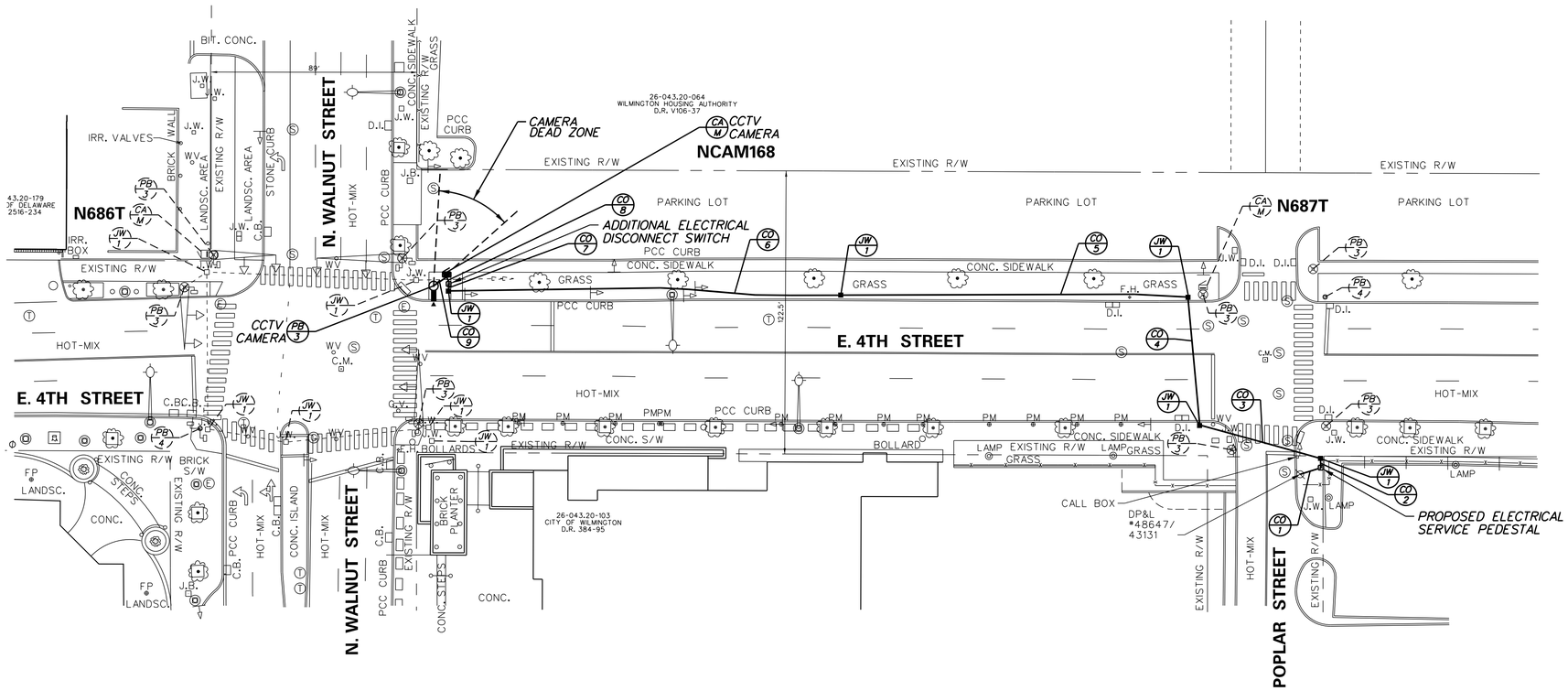
Sample Plan – CCTV Camera Design

CONDUIT RUN SCHEDULE

CO#	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
1*	1	2.0 IN	9 FT	O	(NEW (1) 2/#8 U.F. W/GROUND - LINE SIDE)
2*	1	2.0 IN	2 FT	O	(NEW (1) 2/#8 U.F. W/GROUND - LOAD SIDE)
3	1	4.0 IN	53 FT	B	(NEW (1) 2/#8 U.F. W/GROUND - LOAD SIDE)
4	1	4.0 IN	54 FT	B	(NEW (1) 2/#8 U.F. W/GROUND - LOAD SIDE)
5	1	4.0 IN	149 FT	T	(NEW (1) 2/#8 U.F. W/GROUND - LOAD SIDE)
6	1	4.0 IN	168 FT	T	(NEW (1) 2/#8 U.F. W/GROUND - LOAD SIDE)
7*	1	2.0 IN	1 FT	T	(NEW (1) 2/#8 U.F. W/GROUND - LOAD SIDE)
8*	1	2.0 IN	3 FT	T	(NEW (1) 2/#8 U.F. W/GROUND - LOAD SIDE)
9	1	3.0 IN	7 FT	T	(NEW (1) CCTV CABLE, (1) #6 GROUND)

* GALVANIZED CONDUIT

B = BORE, T = TRENCH, O = OPEN CUT



SIGNAL PHASING

SIGNAL HEAD DIAGRAM

LEGEND

AB	ABANDON	OH/•	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA/X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH/•	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA/X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB/X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO/•	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PB/X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO/•	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PL/X	EXISTING POLE IDENTIFIER (* OF POLE)
JW/X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL/X	PROPOSED POLE IDENTIFIER (* OF POLE)
JW/X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM/C	REMOVE BY CONTRACTOR
MA/XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM/O	REMOVE BY OTHERS
MA/XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM/TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL	P	P
DISCONNECT SWITCH	D	D
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
CCTV CAMERA		
SPAN WIRE	XX	
UTILITY POLE		

NOTES:

1. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED, AND COMPRESSION FITTING ARE NOT ACCEPTABLE.
2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.
3. ALL CONDUITS SHALL BE SCHEDULE 80 PVC WHEN INSTALLED BY TRENCHING OR OPEN CUT AND HDPE SDR-13.5 WHEN INSTALLED BY BORING, UNLESS OTHERWISE NOTED.
4. THE PROPOSED POLE SHALL BE A 75' CCTV POLE.
5. ALL WORK PERFORMED UNDER THIS PROJECT IS INTENDED TO OCCUR WITHIN DELDOT'S EXISTING RIGHT-OF-WAY BASED ON THE PLAN FOR STATE CONTRACT #29-200-13.
6. CCTV CAMERA WILL COMMUNICATE WITH THE TMC VIA A CDMA WIRELESS CONNECTION.

NEW

PREPARED BY

Whitman, Requardt and Associates, LLP
Engineers • Architects • Environmental Planners Est. 1915

THIS SEAL APPLIES TO ALL SHEETS BEARING THE "WRA" SECTION DESIGNATION.

3/18/19
DATE

MATTHEW J.A. BUCKLEY LICENSE No. 18224 PROFESSIONAL ENGINEER

SEAL

APPROVED FOR INSTALLATION

CHIEF TRAFFIC ENGINEER

3/19/19
DATE

ADDENDA / REVISIONS			

SCALE
0 30 60 90
FEET

ADVANCED TRAFFIC MITIGATION FOR I-95 VIADUCT AND BRANDYWINE RIVER BRIDGE

CONTRACT	PERMIT NO.	NCAM168
T201704105	DESIGNED BY: D.C.G. (WRA)	
COUNTY	CHECKED BY: M.J.B. (WRA)	
NEW CASTLE		

CCTV PLAN EAST 4TH STREET @ NORTH WALNUT STREET

SECTION: WRA
SHEET NO.: 7

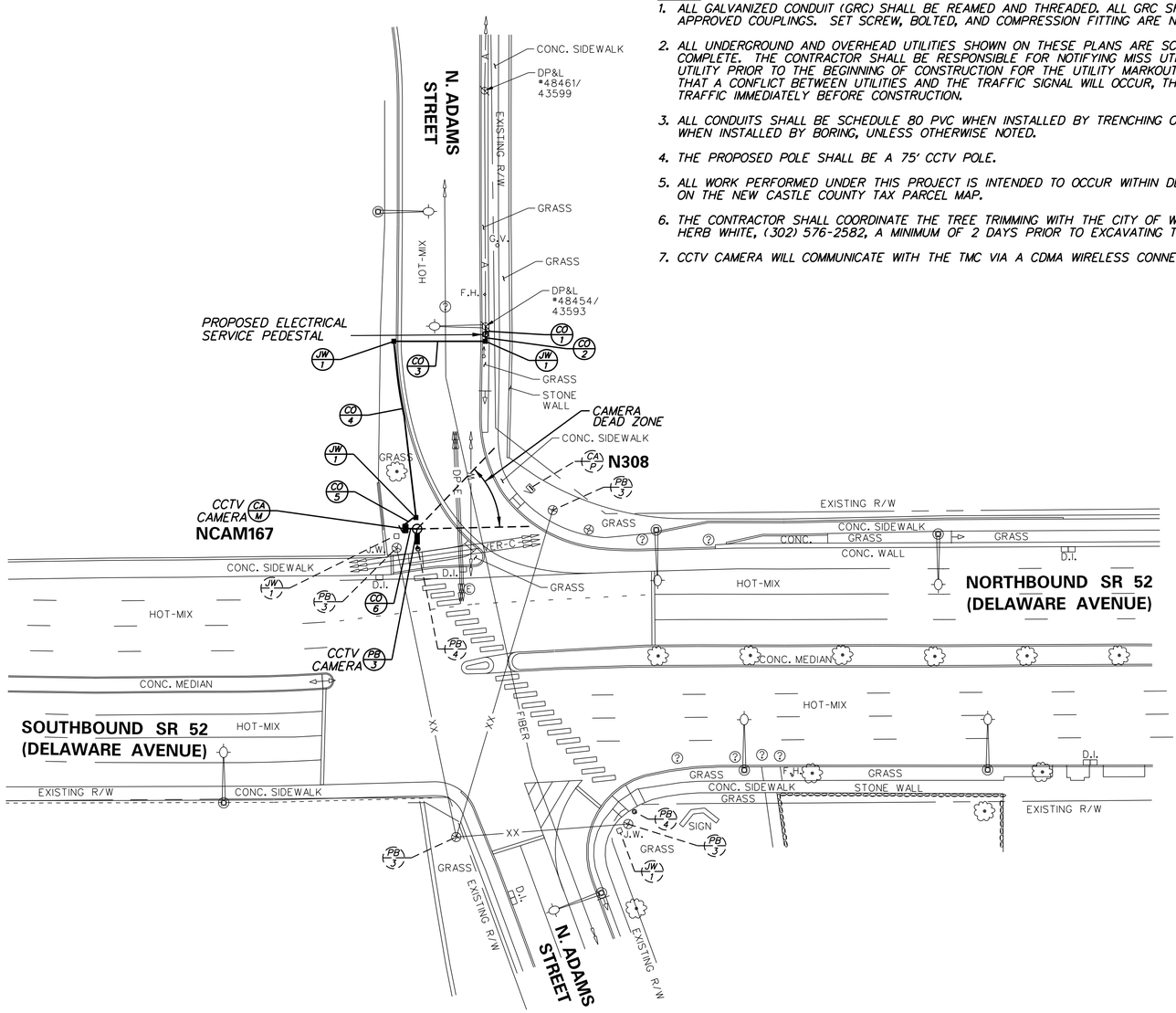
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1/18/2019 9:39:36 AM

CONDUIT RUN SCHEDULE

CO*	* OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
1*	1	2.0 IN	3 FT	T	[NEW (1) 2/*8 U.F. W/GROUND - LINE SIDE]
2*	1	2.0 IN	1 FT	T	[NEW (1) 2/*8 U.F. W/GROUND - LOAD SIDE]
3	1	4.0 IN	38 FT	B	[NEW (1) 2/*8 U.F. W/GROUND - LOAD SIDE]
4	1	4.0 IN	75 FT	T	[NEW (1) 2/*8 U.F. W/GROUND - LOAD SIDE]
5	1	2.0 IN	5 FT	T	[NEW (1) 2/*8 U.F. W/GROUND - LOAD SIDE]
6	1	3.0 IN	4 FT	T	[NEW CCTV CABLE, (1) *6 GROUND]

* GALVANIZED CONDUIT

B = BORE, T = TRENCH, O = OPEN CUT



NOTES:

1. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED, AND COMPRESSION FITTING ARE NOT ACCEPTABLE.
2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.
3. ALL CONDUITS SHALL BE SCHEDULE 80 PVC WHEN INSTALLED BY TRENCHING OR OPEN CUT AND HDPE SDR-13.5 WHEN INSTALLED BY BORING, UNLESS OTHERWISE NOTED.
4. THE PROPOSED POLE SHALL BE A 75' CCTV POLE.
5. ALL WORK PERFORMED UNDER THIS PROJECT IS INTENDED TO OCCUR WITHIN DELDOT'S EXISTING RIGHT-OF-WAY BASED ON THE NEW CASTLE COUNTY TAX PARCEL MAP.
6. THE CONTRACTOR SHALL COORDINATE THE TREE TRIMMING WITH THE CITY OF WILMINGTON URBAN FOREST ADMINISTRATOR, HERB WHITE, (302) 576-2582, A MINIMUM OF 2 DAYS PRIOR TO EXCAVATING THE PROPOSED POLE BASE, TYPE 3.
7. CCTV CAMERA WILL COMMUNICATE WITH THE TMC VIA A CDMA WIRELESS CONNECTION.

SIGNAL PHASING

SIGNAL HEAD DIAGRAM

LEGEND

AB	ABANDON	OH	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH *	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO *	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO *	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PL X	EXISTING POLE IDENTIFIER (* OF POLE)
JW X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (* OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		□
LOOP DETECTOR, TYPE 2		▭
LUMINAIRE	—○—	—●—
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER	—○	—●
OVERHEAD SIGNING	—⊣	—⊣
PEDESTRIAN POLE/BASE	◎	◉
PEDESTRIAN PUSHBUTTON	—▷	—▶
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD	—▷	—▶
SIGNAL POLE/BASE	⊗	⊙
CCTV CAMERA	CCTV	
SPAN WIRE	—XX—	
UTILITY POLE	⊘	
VIDEO DETECTION		

PREPARED BY

Whitman, Requardt and Associates, LLP
Engineers • Architects • Environmental Planners Est. 1915

THIS SEAL APPLIES TO ALL SHEETS BEARING THE "WRA" SECTION DESIGNATION.

3/18/19
DATE

MICHAEL J. BURKE — No. 16234 — REGISTERED PROFESSIONAL ENGINEER

SEAL

APPROVED FOR INSTALLATION

CHIEF TRAFFIC ENGINEER

3/19/19
DATE

NEW

ADDENDA / REVISIONS	

SCALE
0 30 60 90
FEET

ADVANCED TRAFFIC MITIGATION FOR I-95 VIADUCT AND BRANDYWINE RIVER BRIDGE

CONTRACT	T201704105	PERMIT NO.	NCAM167
COUNTY	NEW CASTLE	DESIGNED BY: D.C.C. (WRA)	
		CHECKED BY: M.J.B. (WRA)	

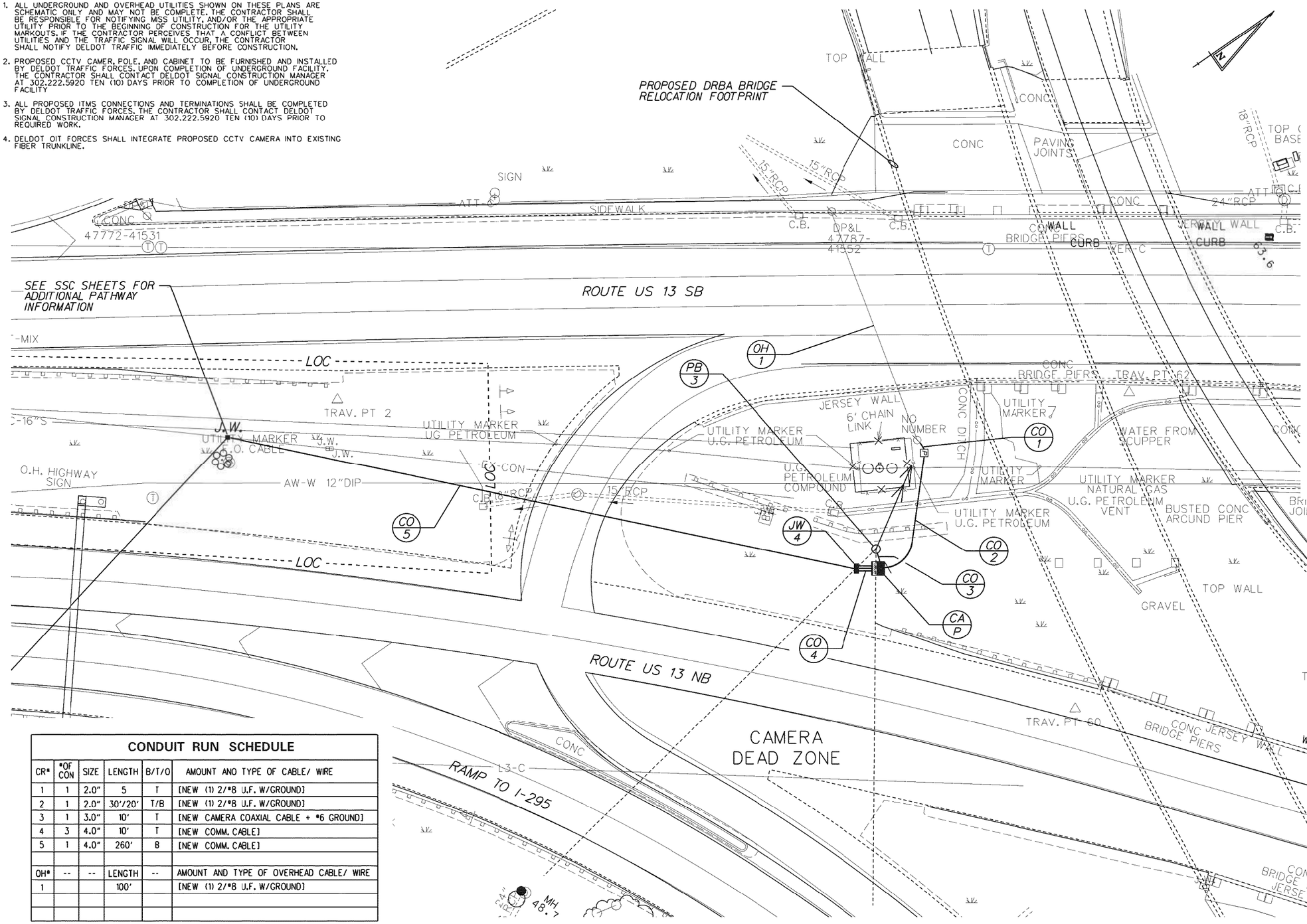
CCTV PLAN DELAWARE AVENUE (SR 52) @ N. ADAMS STREET

SECTION: WRA
SHEET NO.: 8

N:\31987-004\Control_I-95\CADD\ITMS off alignment work ahead of viaduct\SG11_SR52 @ Adams St_CCTV.dgn
3/18/2019 10:01:27 AM

GENERAL CCTV CAMERA NOTES

1. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.
2. PROPOSED CCTV CAMER, POLE, AND CABINET TO BE FURNISHED AND INSTALLED BY DELDOT TRAFFIC FORCES. UPON COMPLETION OF UNDERGROUND FACILITY. THE CONTRACTOR SHALL CONTACT DELDOT SIGNAL CONSTRUCTION MANAGER AT 302.222.5920 TEN (10) DAYS PRIOR TO COMPLETION OF UNDERGROUND FACILITY
3. ALL PROPOSED ITMS CONNECTIONS AND TERMINATIONS SHALL BE COMPLETED BY DELDOT TRAFFIC FORCES. THE CONTRACTOR SHALL CONTACT DELDOT SIGNAL CONSTRUCTION MANAGER AT 302.222.5920 TEN (10) DAYS PRIOR TO REQUIRED WORK.
4. DELDOT OIT FORCES SHALL INTEGRATE PROPOSED CCTV CAMERA INTO EXISTING FIBER TRUNKLINE.



CONDUIT RUN SCHEDULE

CR#	#OF CON	SIZE	LENGTH	B/T/O	AMOUNT ANO TYPE OF CABLE/ WIRE
1	1	2.0"	5	T	[NEW (1) 2/#8 U.F. W/GROUND]
2	1	2.0"	30'/20'	T/B	[NEW (1) 2/#8 U.F. W/GROUND]
3	1	3.0"	10'	T	[NEW CAMERA COAXIAL CABLE + #6 GROUND]
4	3	4.0"	10'	T	[NEW COMM. CABLE]
5	1	4.0"	260'	B	[NEW COMM. CABLE]
OH#	--	--	LENGTH	--	AMOUNT AND TYPE OF OVERHEAD CABLE/ WIRE
1			100'		[NEW (1) 2/#8 U.F. W/GROUND]

B = BORE, T = TRENCH, O = OPEN CUT.

ITMS LEGEND

- CO X - EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)
- CB X - EXISTING MULTIDUCT CONDUIT (INSTALLED IN BARRIER)
- NEMA 4X - EXISTING PULL BOX INSTALLED IN BARRIER
- JW X - EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
- PB X - EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
- CA X - EXISTING CABINET BASE IDENTIFIER (TYPE OF CABINET BASE)
- CO X - *PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)*
- JW X - *PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)*
- PB X - *PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)*
- CA X - *PROPOSED CABINET BASE IDENTIFIER (TYPE OF CABINET BASE)*
- *PROPOSED CCTV CAMERA POLE WITH DIRECTION OF ARM*
- *PROPOSED TAR REPEATER WITH DIRECTION FOR LOWERING POLE*
- P - *PROPOSED METERED SERVICE PEDESTAL WITH DISCONNECT*
- *PROPOSED WAVETRONIX DEVICE*
- *PROPOSED DYNAMIC MESSAGE BOARD*

RECOMMENDED _____ DATE: _____ | RECOMMENDED _____ DATE: _____ | RECOMMENDED _____ DATE: _____ | APPROVED TRAFFIC ENGINEER _____ DATE: _____ | APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER _____ DATE: _____

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

SCALE
0 20 40 60
FEET

BR 1-665 N&S, US 13 OVER BAYLOR BOULEVARD

CONTRACT	PERMIT NO.	SHEET NO.
T201107401	DESIGNED BY: JCR	
COUNTY	CHECKED BY: MH	TOTAL SHTS.
NEW CASTLE		

CCTV PLAN

APPENDIX W

Sample Plan – Permanently-Mounted CMS Board

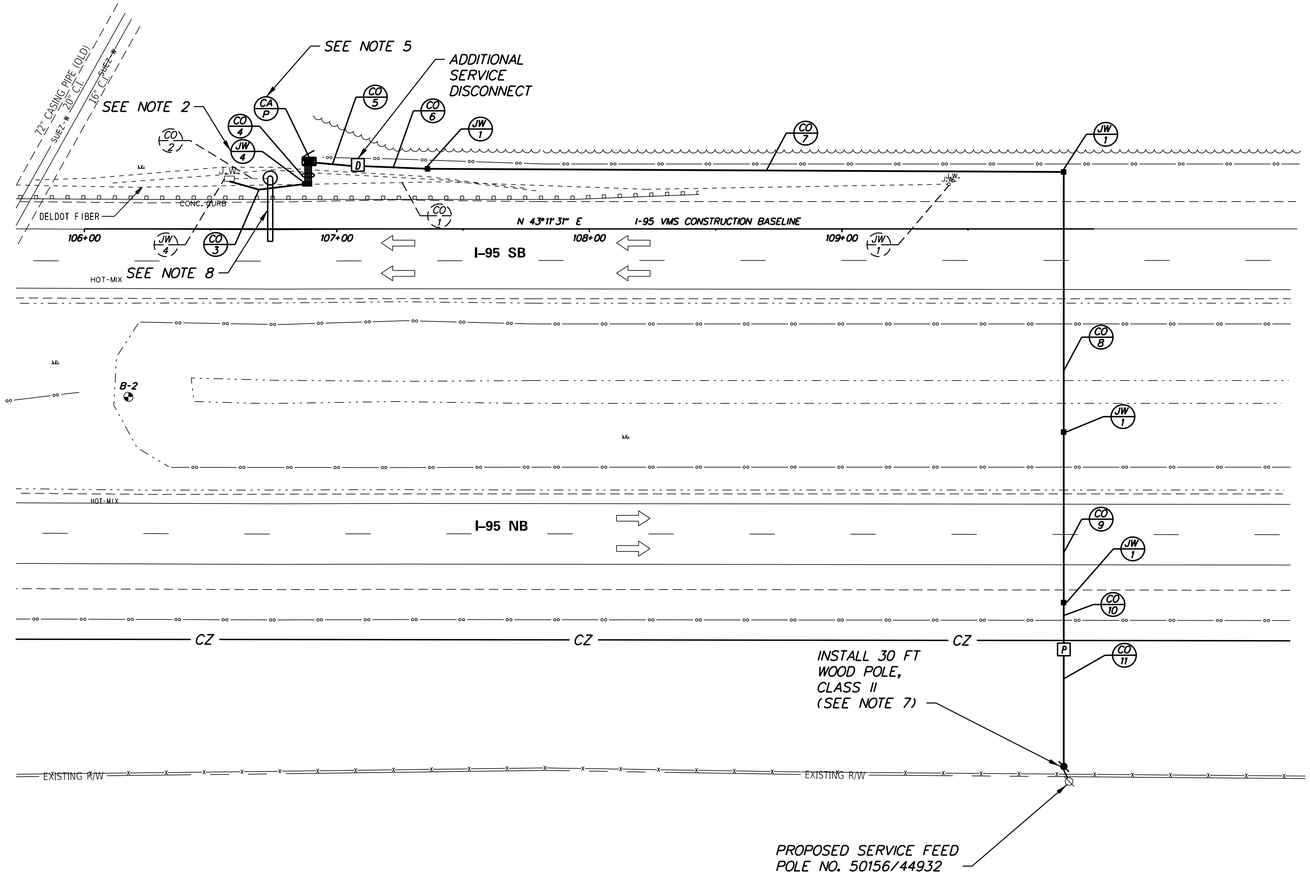
NOTES:

1. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.
2. THE CONTRACTOR SHALL INSTALL THE PROPOSED JUNCTION WELL TYPE 4 SO THAT IT INTERCEPTS EXISTING CONDUIT RUN #1 AND PROPOSED CONDUIT RUNS #3 AND #4.
3. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED, AND COMPRESSION FITTING ARE NOT ACCEPTABLE.
4. ALL WORK IS INTENDED TO OCCUR WITHIN DELDOT'S EXISTING RIGHT-OF-WAY BASED ON THE NEW CASTLE COUNTY TAX PARCEL MAP.
5. DELDOT TRAFFIC/OIT SHALL INSTALL A CDMA IN THE PROPOSED VMS CABINET.
6. ALL CONDUIT SHALL BE SCHEDULE 80 PVC WHEN INSTALLED BY TRENCHING OR OPEN CUT AND HDPE SDR-13.5 WHEN INSTALLED BY BORING, UNLESS OTHERWISE NOTED.
7. CLEARING AND GRUBBING AS NEEDED TO INSTALL CONDUIT 11 AND SET WOOD POLE.
8. THE CONTRACTOR SHALL CONTACT KEVIN LINDELL AT (302) 740-7145 TO INSTALL THE PROPOSED VMS BOARD TO THE PROPOSED VMS STRUCTURE PRIOR TO STEEL ERECTION UNDER CONTRACT NO. T201907002.

CONDUIT RUN SCHEDULE

CO#	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
1*	1	4.0 IN	XX FT	-	EMPTY
2*	1	3.0 IN	15 FT	-	(1) VMS CABLE
3	1	4.0 IN	30 FT	T	(1) VMS CABLE
4	4	4.0 IN	8 FT	T	(1) VMS CABLE
5**	1	2.0 IN	16 FT	T	(2)#1/0, (1)#1/0 GROUND - LOAD SIDE
6**	1	2.0 IN	26 FT	T	(2)#1/0, (1)#1/0 GROUND - LOAD SIDE
7	1	4.0 IN	250 FT	T	(2)#1/0, (1)#1/0 GROUND - LOAD SIDE
8	1	4.0 IN	101 FT	B	(2)#1/0, (1)#1/0 GROUND - LOAD SIDE
9	1	4.0 IN	66 FT	B	(2)#1/0, (1)#1/0 GROUND - LOAD SIDE
10**	1	2.0 IN	16 FT	T	(2)#1/0, (1)#1/0 GROUND - LOAD SIDE
11**	1	2.0 IN	50 FT	T	(2)#1/0, (1)#1/0 GROUND - LINE SIDE

* DENOTES EXISTING CONDUIT
** PROPOSED RIGID GALVANIZED STEEL
B = BORE, T = TRENCH, O = OPEN CUT



LEGEND

AB	ABANDON	OH */•	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH */•	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB */X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO */•	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PB */X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO */•	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PL */X	EXISTING POLE IDENTIFIER (* OF POLE)
JW */X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL */X	PROPOSED POLE IDENTIFIER (* OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
SERVICE DISCONNECT	D	D
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		▭
LOOP DETECTOR, TYPE 2		▭
LUMINAIRE		—◆—
MAST ARM		▶
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
CCTV CAMERA		
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION		

PREPARED BY

Whitman, Requardt and Associates, LLP
Engineers Architects Environmental Planners Est. 1915

MATTHEW J.A. BUCKLEY — No. 16234 — PROFESSIONAL ENGINEER

12/16/2020
DATE

THIS SEAL APPLIES TO ALL SHEETS BEARING THE "WRA" SECTION DESIGNATION.

SEAL

CONCURRENCE FOR INSTALLATION

Peter Haag DelDOT — 12/17/2020

CHIEF OF TRAFFIC ENGINEERING — DATE

NEW

ADDENDA / REVISIONS	

SCALE
0 30 60 90
FEET

ADVANCED TRAFFIC MITIGATION FOR I-95 VIADUCT AND BRANDYWINE RIVER BRIDGE

CONTRACT	T201704105	PERMIT NO.	NVMS012
COUNTY	NEW CASTLE	DESIGNED BY: D. CARSON	
		CHECKED BY: M. BUCKLEY	

VMS PLAN I-95 SOUTHBOUND NORTH OF MARSH ROAD

SECTION	
WRA	
SHEET NO.	
1	

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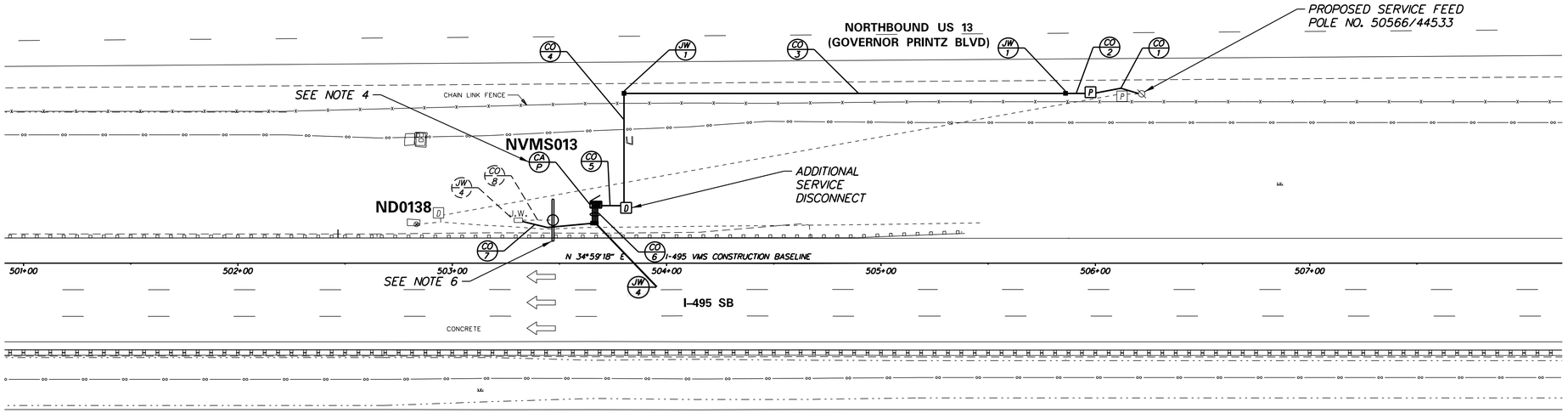
NOTES:

1. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.
2. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED, AND COMPRESSION FITTING ARE NOT ACCEPTABLE.
3. ALL WORK IS INTENDED TO OCCUR WITHIN DELDOT'S EXISTING RIGHT-OF-WAY BASED ON THE NEW CASTLE COUNTY TAX PARCEL MAP.
4. DELDOT TRAFFIC/OIT SHALL INSTALL A CDMA IN THE PROPOSED VMS CABINET.
5. ALL CONDUIT SHALL BE SCHEDULE 80 PVC WHEN INSTALLED BY TRENCHING, UNLESS OTHERWISE NOTED.
6. THE CONTRACTOR SHALL CONTACT KEVIN LINDELL AT (302) 740-7145 TO INSTALL THE PROPOSED VMS BOARD TO THE PROPOSED VMS STRUCTURE PRIOR TO STEEL ERECTION UNDER CONTRACT NO. T201907002.

CONDUIT RUN SCHEDULE

CO*	# OF CONDUITS	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
1**	1	2.0 IN	22 FT	T	(2)#4, (1)#6 GROUND - LINE SIDE
2**	1	2.0 IN	9 FT	T	(2)#4, (1)#6 GROUND - LOAD SIDE
3	1	4.0 IN	204 FT	T	(2)#4, (1)#6 GROUND - LOAD SIDE
4**	1	2.0 IN	50 FT	T	(2)#4, (1)#6 GROUND - LOAD SIDE
5**	1	2.0 IN	10 FT	T	(2)#4, (1)#6 GROUND - LOAD SIDE
6	4	4.0 IN	8 FT	T	(1) VMS CABLE
7	1	4.0 IN	33 FT	T	(1) VMS CABLE
8*	1	3.0 IN	15 FT	-	(1) VMS CABLE

* DENOTES EXISTING CONDUIT
** PROPOSED RIGID GALVANIZED STEEL
B = BORE, T = TRENCH, O = OPEN CUT



NEW

LEGEND

AB	ABANDON	OH */	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA/X	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	OH *	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
CA X	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	PB/X	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO/*	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PB X	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
CO *	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	PL/X	EXISTING POLE IDENTIFIER (* OF POLE)
JW/X	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	PL X	PROPOSED POLE IDENTIFIER (* OF POLE)
JW X	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	RM C	REMOVE BY CONTRACTOR
MA/XX	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	RM O	REMOVE BY OTHERS
MA XX	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	RM TC	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
SERVICE DISCONNECT	D	D
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		R/W
SERVICE PEDESTAL	P	P
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
CCTV CAMERA	CCTV	
SPAN WIRE	XX	
UTILITY POLE		
VIDEO DETECTION		

PREPARED BY

WRA Whitman, Requardt and Associates, LLP
Engineers Architects Environmental Planners Est. 1915

12/16/2020
DATE

THIS SEAL APPLIES TO ALL SHEETS BEARING THE "WRA" SECTION DESIGNATION.

CATHERINE A. BUCKLEY No. 16284 PROFESSIONAL ENGINEER
SEAL

CONCURRENCE FOR INSTALLATION

Peter Haag DelDOT
12/17/2020
CHIEF OF TRAFFIC ENGINEERING — DATE

ADDENDA / REVISIONS	

SCALE
0 30 60 90
FEET

ADVANCED TRAFFIC MITIGATION FOR I-95 VIADUCT AND BRANDYWINE RIVER BRIDGE

CONTRACT	T201704105	PERMIT NO.	NVMS013
COUNTY	NEW CASTLE	DESIGNED BY: D. CARSON	
		CHECKED BY: M. BUCKLEY	

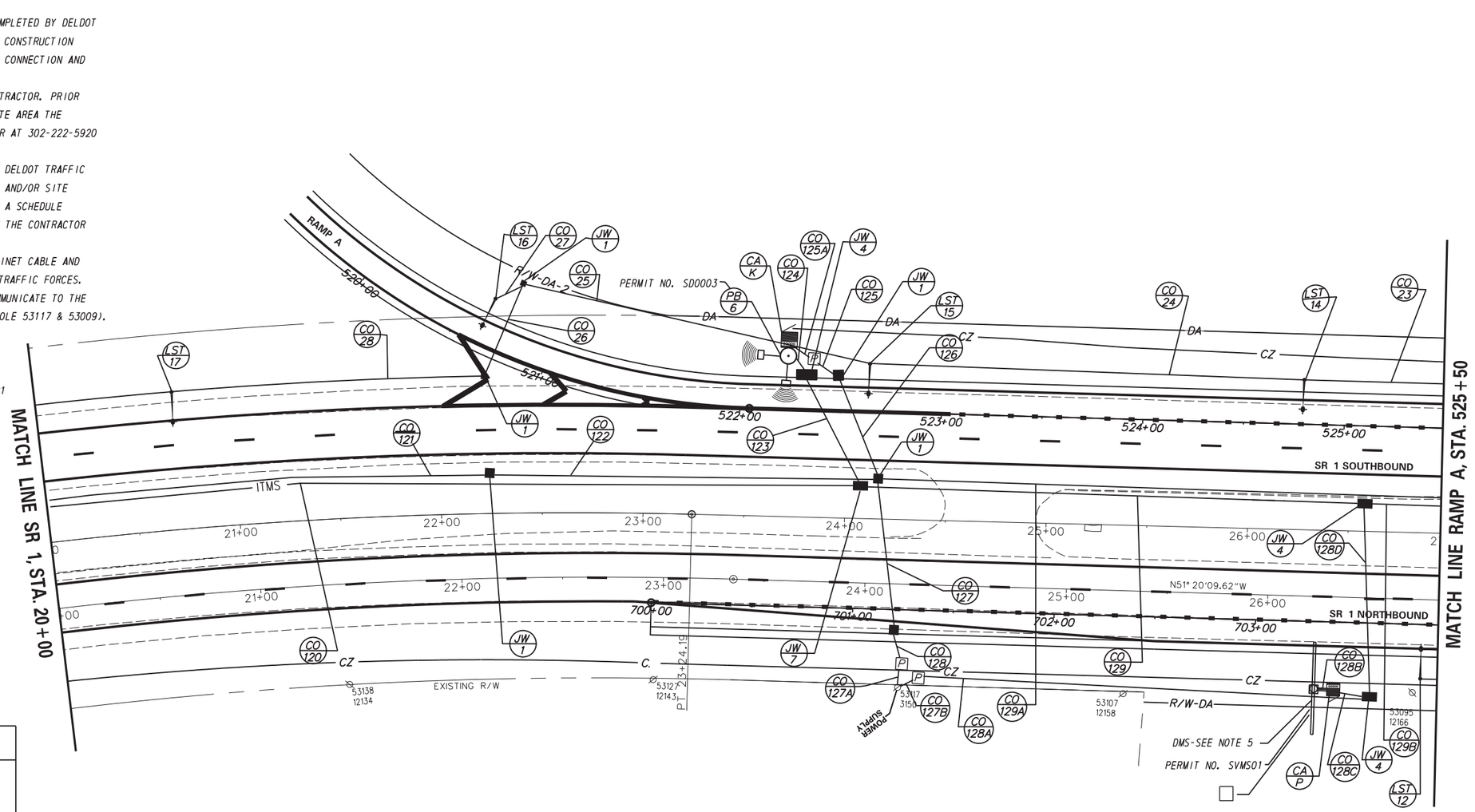
VMS PLAN
I-495 SOUTHBOUND
NORTH OF EDGEMOOR RD

SECTION: WRA
SHEET NO.: 2

N:\31987-004\CONTRACT_I-95\CADD\VMS boards of alignment work\SS02_I-495 DMS.dgn
12/16/2020 2:38:37 PM

NOTES:

1. ALL PROPOSED ITMS CONNECTIONS AND TERMINATIONS SHALL BE COMPLETED BY DELDOT TRAFFIC FORCES. THE CONTRACTOR SHALL CONTACT DELDOT SIGNAL CONSTRUCTION MANAGER AT 302-222-5920 TEN(10) DAYS PRIOR TO ANY REQUIRED CONNECTION AND TERTMINATION WORK.
2. ALL UNDERGROUND ITMS FACILITIES TO BE INSTALLED BY THE CONTRACTOR. PRIOR TO COMPLETION OF UNDERGROUND PATHWAY, FACILITIES AND/OR SITE AREA THE CONTRACTOR SHALL CONTACT DELDOT SIGNAL CONSTRUCTION MANAGER AT 302-222-5920 TEN(10) DAYS PRIOR TO COMPLETION.
3. ALL PROPOSED ITMS DEVICES TO BE FURNISHED AND INSTALLED BY DELDOT TRAFFIC FORCES. UPON NOTIFICATION OF COMPLETION OF ITMS FACILITIES AND/OR SITE AREA BY THE CONTRACTOR, DELDOT TRAFFIC FORCES WILL DEVELOP A SCHEDULE OF WHEN WORK CAN BE PERFORMED TO BOTH AVOID AN WORK WITHIN THE CONTRACTOR PROPOSED SCHEDULE OF WORK.
4. PROPOSED WAVETRONIX, CAMERA, DMS, WEATHER STATION, POLE, CABINET CABLE AND ELECTRIC SERVICE, TO BE FURNISHED AND INSTALLED BY DELDOT TRAFFIC FORCES. CAMERA, WAVETRONIX, DMS AND WEATHER STATION DEVICES TO COMMUNICATE TO THE TMC VIA T1 CONNECTION AND BE POWERD VIA ELECTRIC SERVICE(POLE 53117 & 53009).
5. PRIOR TO STRUCTURE ERECTION, CONTRACTOR SHALL INSTSALL 1.5" FLEXIBLE METALLIC LIQUID TIGHT CONDUIT ALONG FULL LENGTH OF STRUCTURE ARM FOR DELDOT TRAFFIC USE. A 2.5" RISER SHALL ALSO BE INSTALLED ON THE STRUCTURE UP-R1



LIGHTING & ITMS LEGEND

- PROPOSED LUMINAIRE IDENTIFIER (*OF LUMINAIRE)
- PROPOSED CONDUIT RUN (*OF CONDUIT RUN)
- PROPOSED COBRAHEAD LUMINAIRE, SINGLE DAVIT ARM POLE
- PROPOSED JUNCTION WELL TYPE OF JUNCTION WELL
- PROPOSED 277/480V THREE PHASE LIGHTING CONTROL CABINET
- PROPOSED LIGHTING OR ITMS CONDUIT
- PROPOSED JUNCTION WELL
- PROPOSED METERED SERVICE CABINET
- PROPOSED WAVTRONIX DETECTOR
- PROPOSED CCTV CAMERA

ITMS CONDUIT RUN SCHEDULE

CR#	# OF CONDUITS	SIZE	LENGTH	AMOUNT AND TYPE OF CABLE/WIRE	INSTALLATION
120	1	4.0"	409'	COMM. CABLE	TRENCH
121	1	3.0"	265'	(2)#2 THWN (1) #6 GRD	TRENCH
122	1	3.0"	188'	(2)#2 THWN (1) #6 GRD	TRENCH
123	1	4.0"	58'	COMM. CABLE	BORE
124	1	4.0"	8'	COMM. CABLE	TRENCH
125	1	2.0"	13'	(2)#8 THWN (1) #6 GRD	TRENCH
125A	1	2.0"	10'	(2)#8 THWN (1)# 6 GRD	TRENCH
126	1	2.0"	51'	(2)#8 THWN (1)# 6 GRD	BORE
127	1	3.0"	72'	(2)#8THWN, (4)#2THWN, (3)#6GRD	BORE
127A	1	2.0"	8'	(2)#2 THWN (1)# 6 GRD	TRENCH
127B	1	2.0"	8'	(2)#2 THWN (1)# 6 GRD	TRENCH
128	1	3.0"	25'	(2)#8THWN, (2)#2THWN, (1)#6GRD	TRENCH
128A	1	3.0"	218'	(2)#8 THWN (1)#6 GRD	TRENCH
128B	1	4.0"	5'	COMM. CABLE	TRENCH
	2	3.0"	5'	(2)#8 THWN (1) #6 GRD	TRENCH
128C	1	4.0"	12'	COMM. CABLE	TRENCH
128D	1	4.0"	93'	COMM. CABLE	BORE
129	1	4.0"	244'	COMM. CABLE	TRENCH
129A	1	3.0"	318'	(2)#2 THWN (1) #6 GRD	TRENCH
129B	1	4.0"	348'	COMM. CABLE	TRENCH

LIGHTING CONDUIT RUN SCHEDULE

CR#	# OF CONDUITS	SIZE	LENGTH	AMOUNT AND TYPE OF CABLE/WIRE	INSTALLATION
23	1	3.0"	145'	(4)#4 AWG (1)#6 GND	TRENCH
24	1	3.0"	216'	(4)#4 AWG (1)#6 GND	TRENCH
25	1	3.0"	176'	(4)#4 AWG (1)#6 GND	TRENCH
26	1	3.0"	50'	(4)#4 AWG (1)#6 GND	TRENCH
27	1	3.0"	15'	(2)#4 AWG (1)#6 GND	TRENCH
28	1	3.0"	155'	(4)#4 AWG (1)#6 GND	TRENCH

LIGHTING STANDARD SCHEDULE

NO.	CIRCUIT NO.	STATION	OFFSET	ARM	LUMINAIRE MOUNTING HEIGHT	POLE BASE	LUMINAIRE
12	A5	703+82.6	27.0' RT	15'	40'	TYPE 6	250W, HPS, TYPE 2, CUTOFF
14	A3	524+79.5	22.3' LT	12'	40'	TYPE 6	250W, HPS, TYPE 2, CUTOFF
15	A5	522+63.9	24.0' LT	12'	40'	TYPE 6	250W, HPS, TYPE 2, CUTOFF
16	A1	520+63.7	24.0' LT	12'	40'	TYPE 6	250W, HPS, TYPE 2, CUTOFF
17	A3	20+64.7	101.3' LT	15'	40'	TYPE 6	250W, HPS, TYPE 2, CUTOFF

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

3 ADED DMS ON THIS SHEET, ADDED PEDESTAL 04/03/13 CBD

SCALE
0 30 60 90
FEET

SR 1, SR 30
GRADE SEPERATED
INTERSECTION

CONTRACT	BRIDGE NO.	3-004
T200812201	DESIGNED BY:	CBD
COUNTY	CHECKED BY:	DLH
SUSSEX		

LIGHTING, ITMS & UTILITY RELOCATION PLANS

SHEET NO.
122
TOTAL SHTS.
133

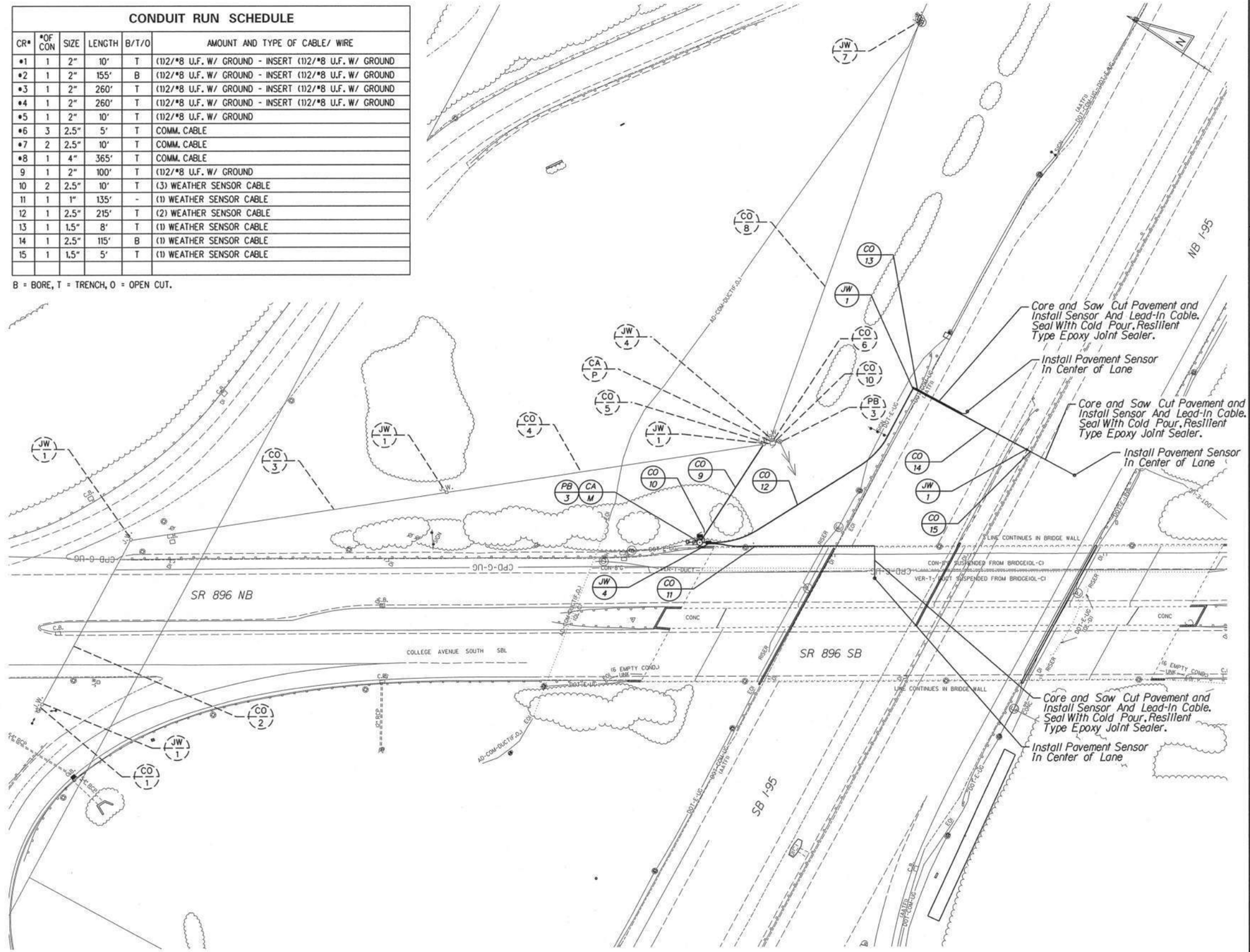
APPENDIX X

Sample Plan – Weather Station

CONDUIT RUN SCHEDULE

CR*	*OF CON	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
*1	1	2"	10'	T	(11)2/*8 U.F. W/ GROUND - INSERT (11)2/*8 U.F. W/ GROUND
*2	1	2"	155'	B	(11)2/*8 U.F. W/ GROUND - INSERT (11)2/*8 U.F. W/ GROUND
*3	1	2"	260'	T	(11)2/*8 U.F. W/ GROUND - INSERT (11)2/*8 U.F. W/ GROUND
*4	1	2"	260'	T	(11)2/*8 U.F. W/ GROUND - INSERT (11)2/*8 U.F. W/ GROUND
*5	1	2"	10'	T	(11)2/*8 U.F. W/ GROUND
*6	3	2.5"	5'	T	COMM. CABLE
*7	2	2.5"	10'	T	COMM. CABLE
*8	1	4"	365'	T	COMM. CABLE
9	1	2"	100'	T	(11)2/*8 U.F. W/ GROUND
10	2	2.5"	10'	T	(3) WEATHER SENSOR CABLE
11	1	1"	135'	-	(1) WEATHER SENSOR CABLE
12	1	2.5"	215'	T	(2) WEATHER SENSOR CABLE
13	1	1.5"	8'	T	(1) WEATHER SENSOR CABLE
14	1	2.5"	115'	B	(1) WEATHER SENSOR CABLE
15	1	1.5"	5'	T	(1) WEATHER SENSOR CABLE

B = BORE, T = TRENCH, O = OPEN CUT.



LEGEND

PROPOSED SIGNAL CABINET	REMOVE BY CONTRACTOR
EXISTING SIGNAL CABINET	REMOVE BY OTHERS
PROPOSED SIGNAL POLE BASE	ABANDON
EXISTING SIGNAL POLE BASE	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
PROPOSED PEDESTRIAN POLE BASE	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
EXISTING PEDESTRIAN POLE BASE	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
PROPOSED WOOD POLE	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
EXISTING UTILITY POLE	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
PROPOSED JUNCTION WELL	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
EXISTING JUNCTION WELL	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
PROPOSED SIGNAL HEAD	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
EXISTING SIGNAL HEAD	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)
PROPOSED PEDESTRIAN SIGNAL HEAD	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)
EXISTING PEDESTRIAN SIGNAL HEAD	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
PROPOSED PEDESTRIAN PUSHBUTTON	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
EXISTING PEDESTRIAN PUSHBUTTON	PROPOSED SPAN WIRE
PROPOSED VIDEO DETECTION	XX EXISTING SPAN WIRE
EXISTING VIDEO DETECTION	RIGHT-OF-WAY OR PROPERTY LINE
PROPOSED MICROWAVE DETECTION	PROPOSED SPAN INSULATOR
EXISTING MICROWAVE DETECTION	EXISTING SPAN INSULATOR
OVERHEAD SIGNING	SERVICE PEDESTAL
PROPOSED OPTICOM RECEIVER	
EXISTING OPTICOM RECEIVER	
PROPOSED MAST ARM	
EXISTING MAST ARM	
PROPOSED LUMINAIRE	
EXISTING LUMINAIRE	
PROPOSED LOOP DETECTOR (TYPE 1 OR 2)	
EXISTING LOOP DETECTOR (TYPE 1 OR 2)	

GENERAL NOTES

1. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
2. POLE BASES, CABINET BASE AND CONDUIT JUNCTION WELLS TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.
3. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREW, BOLTED, AND COMPRESSION FITTING ARE NOT ACCEPTABLE.
4. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.
5. CDMA TECHNOLOGY SHALL BE UTILIZED FOR COMMUNICATION TO THE TMC.

RECOMMENDED _____ DATE: 3.31.10

RECOMMENDED _____ DATE: _____

RECOMMENDED _____ DATE: _____

APPROVED TRAFFIC ENGINEER _____ DATE: 3/31/10

APPROVED FOR INSTALLATION
CHIEF TRAFFIC ENGINEER _____ DATE: 4/5/10

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

RWIS Station
SR 896 over I-95

CONTRACT	30-047-02
COUNTY	New Castle
PERMIT NO.	NWMS14
DESIGNED BY:	JCR
CHECKED BY:	JCR

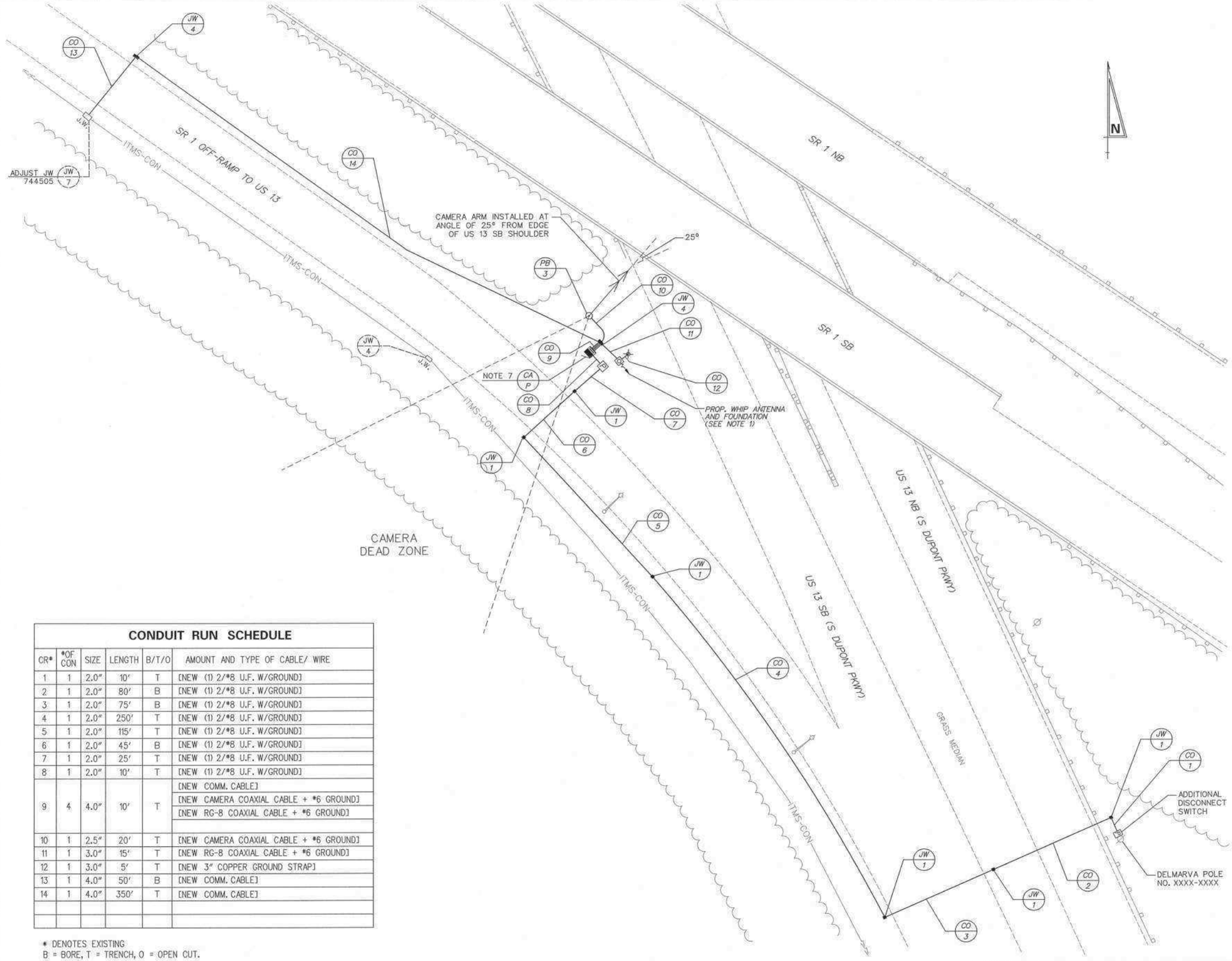
DelTrac
RWIS PLAN

SHEET NO.	1
TOTAL SHTS.	1

Y:\TRAFFIC\USERS\JASON\DELTRAC\WEATHER STATION\RE-DESIGNED\PS_PLAN\NWMS14.DGN

APPENDIX Y

Sample Plan – WTMC Repeater Site



ITMS LEGEND

- (CO X) - EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)
- (CB X) - EXISTING MULTIDUCT CONDUIT (INSTALLED IN BARRIER)
- NEMA 4X - EXISTING PULL BOX INSTALLED IN BARRIER
- (JW X) - EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
- (PB X) - EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
- (CA X) - EXISTING CABINET BASE IDENTIFIER (TYPE OF CABINET BASE)
- (CO X) - *PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)*
- (JW X) - *PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)*
- (PB X) - *PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)*
- (CA X) - *PROPOSED CABINET BASE IDENTIFIER (TYPE OF CABINET BASE)*
- *PROPOSED CCTV CAMERA POLE WITH DIRECTION OF ARM*
- *PROPOSED TAR REPEATER WITH DIRECTION FOR LOWERING POLE*
- P - *PROPOSED METERED SERVICE PEDESTAL WITH DISCONNECT*
- *PROPOSED WAVETRONIX DEVICE*
- *PROPOSED DYNAMIC MESSAGE BOARD*

CONDUIT RUN SCHEDULE

CR*	*OF CON	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
1	1	2.0"	10'	T	[NEW (1) 2/#8 U.F. W/GROUND]
2	1	2.0"	80'	B	[NEW (1) 2/#8 U.F. W/GROUND]
3	1	2.0"	75'	B	[NEW (1) 2/#8 U.F. W/GROUND]
4	1	2.0"	250'	T	[NEW (1) 2/#8 U.F. W/GROUND]
5	1	2.0"	115'	T	[NEW (1) 2/#8 U.F. W/GROUND]
6	1	2.0"	45'	B	[NEW (1) 2/#8 U.F. W/GROUND]
7	1	2.0"	25'	T	[NEW (1) 2/#8 U.F. W/GROUND]
8	1	2.0"	10'	T	[NEW (1) 2/#8 U.F. W/GROUND]
9	4	4.0"	10'	T	[NEW COMM. CABLE] [NEW CAMERA COAXIAL CABLE + #6 GROUND] [NEW RG-8 COAXIAL CABLE + #6 GROUND]
10	1	2.5"	20'	T	[NEW CAMERA COAXIAL CABLE + #6 GROUND]
11	1	3.0"	15'	T	[NEW RG-8 COAXIAL CABLE + #6 GROUND]
12	1	3.0"	5'	T	[NEW 3" COPPER GROUND STRAP]
13	1	4.0"	50'	B	[NEW COMM. CABLE]
14	1	4.0"	350'	T	[NEW COMM. CABLE]

* DENOTES EXISTING
B = BORE, T = TRENCH, O = OPEN CUT.

GENERAL REPEATER AND CCTV CAMERA NOTES

1. CONTRACTOR SHALL INSTALL NEW 44' DELDOT SUPPLIED TAR WHIP ANTENNA ON A MODIFIED TYPE III POLE BASE USING DELDOT SUPPLIED ANCHOR BOLTS (SEE TAR REPEATER CONSTRUCTION DETAILS).
2. CONTRACTOR SHALL AUGER A 10 IN. DIAMETER X 40.5 FT DEEP SHAFT FOR GROUND ROD INSTALLATION. GROUND ROD SHALL NOT BE MORE THAN 5' FROM EDGE OF REPEATER FOUNDATION.
3. DELDOT SHALL INSTALL TAR TRANSMISSION EQUIPMENT AND PERFORM FINAL TUNING.
4. CONDUIT 13 SHALL BE SDR-13.5 HDPE. ALL OTHER CONDUIT SHALL BE RIGID POLYVINYL CHLORIDE SCHEDULE 80.
5. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.
6. ALL SIGNAL EQUIPMENT REMOVED FROM THIS PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.
7. INSTALL CCTV EQUIPMENT AND REPEATER EQUIPMENT IN NEW TYPE P CABINET. DELDOT TRAFFIC FORCES TO ADJUST EQUIPMENT AS NEEDED.
8. DELDOT FORCES SHALL INTEGRATE CCTV CAMERA WITH EXISTING FIBER TRUNKLINE.

RECOMMENDED _____ DATE: 6.28.12	RECOMMENDED _____ DATE: _____	RECOMMENDED _____ DATE: 7/9/12	APPROVED TRAFFIC ENGINEER _____ DATE: 7/11/12
			APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER _____ DATE: 7/11/12

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

SCALE 0 30 60 90 FEET

CONTRACT	PERMIT NO.	NWTMC07
T201304701	DESIGNED BY: SM	
COUNTY	CHECKED BY: JCR	
NEW CASTLE		

WTMC REPEATER AND CCTV PLAN SR 1 @ US 13

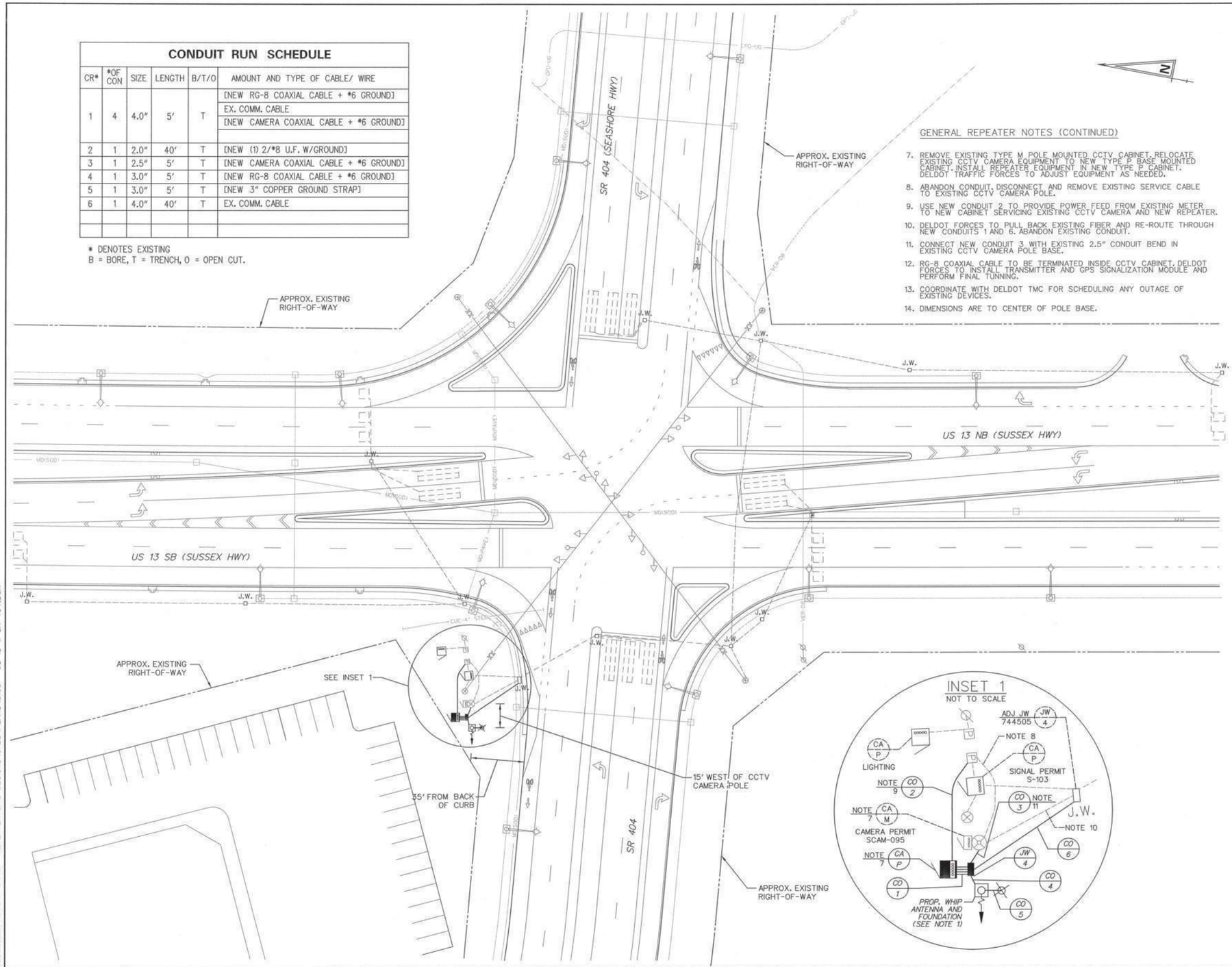
SHEET NO. 1 TOTAL SHTS. 1

6/28/2012 9:18:20 AM
\\RKKMV2010\2010\10028_DELDOT_ITS\TASK 5 - REPEATER SITE DESIGNS\CADD\PLANS\US 13 @ SR 1 (SM)*RNAV.DGN

CONDUIT RUN SCHEDULE

CR*	*OF CON	SIZE	LENGTH	B/T/O	AMOUNT AND TYPE OF CABLE/ WIRE
1	4	4.0"	5'	T	[NEW RG-8 COAXIAL CABLE + #6 GROUND]
					EX. COMM. CABLE
					[NEW CAMERA COAXIAL CABLE + #6 GROUND]
2	1	2.0"	40'	T	[NEW (1) 2/#8 U.F. W/GROUND]
3	1	2.5"	5'	T	[NEW CAMERA COAXIAL CABLE + #6 GROUND]
4	1	3.0"	5'	T	[NEW RG-8 COAXIAL CABLE + #6 GROUND]
5	1	3.0"	5'	T	[NEW 3" COPPER GROUND STRAP]
6	1	4.0"	40'	T	EX. COMM. CABLE

* DENOTES EXISTING
B = BORE, T = TRENCH, O = OPEN CUT.



GENERAL REPEATER NOTES (CONTINUED)

7. REMOVE EXISTING TYPE M POLE MOUNTED CCTV CABINET. RELOCATE EXISTING CCTV CAMERA EQUIPMENT TO NEW TYPE P BASE MOUNTED CABINET. INSTALL REPEATER EQUIPMENT IN NEW TYPE P CABINET. DELDOT TRAFFIC FORCES TO ADJUST EQUIPMENT AS NEEDED.
8. ABANDON CONDUIT, DISCONNECT AND REMOVE EXISTING SERVICE CABLE TO EXISTING CCTV CAMERA POLE.
9. USE NEW CONDUIT 2 TO PROVIDE POWER FEED FROM EXISTING METER TO NEW CABINET SERVICING EXISTING CCTV CAMERA AND NEW REPEATER.
10. DELDOT FORCES TO PULL BACK EXISTING FIBER AND RE-ROUTE THROUGH NEW CONDUITS 1 AND 6. ABANDON EXISTING CONDUIT.
11. CONNECT NEW CONDUIT 3 WITH EXISTING 2.5" CONDUIT BEND IN EXISTING CCTV CAMERA POLE BASE.
12. RG-8 COAXIAL CABLE TO BE TERMINATED INSIDE CCTV CABINET. DELDOT FORCES TO INSTALL TRANSMITTER AND GPS SIGNALIZATION MODULE AND PERFORM FINAL TUNNING.
13. COORDINATE WITH DELDOT TMC FOR SCHEDULING ANY OUTAGE OF EXISTING DEVICES.
14. DIMENSIONS ARE TO CENTER OF POLE BASE.

SIGNAL PHASING

SIGNAL HEAD DIAGRAM

LEGEND

- PROPOSED SIGNAL CABINET
- EXISTING SIGNAL CABINET
- PROPOSED SIGNAL POLE BASE
- EXISTING SIGNAL POLE BASE
- PROPOSED PEDESTRIAN POLE BASE
- EXISTING PEDESTRIAN POLE BASE
- PROPOSED WOOD POLE
- EXISTING UTILITY POLE
- PROPOSED JUNCTION WELL
- EXISTING JUNCTION WELL
- PROPOSED SIGNAL HEAD
- EXISTING SIGNAL HEAD
- PROPOSED PEDESTRIAN SIGNAL HEAD
- EXISTING PEDESTRIAN SIGNAL HEAD
- PROPOSED PEDESTRIAN PUSHBUTTON
- EXISTING PEDESTRIAN PUSHBUTTON
- PROPOSED VIDEO DETECTION
- EXISTING VIDEO DETECTION
- PROPOSED MICROWAVE DETECTION
- EXISTING MICROWAVE DETECTION
- OVERHEAD SIGNING
- PROPOSED OPTICOM RECEIVER
- EXISTING OPTICOM RECEIVER
- PROPOSED MAST ARM
- EXISTING MAST ARM
- PROPOSED LUMINAIRE
- EXISTING LUMINAIRE
- PROPOSED LOOP DETECTOR (TYPE 1 OR 2)
- EXISTING LOOP DETECTOR (TYPE 1 OR 2)
- (RM/C) REMOVE BY CONTRACTOR
- (RM/O) REMOVE BY OTHERS
- (AB) ABANDON
- (PB/X) PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
- (EPB/X) EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
- (JW/X) PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
- (JW/X) EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)
- (CO/#) PROPOSED CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)
- (CO/#) EXISTING CONDUIT RUN IDENTIFIER (# OF CONDUIT RUN)
- (OH/#) PROPOSED OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
- (OH/#) EXISTING OVERHEAD RUN IDENTIFIER (# OF OVERHEAD RUN)
- (MA/XX) PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)
- (MA/XX) EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)
- (CA/X) PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)
- (CA/X) EXISTING CABINET IDENTIFIER (TYPE OF CABINET)
- PROPOSED SPAN WIRE
- XX EXISTING SPAN WIRE
- RIGHT-OF-WAY OR PROPERTY LINE
- (P) SERVICE PEDESTAL
- PROPOSED GROUND ROD
- PROPOSED TAR REPEATER
- DIRECTION FOR LOWERING POLE

GENERAL REPEATER NOTES

1. CONTRACTOR SHALL INSTALL NEW 44' DELDOT SUPPLIED TAR WHIP ANTENNA ON A MODIFIED TYPE III POLE BASE USING DELDOT SUPPLIED ANCHOR BOLTS (SEE TAR REPEATER CONSTRUCTION DETAILS).
2. CONTRACTOR SHALL AUGER A 10 IN. DIAMETER X 40.5 FT DEEP SHAFT FOR GROUND ROD INSTALLATION. GROUND ROD SHALL NOT BE MORE THAN 5' FROM EDGE OF REPEATER FOUNDATION.
3. DELDOT SHALL INSTALL TAR TRANSMISSION EQUIPMENT AND PERFORM FINAL TUNING.
4. ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET SCREWS, BOLTS, AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
5. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT TRAFFIC IMMEDIATELY BEFORE CONSTRUCTION.
6. ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC - DOVER, DELAWARE.

RECOMMENDED _____ DATE: 6.28.12
RECOMMENDED _____ DATE: _____
RECOMMENDED _____ DATE: 7/6/12
APPROVED TRAFFIC ENGINEER _____ DATE: 7/11/12
APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER _____ DATE: 7/11/12

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

SCALE 0 30 60 90 FEET

CONTRACT	T201304701
COUNTY	SUSSEX
PERMIT NO.	SWTMC08
DESIGNED BY:	SM
CHECKED BY:	JCR

WTMC REPEATER PLAN
US 13 (SUSSEX HWY) @
SR 404 (SEASHORE HWY)

SHEET NO.	1
TOTAL SHTS.	1

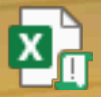
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\\RKAVV2010\2010\10028.DELDOT_ITS\TASK 5 - REPEATER SITE DESIGNS\CADD-PLANS\S103 - US 13 @ SR 404.DGN

APPENDIX Z

M60 Timesheet Training

Note: Timesheet Template and Timesheet Notes are attached.

DelDOT
Delaware Department of Transportation



Timesheet Template v3.1.xlsm



Timesheet Notes v3.1.xlsx

Timesheet Training

Version 3.1 Update

March 2022

WRA

Outline

- Engineering Calcs & Revision Package
  - Current Timesheet / Timings
  - Field Info – Speed Limits, Grades, Crosswalks
  - Turning Paths (W & D) for Red Clearance Calcs
- DelDOT Timesheets for Controller Entry
  - Siemens m60 Series Advanced Traffic Controller
  - Intersection Information and Notes
  - Basic Timing Parameters
  - Preempt & Priority Operation
  - Flashing Red Arrow
- Signal Timing Quick Introduction
  - CMS Analysis
  - MAX Timers

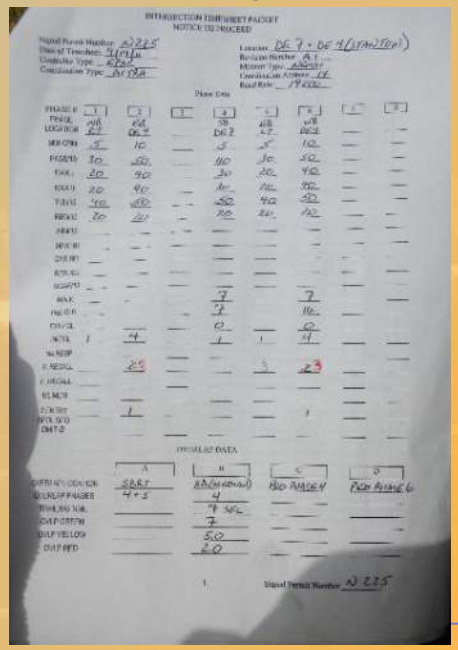


Field Work



- Approach Grades
  - Measure maximum approach downgrade within AASHTO stopping sight distance
  - Only downgrades should be used in yellow interval calculation

- Speed Limit Sign Photos
  - Clear photos showing all approach speed limit sign with location context
  - Photograph the closest sign to the intersection (still on approach)
  - If no sign is posted, typically assume 25 MPH (50 MPH on some unposted rural roads)



- Crosswalk Distances
  - Measure the distance from truncated domes to truncated domes for each crosswalk (or edge of curb if no domes)

- Existing Timings
  - via TMC
    - Existing timesheet (EOPS or scan)
    - Vehicle/Ped basic data from Tactics (if possible)

Timesheet Calculations

SIGNAL TIMESHEET CALCULATIONS

Signal Permit Number:	N999	On System?	☑ Yes ☐ No
Location:	DE 99 @ Main St		
Performed by:	A. Designer	Date:	10/1/2019
Checked by:	A. Manager	Date:	10/5/2019

Major Street Left-Turn Phases	Ø 1 WB L	Ø 5 EB L
Existing Yellow Time (if applicable)	4.0 sec	4.0 sec
YEL/10	60	60
W = intersection width to conflict point (ft), clearing vehicle	83 ft	90 ft
D = conflict distance (ft), entering vehicle	57 ft	51 ft
Red Time (Calculated) R = W/(1.47*20) - 0.283*SQRT(D)	0.7 sec	1.0 sec
Red Time (Implemented)	2.0 sec	2.0 sec
RED/10	20	20

Major Street Through Phases	Ø 2 EB	Ø 6 WB
Existing Yellow Time (if applicable)	6.0 sec	6.0 sec
Approach speed limit (mph)	55 mph	55 mph
Approach Grade (+ for upgrade; - for downgrade)	0.0 %	-1.3 %
Yellow Time (Calculated) Y = 1.2 + V/2(a±Gg) V = Speed Limit + 7	5.3 sec	5.4 sec
Yellow Time (Implemented)	6.0 sec	6.0 sec
YEL/10	60	60
W = intersection width to conflict point (ft), clearing vehicle	78 ft	66 ft
D = conflict distance (ft), entering vehicle	29 ft	38 ft
10th-Percentile Speed (mph) *If W is left-turn path, enter "L"*	47 mph	47 mph
Red Time (Calculated) R = W/(1.47*S_{10}) - 0.283*SQRT(D)	-0.4 sec	-0.8 sec
Red Time (Implemented)	2.0 sec	2.0 sec
RED/10	20	20

Minor Street Left-Turn Phases	Ø	Ø
Existing Yellow Time (if applicable)	sec	sec
YEL/10		
W = intersection width to conflict point (ft), clearing vehicle	ft	ft
D = conflict distance (ft), entering vehicle	ft	ft
Red Time (Calculated) R = W/(1.47*20) - 0.283*SQRT(D)		
Red Time (Implemented)		
RED/10		

Minor Street Through Phases	Ø 3 NB	Ø 4 SB
Existing Yellow Time (if applicable)	4.0 sec	5.0 sec
Approach speed limit (mph)	25 mph	50 mph
Approach Grade (+ for upgrade; - for downgrade)	-3.6 %	0.0 %
Yellow Time (Calculated) Y = 1.2 + V/2(a±Gg) V = Speed Limit + 7	3.5 sec	4.9 sec
Yellow Time (Implemented)	4.0 sec	5.0 sec
YEL/10	40	50
W = intersection width to conflict point (ft), clearing vehicle	117 ft	98 ft
D = conflict distance (ft), entering vehicle	49 ft	51 ft
10th-Percentile Speed (mph) *If W is left-turn path, enter "L"*	25 mph	L 20 mph
Red Time (Calculated) R = W/(1.47*S_{10}) - 0.283*SQRT(D)	1.2 sec	1.3 sec
Red Time (Implemented)	2.0 sec	2.0 sec
RED/10	20	20

- Signal permit number
- On system: yes
- Location: "official" DelDOT signal name, typically from existing timesheet and typically not changed
- Your name and the reviewer's name

- Phase numbers and movements of each active phase
- Existing yellow times: of the existing *movement* (i.e., if phasing is changing)
- Approach speed limits
- Approach grade: Input to nearest 0.1 if negative, 0 if positive (positive grades can be entered but will not impact calculated yellow times
- W and D for each phase (indicate if W is a left-turn)

Timesheet Calculations

DelDOT

SIGNAL TIMESHEET CALCULATIONS

Signal Permit Number: K999 On System? ☑ Yes ☐ No

Location: DE 99 @ Main St

Passage Time and Volume Density Calculations	Ø 2	EB	Ø 6	WB
Distace from loop detector to stop line		ft		ft
Approach speed limit (mph)				
Passage Time (calculated)				
PASS/10				
MIN GRN (Minimum Green Time) *Input value to calculate MAX INI/AINI*		sec		sec
Max. vehicles (L=20') queued between stop line and loop detector				
MAX INI (Maximum Initial Green Time)				
Veh served by MIN GRN				
Remaining number of vehicles to be served				
AINI/10 (Added Initial Green Time)				

Ped Clearance Times Calculations	Ø 2	EB	Ø 6	WB
Ped Crosswalk Length (measured from curb to curb)		60 ft		61 ft
Ped walking speed (Typ. = 3.5 ft/sec)		3.5 ft/sec		3.5 ft/sec
Yellow Change Interval		5.0 sec		5.0 sec
Red Clearance Interval		2.0 sec		2.0 sec
EXT PCL - Fl. Don't Walk ends at: begin Y (0), end AR (1), end Y (2)		0		0
WALK Time		7 sec		7 sec
Pedestrian Clearance Time Required (dist/speed)		18 sec		18 sec

	Ø 3	NB	Ø 4	SB
Ped Crosswalk Length (measured from curb to curb)		ft		75 ft
Ped walking speed (Typ. = 3.5 ft/sec)				3.5 ft/sec
Yellow Change Interval				5.0 sec
Red Clearance Interval				2.0 sec
EXT PCL - Fl. Don't Walk ends at: begin Y (0), end AR (1), end Y (2)				0
WALK Time				7 sec
Pedestrian Clearance Time Required (dist/speed)				22 sec

Notes:

Ped clearance (PED CLR) for major-street movements reduced by duration of yellow and all-red intervals;
Ø2 PED CLR = 18 sec - 7 sec (yellow + red) = 11 sec; Ø6 PED CLR = 18 sec - 7 sec (yellow + red) = 11 sec

Ped clearance (PED CLR) for minor-street movements reduced by duration of yellow and all-red intervals;
Ø4 PED CLR = 22 sec - 7 sec (yellow + red) = 15 sec

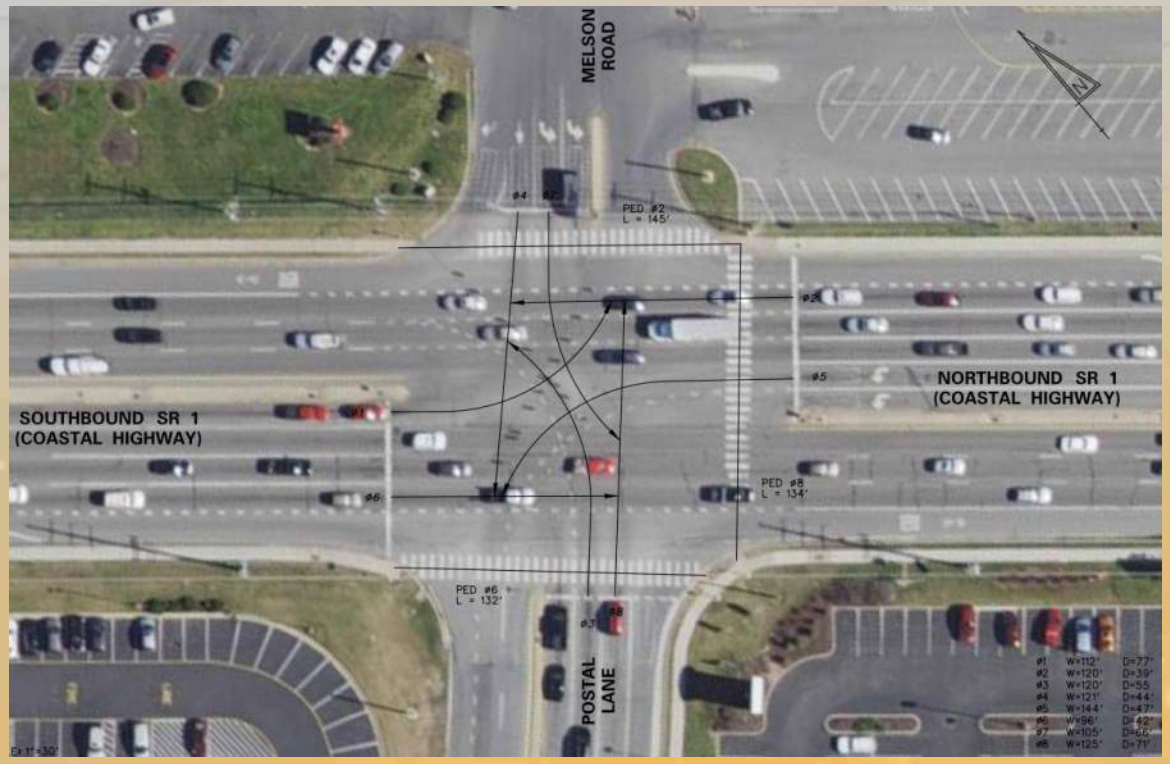
Timesheet Entry

Phase Number	1	2	3	4	5	6	7	8
Movement	WB L	EB	NB	SB	EB L	WB		
YEL/10	50	50	40	50	50	50		
RED/10	20	20	20	20	20	20		
WALK		7		7		7		
PED CLR		11		15		11		

Page 2 of 2

- Passage Time used for new signals only (input distance from passage loop to stop line)
- Volume Density calculations not used
- Field-measured crosswalk distances
- EXT PCL codes (extended ped clear)
  - 0 = countdown ends at end of Green/beginning of Yellow (Most countdown ped signals, except some in City of Newark)
  - 1 = countdown ends at end of All Red/beginning of next Green (Rare)
  - 2 = countdown ends at end of Yellow/beginning of All Red (Non-countdown ped signals)

W and D



Driver's eye visualization > of W & D



- For each phase, find the worst-case (highest R) combination of:
  - W – phase that is ending
  - D – possible conflicting movement
- Suggestion for organization – W (clearing path) shown with arrow; D (conflicting path) not
- Calculate all-red time

$$R = W\frac{W}{1.47 * S_{10}} - 0.283\sqrt{D}$$

- Consider any conflicting phase that could follow (typically, any phase can be skipped except ø2 and ø6)
- Plot the diagram to PDF and paste a screenshot to the "W and D" sheet

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Speed Limit Photo Sheet

SPEED LIMIT PHOTOS

Permit Number: N999 **Signal Name:** DE 99 @ Main St



EB DE 99 (phase 2) north of 2nd St
(about 0.1 miles west of Main St)



WB DE 99 (phase 6) north of South Ave
(about 1.3 miles east of Main St)

NB Main St (phase 3)
No Speed Limit sign



SB Main St (phase 4) west of DE 12
(about 0.5 miles north of DE 99)

COMPLETE FOR ALL PHASES

Phase	Speed Limit Sign Present?	Road Name	Location	Distance from Signal (miles, to nearest 0.1)
	Yes	DE 99	north of 2nd St	0.1
	Yes	DE 99	north of South Ave	1.3
	No	Main St		
	Yes	Main St	west of DE 12	0.5

Resize photos to fit in large center cell.
Photos should show the speed limit clearly and provide some context to the sign's location.
To keep file size down, screenshot the speed limit photos rather than inserting the files here.

- Provide documentation of current posted speed limits on all approaches used to calculate yellow and red intervals
- When there is no approach speed limit posted, typically assume 25 MPH (neighborhoods, driveways, parking lots, downtown areas, some ramps)
- Use engineering judgement for higher-speed off-ramps (consider advisory speed) and unposted rural roads (state law – 50 MPH)

MAX Timers

N999 - DE 99 @ Main St

Count Date: Tuesday, February 11, 2020

Main St

PM	385	43	158
MID	99	25	104
AM	189	9	122
	R	T	L

	AM	MID	PM
R	222	124	185
T	812	375	610
L	10	34	77
	L	T	R

DE 99 (left) | DE 99 (right)

L	210	130	432
T	732	499	822
R	19	56	101
	PM	MID	AM

L	12	8	18	AM
R	49	20	36	MID
	71	41	64	PM

Shops

LANE CONFIGURATION

	L Only	L/T	T Only	T/R	R Only	L/T/R	L/R	"X" if rights are to be excluded
NB						1		
SB	1	1		1				
EB	2		2		1			X
WB	1		2		1			X

PHASING

	L Only	Thru	Split	Bikes	Excl. Ped	Dummy
NB			3			
SB			4			
EB	5	2				
WB	1	6				

"CYCLE LENGTH"

191 seconds

18.84816754 "cycles" per hour

Phase	Min Green	Yellow	All Red	Volume	Lane Factor	Critical Volume	Vehicles per "Cycle"	Green Required	Ex. Max Timer	New Max Timer
1	5	5	2	77	1.00	77	4	12	20	15
2	15	5	2	822	0.55	452	24	54	99	55
3	5	4	2	176	1.00	176	9	23	20	25
4	5	4	2	385	1.00	385	20	47	40	50
5	5	5	2	432	0.55	238	13	30	20	35
6	15	5	2	812	0.55	447	24	53	99	55
7										
8										
								Total:	205	191

NOTES:

- ONE OPTION to check max timers (or provide a CMS file)
- MAX timers used for “free” operation, operation during signal errors, and coordination-type force-offs
- Represent the maximum green time a phase can have
- Steps for engineering:
  - Input peak hour volumes
  - Note lane configuration
    - Exclude rights if they have a dedicated turn lane, and especially if they are channelized ***ENGINEERING JUDGEMENT***
  - Establish signal phasing
  - Input minimum green times and existing max timers (from existing timesheet)
  - Adjust “cycle length” to match total (active feedback provided)
- More information available starting on slide 22

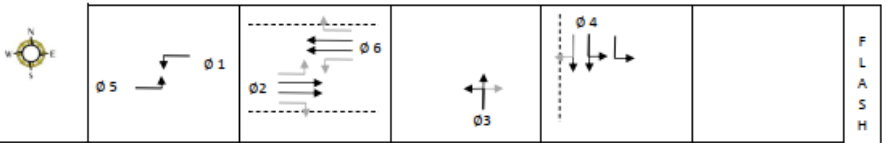
Sequence of Operations

Sequence of Operation Chart

Delaware Department of Transportation
Transportation Management Center

Permit No.: K999
Timesheet Rev: B.1

Intersection: DE 99 @ Main St



Phase	1+5				2+6				3				4								FLASH
Signal # \ Int	1	2	3		4	5	6	7	8	9	10		11	12	13	14					
1,3	R/<G-	R/<Y-	R		G	G	Y	R	R	R	R		R	R	R	R					Y
3,4	R	R	R		G	G	Y	R	R	R	R		R	R	R	R					Y
5	R	R	R		R	R	R	R	G/<G-	Y/<Y-	R		R	R	R	R					R
6	R	R	R		R	R	R	R	G	Y	R		R	R	R	R					R
7	R	R	R		R	R	R	R	R	R	R		<G-	<G-	<Y-	R					R
8	R	R	R		R	R	R	R	R	R	R		G/<G-	G/<G-	Y/<Y-	R					R
9	R	R	R		R	R	R	R	R	R	R		G	G	Y	R					R
10,11,12,13	DW	DW	DW		W	FDW	DW	DW	DW	DW	DW		DW	DW	DW	DW					OFF
14,15	DW	DW	DW		DW	DW	DW	DW	DW	DW	DW		W	FDW	DW	DW					OFF

Legend:	
R	RED
Y	YELLOW
G	GREEN
DW	DON'T WALK
W	WALK
F	FLASHING
←	ARROW

Notes:

	SIGNAL HEAD INDICATIONS						
Signal No.:	1,3	2,4,6,9	5,8	7	10,11,12,13, 14,15		
Total:	2	4	2	1	6		
Signal Head Type:							
Notes: Optically limited, tunnel visor, louvers, etc.							
Lens / Symbol:	12" Lenses	12" Lenses	12" Lenses	12" Lenses	9" Symbol		

PREPARED BY: _____ DATE: _____

CHECKED BY: _____ DATE: _____

EMERGENCY PREEMPTION	
PREEMPT 1	PHASE 2+6
PREEMPT 2	PHASE 2+6
PREEMPT 3	PHASE 3
PREEMPT 4	PHASE 4

Version: October 2021

Page 1 of 1

- Details exactly how the signal progresses through a cycle, light by light
- Can leave for reviewer/TMC to complete if unsure
- Create the arrow diagram of signal phasing
  - Black = protected, gray = permissive/flashing
  - Dashed lines are pedestrian phases
  - Show correct number of lanes/lane configuration
- Assign each signal head a number
  - Follow signal plan
  - Include pedestrian heads as well
- Progress through each light sequence
  - Green → Yellow → Red
  - Walk → Flashing Don't Walk → Don't Walk
- Assign colors for flash operation
  - Yellow for main street thru
  - Red for side street and main street lefts
  - Off for peds
- Indicate type of signal head for each number
- List preemption phasing (see later slide)

Cover Page

INTERSECTION TIMESHEET COVER PAGE

INTERSECTION:	DE 99 @ MAIN ST	REVISION:	B.1
PERMIT NUMBER:	K999	PROJECT NUMBER:	T202000401

SUMMARY OF OPERATION

CONTROLLER TYPE:	☑	m60	☐	m50	☐	m40/300-SERIES	☐	OTHER:	
EXISTING SIGNAL TYPE:	FULL COLOR					CONVERSION TO:	NO CHANGE		
MODE OF OPERATION:	COORDINATED					COORDINATION ZONE:	K032		
COORD. MODE:	YIELD	MAX. MODE:	MAX 2	CORR. MODE:	SW	OFFSET MODE:	BEG. GRN	FORCE MODE:	PLAN

☐	5-SECTION LEFT TURN	☑	PED SIGNALS	☑	COUNTDOWNS
☑	PROTECTED-ONLY LEFT TURN	☐	EXCLUSIVE PED	☐	TWO-STAGE PED
☐	FLASHING YELLOW/RED ARROW	☐	LEADING PED INTERVAL		
☐	LAGGING LEFT TURN	☐	DYNAMIC ADVANCE WARNING FLASHER		
☐	YELLOW TRAP MODIFIED	☑	PREEMPT	☐	SPECIAL PREEMPT (R/R TIE-IN)
☑	SPLIT PHASING	☐	SPECIAL RING STRUCTURE		

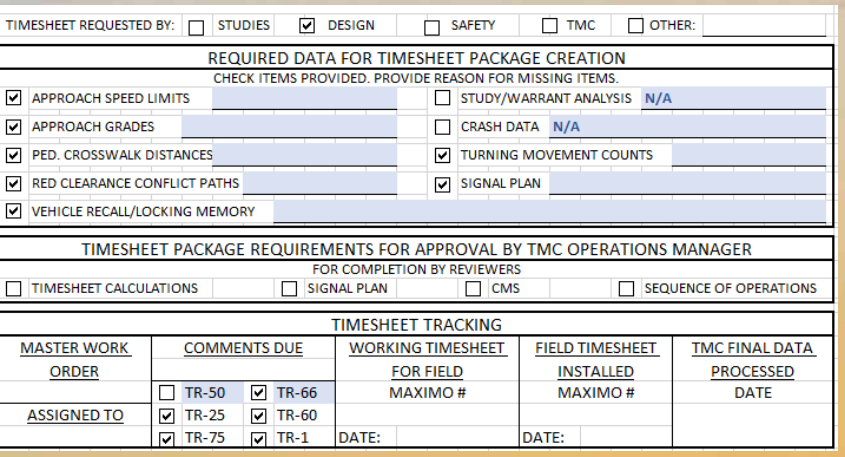
PROJECT NOTES

1	INSTALL EPAC CONTROLLER M60 VERSION 3.58f+
2	ADD PED PHASE 4
3	YELLOW TIME CHANGE PHASES 1, 2, 4, 5 & 6 TO 5.0 SECONDS
4	PLACE PHASES 1, 3, 4 & 5 TO NON-LOCKING
5	ADJUST PREEMPT
6	
7	
8	
9	

*** BLUE = User Input

- Revision: Increase **letter** when making **operational** changes (add/remove phase/ped, convert to m60), increase **number** when making **timing** changes (update yellows/reds/ped times)
  - Letter and number CANNOT both increase
- Project Number: Applies if conversion is done as part of a design contract (i.e. T202012345)
- Controller Type: Specify which controller model will be in the cabinet after completion (field-check or EOPS)
- Existing Signal: Type of signal currently
- Conversion to: Signal type after completion (“No Change” typically)
- Mode of Operation:
  - Coordinated = runs patterns 24/7
  - Coordinated & Free = some combination of the two
  - Free 24/7 = never runs patterns
- Coordination Zone: https://tmc.deldot.gov/datamap/ or ask TMC if unsure
  - Existing signals: “Signal Patterns” level → Click on signal of interest → Group
- Coordination Settings: How the signal operates in various situations
  - Typically copy from existing settings → Ask TMC/reviewer if unsure
  - Preferences: Coordination = Yield, Max. = Max 2 (Max 1 if Free), Correction = SW, Offset = Beg. Grn
- Check all applicable signal characteristics
  - Yellow Trap Modified: for 5-section left turns and FRA (both directions) – check DelDOT guidance for additional situations
- Project Notes: describe the changes in the revision package, used more like a “checklist” of things for the installer to edit or adjust (see notes list)

Cover Page



TIMESHEET REQUESTED BY: ☐ STUDIES ☑ DESIGN ☐ SAFETY ☐ TMC ☐ OTHER:

REQUIRED DATA FOR TIMESHEET PACKAGE CREATION

CHECK ITEMS PROVIDED. PROVIDE REASON FOR MISSING ITEMS.

☑ APPROACH SPEED LIMITS		☐ STUDY/WARRANT ANALYSIS	N/A
☑ APPROACH GRADES		☐ CRASH DATA	N/A
☑ PED. CROSSWALK DISTANCES		☑ TURNING MOVEMENT COUNTS	
☑ RED CLEARANCE CONFLICT PATHS		☑ SIGNAL PLAN	
☑ VEHICLE RECALL/LOCKING MEMORY			

TIMESHEET PACKAGE REQUIREMENTS FOR APPROVAL BY TMC OPERATIONS MANAGER

FOR COMPLETION BY REVIEWERS

☐ TIMESHEET CALCULATIONS ☐ SIGNAL PLAN ☐ CMS ☐ SEQUENCE OF OPERATIONS

TIMESHEET TRACKING

MASTER WORK ORDER	COMMENTS DUE		WORKING TIMESHEET FOR FIELD	FIELD TIMESHEET INSTALLED	TMC FINAL DATA PROCESSED
	☐ TR-50	☑ TR-66	MAXIMO #	MAXIMO #	DATE
ASSIGNED TO	☑ TR-25	☑ TR-60			
	☑ TR-75	☑ TR-1	DATE:	DATE:	

- Timesheet Requested by: Indicate section whose work requires the new timesheet
- Required Data: Check all items that have been done, give a reason why anything hasn't or doesn't need to be done
  - Speed limits, grades, and red clearance paths should always be done
  - Crosswalk distance must be done unless there are no crosswalks
  - Can ignore Vehicle Recall/Locking Memory if unsure(reviewer and TMC will address)
- Timesheet Package Requirements: Do not complete; will be completed by reviewer
- Timesheet Tracking: who will review this timesheet?
  - TR-50 = New Castle signals
  - TR-66 = Kent/Sussex signals
  - The remaining 4 are always included

RSA | WF, HAWKs

FLASHING SIGNAL AHEAD SIGNS - 6/19/2017

The circuit is designed to flash the "Signal Ahead" signs at a programmed time before the beginning of Yellow and continue to flash into the green also at a programmed time. The circuit is activated by the Yellow of Main Street, held by the red of Main Street. The Main Street colors are controlled by the Trailing Green Overlaps. The Yellow and Red of phases 2 & 6 apply a ground to the OFF DELAY timer, starting the circuit. The timer applies a ground to the SCR to activate the flasher. When phases 2 & 6 go Green, the timer turns off after a programmed time, ending the circuit. The circuit is fed from a separate breaker in the cabinet, and the SCR's and flashers are self-contained in the circuit to eliminate any interference with the signal operation.

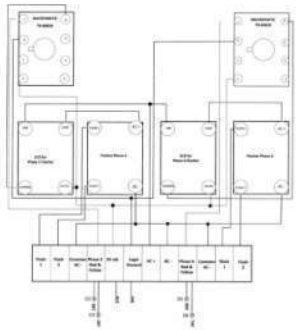
The following adjustments have been made in the signal cabinet:

Phase 2:
- Green (is actually unused in the field)
- Yellow (24V) is wired to the OFF DELAY timer input (activation trigger)
- RED (24) is wired to the OFF DELAY timer input (activation trigger)

Overlap A (phase 2 trailing overlap):
- Green is wired to the green display in the field
- Yellow is wired to SCR phase-2 110V output
  - Field connection to signal display via phase-2 SCR 110V side
- Red is wired to SCR phase-2 110VAC output
  - Field connection to signal display via phase-2 SCR 110V side

Phase 6:
- Green (is actually unused in the field)
- Yellow (24V) is wired to the OFF DELAY timer input (activation trigger)
- RED (24) is wired to the OFF DELAY timer input (activation trigger)

Overlap C (phase 6 trailing overlap):
- Green is wired to the green display in the field
- Yellow is wired to SCR phase-6 110V output
  - Field connection to signal display via phase-2 SCR 110V side
- Red is wired to SCR phase-6 110VAC output
  - Field connection to signal display via phase-2 SCR 110V side



Delaware PED HAWK Signal - Sequence of Operation (rev C.2)

Signal Display	Ped Display	Summary of Sequence
Dark Until Activated	Don't Walk	- Main Street display is dark, and is controlled by phase 1 & 5 Walk Interval - Signal display rests in Phase 1 walk for one direction (no signal display) - Signal display rests in Phase 5 walk for one direction (no signal display) - Pedestrian Signal phase 2 rests in Don't Walk (associated to Phase 1) - Pedestrian Signal phase 6 rests in Don't Walk (associated to Phase 5)
Flashing Yellow	Don't Walk	- Flashing Yellow is activated by ped call placed from a preempt input (phase 2 and 6 calls are placed at the same time). The flashing yellow interval is set by phase 1 & 5 pedestrian clearance interval and must equal the yellow clearance for the through movement (phase 1 & 5 yellow clearance) - Phase 1 & 5 are programmed to minimum vehicle recall and pedestrian recall
Steady Yellow	Don't Walk	- Solid Yellow is controlled by phase 1 & 5 yellow clearance value. This value is calculated using standard engineering practices. Phase 1 & 5 shall not clear through the yellow / red intervals.
Steady Red	Don't Walk	- The Left Head Red is activated by phase 1 red and the Right Head Red is activated by phase 2 red (one combination of displays for one direction) - The Left Head Red is activated by phase 5 red and the Right Head Red is activated by phase 6 red (one combination of displays for one direction)
Steady Red	Walk	- Phase 2 walk activates pedestrian display - Phase 6 walk activates pedestrian display
Alternating Flash Red	Ped Clear	- Phase 2 & 6 pedestrian clearance interval begins - The solid red displays begin to flash in wig/wag operation - The wig/wag is accomplished through the EPAC controller. Load Switches for phases 1, 2, 5, & 6 are programmed to alternatively flash red output. - The wig/wag flash continues through the yellow interval for phase 2 & 6.
Alternating Flash Red	Don't Walk	- The wig/wag flash continues through the red intervals for phase 2 & 6. - The pedestrian display is solid red - don't walk display
Dark Again	Don't Walk	- Return to beginning of sequence.

Notes:
- Main Street dark indication is controlled by phase 1 & 5 Walk interval
- Signal will cycle upon power activation
- Signal Monitor Unit will monitor all indications
- Signal will flash yellow in fault mode (ped displays will be dark)

Delaware FIRE HAWK Signal - Sequence of Operation (rev A.2)

Signal Display	Summary of Sequence
Dark Until Activated	- Main Street display is dark, and is controlled by phase 1 & 5 Walk Interval - Signal display rests in Phase 1 walk for one direction (no signal display) ACT Rest in Walk - Signal display rests in Phase 5 walk for one direction (no signal display) ACT Rest in Walk - Pedestrian Signal phase 2 rests in Don't Walk (associated to Phase 1) is not displayed - Pedestrian Signal phase 6 rests in Don't Walk (associated to Phase 5) is not displayed
Flashing Yellow Upon Activation	- Flashing Yellow is activated by ped call placed from a preempt input (phase 2 and 6 calls are placed at the same time). The flashing yellow interval is set by phase 1 & 5 pedestrian clearance interval and must equal the yellow clearance for the through movement (phase 1 & 5 yellow clearance) - Phase 1 & 5 are programmed to minimum vehicle recall and pedestrian recall - Phase 1 & 5 are programmed for "Actuated rest in Walk"
Steady Yellow	- Solid Yellow is controlled by phase 1 & 5 yellow clearance value. This value is calculated using standard engineering practices. Phase 1 & 5 shall not clear through the yellow / red intervals.
Steady Red	- The Left Head Red is activated by phase 1 red and the Right Head Red is activated by phase 2 red (one combination of displays for one direction) - The Left Head Red is activated by phase 5 red and the Right Head Red is activated by phase 6 red (one combination of displays for one direction) - Minimum 1 second of solid red due to phase 2 & 6 walk time
Alternating Flashing Red	- Phase 2 & 6 pedestrian clearance interval begins - The solid red displays begin to flash in wig/wag operation - The wig/wag is accomplished through the EPAC controller. Load Switches for phases 1, 2, 5, & 6 are programmed to alternatively flash red output. - The wig/wag flash continues through the yellow & red intervals for phase 2 & 6.
Dark Until Activated	- Return to beginning of sequence.

Notes:
- Main Street dark indication is controlled by phase 1 & 5 Walk interval
- Signal will cycle upon power activation
- Signal Monitor Unit will monitor all indications
- Signal will flash yellow in fault mode

Sheets hidden by default. Will print if needed by TMC.

Intersection Info

INTERSECTION TIMESHEET PACKET
NOTICE TO PROCEED

Intersection Info:	
Location:	DE 99 @ MAIN ST
Timesheet Date:	10/1/2019
Signal Permit #:	N999
Timesheet Revision #:	8.1
Controller Type:	EPAC
Controller Model:	m60 3.58f +
Monitor:	NEMA +

System Communication Info:			
ADDRESS:			
BAUD RATE:			
IP Addressing:			
DHCP:	0		
NET:	1		
IP ADDRESS:			
SUBNET MSK:	255.255.255.224		
NETWORK CONFIG:			
TYPE:	1		
DESTINATION:	0.0.0.0		
GATEWAY:			
NETMASK:	255.255.255.224		
SPAT ADDRESSING:			
	DESTINATION IP:	DST PORT:	ENABLED:
01:		1034	0

Signal Permit Number: N999

- Signal information auto-populated from the timesheet calculations sheet
- Reach out to TMC for System Communications info. If unable to, TMC can complete

Phase Data

Phase Data - Bank 1								
DO NOT USE - UNDER CONSTRUCTION								
☐ OK TO USE								
INITIAL, DATE & TIME								
VEHICLE DATA								
VEHICLE TIMES								
PHASE	1	2	3	4	5	6	7	8
DIRECTION	WB	EB	NB	SB	EB	WB		
LOCATION	LT	DE 99	SHOP	MAIN ST	LT	DE 99		
MIN GRN	5	15	5	5	5	15	0	0
PASS/10	40	50	40	40	40	50	0	0
MAX 1	15	60	25	45	35	60	0	0
MAX 2	15	60	20	45	35	60	0	0
YEL/10	60	60	40	50	60	60	0	0
RED/10	20	20	20	20	20	20	0	0
RECALLS +								
VEH RCL	0	2	0	0	0	2	0	0
VEH DLY	0	0	0	0	0	0	0	0
BIKE & AWS TIMES +								
BGRN/10	0	0	0	0	0	0	0	0
BPAS/10	0	0	0	0	0	0	0	0
GDLY/10	0	0	0	0	0	0	0	0
YDLY/10	0	0	0	0	0	0	0	0
DENSITY TIMES +								
AINI/10	0	0	0	0	0	0	0	0
MAX INI	0	0	0	0	0	0	0	0
TIM BEF	0	0	0	0	0	0	0	0
CAR BEF	0	0	0	0	0	0	0	0
TIME TO	0	0	0	0	0	0	0	0
MGAP/10	0	0	0	0	0	0	0	0

- *****ALL UNUSED PHASES MUST HAVE ALL ZEROS HERE**
- DO NOT USE/OK TO USE: For TMC use only
- Phase/Direction/Location:
  - Help clarify which movements are assigned to which phases
  - Use LT or RT for turn phases
  - Use route number for the thru movement, if applicable (**DE, not SR**)
  - Use road name (if it doesn't fit, use a clear abbreviation)
  - Business names for signalized entrances are acceptable
- MIN GRN (Minimum Green): Typically 15 for major street thru phases, 5 otherwise
- PASS/10 (Passage): Copy from existing timesheet (for new signals: left turns = 30, side streets = 40, main thru phases comes from calculation on Timesheet Calcs tab)
- MAX 1 & 2: Copy from existing timesheet unless "Max Timer Calcs" sheet shows updated max green times are warranted
- VEH RCL (Vehicle Recall Mode): Copy from existing timesheet
  - 2 = Min, 3 = Max
  - Major street thrus typically in Min recall

Phase Data

PEDESTRIAN DATA								
PED TIMES +								
WALK 1	0	7	7	0	0	0	0	0
PED CLR 1	0	7	26	0	0	0	0	0
PED RECALL +								
PED RCL	0	0	0	0	0	0	0	0
PED DLY	0	0	0	0	0	0	0	0
PED OFFSET +								
WOFF/10	0	0	0	0	0	0	0	0
MODE *	0	0	0	0	0	0	0	0
MISC PED OPTIONS +								
*FL WK	0	0	0	0	0	0	0	0
**EXT PCL	0	0	0	0	0	0	0	0
*ACT RIW	0	0	0	0	0	0	0	0
INIT & NA RESP +								
INITIAL	1	4	1	1	1	4	0	0
NA RESP	0	1	0	0	0	0	0	0
N. LOCK & MISC +								
NL MEM	1	0	0	0	1	0	0	0
2 ENTRY	0	1	0	0	0	1	0	0
SPEC. SEQUENCE +								
OMIT	2	0	0	0	6	0	0	0
-YEL	0	0	0	0	0	0	0	0
OCAL	4	0	0	0	4	0	0	0
						Signal Permit Number:		N999

- *****ALL UNUSED PHASES MUST HAVE ALL ZEROS HERE**
- PED RCL (Ped Recall Mode): Copy from existing timesheet, usually 0
- WOFF/10 (Walk Offset): Time for a leading ped interval (used only for LPI)
- INITIAL (Initialization):
  - 4 = green, major street thru phases
  - 1 = red, all other phases used
  - 0 = not initialized, unused phases
  - Copy from existing timesheet
- NL MEM (Non-Locking Memory):
  - Usually set all used phases to 1 (TRUE) except coordinated phases (initial = 4)
  - If video detection is used, all used phases must be 0 (FALSE)
- 2 ENTRY (Dual Entry):
  - Copy from existing timesheet – 0 = FALSE, 1 = TRUE
- SPEC. SEQUENCE: Only when both directions have pm+pt or FRA left-turn phasing
  - OMIT: opposing coordinated phase
  - OCAL: side street phase that gets a “soft” call

Unit Data

UNIT DATA

OVERLAP DATA

OVERLAP LOCATION:	A	PHASE 1 FRA	B	PHASE 2 PED	C	PHASE 5 BIKE FYA	D	PHASE 3 PED
	E		F		G		H	

OVERLAP A: 2- FYA/FRA

DELAY/10: 150

PHASE	1	2	3	4	5	6	7	8
PERM PHASES:	0	1	0	0	0	0	0	0
PROT PHASES:	1	0	0	0	0	0	0	0
-PED PHASES:	0	0	0	0	0	0	0	0
OVERLAP	A	B	C	D	E	F	G	H
PERM OVERLAPS:	0	0	0	0	0	0	0	0
PROT OVERLAPS:	0	0	0	0	0	0	0	0

OVERLAP B: 0 - NOT ASSIGNED

OVERLAP C: 2- FYA/FRA

DELAY/10: 0

PHASE	1	2	3	4	5	6	7	8
PERM PHASES:	0	0	0	0	0	1	0	0
PROT PHASES:	0	0	0	0	1	0	0	0
-PED PHASES:	0	0	0	0	0	0	0	0
OVERLAP	A	B	C	D	E	F	G	H
PERM OVERLAPS:	0	0	0	0	0	0	0	0
PROT OVERLAPS:	0	0	0	0	0	0	0	0

OVERLAP D: 0 - NOT ASSIGNED

FLASHING LEFT -TURN NOTES (AS NEEDED)

1	LT IS FLASHING RED ARROW LEFT TURN OPERATION
2	LT HAS A 15-SECOND DELAY PRIOR TO FLASHING
3	LT IS MONITORED ON BOTH SCR 1 AND OVLP A SCR
4	LT (BIKE) IS FLASHING YELLOW BIKE SIGNAL
5	LT (BIKE) HAS A 0-SECOND DELAY PRIOR TO FLASHING
6	LT (BIKE) IS MONITORED ON BOTH SCR 5 AND OVLP C SCR

RING STRUCTURE

CONTROLLER	RING	NXT PHASE	CONCUR PHASE	1	2	3	4	5	6	7	8
PHASE 1			STANDARD	☐	☐	☐	☐	☐	☐	☐	☐
PHASE 2				☐	☐	☐	☐	☐	☐	☐	☐
PHASE 3				☐	☐	☐	☐	☐	☐	☐	☐
PHASE 4				☐	☐	☐	☐	☐	☐	☐	☐
PHASE 5				☐	☐	☐	☐	☐	☐	☐	☐
PHASE 6				☐	☐	☐	☐	☐	☐	☐	☐
PHASE 7				☐	☐	☐	☐	☐	☐	☐	☐
PHASE 8				☐	☐	☐	☐	☐	☐	☐	☐

Signal Permit Number: N999

***** OVERLAP BOXES CHANGE BASED ON INPUTS IN "OVERLAP LOCATION"**

***** IF MORE THAN 4 OVERLAPS NEEDED, DISCUSS WITH TMC / REVIEWERS**

- FRA *must* be placed on Overlap A/C, if applicable
  - DELAY/10: solid red arrow time before flashing begins
    - usually 150 for FRA's, 0 for FYA's
  - Include "BIKE" in label if it is a bike FYA
  - "PERM PHASES": when arrow flashes
  - "PROT PHASES" : when arrow is solid green
- Ped phases *should* be placed as follows:
  - ø2 on Overlap A
  - ø4 on Overlap B
  - ø6 on Overlap C
  - ø8 on Overlap D
  - Ped phases do not get assigned overlap information
- Vehicle phase overlaps (i.e. signalized right turn) *may* be placed on any available overlap
  - Overlap location is the movement where the overlap is placed (i.e. NB RT)
  - TRL GRN is used for trailing overlaps (i.e. 7-second trailing) – 0 otherwise
  - YEL/10 and RED/10 should match the last phase where the overlap is active
- If A-D are filled, use unused phases (via notes). Overlaps E-H are last resort.

Unit Data

UNIT DATA

OVERLAP DATA

OVERLAP LOCATION:	A	PHASE 1 FRA	B	PHASE 2 PED	C	PHASE 5 BIKE FYA	D	PHASE 3 PED
	E		F		G		H	

OVERLAP A: 2- FYA/FRA

DELAY/10: 150

PHASE	1	2	3	4	5	6	7	8
PERM PHASES:	0	1	0	0	0	0	0	0
PROT PHASES:	1	0	0	0	0	0	0	0
-PED PHASES:	0	0	0	0	0	0	0	0
OVERLAP	A	B	C	D	E	F	G	H
PERM OVERLAPS:	0	0	0	0	0	0	0	0
PROT OVERLAPS:	0	0	0	0	0	0	0	0

OVERLAP B: 0 - NOT ASSIGNED

OVERLAP C: 2- FYA/FRA

DELAY/10: 0

PHASE	1	2	3	4	5	6	7	8
PERM PHASES:	0	0	0	0	0	1	0	0
PROT PHASES:	0	0	0	0	1	0	0	0
-PED PHASES:	0	0	0	0	0	0	0	0
OVERLAP	A	B	C	D	E	F	G	H
PERM OVERLAPS:	0	0	0	0	0	0	0	0
PROT OVERLAPS:	0	0	0	0	0	0	0	0

OVERLAP D: 0 - NOT ASSIGNED

FLASHING LEFT -TURN NOTES (AS NEEDED)

1	LT IS FLASHING RED ARROW LEFT TURN OPERATION
2	LT HAS A 15-SECOND DELAY PRIOR TO FLASHING
3	LT IS MONITORED ON BOTH SCR 1 AND OVLP A SCR
4	LT (BIKE) IS FLASHING YELLOW BIKE SIGNAL
5	LT (BIKE) HAS A 0-SECOND DELAY PRIOR TO FLASHING
6	LT (BIKE) IS MONITORED ON BOTH SCR 5 AND OVLP C SCR

RING STRUCTURE

CONTROLLER	RING	NXT PHASE	CONCUR PHASE	1	2	3	4	5	6	7	8
PHASE 1			STANDARD	☐	☐	☐	☐	☐	☐	☐	☐
PHASE 2				☐	☐	☐	☐	☐	☐	☐	☐
PHASE 3				☐	☐	☐	☐	☐	☐	☐	☐
PHASE 4				☐	☐	☐	☐	☐	☐	☐	☐
PHASE 5				☐	☐	☐	☐	☐	☐	☐	☐
PHASE 6				☐	☐	☐	☐	☐	☐	☐	☐
PHASE 7				☐	☐	☐	☐	☐	☐	☐	☐
PHASE 8				☐	☐	☐	☐	☐	☐	☐	☐

Signal Permit Number: N999

- Flashing Left Turn Notes:
  - Input time of day restrictions as needed in blue-shaded entry box
- Ring Structure:
  - "STANDARD" in most cases
  - "PED HAWK" or "FIRE HAWK" when a HAWK signal
  - "NON-STANDARD" when not following standard NEMA phasing
    - Complete "Ring" and "Nxt Phase" columns
    - Check appropriate boxes

m50/m60 Preempt and Priority

m60 PREEMPT DATA PAGE

PREEMPT OVERIDES

	PREEMPT 1	PREEMPT 2	PREEMPT 3	PREEMPT 4	PREEMPT 5	PREEMPT 6
OV FLASH	0	0	0	0		
OV PE+1	0	0	0	0		
OV PRI	0	0	0	0		

PREEMPT MISCELLANEOUS

	PREEMPT 1	PREEMPT 2	PREEMPT 3	PREEMPT 4	PREEMPT 5	PREEMPT 6
TEST	0	0	0	0		
DET	248	249	250	251		
DELAY	0	0	0	0		
MXCAL	0	0	0	0		
DB/10	0	0	0	0		
NON-LOCK	1	1	1	1		
EXTND	0	0	0	0		
LOCK OUT	1	1	1	1		
SRMOD	1	1	0	0		
LINK#	0	0	0	0		
DURAT	0	0	0	0		
GATE	0	0	0	0		
R2C	0	0	0	0		
PREEMPT EXIT PHASE	1 2 3 4 X X 5 6 7 8	1 2 3 4 X X 5 6 7 8	1 2 3 4 X 5 6 7 8	1 2 3 4 X X 5 6 7 8	1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8

PREEMPT INTERVAL TIMES

	PREEMPT 1	PREEMPT 2	PREEMPT 3	PREEMPT 4	PREEMPT 5	PREEMPT 6
MIN GRN	5	5	5	5		
MIN WALK	0	0	0	0		
DWELL GRN	10	10	5	5		
EXT PED	0	0	0	0		
SELECT PED CLR	26	26	26	26		
SELECT YEL/10	60	60	60	60		
SELECT RED/10	20	20	20	20		
TRACK GRN						
TRACK PED CLR						
TRACK YEL/10	60	60	60	60		
TRACK RED/10	20	20	20	20		
RETURN PED CLR						
RETURN YEL/10	60	60	60	60		
RETURN RED/10	20	20	20	20		

PREEMPT VEHICLE STATUS

	PREEMPT 1	PREEMPT 2	PREEMPT 3	PREEMPT 4	PREEMPT 5	PREEMPT 6
TRACK GRN						
DWELL	1 2 3 4 X X 5 6 7 8	1 2 3 4 X X 5 6 7 8	1 2 3 4 X 5 6 7 8	1 2 3 4 X 5 6 7 8	1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8
CYCLE						

PREEMPT PEDESTRIAN STATUS **NOT USED**

PREEMPT OVERLAP STATUS

	PREEMPT 1	PREEMPT 2	PREEMPT 3	PREEMPT 4	PREEMPT 5	PREEMPT 6
TRACK STATUS						
DWELL STATUS	A = 0 B = 0 C = 0 D = 0	A = 0 B = 0 C = 0 D = 0	A = 0 B = 0 C = 0 D = 0	A = 0 B = 0 C = 0 D = 0		
CYCLE STATUS						
TRAIL						

Signal Permit Number: N999

- Preempt = High Priority (emergency vehicles)
  Priority = Low Priority (transit vehicles)
- Opticom detector triggered by vehicle and signal transitions to service that phase (“DWELL”)
- Once preempt/priority call is released, controller will “exit” to service next phase (“EXIT PHASE”)
- Assigning Exit Phases:
  - ø2/ø6, ø1/ø6, ø2/ø5 exits to ø2/ø6
  - ø3/ø8, ø4/ø7 exits to ø4/ø8
  - ø4/ø8, ø4 exits to first phases in cycle
  - ø3 exits to ø4

m50/m60 Preempt and Priority

m60 PREEMPT DATA PAGE

PREEMPT OVERIDES

	PREEMPT 1	PREEMPT 2	PREEMPT 3	PREEMPT 4	PREEMPT 5	PREEMPT 6
OV FLASH	0	0	0	0		
OV PE+1	0	0	0	0		
OV PRI	0	0	0	0		

PREEMPT MISCELLANEOUS

	PREEMPT 1	PREEMPT 2	PREEMPT 3	PREEMPT 4	PREEMPT 5	PREEMPT 6
TEST	0	0	0	0		
DET	248	249	250	251		
DELAY	0	0	0	0		
MXCAL	0	0	0	0		
DB/10	0	0	0	0		
NON-LOCK	1	1	1	1		
EXTND	0	0	0	0		
LOCK OUT	1	1	1	1		
SRMOD	1	1	0	0		
LINK#	0	0	0	0		
DURAT	0	0	0	0		
GATE	0	0	0	0		
R2C	0	0	0	0		
PREEMPT EXIT	1 [2] 3 4	1 [2] 3 4	1 2 3 [4]	[1] 2 3 4	1 2 3 4	1 2 3 4
PHASE	X X 5 [6] 7 8	X X 5 [6] 7 8	X 5 6 7 8	X X 5 6 7 8	5 6 7 8	5 6 7 8

PREEMPT INTERVAL TIMES

	PREEMPT 1	PREEMPT 2	PREEMPT 3	PREEMPT 4	PREEMPT 5	PREEMPT 6
MIN GRN	5	5	5	5		
MIN WALK	0	0	0	0		
DWELL GRN	10	10	5	5		
EXT PED	0	0	0	0		
SELECT PED CLR	26	26	26	26		
SELECT YEL/10	60	60	60	60		
SELECT RED/10	20	20	20	20		
TRACK GRN						
TRACK PED CLR						
TRACK YEL/10	60	60	60	60		
TRACK RED/10	20	20	20	20		
RETURN PED CLR						
RETURN YEL/10	60	60	60	60		
RETURN RED/10	20	20	20	20		

PREEMPT VEHICLE STATUS

	PREEMPT 1	PREEMPT 2	PREEMPT 3	PREEMPT 4	PREEMPT 5	PREEMPT 6
TRACK GRN						
DWELL	1 [2] 3 4	1 [2] 3 4	1 2 [3] 4	1 2 3 [4]	1 2 3 4	1 2 3 4
	X X 5 [6] 7 8	X X 5 [6] 7 8	X 5 6 7 8	X 5 6 7 8	5 6 7 8	5 6 7 8
CYCLE						

PREEMPT PEDESTRIAN STATUS **NOT USED**

PREEMPT OVERLAP STATUS

	PREEMPT 1	PREEMPT 2	PREEMPT 3	PREEMPT 4	PREEMPT 5	PREEMPT 6
TRACK STATUS						
DWELL STATUS	A = 0 B = 0 C = 0 D = 0	A = 0 B = 0 C = 0 D = 0	A = 0 B = 0 C = 0 D = 0	A = 0 B = 0 C = 0 D = 0		
CYCLE STATUS						
TRAIL						

Signal Permit Number: N999

- Assigning Preempts ("DWELL") –
  - Preempt 1:
    - ø1 & ø6 (if ø1 is Prot-Only)
    - ø2 & ø6 (if ø1 is Prot/Perm, FRA, Omitted)
  - Preempt 2:
    - ø2 & ø5 (if ø5 is Prot-Only)
    - ø2 & ø6 (if ø5 is Prot/Perm, FRA, Omitted)
  - Preempt 3:
    - ø3 & ø8 (if ø3 is Prot-Only)
    - ø4 & ø8 (if ø3 is Prot/Perm, FRA, Omitted)
    - ø3 (if Split Phased)
  - Preempt 4:
    - ø4 & ø7 (if ø7 is Prot-Only)
    - ø4 & ø8 (if ø7 is Prot/Perm, FRA, Omitted)
    - ø4 (if Split Phased)

m50/m60 Priority Data Page

m60 PRIORITY PREEMPT DATA PAGE

PRIORITY DETECTION **NOT USED**

PRIORITY SERVICE

	PREEMPT 1	PREEMPT 2	PREEMPT 3	PREEMPT 4	PREEMPT 5	PREEMPT 6
CO-PHASE (PHASES FOR PRIORITY)	1 **2** 3 4 X X 5 **6** 7 8	1 **2** 3 4 X X 5 **6** 7 8	1 2 **3** 4 X 5 6 7 8	1 2 3 **4** X 5 6 7 8	1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8
EXCL	1	1	1	1		
MIN WALK +	0	0	0	0		
MIN GRN	5	5	5	5		
MAX GRN	255	255	255	255		
N-LOUT	1	1	1	1		
LOUT A	1	1	1	1		
LOUT B	1	1	1	1		

PRIORITY TRANSIT SIGNAL **NOT USED**

PRIORITY LEVEL / MISC +

	PRIORITY 1	PRIORITY 2	PRIORITY 3	PRIORITY 4	PRIORITY 5	PRIORITY 6
LEVEL	2	2	2	2		

PRIORITY PARTIAL DATA + **NOT USED**

PRIORITY FULL DATA +

	PRIORITY 1	PRIORITY 2	PRIORITY 3	PRIORITY 4	PRIORITY 5	PRIORITY 6
FP WAIT	0	0	0	0		
FPW LVL	1	1	1	1		
FPW OVR	0	0	0	0		
FRC FUL	1	1	1	1		
PHS OMIT	**1** **2** **3** **4** **5** **6** **7** **8**	**1** **2** **3** **4** **5** **6** **7** **8**	**1** **2** **3** **4** **5** **6** **7** **8**	**1** **2** **3** 4 **5** **6** **7** **8**	1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8

PRIORITY RECOVERY +

	PRIORITY 1	PRIORITY 2	PRIORITY 3	PRIORITY 4	PRIORITY 5	PRIORITY 6
METHOD	2	2	2	2		
RETURN	1	1	1	1		
PED WAIT	0	0	0	0		
PED OVR	0	0	0	0		
RECOVERY PHASES	1 **2** 3 4 5 **6** 7 8	1 **2** 3 4 5 **6** 7 8	1 **2** 3 4 5 **6** 7 8	1 **2** 3 4 5 **6** 7 8	1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8

PRIORITY QUEUE MONITOR + **NOT USED**

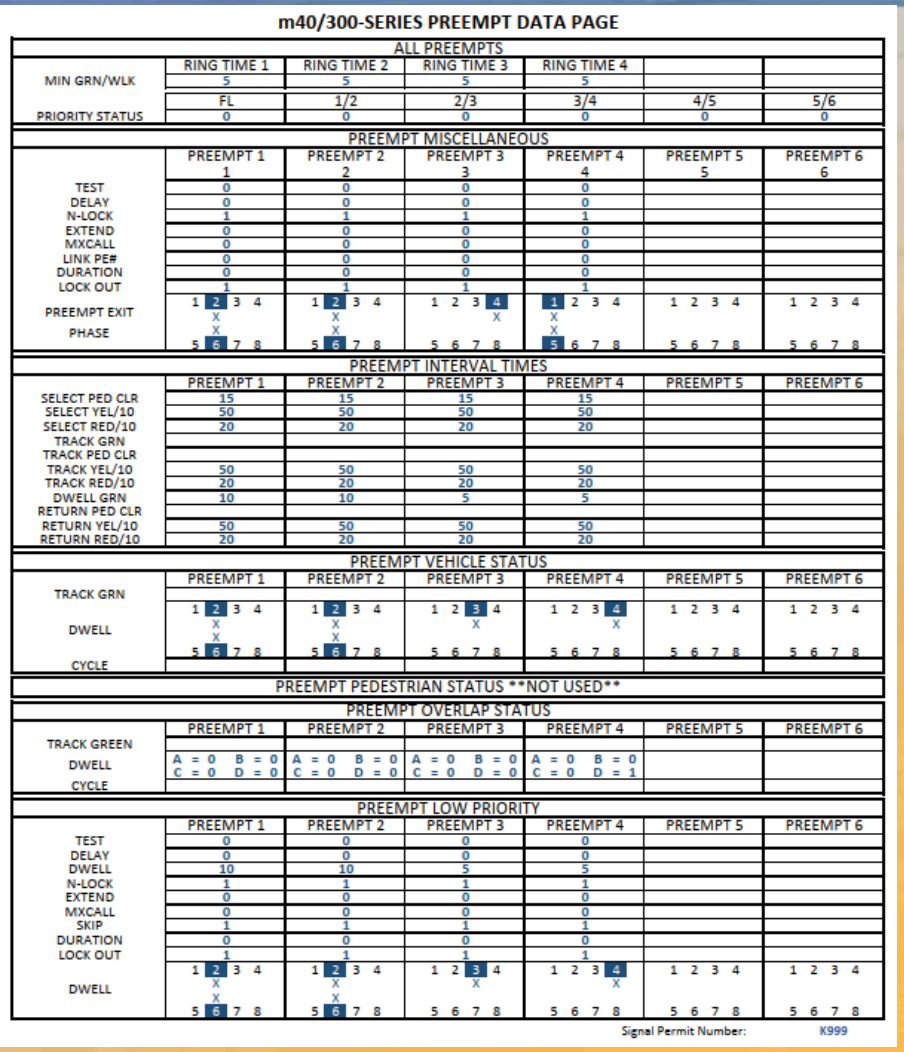
PRIORITY DATA BANK COPY **NOT USED**

PRIORITY SEL DATA BANK (SET TO 1)

Signal Permit Number: N999

- CO-PHASE:
  - The same as Preempt Vehicle "DWELL" except turn phases are not considered
  - i.e. ø2/ø6 on Preempt 1 instead of ø1/ø6
- PHS OMIT: the exact opposite of CO-PHASE (auto-populated)
- RECOVERY PHASES: always the coordinated phases (auto-populated)

m40/300-Series Priority Data Page



m40/300-SERIES PREEMPT DATA PAGE

ALL PREEMPTS

	RING TIME 1	RING TIME 2	RING TIME 3	RING TIME 4		
MIN GRN/WLK	5	5	5	5		
	FL	1/2	2/3	3/4	4/5	5/6
PRIORITY STATUS	0	0	0	0	0	0

PREEMPT MISCELLANEOUS

	PREEMPT 1	PREEMPT 2	PREEMPT 3	PREEMPT 4	PREEMPT 5	PREEMPT 6
	1	2	3	4	5	6
TEST	0	0	0	0		
DELAY	0	0	0	0		
N-LOCK	1	1	1	1		
EXTEND	0	0	0	0		
MXCALL	0	0	0	0		
LINK PE#	0	0	0	0		
DURATION	0	0	0	0		
LOCK OUT	1	1	1	1		
PREEMPT EXIT	1 [2] 3 4	1 [2] 3 4	1 2 3 [4]	[1] 2 3 4	1 2 3 4	1 2 3 4
	X	X	X	X		
PHASE	X	X		X		
	5 [6] 7 8	5 [6] 7 8	5 6 7 8	[5] 6 7 8	5 6 7 8	5 6 7 8

PREEMPT INTERVAL TIMES

	PREEMPT 1	PREEMPT 2	PREEMPT 3	PREEMPT 4	PREEMPT 5	PREEMPT 6
SELECT PED CLR	15	15	15	15		
SELECT YEL/10	50	50	50	50		
SELECT RED/10	20	20	20	20		
TRACK GRN						
TRACK PED CLR						
TRACK YEL/10	50	50	50	50		
TRACK RED/10	20	20	20	20		
DWELL GRN	10	10	5	5		
RETURN PED CLR						
RETURN YEL/10	50	50	50	50		
RETURN RED/10	20	20	20	20		

PREEMPT VEHICLE STATUS

	PREEMPT 1	PREEMPT 2	PREEMPT 3	PREEMPT 4	PREEMPT 5	PREEMPT 6
TRACK GRN						
DWELL	1 [2] 3 4	1 [2] 3 4	1 2 [3] 4	1 2 3 [4]	1 2 3 4	1 2 3 4
	X	X	X	X		
CYCLE	X	X				
	5 [6] 7 8	5 [6] 7 8	5 6 7 8	5 6 7 8	5 6 7 8	5 6 7 8

PREEMPT PEDESTRIAN STATUS **NOT USED**

PREEMPT OVERLAP STATUS

	PREEMPT 1	PREEMPT 2	PREEMPT 3	PREEMPT 4	PREEMPT 5	PREEMPT 6
TRACK GREEN						
DWELL	A = 0 B = 0	A = 0 B = 0	A = 0 B = 0	A = 0 B = 0		
	C = 0 D = 0	C = 0 D = 0	C = 0 D = 0	C = 0 D = 1		
CYCLE						

PREEMPT LOW PRIORITY

	PREEMPT 1	PREEMPT 2	PREEMPT 3	PREEMPT 4	PREEMPT 5	PREEMPT 6
TEST	0	0	0	0		
DELAY	0	0	0	0		
DWELL	10	10	5	5		
N-LOCK	1	1	1	1		
EXTEND	0	0	0	0		
MXCALL	0	0	0	0		
SKIP	1	1	1	1		
DURATION	0	0	0	0		
LOCK OUT	1	1	1	1		
DWELL	1 [2] 3 4	1 [2] 3 4	1 2 [3] 4	1 2 3 [4]	1 2 3 4	1 2 3 4
	X	X	X	X		
	X	X				
	5 [6] 7 8	5 [6] 7 8	5 6 7 8	5 6 7 8	5 6 7 8	5 6 7 8

Signal Permit Number: K999

- Included if m40/300-Series controller is used
- Sheet is hidden by default and is auto-populated using previous m60 sheets, so no need to fill it out
- Will be printed by TMC if needed

Intersection Notes

INTERSECTION NOTES

1	PHASES 1 & 5 ARE PROTECTED-PERMISSIVE (5-SECTION) LEFT TURNS
2	PEDS ARE COUNTDOWN DISPLAYS
3	YELLOW TRAP MODIFY: PHASE 1 OMITTED BY PHASE 2 GREEN; PHASE 5 OMITTED BY PHASE 6 GREEN
4	OCAL = 4 OCAL = 4
5	SYSTEM LOOPS
6	PREEMPT: TRANS (PRIORITY) = EB + WB, NB OR SB
7	EMERG (PREEMPT) = EB + WB, NB OR SB
8	
9	
10	
11	
12	
13	
14	
15	EPAC MUST BE m60 3.58f+

DESIGNED BY: **CHECKED BY:**

PRINT NAME PRINT NAME

RECOMMENDED BY:

PRINT NAME

SIGNATURE DATE

APPROVED BY:

GENE S DONALDSON

PRINT NAME

SIGNATURE DATE

CHIEF OF TRAFFIC ENGINEERING:

PETER HAAG, PE

PRINT NAME

SIGNATURE DATE

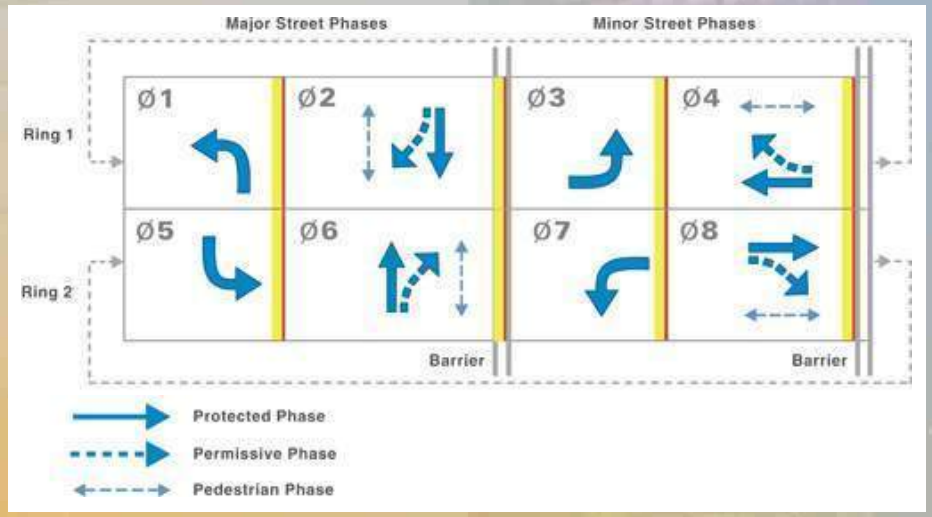
Signal Permit Number: K999

- Generally, this page describes characteristics of the signal operation/equipment or to reinforce/clarify non-standard settings
- Sets of commonly used notes are available in a separate excel file

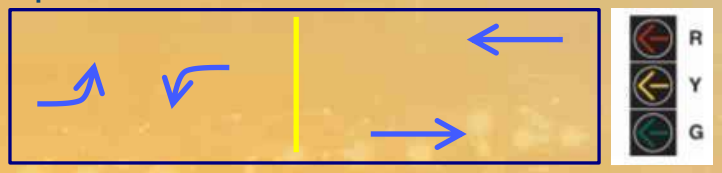
*****Do not complete the "Detector Page" sheet – it is the field sheet for the installer**

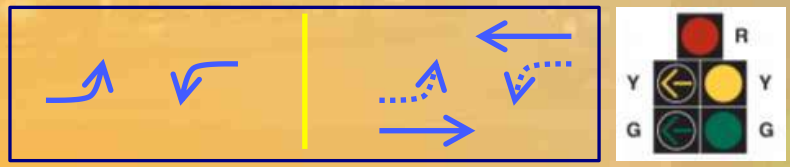
Signal Phasing Basics

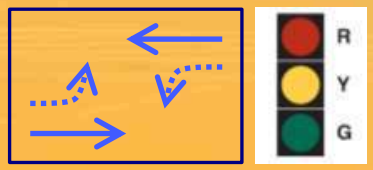
- National Electrical Manufacturers Association (NEMA) standard
  - Major street thrus – Ø2 & Ø6
  - DelDOT – Ø2 is NB or EB
  - Barriers separate major and minor street movements
  - Ped phases share a phase number with the nearest parallel thru phase

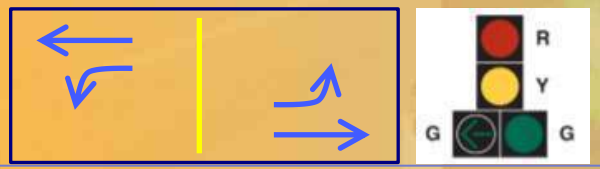


- Terminology:
  - Protected-only
  - Protected-permissive
  - Concurrent
  - Split

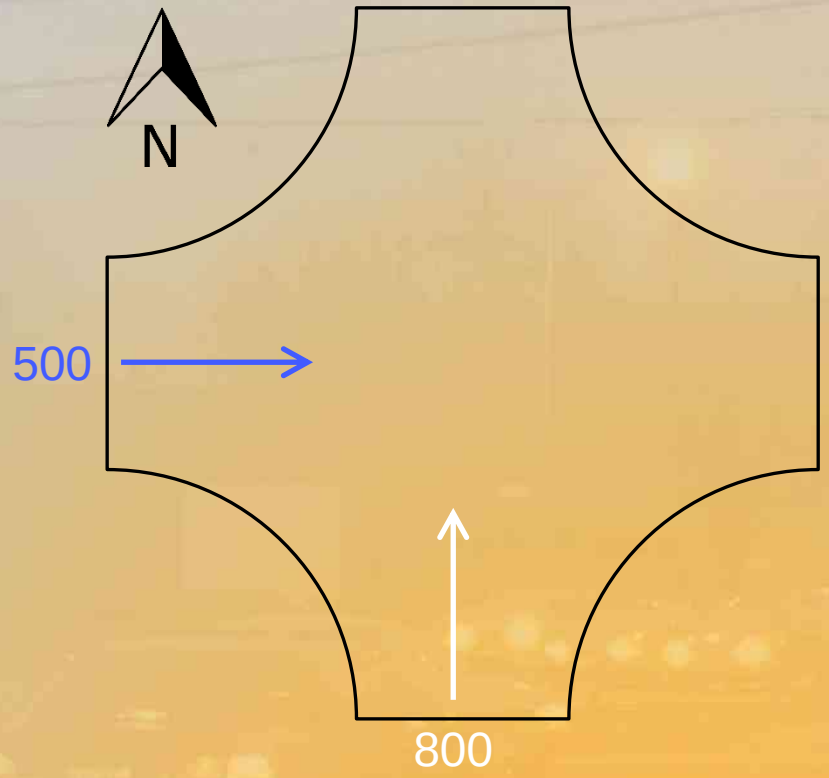








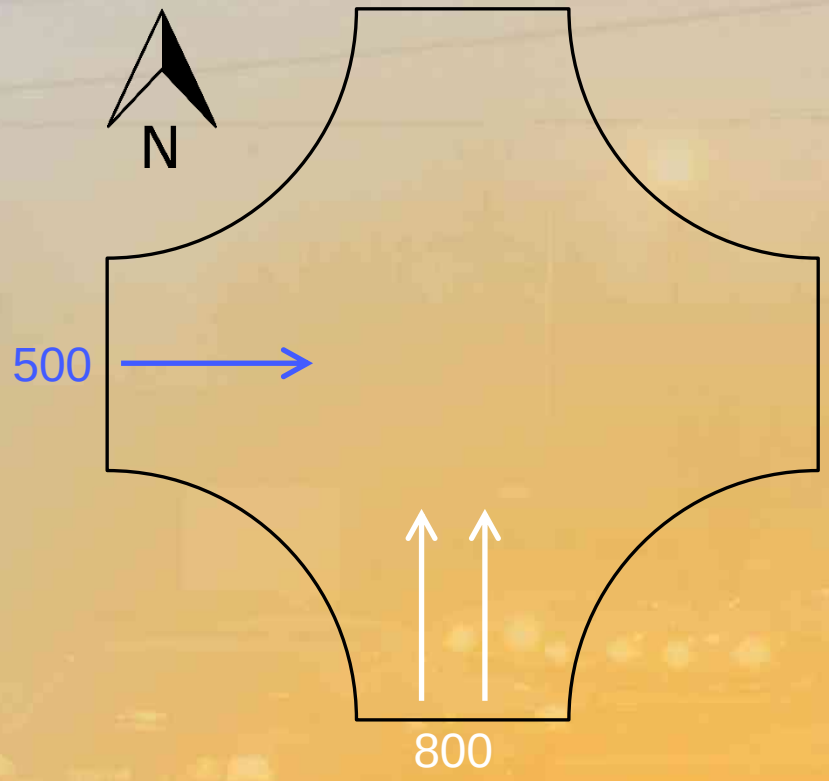
Critical Movement Summation



800 + 500 = **1,300**

- Use hour-long turning movement count data
- Also called Critical Lane Volume (CLV) analysis
- Determines how much conflicting volume must be “served” to clear the intersection
- Signal phasing, number of lanes and lane assignment all factor into the calculation

Critical Movement Summation



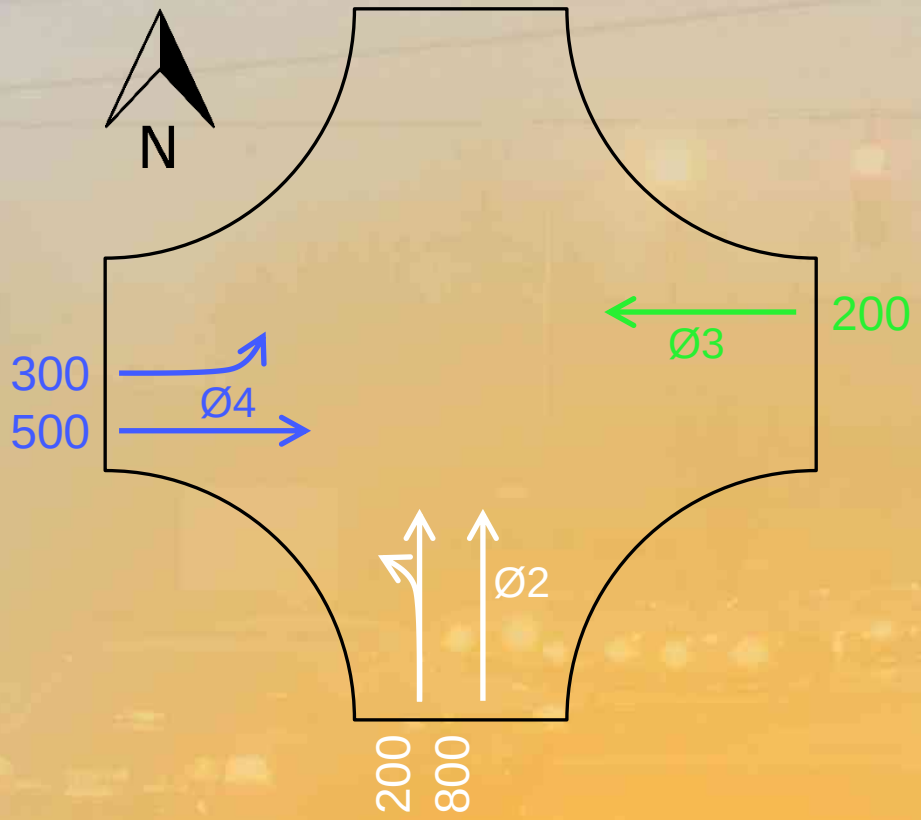
- If a movement has more than one lane provided, a lane factor is applied:

Lanes	Factor
1	1.00
2	0.55
3	0.40
4	0.30

- This accounts for slightly less-than-ideal lane usage (e.g., 55%/45% volume split in two lanes vs. even 50%/50% split)

800(0.55) + 500 = **940**

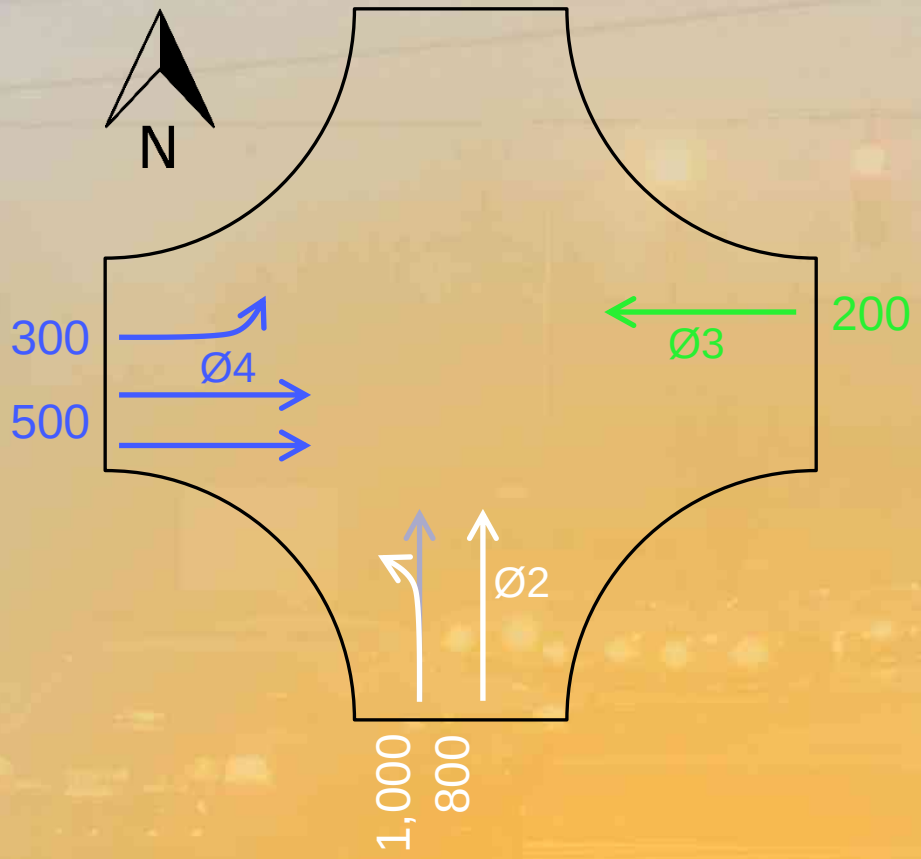
Critical Movement Summation



- Within a single phase:
  - If two movements share a lane, their volumes are added prior to applying a lane factor – motorists will typically occupy available lanes evenly **if possible**
  - If exclusive lanes are provided, only the **maximum lane volume** is included in the summation – these movements clear at the same time, so the critical volume is whichever movement takes the longest to clear

(800+200)(0.55) + 200 + 500 = **1,250**

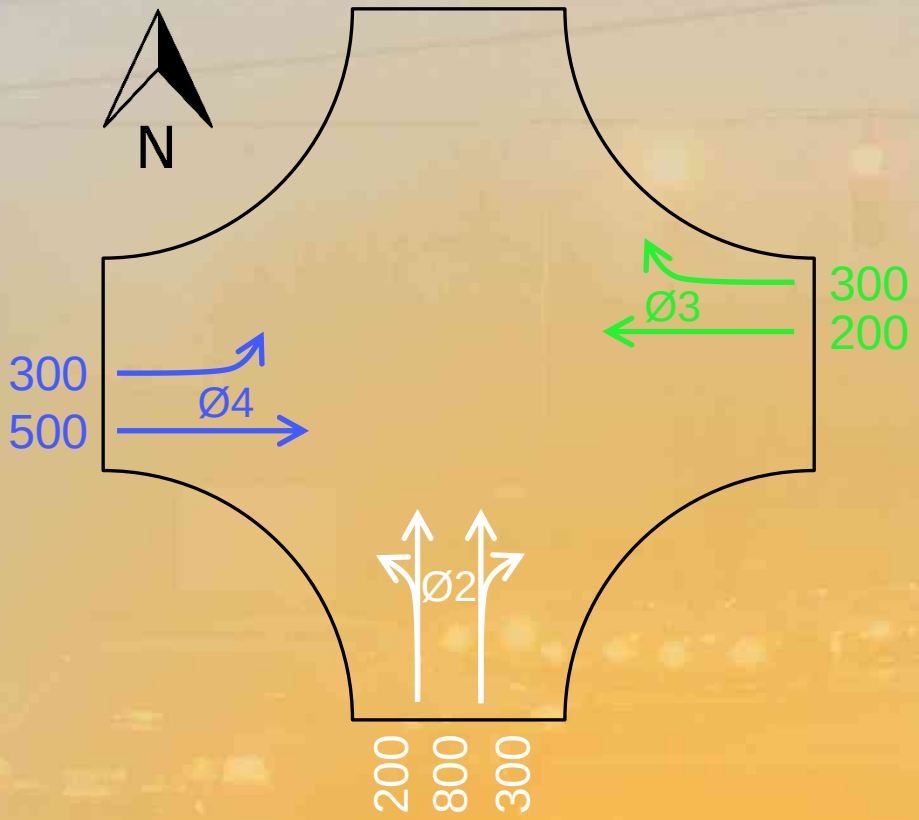
Critical Movement Summation



1,000 + 200 + 300 = **1,500**

- But…be aware:
  - A shared lane could be “filled” by one of the shared movements, where it effectively functions as an exclusive lane(s)
  - Make sure to apply lane factors prior to “comparing” different movements using the same phase

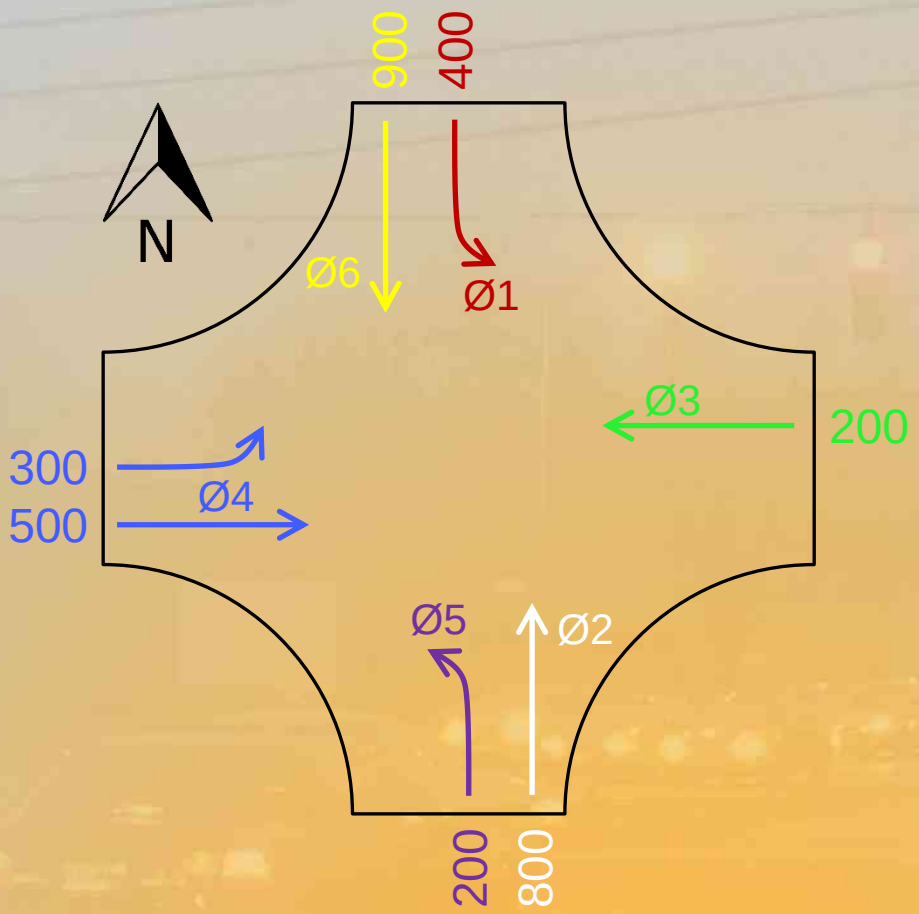
Critical Movement Summation



(800+200+300)(0.55) + 200 + 500 = **1,415**

- Right turns are included in the summation if they are in a shared lane
- Typically, right turns with an exclusive right-turn lane are excluded from the analysis
- Engineering judgement can be used in some scenarios to include all or part of a right-turn volume:
  - No Turn on Red restriction
  - Very short right-turn storage
  - Extremely high volume
  - Exclusive phase provided (or overlap phase)

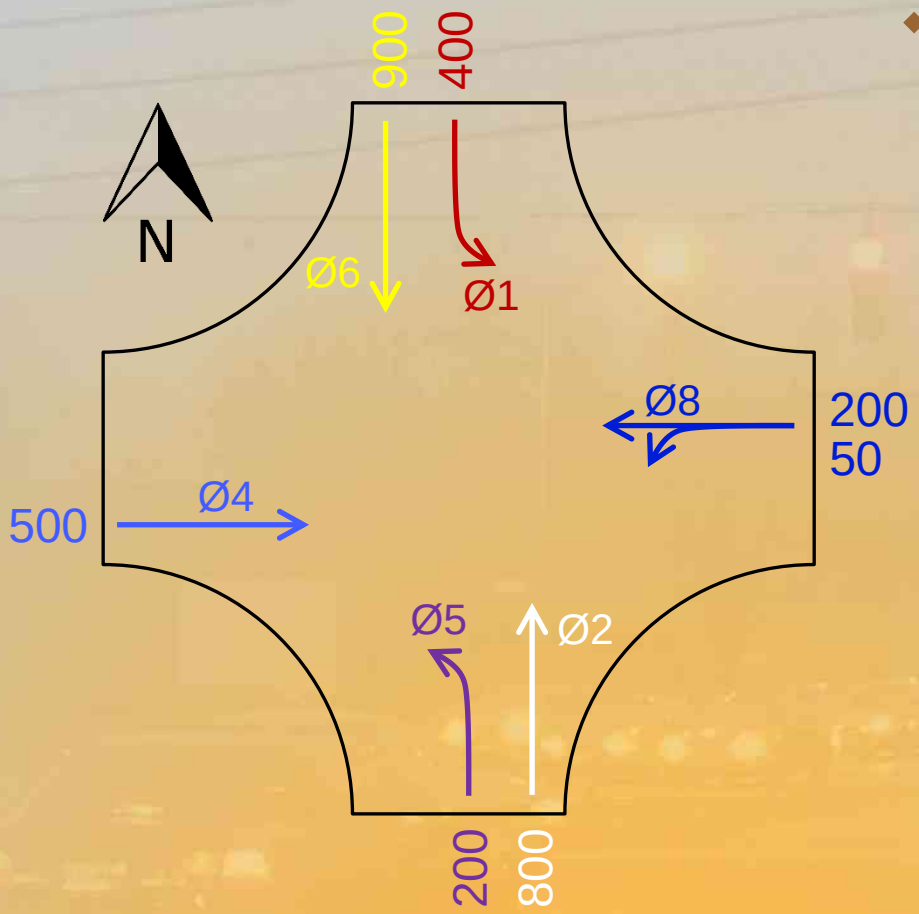
Critical Movement Summation



400 + 800 + 200 + 500 = **1,900**

- Typical major-street operation example:
  - Many movements can overlap/happen concurrently (e.g., NBL can go with SBL or NBT without being in conflict)
  - Two pairs of movements do conflict and typically occur sequentially:
    - NBL followed by SBT
    - SBL followed by NBT
  - Whichever phase "pair" has the largest critical volume are the "critical phases"
    - 200 + 900 = 1,100
    - **400 + 800 = 1,200**

Critical Movement Summation



400 + 800 + (500+50) = **1,750**

- Concurrent example:
  - When no (or only one) left-turn phases are provided, conflicting movements can operate within the same phase or concurrent phases
  - Standard practice is to add "opposing left" volume to the phase being analyzed
    - For example, EBT would clear followed by WBL yielding to the EBT
  - Shared lanes can introduce some uncertainty
    - Worst case would be all lane volume is "blocked" behind yielding lefts
    - Typically, bypassing is possible or left volume is low enough that blocking is uncommon

Using CMS in Practice

- Level of service (LOS) can be approximated based on total critical volume
  - Only recommended as a “ballpark” estimate (i.e., the intersection is likely below/near/over capacity)
  - Does not replicate/replace delay & LOS estimates from modeling software
- Knowing each phase’s critical volume as a percent of the intersection’s critical volume can help to assign phase split times as a percent of the full cycle length
  - Does not account for signal timing parameters (minimums, change/clearance intervals)
  - No way to pinpoint proper cycle length

LOS	Critical Movement Volume
A	Less than 1,000 veh/hr
B	1,000 to 1,150 veh/hr
C	1,151 to 1,300 veh/hr
D	1,301 to 1,450 veh/hr
E	1,451 to 1,600 veh/hr
F	More than 1,600 veh/hr

Using CMS in Practice

Typical cycle lengths to consider:
60, 75, 90, 100, 120, 150

Greenshields' Model

Timesheet Data

Cycle Length = 120 seconds
30 cycles per hour

Phase	Movement	Volume	Lane Factor	Critical Volume	Vehicles Per Cycle	Green Required	Min Green	Clearance (Y + R)	Total Split	Critical Movement
Foulk Rd										
1	SB L	116	1.00	116	4	12	5	5.0	17	
2	NB	456	0.55	251	8	21	10	7.0	28	
5	NB L	93	1.00	93	3	10	5	5.0	15	*
6	SB	666	0.55	366	12	29	10	7.0	36	*
Shipley Rd										
3	EB L	106	1.00	106	4	11	5	5.0	16	*
4	WB	491	1.00	491	16	38	5	6.0	44	*
7	WB L	20	1.00	20	1	5	5	5.0	11	
8	EB	407	1.00	407	14	32	5	6.0	38	
Totals				1056				23	111	

Analysis covered to this point

Relates volumes to signal timings

Required time to clear vehicles per above cycle length; Should be ≤ cycle

Using CMS in Practice

- Recommend split times for implementation based on CMS required splits

Phase	Movement	Total Split	Critical Movement	120" SB Foulk
1	SB L	17		17
2	NB	28		43
5	NB L	15	*	15
6	SB	36	*	45
3	EB L	16	*	16
4	WB	44	*	44
7	WB L	11		11
8	EB	38		49
Totals		111		120

  - Typically, assign time to critical phases first, then fill out rest of phases
  - In this example, “extra time” was all allocated to phase 6; phases 3, 4, and 5 were not given more than needed per CMS
  - Occasionally, protected/permissive phases are a good place to “cheat” time when assigning splits since some vehicles can turn on permissive
  - Also remember that unused minor phase split time is “returned” to coordinated phases (typically)
  - Make sure min times are covered!

Minimum Split Times

- All phases have minimum vehicular programmed split:
  - PH MIN VEH SERV = MIN GRN + YELLOW + ALL-RED + 1 (extra second for coordination purposes)
- Pedestrian phases have minimum service times:
  - Coordinated phase with ped phase
    - PH MIN PED SERV = WALK + PED CLR + YELLOW (if EXT PCL = 0) + ALL-RED + 1 (extra second for coordination purposes)
    - **Split times MUST cover ped phases for coordinated movements**
  - Minor phase with ped phase
    - PH MIN PED SERV = WALK + PED CLR + YELLOW (if EXT PCL = 0) + ALL-RED
    - Split times *do not need* to cover minor movement ped phases, but consideration for frequency of actuation/number of pedestrians served should be taken into account when deciding to cover or not cover a ped phase

Questions

Thank you!

Questions?

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