



# Construction Issues

## District Maintenance & Operations







Subdivision Streets, Drainage & Sidewalks



# UTILITY INFRASTRUCTURE

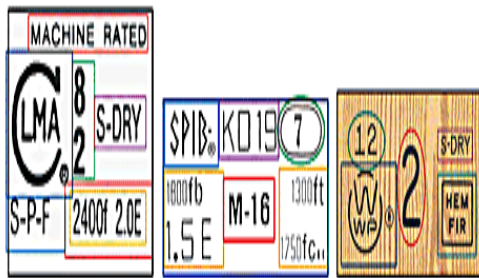


# ROAD RESTORATION AND ADA RAMPS

# Ways to Streamline the Process

## Early Submittal

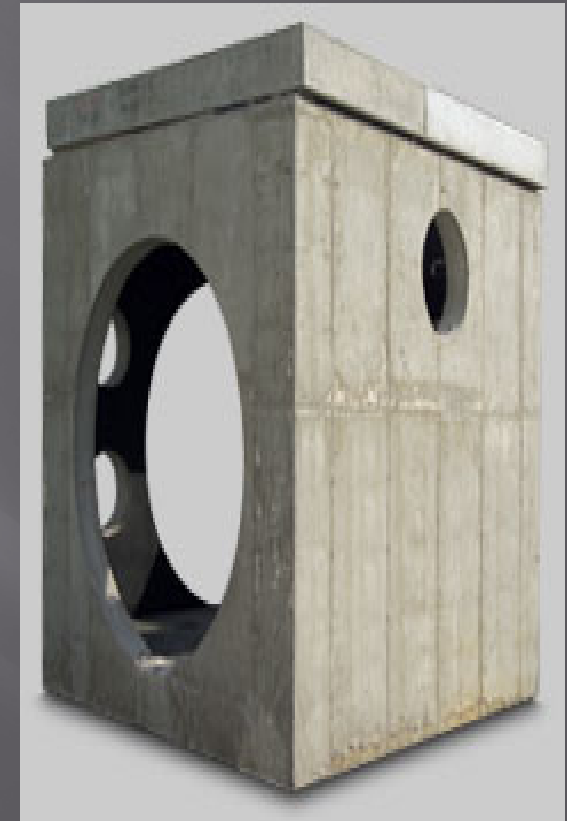
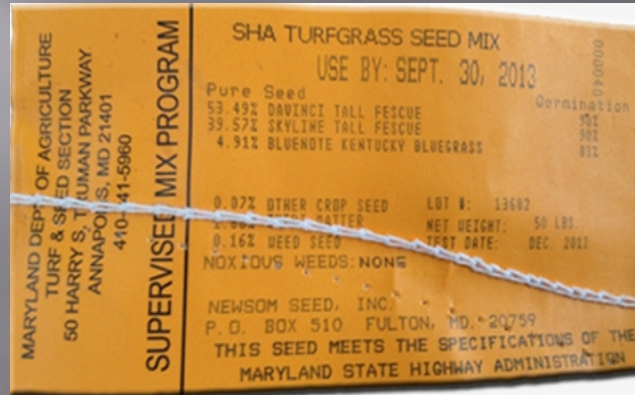
### How to Read a Grade Stamp:



MRA Grade      MP Grade      Yield Grade

- Lumber Grade
- Mill Producer
- Species Group
- Grading Agency
- Lumber Strength Properties
- Moisture Content at the time of surfacing

- MC15 or KD15 for a moisture content of 15 percent or less;
- S-DRY, KD, or KD19 for a moisture content of 19 percent or less;
- S-GRN for unseasoned with a moisture content of more than 19 percent



- Approved Source of Materials (MOS.) from DelDOT M&R Lab

# Pre-Construction Items

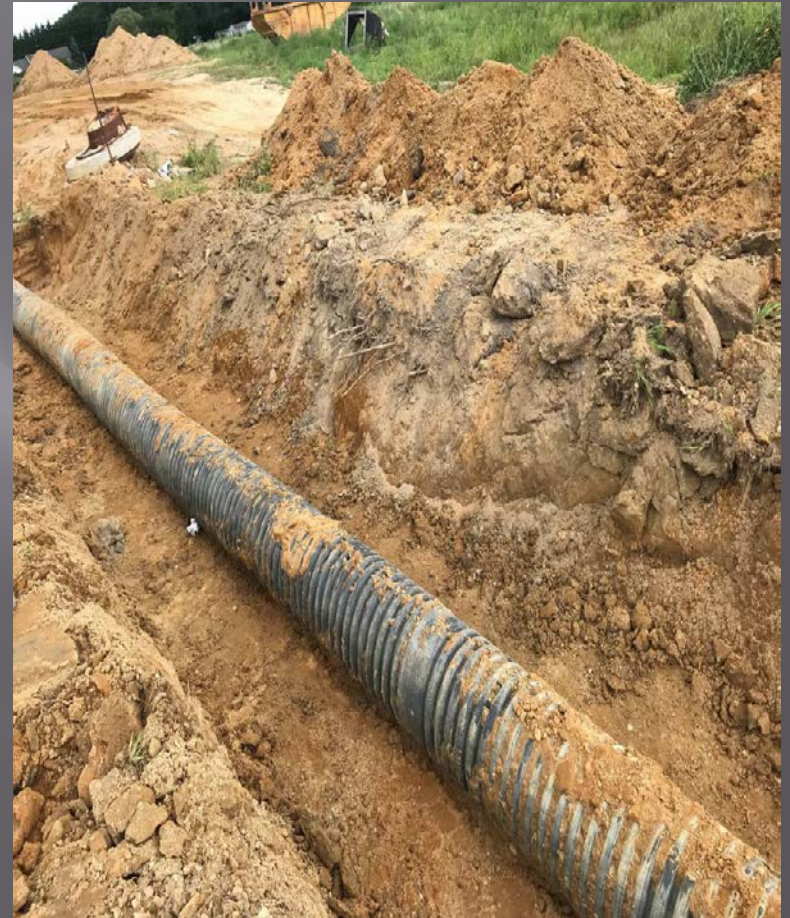
## Items Frequently Tested & Methods



- ▣ Soil and Stone Aggregates. (Gradation, Compaction, Moisture..)

# Pre-Construction Items

Test Native Soils for Suitability as Backfill




- ▣ Existing Site Conditions and Utilities. (Test Pits, Metal Detectors...)



# Inspection Standards

- Acquire Approved Plans, Standard Details, Specifications and Construction Permits



**STATE OF DELAWARE**  
Department of Transportation

## Utility Permit

**PERMIT ID:** KC-0020-14IX  
**PROJECT NAME:** Hazletville Road Interceptor Replacement WW1301

**EMERGENCY**

**AREA:**  
ADC GRID: 17C5  
KAPPA GRID:

**INSPECTOR:** Bill Jacobs  
**INSPECTOR PHONE:** 302.6322575  
**INSPECTOR EMAIL:** Bill.Jacobs@state.de.us

**FIELD CONTACT:**  
**FIELD CONTACT PHONE:**  
**FIELD CONTACT EMAIL:**

**COMPANY:** City of Dover (Public Works)  
**Authorized By:** John Pallam  
**Permit Type:** Utility Permit

**Received:** 11/5/2014  
**Issued On:** 12/8/2014  
**Expiry Date:** 6/8/2015  
**Permit Site:** Kent

**Location:** Hazletville Road- between Electric Avenue and Enterprise Place  
Work varies in distance from Hazletville Road centerline, but minimum is 23 feet.

**Project Desc:** The City of Dover is upgrading the existing 15" gravity wastewater main along Hazletville Road, which is overloaded in peak conditions due to negative slopes. The project consists of upgrading the existing 15" main to a 18" main, removing, replacing, and/or abandoning 16 manholes, and removing, replacing, and/or abandoning approximately 2,066 of 15" sanitary sewer.  
Work will take place in shoulder of roadway or beyond the shoulder.

**Dimension:** 2,340 linear feet by 140 linear feet

**Utility Coordinator** TRAFFIC CONTROL MUST BE IN ACCORDANCE WITH THE DE. MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD - Latest Edition)  
CONTACT INSPECTOR 24 HRS IN ADVANCE PRIOR TO ANY WORK.  
ROADWAY NOT TO BE DISTURBED  
ROADWAY TMC @ 639-4600/326-4459 FOR ANY LANE/SHOULDER CLOSURES.  
HOTMIX ROAD RESTORATION SHALL BE FULL WIDTH OF LANES/SHOULDERS DISTURBED. A 3 YEAR WARRANTY SHALL BE REQUIRED FOR RESTORATION.  
IF IN NEW PAVING SECTION, HOTMIX ROAD RESTORATION SHALL BE MILLED AND OVERLAYED AT 2" DEPTH AT FULL WIDTH OF LANE(S) DISTURBED AND AT A MIN. LENGTH OF 50'. 3 YR WARRANTY SHALL BE REQUIRED FOR RESTORATION.  
SIDEWALK SHALL BE 4" CLASS B W/ 4" G.A.B.C. (SIDEWALK/APRON IN DRIVEWAYS AND ISLANDS/HC RAMPS SHALL BE 6" CLASS B W/ 6" G.A.B.C. HANDICAP RAMPS SHALL BE REPLACED TO CURRENT SPECS IF DISTURBED. ALL SIDEWALK SHALL HAVE A

**DeIDOT Authorized Signature:** Signature on File


It is hereby agreed by both parties involved in the granting of this permit that the actual construction or adjustment covered by this permit shall be performed in accordance with the policies and procedures set forth in the Utilities Policies and Procedures Manual, State of Delaware, Division of Maintenance and Operations, in effect on the date of this permit. Work is to be begun within 30 days from the date of this permit and completed with as little delay as possible, the right to work under this permit expires 6 months from the date of issuance. It may be renewed or extended upon application.

The holder of this permit shall indemnify and save harmless the Division of Maintenance and Operations of and from all suits and damages arising from or on account of the construction or operation of its aid poles, wire, pipe, conduits, appurtenances, etc. herein permitted on State rights-of-way.

Permittee shall call the Division of Maintenance and Operations Permit Section, (North District - 326-4679, Central District - 760-2444, South District - 853-1340) 24 hours prior to any installation on State rights-of-way.

Traffic Control shall be in accordance with the Delaware Manual on Uniform Traffic Control Devices.

Page : 1 of 3



**STATE OF DELAWARE**  
DEPARTMENT OF TRANSPORTATION

## PERMIT FOR ENTRANCE CONSTRUCTION

**DISTRICT:** CENTRAL **AREA:** 7 **PERMIT NO.:** 220470 **E-6 DATE:** 1/22/2015

**Type of Access:**  Commercial  Residential  Farm  Special

**Maintenance Road No.:** Aristocrat Lane **Delaware Grid Coordinate:**

**Issue To:** Lifestyle Land Development Co. **Phone No.:** (302) 734-7500

**Address:** 111 Patriot Drive **Middletown, DE 19709**

**Type of Security Furnished:** N/A **Amount:** N/A

**Estimated Construction Cost:** N/A **Completion Date:** (150% of cost)

### DESCRIPTION OF CONSTRUCTION

#### Temporary Construction Permit

Permittee shall use the existing farm entrance as a temporary construction entrance to access Ponds at Willow Grove Rd - Water Treatment Plant

**Entrance Location:** On the south side of Willow Grove Road (Rt 10) approximately 180' north east of Pickett Lane.

**Permit Expires:** 31 JAN 2016 **Tax Parcel I.D. #:** NM 00 102 02 04 90 00 000/NM 00 102 02 04 90 00 000

**Description of Work:** Permittee shall use the existing farm entrance as a temporary construction entrance. All work shall be performed in accordance with the DeDOT Standard Specifications. Entrance width shall not exceed 30 feet at the right-of-way line. Conform with requirements of Standard Specification Section 268 (Stabilized Construction Entrance), and Standard Construction Detail E-21. Place minimum of 10 inches of D-33 stone on geotextile. **This permit is issued with the following stipulations:**

- This Temporary entrance is granted so that Kent County can review Ponds at Willow Grove - Water Treatment Plant Plans "Only."
- Construction work within the subject parcel shall be limited to clearing, grading, and stormwater of subject parcel.
- The inspector may require additional placement of stone to the temporary entrance if the entrance deteriorates.

No permanent entrance construction is authorized under this temporary permit. No permanent materials such as hot-mix pavement or concrete shall be placed within State right-of-way. Contact the DeIDOT Permits Inspector 72 hours prior to commencing construction at (302)760-2433. All streets and roads shall be kept clear and clean of all dirt, mud and debris at all times.

It is hereby agreed by the owner of the property affected, and all heirs, assigns, and/or successors in interest, that all construction covered by this permit shall be performed in accordance with the approved construction plan and the current Standard Specifications published by the Department of Transportation. The plan and specifications are incorporated herein by reference, and made part of this permit. Work is to begin within 90 days of the date of this permit, and it is to be completed on or before the above completion date. Requests for an extension of this permit shall be submitted in writing to the Permit Section 30 days prior to expiration.

The owner agrees not to sell, lease, or change the use of the property to significantly alter the flow and/or volume of traffic and/or drainage as determined within the sole discretion of the Division, and/or transfer his/her interest in the property without obtaining a new permit from the Division of Highway Operations. Such failure automatically voids this permit.

The holder of this permit shall indemnify and save harmless the Division of Highway Operations and its officers, employees, and/or agents from suits and damages arising from, or on account of the above described construction herein permitted on State rights-of-way, or the Division's acceptance thereof consistent with Section 107.14 of the Standard Specifications and all amendments thereto, incorporated herein by reference.

Traffic control and utility alterations shall be in accordance with current The Division of Highway Operations "Traffic Controls for Streets and Highway Construction Manual" and the "Utilities Policy and Procedure Manual," incorporated herein by reference.

Permittee shall call the Division of Highway Operations Permit Section, (Central District: 326-4679, Central District: 760-2433, South District: 853-1342) and Miss Utility (1-800-282-8555) prior to any construction on State rights-of-way.

The Division of Highway Operations may require revisions to the approved plans as required by field conditions.

The permittee shall request the Division of Highway Operations make final inspection of the construction when work is completed, and all work must be completed to the satisfaction of said Division of Highway Operations.

This permit shall be wholly conditional upon the satisfactory completion of all provisions set forth herein. If, upon expiration of this permit, work is incomplete or not performed according to the aforesaid plan and specifications, and no extension is applied for and issued, this permit shall become null and void for all legal purposes and the entrance shall be considered illegal with reference to 17 Del. C. §146.

**Authorized Representative of**  
Division of Highway Operations

**Property Owner**  
Property Owner Signature

PL-41 05/01 Document No: 55 02 01 81 06 04

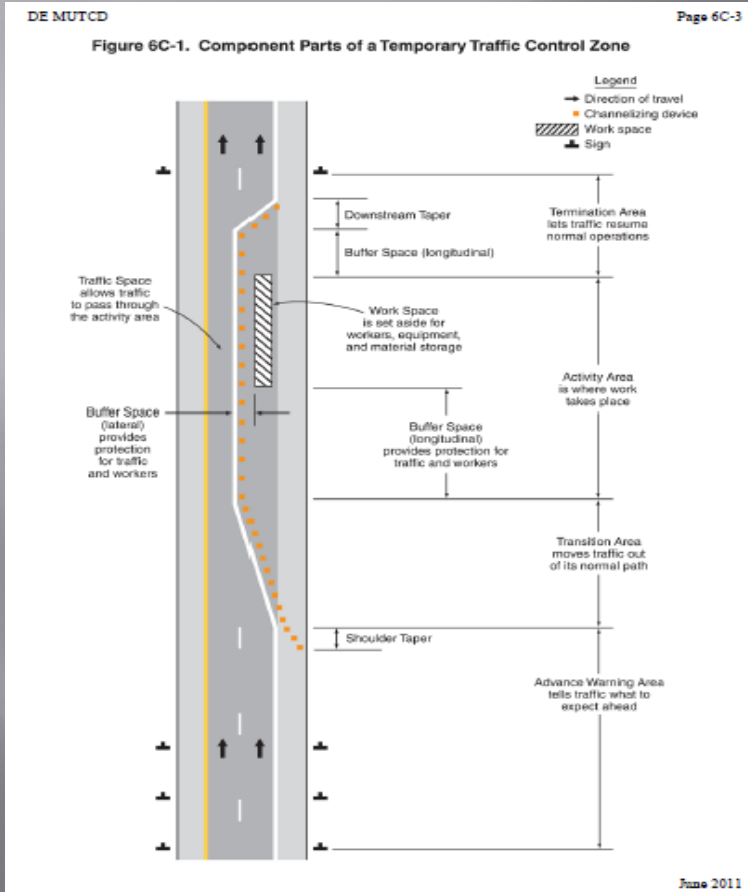
# Public Works Inspection

Coordinate Water and Sewer  
Connections to the site including  
Excavation, Repair & Patching



# Public Works Inspection

Include Traffic Safety as early as possible for Maintenance of Traffic



*\* Good To 7-19-14*

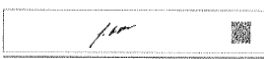
*Commerce St. (Smyrna) \* ext to 8/23/14*

**DELDOT ROAD CLOSURE NOTIFICATION**

Transportation Maintenance Center

REQUESTER: John Pallum  
 DATE: 04/27/2014 rv.3  
 RECORD #: RC20140427.3320  
 SUBJECT: COMMERCE ST (SMYRNA) UTILITY UPGRADES

SECTION: UTILITIES  
 AGENCY: PUBLIC WORKS/UTILITIES

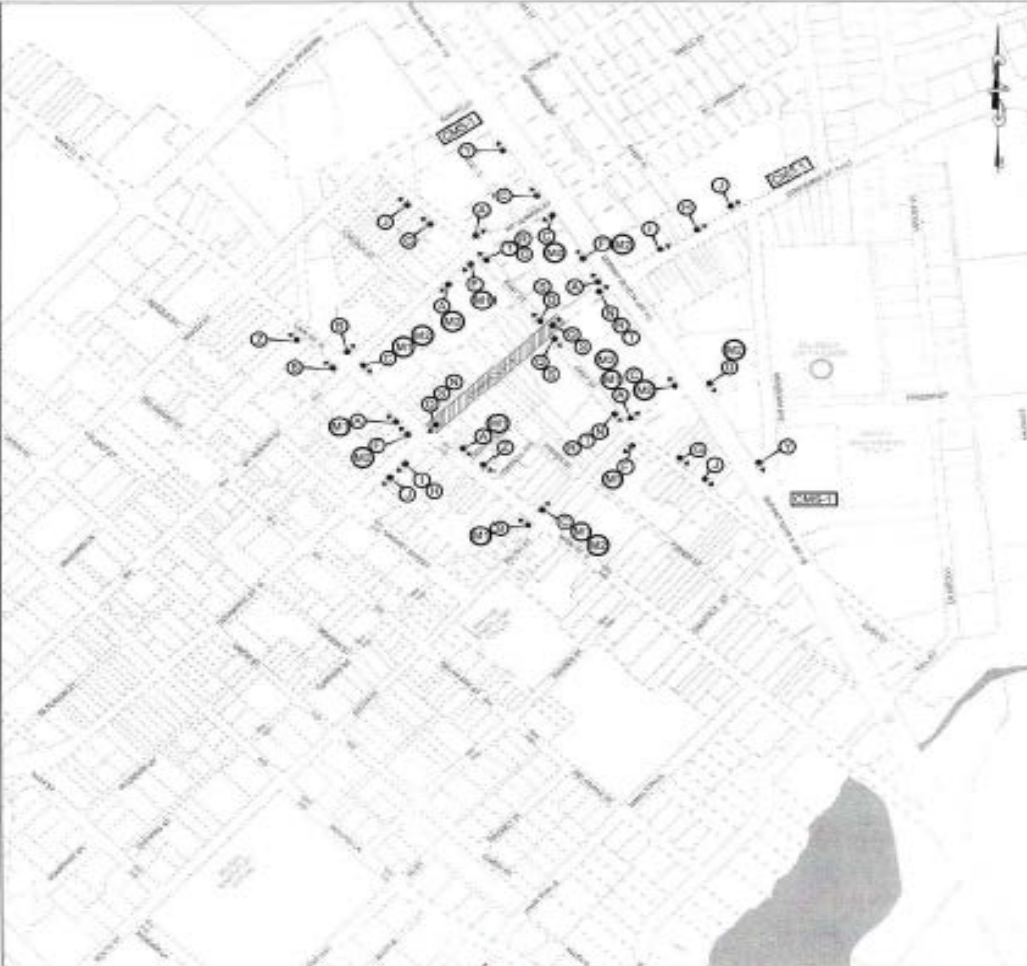
























PROJECT / PERMIT / MAXIMO	KPC-0002-19P		
PROJECT NAME:	COMMERCE ST (SMYRNA) UTILITY UPGRADES		
CLOSURE/PROJECT DESCRIPTION:	COMMERCE ST (DE RT 6 SMYRNA SEWER AND WATER REHAB PROJECT		
CONTRACTOR:	LINDSTROM EXCAVATING CONTRACTORS		
ROAD NAME/ROUTE NUMBER	COMMERCE ST		
BETWEEN ROAD NAME/ROUTE #:	DELAWARE ST		
AND ROAD NAME/ROUTE #:	MAIN ST		
PROJECT MANAGER (REQUESTER)	John Pallum (UTILITIES)	CONTACT NUMBER:	(302) 632-2509
DELDOT AREA SUPERVISOR	Eddie Toulson (MAINTENANCE)	CONTACT NUMBER:	(302) 632-2581
		CONTACT NUMBER:	
		CONTACT NUMBER:	
		CONTACT NUMBER:	
		CONTACT NUMBER:	
DETOUR NEEDED: (If yes, see below)	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	DISTRICT
MESSAGE BOARDS NEEDED:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	NEW CASTLE
	<input type="checkbox"/> DAY ONLY	<input type="checkbox"/> NIGHT ONLY	CANAL
DETOURS WILL BE POSTED:	<input checked="" type="checkbox"/> 24 HOURS		KENT
			SUSSEX
APPROVED DETOUR PLAN ATTACHED?	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO	
EMERGENCY VEHICLE ACCESS?	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	
DETOUR SPECIFICS	EIB ON COMMERCE ST - TURN RIGHT ONTO UNION ST - TURN LEFT ONTO SOUTH ST - TURN LEFT ONTO S MAIN ST - WIG ON COMMERCE ST - TURN LEFT ONTO S. MAIN ST - TURN RIGHT ONTO SOUTH ST. - TURN RIGHT ONTO DELAWARE ST.		
NOTE: SAFETY OFFICER MUST REVIEW THIS DOCUMENT SHOWING CONCURRENCE WITH DETOUR ROUTE BEFORE NOTIFICATIONS ARE MADE	SIGNATURE 		
	James (Jim) King - Canal Dist Safety Officer		
ADC MAP (MAP #/GRID COORDINATES)	MAP NO: _____	GRID NO: _____	
WILL BE CLOSED BEGINNING:	05/18/2014 *	19:00	05:00
	DATE	START TIME	END TIME
AND ENDING APPROXIMATELY:	07/19/2014 *	19:00	05:00
	DATE	START TIME	END TIME
RAIN DATE (S)	not provided	not provided	not provided
	DATE	START TIME	END TIME

\*This is a revised schedule! This new schedule overrides the previous schedule from 05/11/2014 to 07/19/2014 starting at 19:00 hours until 05:00 hours.

□ Delaware MUTCD Work Zone Set-Up

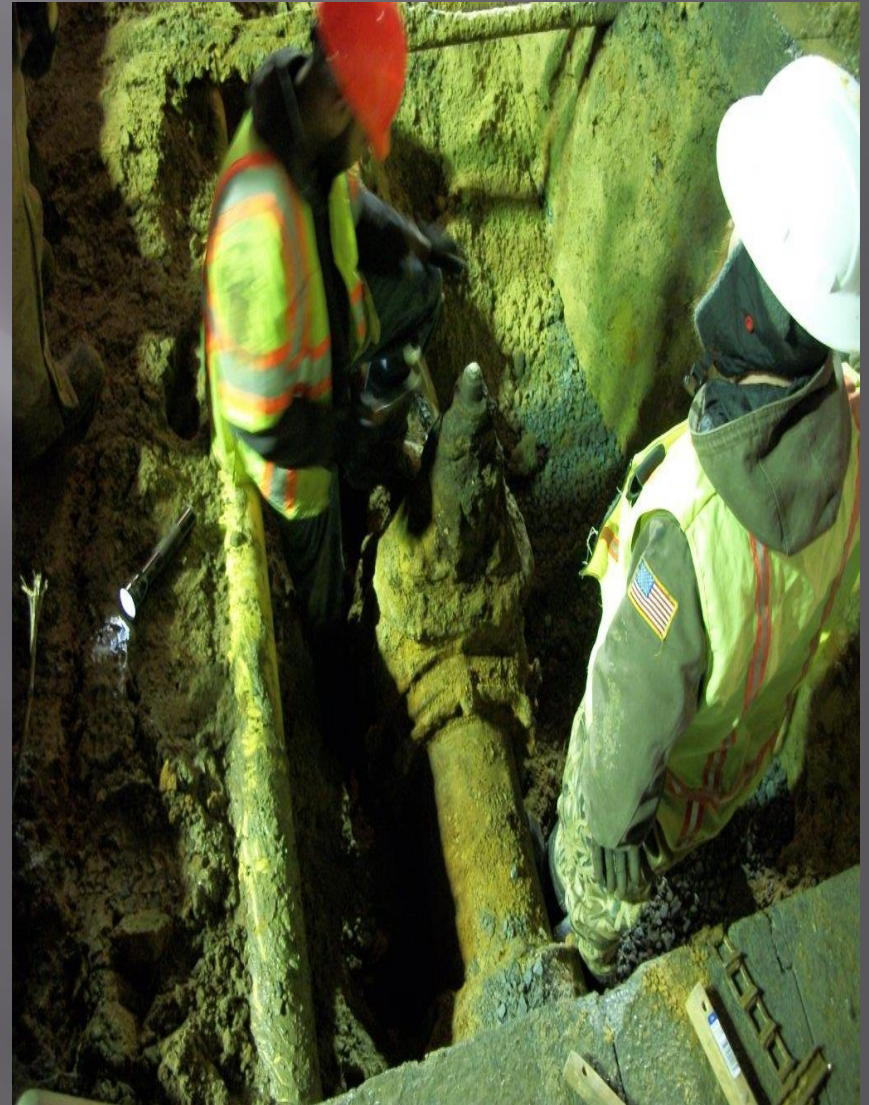
# Public Works Inspection

## Road Closures & Detour Plans

CHANGEABLE MESSAGE BOARDS			SIGN LEGEND			
<b>PRIOR TO DETOUR</b> CMS-1 <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 5px; width: 45%;"> <b>COMMERCE STREET TO CLOSE</b> </div> <div style="border: 1px solid black; padding: 5px; width: 45%;"> <b>AT US 13 XX/XX/XX 7 PM - 5 AM</b> </div> </div>			  	<b>GENERAL NOTES:</b> 1. THIS PLAN SHOWS THE LOCATION OF THE ROAD CLOSURE AND THE LOCATION OF THE DETOUR ROUTE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LOCATION OF THE DETOUR ROUTE AND THE LOCATION OF THE ROAD CLOSURE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LOCATION OF THE DETOUR ROUTE AND THE LOCATION OF THE ROAD CLOSURE.		
<b>DURING DETOUR</b> CMS-1 <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 5px; width: 45%;"> <b>COMMERCE STREET CLOSED</b> </div> <div style="border: 1px solid black; padding: 5px; width: 45%;"> <b>7 PM - 5 AM FOLLOW DETOUR</b> </div> </div>			  	2. THE CONTRACTOR SHALL MAINTAIN ADEQUATE SIGNAGE TO ADVISE THE PUBLIC OF THE ROAD CLOSURE AND THE LOCATION OF THE DETOUR ROUTE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LOCATION OF THE DETOUR ROUTE AND THE LOCATION OF THE ROAD CLOSURE.		
<b>SPECIAL SIGNS</b>   		  	3. THE CONTRACTOR SHALL MAINTAIN ADEQUATE SIGNAGE TO ADVISE THE PUBLIC OF THE ROAD CLOSURE AND THE LOCATION OF THE DETOUR ROUTE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LOCATION OF THE DETOUR ROUTE AND THE LOCATION OF THE ROAD CLOSURE.			
  		  	4. THE CONTRACTOR SHALL MAINTAIN ADEQUATE SIGNAGE TO ADVISE THE PUBLIC OF THE ROAD CLOSURE AND THE LOCATION OF THE DETOUR ROUTE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LOCATION OF THE DETOUR ROUTE AND THE LOCATION OF THE ROAD CLOSURE.			
 		 	5. THE CONTRACTOR SHALL MAINTAIN ADEQUATE SIGNAGE TO ADVISE THE PUBLIC OF THE ROAD CLOSURE AND THE LOCATION OF THE DETOUR ROUTE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LOCATION OF THE DETOUR ROUTE AND THE LOCATION OF THE ROAD CLOSURE.			
  		6. THE CONTRACTOR SHALL MAINTAIN ADEQUATE SIGNAGE TO ADVISE THE PUBLIC OF THE ROAD CLOSURE AND THE LOCATION OF THE DETOUR ROUTE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LOCATION OF THE DETOUR ROUTE AND THE LOCATION OF THE ROAD CLOSURE.				
RECOMMENDED _____ DATE _____		RECOMMENDED _____ DATE _____		RECOMMENDED _____ DATE _____		
<b>DELAWARE DEPARTMENT OF TRANSPORTATION</b>		SCALE: 1" = 200'		APPROVED CHIEF SAFETY OFFICER _____ DATE 8/28/23		
COMMERCIAL STREET UTILITY REPLACEMENT PHASE 1		COMMERCIAL STREET DETOUR PLAN		APPROVED TRAFFIC ENGINEER _____ DATE 8/28/23		

# Public Works Inspection

Be Prepared to work at Night

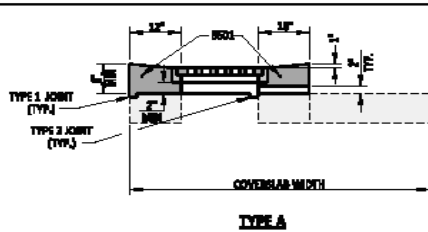




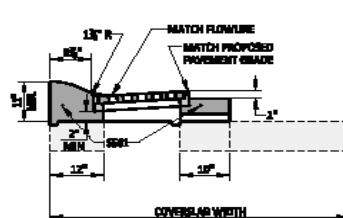
# Public Works Inspection

## Catch Basin/Drainage Inlet Top Units

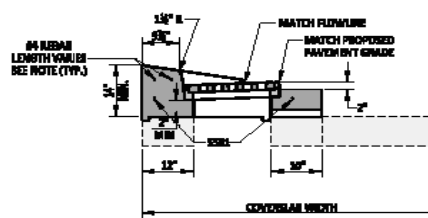
SCALE: NTS



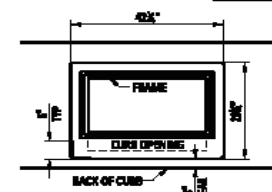
TYPE A



TYPE D

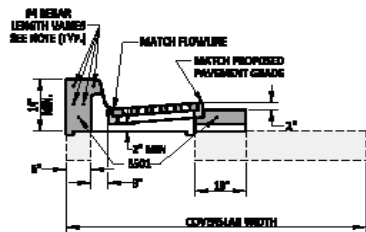


TYPE E

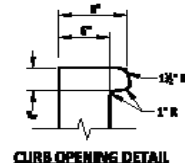


SOIL BENDING DIAGRAM

SOIL IS NOT REQUIRED TO BE ONE CONTINUOUS BAR, IF MORE THAN ONE BAR IS USED, THESE MUST BE A 12" OVERLAP BETWEEN BARS.

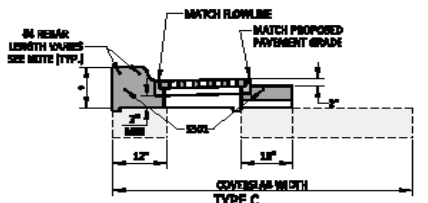


TYPE B  
SEE CURB OPENING DETAIL ON THIS SHEET



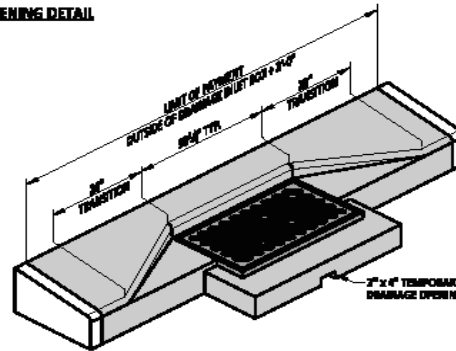
CURB OPENING DETAIL

INLET TOP UNIT APPLICATIONS	
TOP UNIT	CURB
TYPE A	USE IN DRAINAGE PANEL
TYPE B	INTERNAL P.C.C. CURB & GUTTER, TYPES 3-B & 3-C, P.C.C. CURB TYPE 1-B
TYPE C	INTERNAL P.C.C. CURB & GUTTER, TYPES 1-A, 3-A, 3-4, 1-2 AND 3-2 AND P.C.C. CURB TYPE 1-A, 1-4, AND 3-3
TYPE D	INTERNAL P.C.C. CURB & GUTTER, TYPE 2
TYPE E	P.C.C. CURB TYPE 2

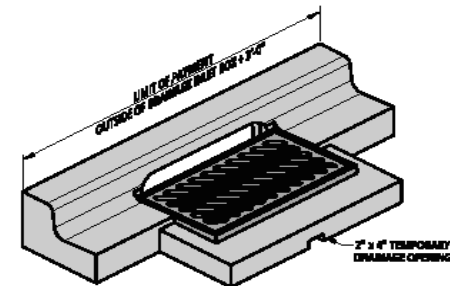


TYPE C

- \* THIS DIMENSION VARIES DEPENDING ON THE HEIGHT OF THE CURB AND GUTTER OR CURB USED:
  - INTERNAL P.C.C. CURB AND GUTTER, TYPES 1-A AND 3-A & CURB, TYPE 1-A - 12" MIN.
  - INTERNAL P.C.C. CURB AND GUTTER, TYPES 3-A AND 3-4 & CURB, TYPE 3-A - 12" MIN.
  - INTERNAL P.C.C. CURB AND GUTTER, TYPES 1-B AND 3-B & CURB, TYPE 1-B - 18" MIN.



ISOMETRIC VIEW  
TYPE A UNIT SHOWN



ISOMETRIC VIEW  
TYPE B TOP UNIT SHOWN WITH  
INTERNAL CURB & GUTTER TYPE B

NOTE: LENGTH OF IN REAR SHALL BE THE OUTSIDE OF THE DRAINAGE INLET BOX PLUS 2'-0".

**DELAWARE**  
DEPARTMENT OF TRANSPORTATION

DRAINAGE INLET TOP UNITS			
STANDARD NO.	D-5 (2012)	SHT.	3 OF 9

APPROVED	SG SIGNATURE OR FILE	01/07/2018
RECOMMENDED	SG SIGNATURE OR FILE	11/26/2018

# Public Works Inspection

Common Field Items Delaying Projects  
Improper Joints





# Public Works Inspection

Common Field Items Delaying Projects  
Removal & Replacement of Work



# Public Works Testing

Common Field Items Delaying Projects  
Pipe Video Inspection Issues

CB-33 to MH-11  
01/16/2018 03:29:58 PM  
129.0 ft  
ma

CB-33 to MH-11\_5\_1162018



# Public Works Testing

## Compliance with Letter Agreements for Off-Site Improvements

### LETTER AGREEMENT BY AND BETWEEN THE DELAWARE DEPARTMENT OF TRANSPORTATION AND WILLOWOOD SUBDIVISION

This AGREEMENT, made and executed in quadruplicate, the day, month, and year affixed by hereto by the signature of the Department of Transportation's representative by and between the DELAWARE DEPARTMENT OF TRANSPORTATION, a Department created under the laws of the State of Delaware, hereinafter designated as "DEPARTMENT", and Willowcap, LLC, whose address is 105 Foulk Road, Wilmington, DE 19803, hereinafter called "DEVELOPER", being the contractual owner of the land on which the development project is to be constructed.

In the event that the DEVELOPER assigns, conveys, transfers or gives up their interest in the property or any part thereof, the obligations and/or requirements contained within this Agreement shall become the responsibility of the assignee, successor and/or subsequent property owner and/or developer, who will then be considered the DEVELOPER for the purposes of this agreement.

This letter supersedes the Letter of Agreement dated July 21, 2005. The following terms used in this Agreement shall have the following meaning:

"MANAGING DEVELOPER" shall mean the participating developer, or third party entity, identified by the DEPARTMENT to take the lead in constructing and coordinating the particular roadway and/or intersection improvement project(s) identified herein.

"FAIR SHARE CONTRIBUTION" shall mean each developer's contribution toward costs associated with required roadway and/or intersection improvements identified by the DEPARTMENT. DEVELOPER's FAIR SHARE CONTRIBUTION is calculated by dividing the land development project's generated PM peak trips passing through the improvement by the total number of PM peak trips generated by all participating land development projects passing through the improvement.

"PARTICIPANT(S)" shall mean any developer(s) identified by the DEPARTMENT, prior to the acceptance of the completed improvement(s), as needing to make a FAIR SHARE CONTRIBUTION to a particular roadway and/or intersection improvement. PARTICIPANTS may be included, at the DEPARTMENT's discretion, on the basis that their development project has made a qualifying submittal, (prior to the acceptance of the completed improvement), to any Federal, State, County or Municipal authority requiring review. Qualifying reviews include but are not limited to the Regional Planning Commission (RPC) submittals, Planning and Land Use Service (PLUS) submittals, Support Facilities Requests, Traffic Impact Study scoping meetings, project related meetings with the DEPARTMENT or plan submittals to the DEPARTMENT. PARTICIPANTS shall be required to enter into separate Letter Agreements with respect to particular roadway and/or intersection improvement(s) prior to obtaining any approval from the DEPARTMENT for their project's entrance plans or construction plans. Failure of a PARTICIPANT to make their appropriate FAIR SHARE CONTRIBUTION will be just cause for the DEPARTMENT to withhold any processing of Reviews, Permits or Approvals for that PARTICIPANT's project. The DEPARTMENT will not hinder or deter the DEVELOPER's project for lack of receiving the appropriate FAIR SHARE CONTRIBUTION from another PARTICIPANT, provided that the required improvements can be phased and constructed to the extent the DEPARTMENT deems necessary for the DEVELOPER's project to proceed.

The DEPARTMENT has determined that the construction of the Willowood Subdivision (the "PROJECT"); a residential subdivision comprised of 498 units (Protocol Tax Parcel No. 1-00-

*File  
shane*

# Public Works Inspection

Common Field Items Delaying Projects  
Cold/Non-Compliant Hot-Mix



- ❑ Pavements. (Temperature, Compaction, Unit Weight, %Asphalt...)

# Public Works Inspection

## Items Frequently Tested & Methods



- ▣ Pavements. (Compaction, Unit Weight, %Asphalt...)

# Public Works Inspection

## Materials & Research Lab Results

### MATERIALS & RESEARCH SECTION

#### SUPERPAVE PRODUCTION 2008 Production Season - ENGLISH YIELDS

WT (lb/ft <sup>3</sup> )	BCBC 151.5	Type B 151.5	Type C			SMA 149.5
			9.5mm Stone 151.5	12.5 mm Stone 151.5	4.75mm Stone 143.6	
SQUARE YARD/TON						
DEPTH (in)	DEEP LIFT	TYPE B	TYPE-C	TYPE-C	TYPE-C	SMA
0.50					37.14	
0.75					24.76	
1.00					18.57	
1.25			14.08		14.86	
1.50			11.73	11.73	12.38	11.89
1.75			10.06	10.06	10.61	10.19
2.00			8.80	8.80	9.29	8.92
2.25		7.82				
2.50		7.04				
3.00	5.87	5.87				
3.50	5.03					
4.00	4.40					
4.50	3.91					
5.00	3.52					
5.50	3.20					
6.00	2.93					

#### NOTES:

- 1) Square yard coverage is based upon 95 % compaction that has 100% Pay Factor under QA/QC spec.
- 2) Unless otherwise directed by Materials & Research, 9.5mm Type 'C' Hot-Mix is to be used.

#### SAMPLE CALCULATION:

The design is for a 1 mile long pavement, 24 feet wide, and 2 inches of Type C Hot-Mix.

$$[(5280 \text{ ft}) \times (24 \text{ ft}) / 9 \text{ ft}^2 \text{ per yd}^2 = 14080 \text{ yd}^2]$$

Using the above chart, for Type C - 9.5 mm Stone Hot-Mix @ 2 inches, the value is 8.80 yd<sup>3</sup> per ton.

$$14080 \text{ yd}^2 / 8.80 \text{ yd}^3 \text{ per ton} = 1600 \text{ tons of Type C Hot-Mix}$$

### MATERIALS & RESEARCH SECTION

#### MATERIAL AVERAGE WEIGHTS CHART

February 26, 2010

	Material	Unit Weights	
		#/ft <sup>3</sup>	#/yd <sup>3</sup>
Stone	#8 Stone	98.0	2646.0
	#57 Stone	103.0	2781.0
	GABC	138.1	3728.7
	Millings	121.2	3272.4
	Crushed Concrete	118.5	3199.5
Soil	A, C, F Borrow	113.0	3050.0
	B Borrow	105.5	2848.0
	Topsoil	90.0	2430.0

# Public Works Inspection

## Pavement/Hot-Mix Inspection & Testing

~~Stone~~  
~~B. McCabe~~ MIA  
Les Manning

	Asphalt	8 Sieve B	200 Sieve	Air Void	
Targets	4.50	27.0	5.00	4.0	
Sub Lot 1	4.46	25	5.50	4.1	
Sub Lot 2	4.10	26	5.40	4.8	
Sub Lot 3	3.88	26	5.90	4.9	
Average	4.15	25.7	5.6	4.6	
SD	0.293	0.577	0.265	0.436	
QU	2.57	14.43	5.29	3.21	
QL	0.16	9.81	9.83	5.96	
PU	100	100	100	100	
PL	55	100	100	100	
PWL	55	100	100	100	
Weight Factor%	30	30	30	10	
Total Pay %	0	30	30	10	70.0

8-8-14 EDGEMOOR OE

89 B/115 64-22 (40647) SANDY HILL

Low Asphalt 3.88% on a 4.50% target (-0.62%)

Remove and replace or credit full value of materials

$$89 \text{ TN} \times 0.70 \times \frac{\$}{\text{unit price}} = \frac{\$}{\text{unit price}}$$

STATE OF DELAWARE  
DEPARTMENT OF TRANSPORTATION  
MATERIALS & RESEARCH

SPGR DATE: 06-Aug-14  
MIX ID: Edm-111  
TEST NO: Edm-080816-1B  
TYPE OF MIX: B

ITEM NUMBER: 421647  
ITEM NAME: SUPERPAVE TYPE B HOT MIX, 1.5% GYRATIONS, PG 64-22

GYRATORY METHOD

MATERIAL SOURCES	% AC	NAME	AGG SIZE	% OF MATERIAL	AASHTO T-209 SPECIFIC GRAVITY
RECYCLED MATERIAL 1	4.80%	Edgemoor Dis Ray		33.02%	
RECYCLED MATERIAL 2	0.00%			0.00%	SPLIT 1
RECYCLED MATERIAL 3	0.00%			0.00%	2.028
COARSE AGGREGATE		Maryland Materials	57	23.02%	SPLIT 2
COARSE AGGREGATE		Marin Limestone - Kurtz	8	55.00%	2.626
FINE AGGREGATE		Maryland Materials	Wash 10	10.00%	AVERAGE
FINE AGGREGATE				0.00%	2.652
SAND				0.00%	TOTAL GSB
MINERAL FILLER				0.00%	2.770
FIBER/TYP				0.00%	VOIDLESS WT.
Asphalt Source		Axian - Paulsboro NJ	1.03%	4.50%	164.2
ASPHALT TYPE		58-20		0.00%	
ASPHALT ADDITIVE					
				Total	100%

AGGREGATE SIEVE ANALYSIS, AASHTO T-30

SPL. WT.	2395.40	TEST A %PASSING	RAP %PASSING	Control Points Percent Passing	COMP TEMP.	CORE #1	CORE #2	CORE #3	Average
SIEVE SIZE	JOB MIX			Min	Max	HT@ND	HT@ND	HT@ND	
37.5		100	100.0			HT@5M	115.0	115.0	115.0
25.4	180	100	100.0	100	100	HT. IN AIR	499.0	509.2	505.9
19.0	88	94	100.0	88	100	HT. 200	498.4	501.7	501.5
12.5	88	82	100.0	78	80	HT. IN WATER	303.9	307.5	303.9
9.50	89	75	100.0	73	87	GMB INDEX	2.880	2.969	2.927
4.75	42	41	100.0	36	40	% PA	5.82	4.90	4.73
2.36	27	26	100.0	23	24	% VFA	13.4	13.3	13.2
1.18	19	19	100.0	16	22	REMARKS	62.7	63.2	64.1
0.80	14	15	100.0	11	16				
0.30	11	11	100.0	7	15				
0.15	8	8	100.0	4	12				
0.075	5	5.9	100.0	3	6.6				

Sample was graded to 100 and back calculated to 26.  
Available Out Of Tolerance.

AASHTO T-268

AC CONTENT	4.80	UNDESIRABLE AC	3.88	EFFECTIVE ASPHALT	3.48	MAX DUST	6.56	RAP AC	8
------------	------	----------------	------	-------------------	------	----------	------	--------	---

ASPHALT REF. TANK# 8101 ASPHALT LOT# 8 TIME SAMPLED 11:03 AM LOAD NUMBER 3 MIX TEMP FOR TRACK 300

CONTRACT	FED STATE	TONS AT TEST	# LOADS	TIME 1ST	TIME LAST	DEVELOPMENT	LOCATION #	Substitute		
								TONS	TONS AT TEST	Item #
		65.17	4	10:52:00 AM	11:02:30 AM	SANDY HILL	0	0	0	
		0	0				0	0	0	
		0	0				0	0	0	
		0	0				0	0	0	
		0	0				0	0	0	
		0	0				0	0	0	
		0	0				0	0	0	
		0	0				0	0	0	
		0	0				0	0	0	
		0	0				0	0	0	
		0	0				0	0	0	

DATE PRINTED 8/12/2014 11:13:56 AM TESTED BY Siva

# Public Works Inspection

## Maintenance of Traffic

DE MUTCD

Page 6B-1

### CHAPTER 6B. FUNDAMENTAL PRINCIPLES

#### Section 6B.01 Fundamental Principles of Temporary Traffic Control

##### Support:

- 01 Construction, maintenance, utility, and incident zones can all benefit from TTC to compensate for the unexpected or unusual situations faced by road users. When planning for TTC in these zones, it can be assumed that it is appropriate for road users to exercise caution. Even though road users are assumed to be using caution, special care is still needed in applying TTC techniques.
- 02 Special plans preparation and coordination with transit, other highway agencies, law enforcement and other emergency units, utilities, schools, and railroad companies might be needed to reduce unexpected and unusual road user operation situations.
- 03 During TTC activities, commercial vehicles might need to follow a different route from passenger vehicles because of bridge, weight, clearance, or geometric restrictions. Also, vehicles carrying hazardous materials might need to follow a different route from other vehicles. The Hazardous Materials and National Network signs are included in Sections 2B.62 and 2B.63, respectively.
- 04 Experience has shown that following the fundamental principles of Part 6 will assist road users and help protect workers in the vicinity of TTC zones.

##### Guidance:

05 Road user and worker safety and accessibility in TTC zones should be an integral and high-priority element of every project from planning through design and construction. Similarly, maintenance and utility work should be planned and conducted with the safety and accessibility of all motorists, bicyclists, pedestrians (including those with disabilities), and workers being considered at all times. If the TTC zone includes a grade crossing, early coordination with the railroad company or light rail transit agency should take place.

##### Support:

- 06 Formulating specific plans for TTC at traffic incidents is difficult because of the variety of situations that can arise.

##### Guidance:

07 The following are the seven fundamental principles of TTC:

1. General plans or guidelines should be developed to provide safety for motorists, bicyclists, pedestrians, workers, enforcement/emergency officials, and equipment, with the following factors being considered:
  - A. The basic safety principles governing the design of permanent roadways and roadsides should also govern the design of TTC zones. The goal should be to route road users through such zones using roadway geometrics, roadside features, and TTC devices as nearly as possible comparable to those for normal highway situations.
  - B. A TTC plan, in detail appropriate to the complexity of the work project or incident, should be prepared and understood by all responsible parties before the site is occupied. Any changes in the TTC plan should be approved by an official who is knowledgeable (for example, trained and/or certified) in proper TTC practices.
2. Road user movement should be inhibited as little as practical, based on the following considerations:
  - A. TTC at work and incident sites should be designed on the assumption that drivers will only reduce their speeds if they clearly perceive a need to do so (see Section 6C.01).
  - B. Frequent and abrupt changes in geometrics such as lane narrowing, dropped lanes, or main roadway transitions that require rapid maneuvers, should be avoided.
  - C. Work should be scheduled in a manner that minimizes the need for lane closures or alternate routes, while still getting the work completed quickly and the lanes or roadway open to traffic as soon as possible.
  - D. Attempts should be made to reduce the volume of traffic using the roadway or freeway to match the restricted capacity conditions. Road users should be encouraged to use alternative routes. For high-volume roadways and freeways, the closure of selected entrance ramps or other access points and the use of signed diversion routes should be evaluated.
  - E. Bicyclists and pedestrians, including those with disabilities, should be provided with access and reasonably safe passage through the TTC zone.

June 2011

DE MUTCD

Page 6D-1

### CHAPTER 6D. PEDESTRIAN AND WORKER SAFETY

#### Section 6D.01 Pedestrian Considerations

##### Support:

- 01 A wide range of pedestrians might be affected by TTC zones, including the young, elderly, and people with disabilities such as hearing, visual, or mobility. These pedestrians need a clearly delineated and usable travel path. Considerations for pedestrians with disabilities are addressed in Section 6D.02.

##### Standard:

- 02 The various TTC provisions for pedestrian and worker safety set forth in Part 6 shall be applied by knowledgeable (for example, trained and/or certified) persons after appropriate evaluation and engineering judgment.
- 03 Advance notification of sidewalk closures shall be provided by the maintaining agency.
- 04 If the TTC zone affects the movement of pedestrians, adequate pedestrian access and walkway shall be provided. If the TTC zone affects an accessible and detectable pedestrian facility, the accessibility and detectability shall be maintained along the alternate pedestrian route.

##### Option:

- 05 If establishing or maintaining an alternate pedestrian route is not feasible during the project, an alternate means of providing for pedestrians may be used, such as adding free bus service around the project or assigning someone the responsibility to assist pedestrians with disabilities through the project limits.

##### Support:

- 06 It must be recognized that pedestrians are reluctant to retrace their steps to a prior intersection for a crossing or to add distance or out-of-the-way travel to a destination.

##### Guidance:

07 The following three items should be considered when planning for pedestrians in TTC zones:

- A. Pedestrians should not be led into conflicts with vehicles, equipment, and operations.
  - B. Pedestrians should not be led into conflicts with vehicles moving through or around the worksite.
  - C. Pedestrians should be provided with a convenient and accessible path that replicates as nearly as practical the most desirable characteristics of the existing sidewalk(s) or footpath(s).
- 08 A pedestrian route should not be severed and/or moved for non-construction activities such as parking for vehicles and equipment.
  - 09 Consideration should be made to separate pedestrian movements from both worksite activity and vehicular traffic. Unless an acceptable route that does not involve crossing the roadway can be provided, pedestrians should be appropriately directed with advance signing that encourages them to cross to the opposite side of the roadway. In urban and suburban areas with high vehicular traffic volumes, these signs should be placed at intersections (rather than midblock locations) so that pedestrians are not confronted with midblock worksites that will induce them to attempt skirting the worksite or making a midblock crossing.

##### Support:

- 10 Figures 6H-28 and 6H-29 show typical TTC device usage and techniques for pedestrian movement through work zones.

##### Guidance:

- 11 To accommodate the needs of pedestrians, including those with disabilities, the following considerations should be addressed when temporary pedestrian pathways in TTC zones are designed or modified:
  - A. Provisions for continuity of accessible paths for pedestrians should be incorporated into the TTC plan.
  - B. Access to transit stops should be maintained.
  - C. A smooth, continuous hard surface should be provided throughout the entire length of the temporary pedestrian facility. There should be no curbs or abrupt changes in grade or terrain that could cause tripping or be a barrier to wheelchair use. The geometry and alignment of the facility should meet the applicable requirements of the "Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG)" (see Section 1A.11).
  - D. The width of the existing pedestrian facility should be provided for the temporary facility if practical. Traffic control devices and other construction materials and features should not intrude into the usable

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Page 6F-1

### CHAPTER 6F. TEMPORARY TRAFFIC CONTROL ZONE DEVICES

#### Section 6F.01 Types of Devices

##### Guidance:

01 The design and application of TTC devices used in TTC zones should consider the needs of all road users (motorists, bicyclists, and pedestrians), including those with disabilities.

##### Support:

02 FHWA policy requires that all roadside appurtenances such as traffic barriers, barrier terminals and crash cushions, bridge railings, sign and light pole supports, and work zone hardware used on the National Highway System meet the crashworthiness performance criteria contained in the National Cooperative Highway Research Program (NCHRP) Report 350, "Recommended Procedures for the Safety Performance Evaluation of Highway Features." The FHWA website at "<http://safety.fhwa.dot.gov/programs/roadsideHardware.htm>" identifies all such hardware and includes copies of FHWA acceptance letters for each of them. In the case of proprietary items, links are provided to manufacturers' websites as a source of detailed information on specific devices. The website also contains an "Ask the Experts" section where questions on roadside design issues can be addressed.

03 Various Sections of the MUTCD require certain traffic control devices, their supports, and/or related appurtenances to be crashworthy. Such MUTCD crashworthiness provisions apply to all streets, highways, and private roads open to public travel. Also, State Departments of Transportation and local agencies might have expanded the NCHRP Report 350 crashworthiness criteria to apply to certain other roadside appurtenances.

04 Crashworthiness and crash testing information on devices described in Part 6 are found in AASHTO's "Roadside Design Guide" (see Section 1A.11).

05 As defined in Section 1A.13, "crashworthy" is a characteristic of a roadside appurtenance that has been successfully crash tested in accordance with a national standard such as the NCHRP Report 350, "Recommended Procedures for the Safety Performance Evaluation of Highway Features."

06A (DE Revision) Information on the maintenance of TTC devices is contained in "Quality Guidelines for Work Zone Traffic Control Devices", published by the American Traffic Safety Services Association (ATSSA) and is available at the ATSSA website "<http://www.atssa.com>".

##### Standard:

- 06 Traffic control devices shall be placed as all signs, signals, markings, and other devices used to regulate, warn, or guide road users, defined on, over, or adjacent to a street, highway, private road open to public travel (see definition in Section 1A.13), pedestrian facility, or bikeway by authority of a public body or official having jurisdiction.
- 07 All traffic control devices used for construction, maintenance, utility, or incident management operations on a street, highway, or private road open to public travel (see definition in Section 1A.13) shall comply with the applicable provisions of this Manual.

#### Section 6F.02 General Characteristics of Signs

##### Support:

01 TTC zone signs convey both general and specific messages by means of words, symbols, and/or arrows and have the same three categories as all road user signs: regulatory, warning, and guide.

##### Standard:

02 (DE Revision) The colors for regulatory signs shall follow the Standards for regulatory signs in Table 2A-5 and Chapter 2B. Warning signs in TTC zones shall have a black legend and border on a fluorescent orange background, except for the Grade Crossing Advance Warning (W10-1) sign which shall have a black legend and border on a yellow background, and except for signs that are required or recommended in Part 2 or 7 to have fluorescent yellow-green backgrounds. Colors for guide signs shall follow the Standards in Table 2A-5 and Chapter 2D, except for guide signs as otherwise provided in Section 6F.55.

##### Option:

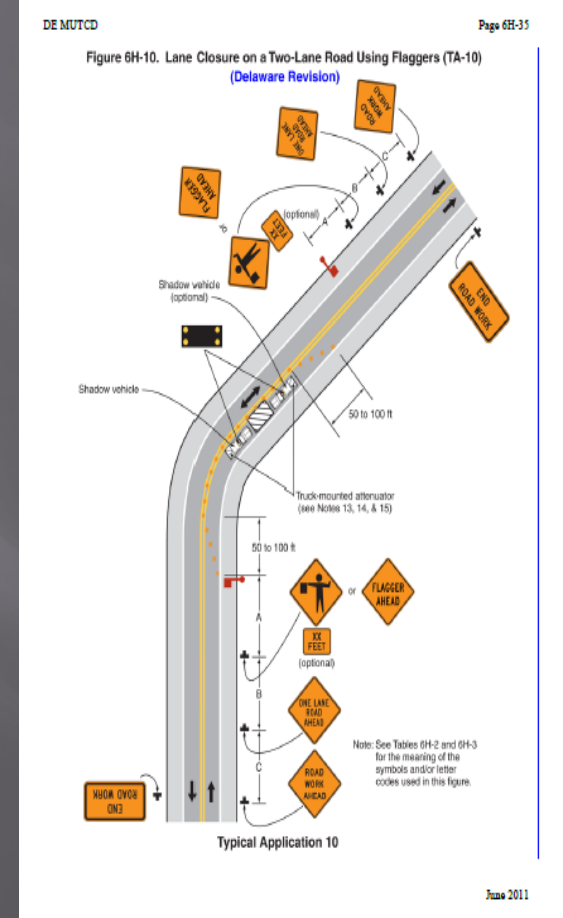
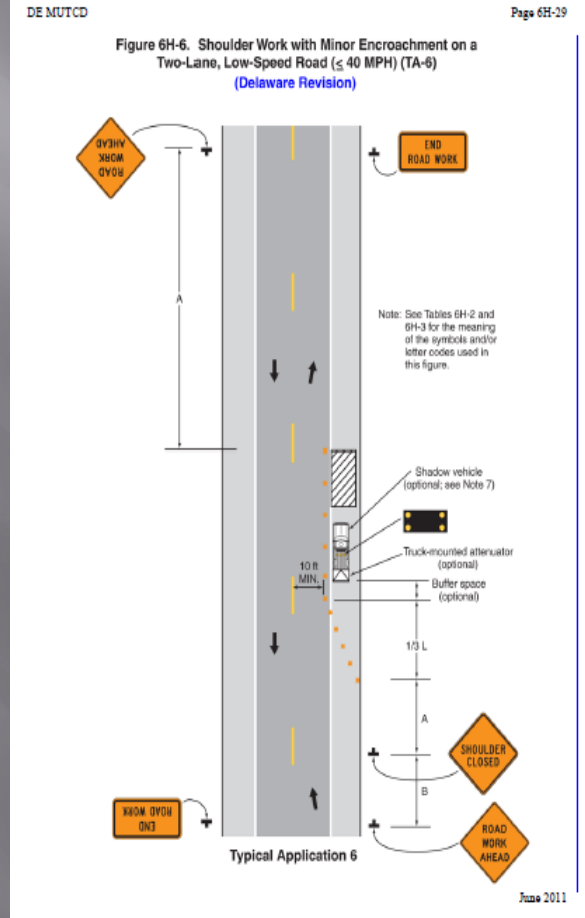
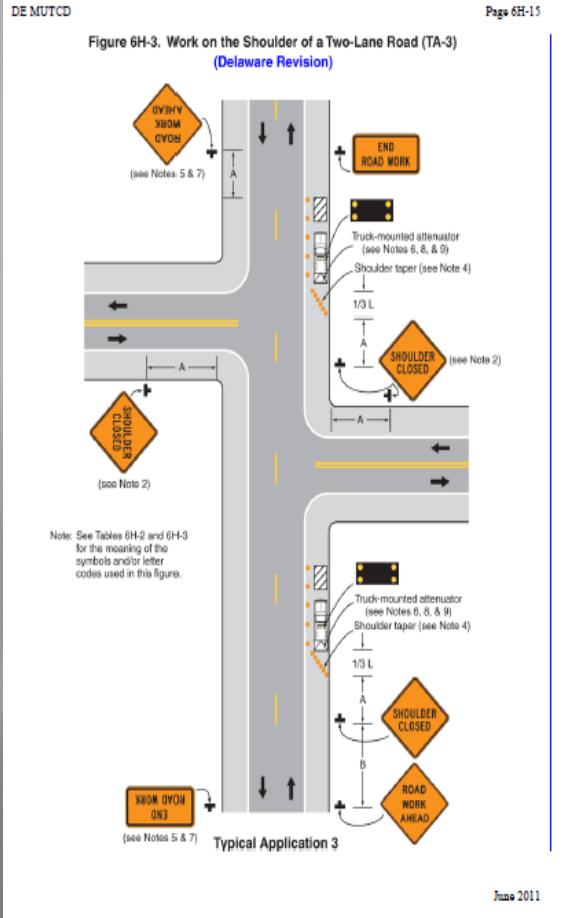
03 (DE Revision) Paragraph deleted.

June 2011



# Public Works Inspection

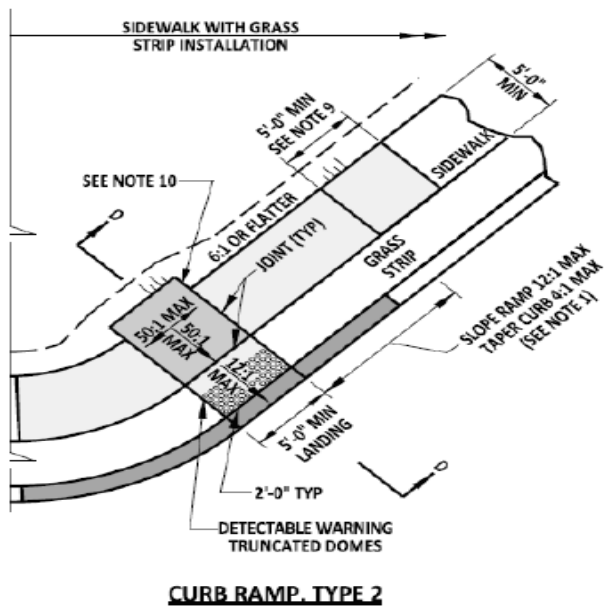
## Maintenance of Traffic



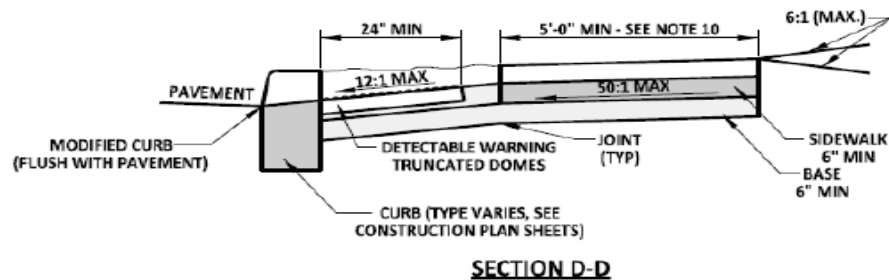
□ Delaware MUTCD Typical Applications

# Public Works Inspection

## ADA Ramps and PAS Compliance



ADA Ramp Worksheet



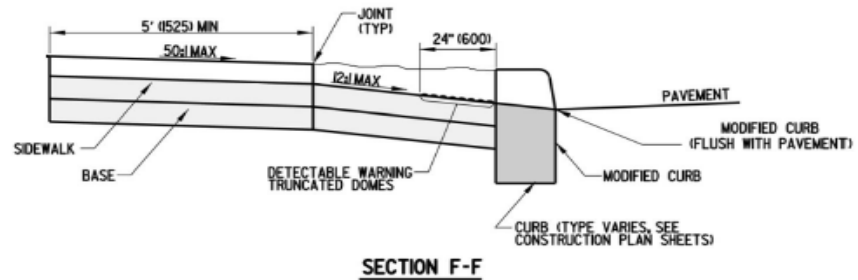
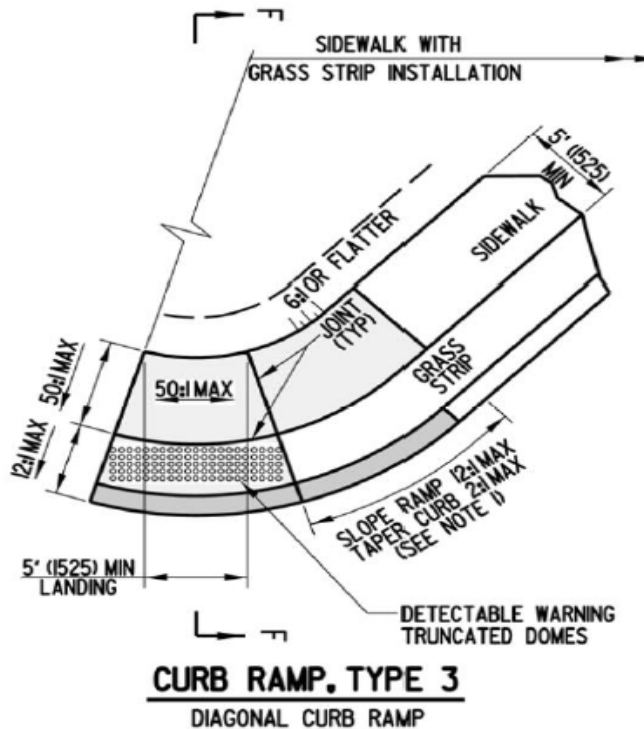
### NOTES:

- 1). FOR ALTERATIONS WITHOUT A GRASS STRIP OR WHERE THE EXISTING ROAD PROFILE IS STEEPER THAN 7% AND A<sub>1</sub> 12:1 MAXIMUM SLOPE RAMP WILL NOT MEET THE SIDEWALK GRADE WITHIN A LENGTH OF 15'-0", THE RAMP LENGTH MAY BE LIMITED TO 15'-0" AT A CONSTANT SLOPE, AND THE RAMP SLOPE ALLOWED TO EXCEED 12:1.
- 9). FOR REHABILITATION WORK, PLACE TRANSITION SLAB TO TRANSITION FROM THE NEW RAMP TO THE EXISTING SIDEWALK WHEN THE EXISTING SIDEWALK HAS A NON-CONFORMING RUNNING SLOPE, CROSS SLOPE, OR WIDTH. ADJACENT CURB SHOULD MATCH THE SLOPE OF THE TRANSITION SLAB.
- 10). LANDING AREAS SHALL BE EXTENDED 18" MIN BEYOND THE PEDESTRIAN PUSH BUTTON FOR ALL CURB RAMP TYPES. WHEN NO PEDESTRIAN PUSH BUTTON EXISTS, THE 18" EXTENSION CAN BE OMITTED.

# Public Works Inspection

## ADA Ramps

ADA Ramp Worksheet



### NOTES:

- D. WHERE A 12:1 MAXIMUM SLOPE RAMP WILL NOT MEET THE SIDEWALK GRADE WITHIN A LENGTH OF 15' (4570) DUE TO STEEP ADJACENT ROADWAY, THE RAMP LENGTH MAY BE LIMITED TO 15' (4570), AND THE RAMP SLOPE ALLOWED TO EXCEED 12:1.

# Public Works Inspection

## ADA Ramps

**Office of Performance Management  
ADA Compliance Review Report  
Agreement No. 1662  
Wicksfield Development, Section III  
Central Public Works  
November 25, 2014**

**Contractor:** George & Lynch, Inc.  
150 Lafferty Lane  
Dover, DE 19901

**Reviewers:** Allan Scrutchfield AECOM Technical Services  
Earle Hines AECOM Technical Services

**Topic:** Vertical Differences

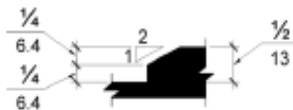
**Requirements:**

**303.2 Vertical.** Changes in level of  $\frac{1}{4}$  inch (6.4 mm) high maximum shall be permitted to be vertical.



**Figure 303.2  
Vertical Change in Level**

**303.3 Beveled.** Changes in level between  $\frac{1}{4}$  inch (6.4 mm) high minimum and  $\frac{1}{2}$  inch (13 mm) high maximum shall be beveled with a slope not steeper than 1:2.



**Figure 303.3  
Beveled Change in Level**

**Topic:** Drainage

**Requirements:**

**405.10 Wet Conditions.** Landings subject to wet conditions shall be designed to prevent the accumulation of water.

**Topic:** Landings

**Requirements:**

**405.7.1 Slope.** Landings shall comply with 302. **Changes in level are not permitted.**  
EXCEPTION: Slopes not steeper than 1:48 shall be permitted.

**405.7.2 Width.** The landing clear width shall be at least as wide as the widest ramp run leading to the landing.

**405.7.3 Length.** **The landing clear length shall be 60 inches (1525 mm) long minimum.**

**Topic:** Horizontal Gaps (Openings)

**Requirements:**

**302.3 Openings.** **Openings in floor or ground surfaces shall not allow passage of a sphere more than  $\frac{3}{8}$  inch (13 mm) diameter** except as allowed in 407.4.3, 409.4.3, 410.4, 810.5.3 and 810.10. Elongated openings shall be placed so that the long dimension is perpendicular to the dominant direction of travel.

**General Comment:**

An outline of the ADA requirement deficiencies are outlined in this report. Any questions regarding the outlined deficiencies, regulation interpretations or technical guidance should be directed to DelDOT's ADA Coordinator. All deficiencies must be corrected prior to contract acceptance.

**Attachments:** Three (3) pages

Respectfully submitted by:  
Clayton Bedwell  
Projects Compliance Manager  
DelDOT Quality Section





# Public Works Inspection

## Final Inspection & Release of Bond

**Office of Performance Management  
Final Inspection Comments Report  
Agreement No. 1768  
Champions Club Phase 1-3 – Subdivision Agreement  
Central Public Works  
July 3, 2019**

**Contractor:** Cirillo Bros. Inc.  
161 Cirillo Circle  
New Castle, DE 19720

**Contract Duration:** N/A

**Award Amount:** N/A

<b>Attendees:</b>	Stephen McCabe	DeIDOT Central Public Works
	David Scott	DeIDOT Central Public Works
	Cody Robinson	DeIDOT Central Public Works
	Omar Simpson	DeIDOT Office of Performance Mgmt.
	Maria Gieske	DeIDOT Office of Performance Mgmt.
	David Watt-McKee	McKee Builders

**Location:** Augusta National, Sta. 24+00 – 43+42  
Niklaus Lane, Sta. 16+90 – 40+29  
Bayhill Road, Sta. 0+00 – 17+95  
Congressional Court, Sta. 0+00 – 3+25  
Cherry Hill Road, Sta. 0+00 – 14+58

### Map Location



*Location snapshot courtesy of Google Earth*