NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

PHASE II MS4 TIER I GENERAL PERMIT

NPDES Permit No. DE 0051195
State Permit No. WPCC 3212/20

STORMWATER MANAGEMENT PROGRAM (SWMP) PLAN

for

THE DELAWARE DEPARTMENT OF TRANSPORTATION (DelDOT)

Submitted:
February 2025
Last Revised:
N/A

PHASE II MS4 TIER I GENERAL PERMIT

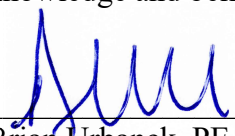
STORMWATER MANAGEMENT PROGRAM PLAN

General Permit Authorization for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4) under the National Pollutant Discharge Elimination System (NPDES) and the Laws of Delaware

State Permit Number: WPCC 3212/20 / NPDES Permit Number: DE 0051195
Effective Date: January 1, 2024 / Expiration Date: December 31, 2028

CERTIFICATION

I certify under penalty of law this document and all attachments were prepared under my direction, or supervision, in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or person(s) directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete.



2/26/25

Brian Urbanek, PE
Assistant Director
Statewide Support Services

Date

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INTRODUCTION

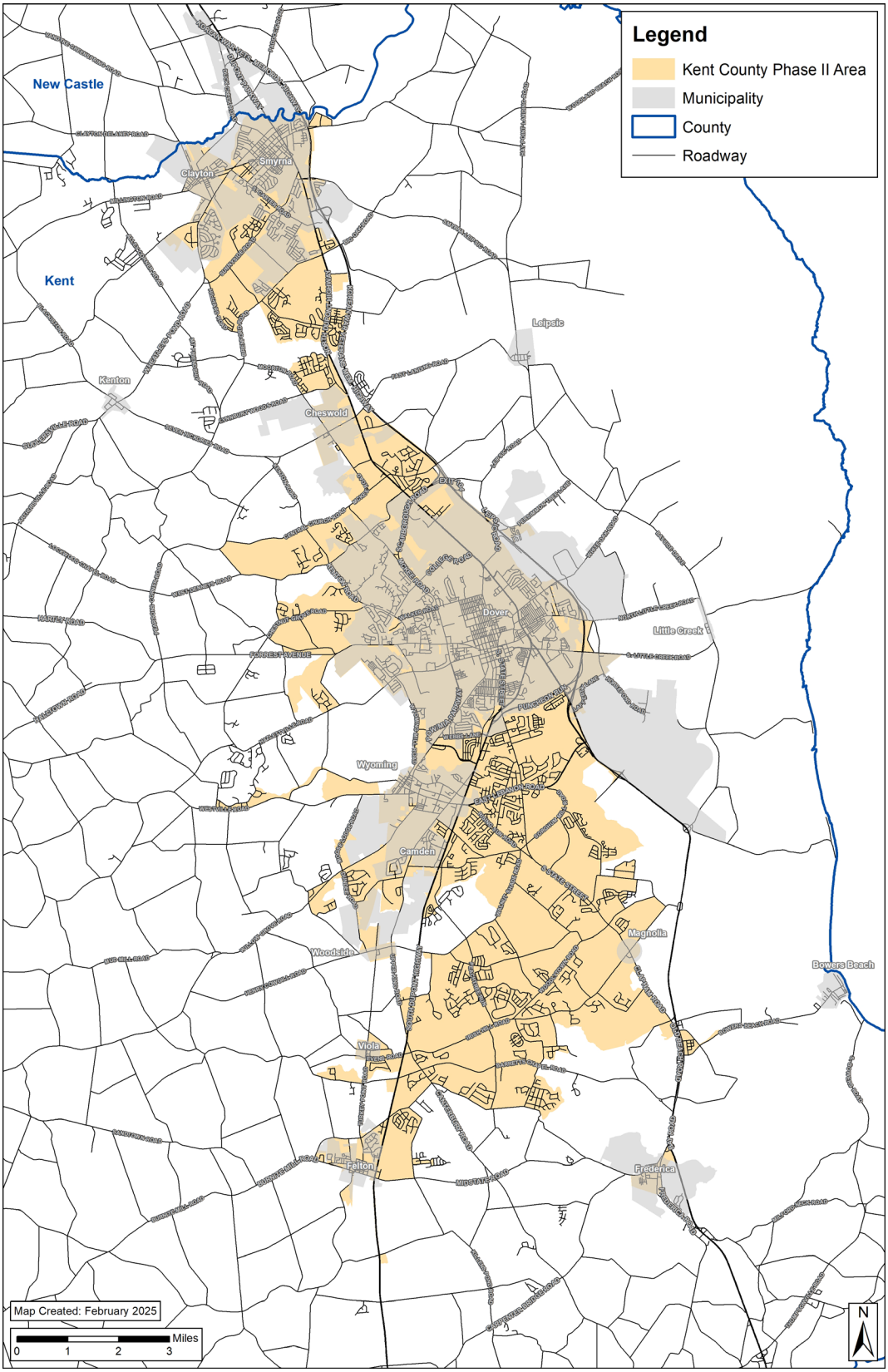
NPDES General Permit (GP) DE 0051195 / State Permit WPCC 3212/20 (permit) provides authorization for regulated small municipal separate storm sewer systems (MS4s) located within the State of Delaware to discharge stormwater into the waterbodies of the State. According to the permit, the permittee shall write, implement, manage, and enforce a Stormwater Management Program (SWMP) Plan in accordance with the Clean Water Act and its implementing NPDES regulations, 40 C.F.R. §122.34(a) to meet the stipulated requirements. These include reducing pollutants to the maximum extent practicable to the MS4 and effectively reducing pollutants in stormwater discharges or other unauthorized discharges into the MS4 as necessary to achieve Delaware's Surface Water Quality Standards to the maximum extent practicable. As well as, complying with all other provisions and requirements contained in the permit.

This document is intended to serve as the SWMP Plan for the Delaware Department of Transportation's (DelDOT) Phase II MS4 in Kent County, Delaware.

Within this document, Best Management Practices (BMPs) were identified for each program element requiring permit compliance activities for the permittee. Under each BMP, the permit requirements are stated, along with a timeline for accomplishing the requirements; SWMP Plan for accomplishing permit compliance; and lists of documentation that will be needed in each annual report. Many of the BMPs listed in this SWMP Plan are broad in nature and are identified in more detail in an Appendix document as noted.

Once the SWMP Plan has been approved by the Department of Natural Resources and Environmental Control (DNREC), it will be evaluated on an annual basis and may be updated and revised as appropriate. Any updates will be communicated to DNREC within DelDOT's Phase II annual report. The most current SWMP Plan will be available on DelDOT's website.

Figure 1: Location Map[1]



[1] Boundary submitted as part of the NOI.

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SECTION I: GENERAL REQUIREMENTS (GR)

NPDES General Permit (GP) DE 0051195 / State Permit WPCC 3212/20 provides authorization for existing regulated small municipal separate storm sewer systems (MS4s) located within the State of Delaware to discharge stormwater into the waterbodies of the State.

MS4 permittees are required under this Tier I General Permit (GP) to reduce the discharge of pollutants from its MS4 to the maximum extent practical (MEP) and to meet water quality requirements of the Clean Water Act (CWA) as applicable.

GR-1: Responsible Parties and Contact Information

Following is the responsible party and contact information for permittee submitting this SWMP Plan to DNREC. Please refer to **Appendix A-1: AUTHORIZATION TO SIGN** for the Record of Decision giving Brian Urbanek authorization to sign.

Responsible Party:
Brian Urbanek, PE
Assistant Director
Delaware Department of Transportation
Maintenance & Operations
800 S. Bay Road
Dover, Delaware 19901
302.760.2536
brian.urbanek@delaware.gov

Secondary Contact:
Sara Esposito, PE
NPDES Program Manager
Delaware Department of Transportation
Maintenance & Operations
800 S. Bay Road
Dover, Delaware 19901
302.760.2346
sara.esposito@delaware.gov

GR-2: Notice of Intent (Part I.D)

Requirements:

- *The permittee must complete a Notice of Intent (NOI) form on DNREC's website and submit it to DNREC.*
- *Obtain written authorization from DNREC to discharge.*
- *Include the NOI and DNREC's written authorization to discharge in the final SWMP Plan.*

Timeline:

- The NOI shall be submitted to DNREC within 60 days of the permit effective date (by March 1, 2024).

SWMP Plan:

- DelDOT submitted the NOI electronically on February 29, 2024. A copy of the NOI is included in **Appendix A-2: NOTICE OF INTENT**.

- DNREC approved the Authorization for Stormwater Discharges to DelDOT on March 14, 2024. A copy of the Authorization is in **Appendix A-3: NOTICE OF INTENT APPROVAL**.

GR-3: Stormwater Management and Water Quality (Part I.E)

Requirements:

- *The permittee shall write, implement, manage, and enforce a SWMP Plan in accordance with the Clean Water Act and its implementing NPDES regulations, 40 C.F.R. §122.34(a) to meet the following requirements.*
  1) *Effectively reduce pollutants in stormwater discharges or other unauthorized discharges into the MS4 as necessary to comply with Delaware's Surface Water Quality Standards to the maximum extent practicable.*
  2) *Reduce the discharge of pollutants from the MS4 for which Total Maximum Daily Loads (TMDLs) have been established and as required by a Pollutant Reduction Plan developed in accordance with this permit.*
  3) *Comply with all other provisions and requirements contained in this general permit.*
  4) *The SWMP plan shall include a list of all waters that receive a discharge from the MS4 owned or operated by the permittee, including the following information for each such receiving water:*
     a) *The number of outfalls discharging to each waterbody.*
     b) *Designated uses of each waterbody which can be found on the Department's website at*

     http://regulations.delaware.gov/AdminCode/title7/7000/7400/7401.shtml

     c) *Whether the receiving water is listed as impaired in the latest State of Delaware Combined Watershed Assessment Report (305(b)) and the Clean Water Act Section 303(d) List of Waters Needing TMDLs which can be found on the Department's website at*

     https://documents.dnrec.delaware.gov/swc/wa/Documents/2018%20Final%20Delaware%20IR%201-24-2019.pdf.

     If the water is included on the Combined Watershed Assessment Report as impaired (Integrated Report Code 4, 4a, or 5), provide the following details:
        i) *TMDL status or Pollutant Attainment Classification*
        ii) *Listing of relevant pollutant(s) or stressor(s) causing impairment*
        iii) *Probable source of pollutant(s) or stressor(s) (according to the 303(d) list)*

iv) A summary of any pollution control strategies or watershed plans and strategies that have been developed for the waterbodies which can be found on the Department's website at https://dnrec.alpha.delaware.gov/watershed-stewardship/assessment/plans-and-strategies/

v) A description of the permittee's potential sources of relevant pollutants, including description of the sources, their locations, and any structural and nonstructural measures and Best Management Practices (BMPs) that are or can reasonably be taken to reduce their exposure or release to the MS4.

5) The SWMP plan shall also include a statement describing what, if any, local public notice requirements apply to the applicant's stormwater program, including the SWMP finalization, if applicable, including a:

a) Citation to any applicable public notice rules.

b) Description of the process for notice and comment as described in the rule.

c) Timeline for complying with the rule, which outlines total amount of time required to notice, allow for comment, respond to comments, revise, and finalize the SWMP plan under the applicable rule so that the notice and comment part of the SWMP plan will be accounted for and completed in compliance with the deadline of this permit.

d) If there is no local requirement for public notice, the permittee shall state this in the SWMP plan.

e) Attestation to the following statement with original signature of a person who is authorized to represent and legally bind the entity.

"I certify under penalty of law this document and all attachments were prepared under my direction, or supervision, in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or person(s) directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete.

SWMP Plan:

- 1**)** This SWMP Plan will effectively reduce pollutants in DelDOT stormwater discharges or other unauthorized discharges into the MS4 as necessary to comply with Delaware's Surface Water Quality Standards to the maximum extent practicable.

- 2) The Pollutant Reduction Plan (PRP) will be prepared with the intent of reducing the discharge of pollutants from the MS4 for one watershed which Total Maximum Daily Loads (TMDLs) have been established. Per the permit the PRP is due within twenty-four (24) months from the date of

written NOI authorization to discharge issued by DNREC. As such it shall be submitted to DNREC by March 15, 2026.

- 3) The SWMP Plan strives to comply with all other provisions and requirements contained in the permit.

- 4) Reference **Appendix A-4: WATERSHEDS THAT RECEIVE RUNOFF** for the Watersheds that Receive Runoff from DelDOT's Phase II Rights-of-Way table that contains the requested supplemental information and the *State of Delaware 2022 Combined Watershed Assessment Report (305(b)) and Determination for the Clean Water Act Section 303(d) List of Waters Needing TMDLs, The Integrated Report* highlighted to show applicable waterbodies.

- 5) DelDOT, as a state agency, does not have any local public notice requirements for the finalization of the SWMP Plan.

- 6) Reference the Certification at the beginning of this SWMP Plan.

GR-4: Permittees Renewing Coverage (Part II.A)

Requirements:

- *The permittee renewing coverage under this permit shall continue to operate pursuant to its current SWMP plan and make progress on permit requirements and report information annually. The permittee shall review its current SWMP plan and revise as needed to be in compliance with this permit.*

Timeline:

- The updated SWMP plan shall be submitted for review within twelve (12) months of submitting an NOI to obtain coverage under the permit (by February 28, 2025).

SWMP Plan:

- DelDOT will continue to operate under its current SWMP until this revised SWMP, which is a substantial rewrite, has been submitted and reviewed by DNREC; however, we will make progress towards the revised permit requirements in the meantime.

- The revised SWMP will be submitted by February 28, 2025, and any necessary updates will be included in the annual report from thereon.

GR-5: Small MS4s Working Together as Co-Permittees (Part II.C)

Requirements:

- *The permittee has the option to establish a co-permittee relationship through a memorandum of understanding (MOU) or other contractual and legally binding agreement with another regulated MS4.*

SWMP Plan:

- DelDOT will not be a formal Co-Permittee with another MS4. However, extensive coordination has occurred with other MS4s, including the City of Dover, the Town of Middletown[2], the City of Newark[2], the Town of Smyrna, and the Town of Clayton.

- Background:
  - It is a goal of this permit term to better map the stormdrain maintenance responsibilities within municipal limits. It has been a gray area for numerous years, with many town agreements being vague or easily misinterpreted.
  - Generally, most State roads going through municipalities are designated as "curb to curb" roads where DelDOT is responsible for the pavement, but the municipality is responsible for all other items, including stormdrain maintenance.
  - However, because they are labeled as State roads and important throughfares, many municipalities think that they are DelDOT maintenance, and on occasion our maintenance crews have addressed non-pavement issues, either through our own oversight, or to benefit the traveling public.

- Coordination:
  - For each of the above-mentioned municipalities, DelDOT's consultant reviewed all existing Town/City agreements on file with a lens of stormwater maintenance and created a table and corresponding color-coded map based on the maintenance indicated by the agreements, or if there was agreement, or if the agreement was too ambiguous to determine. It is the goal to eventually go through the same process for all municipalities, but each analysis and subsequent communication takes significant time.
  - The information is shared with the municipalities for their review, and then meeting(s) held to discuss the roadways and determine responsibility for roadways with no agreements, undetermined responsibility, and for areas that had agreements but agreed illogical. Any changes to the responsibilities as a result of the discussions are overlaid with a hatch so both the original determination and any revisions can be seen.
  - Once all parties have agreed the resulting map can be used to better understand maintenance responsibilities. The DelDOT NPDES Map Viewer ownership field is updated accordingly, and the maps can be appended to each SWMP, and/or updated in the annual reports.

[2] Outside of DelDOT's Phase II area, but another Phase II permittee requesting stormwater coordination.

- Status of Updated Mapping:
  - City of Dover:
    - Initial Documentation Sent: 06/14/24
    - Discussion Meeting: 07/11/24
    - Final Documentation Sent: 09/11/24
    - City of Dover MS4 Maintenance Map, dated August 2024 is in **Appendix A-5: CITY OF DOVER MS4 MAINTENANCE MAP**
  - City of Newark:
    - Initial Documentation Sent: 08/22/24
    - Draft City of Newark MS4 Maintenance Map, dated August 2024 is in **Appendix A-6: CITY OF NEWARK MS4 MAINTENANCE MAP**
    - Discussion Meeting: 09/17/24
    - Final Documentation Sent: Still in Discussions
  - Town of Middletown:
    - Initial Documentation Sent: 08/22/24
    - Draft Town of Middletown MS4 Maintenance Map, dated May 2024 is in **Appendix A-7: TOWN OF MIDDLETOWN MS4 MAINTENANCE MAP**
    - Discussion Meeting: TBD
  - Town of Smyrna:
    - Initial Documentation Sent: 08/21/24
    - Discussion Meeting: 10/14/24
    - Final Documentation Sent: 12/03/24
    - Town of Smyrna MS4 Maintenance Map, dated November 2024 is in **Appendix A-8: TOWN OF SMYRNA MS4 MAINTENANCE MAP**
  - Town of Clayton:
    - Initial Documentation Sent: 12/04/24
    - Discussion Meeting: 01/13/25
    - Final Documentation Sent: In Progress
    - Town of Clayton MS4 Maintenance Map, dated January 2025 is in **Appendix A-9: TOWN OF CLAYTON MS4 MAINTENANCE MAP**.
- In addition to the above, Delaware MS4s meet quarterly as an MS4 consortium to share updates, resources and lessons learned.

❖ Each annual report will contain any updates to the municipality discussions and updated mapping.

GR-6: Evaluation and Assessment (Part III.A)

Requirements:

- *The permittee shall assess and evaluate the BMPs described in the SWMP Plan. The assessment is the process of evaluating the actual BMP's effectiveness. The evaluation is conducted to determine whether the BMP is performing as intended to achieve its water quality goals as defined in the SWMP plan. In this evaluation, the permittee shall consider the appropriateness of the BMPs and whether other or additional BMPs would be more effective in pursuing those goals. If, as a result of the evaluation, the permittee determines that additional or other BMPs could advance the SWMP plan toward the goals more effectively, the permittee shall incorporate those BMPs into its SWMP plan. Assessment and evaluation activities shall be documented in the annual report as defined in this part, section C below.*

SWMP Plan:

- DelDOT will include an evaluation and assessment section in each annual report.

GR-7: Recordkeeping (Part III.B)

Requirements:

- *The permittee shall keep records for at least 5 years after the expiration of this general permit. In addition to the information required in MS4 annual reports specified below, permittees must submit any additional supporting documentation at the request of the Department. The permittee shall make its MS4 program information, including records, available to the public during regular business hours.*

SWMP Plan:

- DelDOT will keep all information related to the permit compliance for at least 5 years after the expiration of the permit (December 31, 2028).

GR-8: Reporting (Part III.C)

Requirements:

The permittee shall prepare and submit an annual report. The annual report shall document the activities, and best practices implemented by the permittee to demonstrate compliance with this General Permit.

If more than one entity is permitted via the same written NOI authorization to discharge under this permit, one comprehensive annual report shall be submitted with input from each principal and co-permittee. The permittee(s) shall submit the annual report to the Department's Commercial Services and Government Section no later than July 1st of each year after issuance of written NOI authorization to discharge and shall describe all activities related to this permit during the preceding calendar year. The permittee shall include a summary of the data documenting compliance with this permit in the annual report.

All permittees are jointly responsible for timely submittal of the system-wide annual report, and each section addressed within the annual report shall identify individual tasks along with the jurisdiction responsible for performing them. The annual report shall indicate any missing information. Each permittee is responsible for the content of the report related to those portions of the MS4 for which it is responsible, as determined in the MOU.

After issuance of this permit, the first annual report submission shall include reporting information from the existing SWMP plan as described in the most recent annual report submitted to the Department until the final SWMP plan is developed by the permittee. Once the new SWMP plan is developed and implemented, the annual report shall contain information relevant to the most recent SWMP plan. The permittee shall ensure that all MOUs or other legally binding agreements entered into during the formation of the SWMP plan are contained in the annual report following their finalization.

The permittee shall include a summary of the data documenting its/their compliance with this permit in the annual report, in addition to one "MS4 Summary Report Form" per permittee which is available at https://documents.dnrec.delaware.gov/wr/Information/SWDInfo/Documents/Draft%20Appendix%20B.%20Summary%20Report%20(1).pdf.

SWMP Plan:

- DelDOT will prepare an annual report for each calendar year that will be submitted no later than July 1st of each year. The annual report for calendar 2024 will be based on the existing SWMP plan, however, all subsequent annual reports will be based on this SWMP plan.

- Each annual report will include the Appendix B "MS4 Report Form".

SECTION II: MINIMUM CONTROL MEASURES (MCMs)

1. Public Education and Outreach (Part II.D.1)

The goal of MCM-1 is to educate and provide actions the public can take to reduce pollutants from entering the stormwater system. Under this MCM, the permittees shall develop, implement, and maintain a written public education and outreach program and distribute educational materials to the community, employees, and contractors about the consequences of polluted stormwater runoff. Examples of educational materials include web pages, brochures, booklets, and training programs. The education and outreach program may be coordinated with other portions of the permittee's MS4 program or developed independent of other pollution control efforts.

The program shall be designed to achieve measurable improvements in the public's understanding of the causes and impacts of stormwater pollution and the actions they can take to prevent pollution. Permittees are encouraged to work with other MS4 permittees, especially those located in the same watershed, when educating the public.

BMP 1-1: Hotline (Part II.D.1.a)

Requirements:

- *Establish a process by which the public can report water quality complaints that must include a 24-hr hotline phone number.*

Timeline:

- Within 60 days of the permit effective date (by March 1, 2024).

SWMP Plan:

- DelDOT provides the 302-STOPPIT program that allows the public to call or text 302-STOPPIT, or enter the compliant at www.302stoppit.org. This was in operation prior to March 1, 2024 (since DelDOT's Phase I permit DE 0051071 / WPCC 3063A/96 was issued in 2013).

- The hotline is posted on our website: https://deldot.gov/Programs/stormwater/index.shtml?dc=report_a_problem.

- MS4 related complaints received from the public are investigated in a timely manner (same or next business day). DNREC's Emergency Response information is provided for more urgent concerns.

- For MS4 related complaints, the written procedures outlined in the Illicit Discharge Detection and Elimination (IDDE) program are followed for handling potential illicit discharge complaints from the public. Reference BMP 3 for additional information.

Annual Report:

- A tracking sheet to document the complaints received through the hotline including the date of the complaint, location of the complaint, nature of complaint, the resolution, and the date of resolution, will be provided. The tracking mechanism will also state whether the complaint is MS4 related.

BMP 1-2: Target Audience (Part II.D.1.b)

Requirements:

- *Update the target audience(s) within the MS4 jurisdiction and continue developing engaging materials to educate the audience(s) on the impact of stormwater pollution. These topics may include water conservation, chemical application on lawns and landscaping, proper car wash procedures, proper disposal of paint and other household hazardous waste, recycling and trash pick-up, and proper pet waste disposal.*

Timeline:

- Include in the SWMP and update annually as necessary.

SWMP Plan:

- Target audience essentially includes all members of the public as we can all learn and strive to do better. Some examples of different audiences and potential messages to deliver may include:

Messages	School Age	Home Owners	Environmental Justice Areas	Contractors
Water Conservation	✓		✓	
Impervious Surfaces/Stormwater Management	✓		✓	✓
Fertilization		✓		✓
Car Wash	✓	✓		
Hazardous Household Waste		✓	✓	
Recycling	✓	✓	✓	
Pet Waste	✓	✓	✓	

- DelDOT will use a mix of in person educational events and workshops, written materials, digital ads, and/or giveaways to engage the public.

Annual Report:

- A list of target audiences, educational materials utilized and outreach initiatives conducted will be included.

BMP 1-3: Educational Events or Campaigns (Part II.D.1.c)

Requirements:

- *Conduct two educational events or campaigns per year that may include distributing educational materials describing the impacts of stormwater pollutant discharges on water bodies and methods of reducing stormwater pollution. Materials may be distributed through newsletters, websites, or other appropriate methods, radio or television public service announcements, or other events that will reach the target audiences*.

Timeline:

- Annually after the SWMP submittal.

SWMP Plan:

- Two educational events and/or campaigns per year will be conducted. DelDOT plans on doing at least one educational event and one digital advertising campaign per year.
  - Potential examples of educational events include: DNREC's Make-a-Splash, DelDOT's Bridge Competition, Livable Lawns workshops, State Fair, etc.
  - Potential examples of digital advertising campaigns include: Fertilization/Livable Lawns ads, 302-STOPPIT ads, Adopt-a-Highway, Anti-Litter and Pet Waste ads.

Annual Report:

- For events, the date of the event, target audience, materials distributed, and number of attendees will be provided, and if possible, photos provided.

- For campaigns, the dates of advertisement, method of advertisement, target audience, number of impressions and number of clicks will be provided, in addition to the material advertised.

BMP 1-4: Employee Training (Part II.D.1.d)

Requirements:

- *Revise as needed and implement an annual training program for appropriate employees that addresses topics to prevent or reduce the discharge of stormwater pollution into the MS4.*

Timeline:

- Annually after the SWMP submittal.

SWMP Plan:

- Our annual employee training will continue and be revised as necessary. Currently the training program includes:
  - Maintenance yard staff watch training videos on "Environmental Compliance at Maintenance Yards " (SWMP, SPCC, good housekeeping, etc) and "Environmental compliance along Roadways" (illicit discharge response, vegetation management, BMP maintenance, etc). The training videos were completed and dispersed to the maintenance yard staff in 2024.
  - Professional staff are updated through in-house workshops and publications as appropriate, including but not limited to: Winter Workshop, Lessons Learned, the Erosion, Sediment & Stormwater Section Wiki page, and the weekly newsletter, among others .
  - Staff attend conferences and trainings as appropriate, including but not limited to: National Highway Institute (NHI), Federal Highway Administration (FHWA), StormCon, Roadway Management Conference (RMC), and American Stormwater Institute, among others.

Annual Report:

- Attendee lists for in-house trainings and details on external trainings will be included.

BMP 1-5: Education Effectiveness (Part II.D.1.e)

Requirements:

- *Describe in annual reports how the education programs complement and strengthen other requirements in the MS4 permit.*

Timeline:

- Annually after the SWMP submittal.

SWMP Plan:

- N/A.

Annual Report:

- The permittee will summarize the number of calls to the hotline, amount of educational materials distributed to the target audiences, website viewership, and attendance at educational event(s) to gain an understanding of total impressions.

- The permittee will include the total impressions and an evaluation of their public education and outreach program in the annual report to DNREC.

- The permittee will submit examples of educational materials to DNREC as part of the annual report.

2. Public Involvement and Participation (Part II.D.2)

The goal of MCM-2 is to create opportunities for public participation and to encourage citizens to engage in the MS4 management program for controlling stormwater discharges. Examples of activities that involve the public include stewardship activities such as adopt-a-stream programs, stream clean-ups, litter pickup days, public surveys, storm drain marking, volunteer water quality monitoring, tree plantings, and other pollution prevention events.

This program may be coordinated with other portions of the permittee's MS4 program or developed independently of other pollution control efforts. Permittees are encouraged to work with neighboring MS4 permittees that are located in the same watershed when involving and engaging the public to participate in the SWMP Plan.

The permittee shall develop, implement, and maintain a public involvement and participation program. The permittee shall provide program updates in the annual report.

BMP 2-1: Written Public Involvement and Participation Program (Part II.D.2.a)

Requirements:

- *Update, implement, and maintain a written public involvement and participation program which promotes and provides participation activities available to the community and describes the methods on encouraging the public's involvement and input.*

Timeline:

- Annually after the SWMP submittal.

SWMP Plan:

- The program shall be updated as necessary to achieve progress with each identified BMP in this section.

- Public involvement and participation will be integrated with other program elements and adjusted to address issues brought to the permittee from the public and from lessons learned in implementing other program elements.

Annual Report:

- Any updates to the Public Involvement and Participation Program will be included in the annual report.

BMP 2-2: Target Audiences (Part II.D.2.b and Part II.D.2.c)

Requirements:

- *Determine the target audiences within the MS4 jurisdiction to promote public involvement and participation activities. Identify key individuals and groups (public and private), who are interested in or affected by the SWMP. Specify activities appropriate for each of the target audience groups and promote participation through the permittee's website, print media and other methods.*

Timeline:

- Annually after the SWMP submittal.

SWMP Plan:

- Similar to BMP 1-2, target audiences for public involvement and participation essentially includes all members of the public as we can all learn and strive to do better. Some examples of different audiences and potential events to deliver may include:

Messages	School Age	Home Owners	Environmental Justice Areas	Contractors
BMP Implementation/ Retrofits	✓	✓	✓	✓
Litter Clean-Ups	✓	✓	✓	
Tree Plantings	✓	✓	✓	
Storm Drain Marking	✓	✓	✓	
Reduced Fertilizer Implementation	✓	✓		✓
Water Quality Monitoring	✓	✓	✓	

Annual Report:

- Any updates to the target audiences and activities will be included in the annual report.

BMP 2-3: Public Participation Activities (Part II.D.2.c)

Requirements:

- *Perform three public participation activities each year during the permit term.*

Timeline:

- Annually after the SWMP submittal.

SWMP Plan:

- DelDOT will sponsor three public participation activities a year, which may include, but is not limited to:
  - Adopt-a-Highway:
    - Target Groups: Work organizations; Families; Sororities/fraternities; Church groups; HOAs; School Groups; and other community groups.
    - DelDOT Provides: Promotion including social media and/or digital ads; Website; signage; Safety materials; Trash pick-up
  - Work-a-Day, Earn-a-Pay:
    - Target Groups: Low Income; Recently paroled
    - DelDOT Provides: Promotion including social media and/or digital ads; Transportation vehicles; Pay; Safety materials; Trash pick-up
  - Livable Lawns:
    - Target Groups: Homeowners; Commercial applicators
    - DelDOT Provides: Promotion including social media and/or digital ads; Website; Soil test kits; Commercial supply materials
  - Tree Plantings:
    - Target Groups: Schools; Churches; Home owner associations
    - DelDOT Provides: Trees; Equipment; or Funding

Annual Report:

- A summary of the activity, number of participants, and applicable statistics will be included in the annual report.

BMP 2-4: Public Access (Part II.D.2.d)

Requirements:

- *Provide public access to the permittee's MS4 annual reports on a website or by request and consider incorporating substantive public comments received when updating and implementing, and/or making improvements to the SWMP.*

Timeline:

- Annually after the SWMP submittal.

SWMP Plan:

- DelDOT has website discussing the Phase II permit: https://deldot.gov/Programs/stormwater/index.shtml?dc=permit.
  - States that the annual reports are available upon request;
  - Encourages the public to comment on the SWMP and annual reports.

Annual Report:

- Any comments received and/or incorporated into the SWMP will be noted in the annual report.

3. Illicit Discharge Detection and Elimination (IDDE) (Part II.D.3)

The goal of MCM-3 is to update, implement, manage and enforce a program to detect and reduce to the maximum extent practicable illicit discharges into the MS4. The program shall include a plan to detect and reduce to the maximum extent practicable non-stormwater discharges, including illegal dumping and spills to the MS4. Unless identified by the permittee as a significant source of pollutants to waters of the State, the following non-stormwater discharge categories are allowed to enter the MS4:

- *water line flushing.*
- *landscape irrigation.*
- *diverted stream flows.*
- *rising groundwaters.*
- *uncontaminated groundwater infiltration.*
- *uncontaminated pumped groundwater.*
- *discharges from potable water sources.*
- *foundation drains.*
- *air conditioning condensate.*
- *springs.*
- *water from crawl space pumps.*
- *footing drains.*
- *lawn watering.*
- *individual residential vehicle washing.*
- *flows from riparian habitats and wetlands.*
- *dechlorinated swimming pool discharges.*
- *street wash water (discharges or flows from firefighting activities are excluded from the effective prohibition against non-stormwater and need only be addressed where they are identified as significant sources of pollutants to waters of the United States).*

BMP 3-1: Stormwater Mapping (Part II.D.3.a and b)

Requirements:

- *Update and maintain a map(s) of the regulated MS4 that identifies all stormwater conveyances, outfalls, stormwater management structures and waters of the State that receive stormwater discharges from the MS4. In the development of mapping, verify outfall locations and map new conveyances, outfalls, and stormwater management structures as they are constructed or newly discovered within the regulated MS4 area.*

Timeline:

- Annually after the SWMP submittal.

SWMP Plan:

- DelDOT's NPDES Section in the Division of Maintenance and Operations oversees the mapping of the stormdrain conveyances, structures, and outfalls (stormdrain infrastructure) and stormwater best management practices (BMPs) that service DelDOT's rights-of-way.

- To support DelDOT in inventorying the stormdrain infrastructure and BMPs, DelDOT has a contract with KCI Technologies Inc (KCI) awarded on 11/09/22 and valid through 11/09/25, with two one-year extensions possible. The Request for Proposals detailing the required services can be found in **Appendix B-1: AGREEMENT 2056 REQUEST FOR PROPOSAL** and information regarding the status of the contracts can be found at: https://mmp.delaware.gov/Contracts/Details/5871.

- A NPDES database is maintained that shows the location of DelDOT stormdrain infrastructure and BMPs, pertinent size/type/condition information, and latest inspection reports.

- DelDOT inventory process is generally:
  - Stormdrain infrastructure that is accessible is reinspected in approximately a 5-year cycle. Reference BMP 6-4: Catchbasin Inspection and Cleaning for additional information.
  - New stormdrain infrastructure in subdivisions is inspected and inventoried prior to the end of the contractor warranty period to ensure it was constructed adequately.
  - New stormdrain infrastructure from DelDOT projects is typically entered from project plans. DelDOT is in the early stages of trying to automate this process from electronic asbuilts.
  - All stormdrain infrastructure is verified by DelDOT Construction staff through contracted pipe video inspection to ensure the infrastructure is built appropriately.
  - All new stormwater BMPs are entered into the database after the project is accepted into Maintenance and Operations. Prior to acceptance, BMPs are inspected to ensure adequate construction. Asbuilt approval is administered by DelDOT's Water Resources section, who also oversees the design and construction of all stormwater and drainage features.

- Reference the Inventory and Inspection Standard Operating Procedure (SOP) in **Appendix B-2: INVENTORY AND INSPECTION STANDARD OPERATING PROCEDURE** for additional information.

Annual Report:

❖ A yearly submission of our stormdrain and BMP mapping will be submitted with the annual report, along with a summary of the totals inspected and inventoried.

BMP 3-2: Non-Stormwater Discharges Ordinance (Part II.D.3.c)

Requirements:

❖ *Maintain an ordinance or other regulatory means to implement and enforce a program that includes the prohibition of non-stormwater discharges to the MS4.*

Timeline:

❖ N/A.

SWMP Plan:

❖ DelDOT does not have statutory authority to enact an ordinance, but does maintain a policy that requires a permit from anyone seeking to tie into its system. The requirement for the permit is stated in DelDOT's Development Coordination Manual, Section 7.5 – Residential Discharges: "Residential discharges into roadside drainage systems require a permit which must be obtained from DelDOT Public Works Office prior to connection/installation." The agreement that is utilized when a permitted connection is approved states that illicit discharges are not allowed. Reference **Appendix B-3: SUMP PUMP DISCHARGE LETTER** for a copy of the agreement.

Annual Report:

❖ N/A.

BMP 3-3: IDDE Program (Part II.D.3.d)

Requirements:

- *Update, maintain, and enforce a written Illicit Discharge Detection and Elimination (IDDE) Program that contains the requirements in permit Parts II.D.3.d.1 through permit Part II.D.3.d.7.*

Timeline:

- Annually after the SWMP submittal.

SWMP Plan:

- See separated responses to permit requirements Parts II.D.3.d.1 through Parts II.D.3.d.7 below.

- DelDOT's NPDES Section in the Division of Maintenance and Operations oversees IDDE investigations pertaining to DelDOT rights-of-way.

- To support DelDOT in IDDE investigations, DelDOT has a contract with KCI Technologies Inc (KCI) awarded on 07/11/23 and valid through 07/11/26, with two one-year extensions possible. The Request for Proposals detailing the required services can be found in **B-4: AGREEMENT 2070 REQUEST FOR PROPOSAL** and information regarding the status of the contracts can be found at: https://mmp.delaware.gov/Contracts/Details/6225.

- Reference the IDDE Standard Operating Procedure (SOP) in **Appendix B-5: IDDE PROGRAM STANDARD OPERATING PROCEDURES**.

Annual Report:

- Any changes to the IDDE SOP will be highlighted in the annual report.

BMP 3-4: High Priority Areas (Part II.D.3.d.1)

Requirements:

- *Update, maintain and enforce procedures for identifying priority areas that have a higher likelihood of illicit discharges, illicit connections, or illegal dumping. Areas to examine include older infrastructure, historical high-risk activities, and areas with higher incidence of spill or illicit discharge history.*

Timeline:

- Annually after the SWMP submittal.

SWMP Plan:

- DelDOT's MS4 IDDE consultant will re-visit locations of previous illicit discharges from five years prior each year, unless the possibility of that illicit discharge was completely removed. Reference **Appendix B-5: IDDE PROGRAM STANDARD OPERATING PROCEDURES** for additional information.

Annual Report:

- The results of IDDE screenings for past IDDE investigations will be included.

- Any changes to the IDDE SOP will be highlighted in the annual report.

BMP 3-5: IDDE Screening Program (Part II.D.3.d.2)

Requirements:

- *Update and continue to implement a screening program to assist in detecting and eliminating illicit discharges.*
    - *The screening program shall include a schedule and methodology to evaluate at least 20% of the permittee's storm sewer system per year using mapping and water quality data to determine areas with high potential for illicit discharges and improper disposal. Dry weather screening and field evaluation activities shall be conducted in these areas.*
    - *Update written procedure to determine which outfalls will receive dry weather screening based on results of field observations, complaints from the public, or investigation from the permittee's trained field staff. When visual observations indicate a potential problem such as discolored flows, foam, surface sheen, and other similar indicators of contamination, the permittee shall sample and analyze for selected indicator pollutants that are defined in the written procedures. Any field evaluations shall be included in the annual report.*

Timeline:

- Annually after the SWMP submittal.

SWMP Plan:

- At least 20% of the storm sewer system will be evaluated per year:
    - The MS4 area has been divided into five distinct areas, labeled IDDE Area 1 through IDDE Area 5. Each of the five areas contains 20% (+/-) of the mapped structures (i.e. inlets, pipe ends, swale ends). Reference **Appendix B-5: IDDE PROGRAM STANDARD OPERATING PROCEDURES** for the Phase II IDDE Outfall Screening Map.
    - One IDDE Area will be evaluated each year of the permit.

- All outfalls within each IDDE Area will be visited during the course of the year for that IDDE Area, and screened for evidence of illicit discharge.
    - All outfall screenings will occur during dry-weather.
    - Outfalls with evidence of illicit discharge (i.e. odor, staining, deposits, etc.) will be followed up with further investigation, following the IDDE SOP.
    - If an outfall can physically not be accessed due to safety or accessibility, then the nearest upstream structure will be screened in its place.
    - In addition to the outfall screening, all contributing structures to the outfall will be evaluated as part of the IDDE process. Reference BMP 6-4, Catchbasin Inspection and Cleaning for additional information.

Annual Report:

- A summary of all IDDE investigations, including how they were discovered and resolved, will be included in the annual report.
- Any changes to the IDDE SOP will be highlighted in the annual report.

BMP 3-6: Source of an Illicit Discharge (Part II.D.3.d.3)

Requirements:

- *Implement a system for identifying the source of an illicit discharge when a contaminated flow is detected at an outfall and establish procedures for eliminating an illicit discharge when possible.*
- *The annual report shall include the written procedures, sample report template, and a summary of all reported illicit discharges including incident description reported, date, response actions, follow-up actions, and enforcement actions.*

Timeline:

- Annually after the SWMP submittal.

SWMP Plan:

- The IDDE SOP in **Appendix B-5: IDDE PROGRAM STANDARD OPERATING PROCEDURES** identifies how illicit discharges are typically investigated to identify the source of the concern, and also the procedures for forwarding the concern to the appropriate entity for resolution. Reference BMP 3-7, Legal Mechanism for Access for additional information.
- The IDDE SOP also contains a sample investigation report template.

Annual Report:

- The annual report will include a summary of all reported illicit discharges including incident description reported, date, response actions, follow-up actions, and enforcement actions.
- Any changes to the IDDE SOP or sample investigation report will be highlighted in the annual report.

BMP 3-7: Legal Mechanism for Access (Part II.D.3.d.4)

Requirements:

- *Legal mechanism for gaining access to private properties to inspect outfalls and investigate illicit connections or discharges. Examples of mechanisms include, town/city ordinances, land easements, and search warrants.*

Timeline:

- At time of SWMP submittal.

SWMP Plan:

- Delaware Code, Title 17, Chapter 1, Subchapter III, Section 132.c.13 states "the Department may do the following…enter upon the lands or waters of any person for the purposes of surveys, repairs, reconstruction and operation of publicly financed improvements…"

- DelDOT does not have a legal mechanism for entering private property other than for publicly funded improvements as stated above, as our jurisdiction is otherwise limited to our rights-of-way.

- DelDOT will investigate all illicit discharges that originate and are caused by the entities within rights-of-way where DelDOT has stormdrain responsibility ("DelDOT rights-of-way"). Illicit discharges that originate and/or are caused by entities outside DelDOT rights-of-way will be referred to the municipality/local authority having jurisdiction over that property. If the municipality/local authority is not of assistance, or it is a septic overflow concern, DelDOT will refer the incident to DNREC. Examples of possible situations are stated below:
  - DelDOT responsibility:
    - Major leaks or spills from vehicles using DelDOT rights-of-way, however follow-up action on the discharger may be limited[3];
    - Trash originating within DelDOT rights-of-way from motorists, cyclists or pedestrians[3];
    - Dog waste and dog waste bags left in DelDOT rights-of-way[3];
    - Non-individual residential car washing activities taking place within DelDOT rights-of-way;
    - Wastes and illicit discharges from construction activities originating within DelDOT rights-of-way.
  - Non-DelDOT responsibility:
    - Illicit liquids or grease originating outside DelDOT rights-of-way either dumped or migrated within DelDOT rights-of-way;
    - Trash and other wastes originating outside DelDOT rights-of-way either dumped or migrated within DelDOT rights-of-way;

[3] Follow-up action on the discharger may be limited, however, these items will be cleaned up as best as possible and education to the public provided as applicable.

- Direct connections to the DelDOT stormdrain system with illicit discharges from entities residing outside DelDOT rights-of-way. Note, if the connection was not previously approved, DelDOT will issue a Notice of Illegal Connection and will work with the entity to either remove or properly approve the connection, but the illicit discharge investigation shall be on the municipality having jurisdiction on the entity causing the illicit discharge.
- Car washing runoff originating outside DelDOT rights-of-way either dumped or migrated within DelDOT rights-of-way;
- Wastes and illicit discharges from construction activities originating outside DelDOT rights-of-way either dumped or migrated within DelDOT rights-of-way.

Annual Report:

❖ N/A

BMP 3-8: Record of Inspections (Part II.D.3.d.5)

Requirements:

- *Record all outfall inspections including flows observed, results of screening and testing, follow up investigations, and corrective actions taken to reduce illicit discharges to the MEP.*

Timeline:

- Annually after the SWMP submittal.

SWMP Plan:

- Reference the IDDE SOP in **Appendix B-5: IDDE PROGRAM STANDARD OPERATING PROCEDURES** for blank copies of:
  - Potential Illicit Discharge Investigation Summary Table
  - 302-STOPPIT Investigation Summary Table
  - Illicit Discharge Detection and Elimination Field Tracking Form
  - Notice of Illicit Discharge Template
  - Spill Response Summary Table

Annual Report:

- The annual report will include records of all outfall inspections, including flows observed, results of screening and testing, follow up investigations, and corrective actions taken.

BMP 3-9: Public Reporting (Part II.D.3.d.6)

Requirements:

- *Maintain a system for addressing public reporting of illicit discharges and procedures to inform employees, businesses, and the general public of the hazards associated with illegal discharges and improper waste disposal.*

Timeline:

- Annually after the SWMP submittal.

SWMP Plan:

- DelDOT, in conjunction with other MS4s, maintains the 302-STOPPIT hotline and website for the public to call, text or submit electronically any water quality concerns. The website can be found at: https://www.302stoppit.org/.
  - All potential illicit discharges that are received are investigated within 24 business hours.
  - DNREC's Emergency Hotline is provided for any emergencies requiring urgent attention.
  - If a potential illicit discharge is received that is not under DelDOT's jurisdiction it will be forwarded to the applicable entity.
  - Reference the IDDE SOP in **Appendix B-5: IDDE PROGRAM STANDARD OPERATING PROCEDURES** for additional information.

- DelDOT's website contains:
  - IDDE general information at: https://deldot.gov/Programs/stormwater/index.shtml?dc=idde
  - 302-STOPPIT information at: https://deldot.gov/Programs/stormwater/index.shtml?dc=report_a_problem.
  - Hazardous waste information at: https://deldot.gov/Programs/stormwater/index.shtml?dc=hazardouswaste

Annual Report:

- The annual report will include a summary of all 302-STOPPIT investigations as mentioned in BMP 3-8, Record of Inspections.

BMP 3-10: Sanitary Sewer Overflows (Part II.D.3.d.7)

Requirements:

- *The permittee shall develop procedures to recognize and report any sanitary sewer overflows (SSOs) or leaking on-site sewage disposal systems that discharge into the small MS4 and submit those procedures to DNREC for review.*

- *For any SSO that enters the MS4 or is over 50 gallons that has the potential to impact the MS4, a written report shall be provided to DNREC's Surface Water Discharges Section at the address noted in this permit within five days of the release. This notification shall contain the following information:*

  a) a description of the discharge, including an estimate of the amount discharged, and the cause;
  b) the period of discharge, including the dates and times and if the discharge has not been corrected, the anticipated time when the discharge will be eliminated, and the system will return to normal operation; and
  c) actions taken or to be taken to reduce, eliminate, and prevent recurrence of the discharge.

Timeline:

- Within 90 days of the permit effective date (by March 31, 2024), the co-permittees will submit procedures to report any SSOs to DNREC.

SWMP Plan:

- DelDOT submitted the SSO plan, including an Alternative Compliance Request to DNREC on March 8, 2024.

- The Alternative Compliance Request found in **Appendix B-6: SSO ALTERNATIVE COMPLIANCE REQUEST** stated that DelDOT cannot take action to reduce, mitigate of prevent a reoccurrence of a SSO discharge as a state agency with only authority over road rights-of-way.

- Approval from DNREC was received on March 14, 2024 and is found in **Appendix B-7: SSO ALTERNATIVE COMPLIANCE REQUEST APPROVAL**.

- To ensure that DelDOT is receiving the appropriate information in our annual report from sanitary sewer providers when they have an overflow, a notice was sent to all providers indicating the steps they must take when they have a leak or overflow that either originates in a DelDOT right-of-way or discharges into a DelDOT right-of-way. A copy of this letter can be found in **Appendix B-8: NOTICE TO SANITARY SEWER PROVIDERS**.

Annual Report:

- ❖ DelDOT's annual report will contain:
  - A description of the SSO discharge, including an estimate of the amounts discharged, and the cause of the discharge;
  - The period of the discharge, including dates and times of correction and elimination.

4. Construction Site Stormwater Runoff Control (Part II.D.4)

The permittee shall develop and implement its Construction Stormwater Management Program. All local regulatory mechanisms shall be reviewed and updated in accordance with Title 7 Delaware Code Chapter 40. Modifications or updates to State and/or federal regulations shall be implemented as required to maintain compliance with this permit. The permittee shall modify and update its SWMP Plan to meet all the requirements of the updated Delaware Sediment and Stormwater Regulations.

BMP 4-1: Construction Delegated Authority (Part II.D.4)

Requirements:

- *The permittee shall implement and enforce a program to reduce the discharge of pollutants from active construction sites that result in land disturbance of greater than 5,000 square feet. The permittee may fulfill this requirement through a cooperative agreement with a Delegated Agency in accordance with Delaware Administrative Code 5101, Sediment and Stormwater Regulations, or the permittee shall be a Delegated Agency themselves. If the permittee chooses to rely on a Delegated Agency, it shall indicate this in the SWMP Plan and ensure that the fully executed cooperative agreement with the Delegated Agency clearly describes each of the participant's responsibilities to coincide with 40 CFR Part 122 and that the cooperative agreement is appended to the SWMP Plan.*

Timeline:

- Annually after the SWMP submittal.

SWMP Plan:

- DelDOT is a Delegated Agency under the DNREC Sediment and Stormwater Program's authority, with the last delegation received on March 12, 2020, valid through June 30, 2025. A copy of our delegation letter can be found in **Appendix C-1: DELDOT DELEGATION LETTER**.

- Note: Since DelDOT is its own Delegated Agency, permit requirement Part II.D.4.f, which states *summary within the annual report that the Delegated Agency is performing these actions appropriately throughout the MS4 jurisdiction in accordance with the MOU, if applicable*, has not been included in this SWMP.

Annual Report:

- Any changes to DelDOT's Delegated Agency status will be highlighted in the annual report.

BMP 4-2: Review and Approval of Sediment and Stormwater Plans (Part II.D.4.a)

Requirements:

- *Maintain a program that includes requirements for the review and approval of Sediment and Stormwater Plans to ensure compliance with standards in the Delaware Sediment and Stormwater Regulation and Special Conditions for Stormwater Discharges Associated with Construction Activities (7 Del. C. Ch. 60). The permittee or Delegated Agency will review and approve Sediment and Stormwater Plans, inspect that a copy of the approved Sediment and Stormwater Plan along with the Construction General Permit are on every construction site, which may include electronically available, and document inspections.*

Timeline:

- Annually after the SWMP submittal.

SWMP Plan:

- DelDOT's Water Resources Section in the Division of Transportation Solutions oversees the review and approval of all plans with disturbances greater than 5,000 sf under the jurisdiction of DelDOT.

- To support DelDOT in reviewing plans, DelDOT has two consultants available to assist with reviewing plans and generating comments. Currently these two consultants are Johnson Mirmiran & Thompson Inc (JMT) and Whitman Requardt & Associates LLP (WRA). Both were awarded on 12/08/23 and valid through 12/08/26, with two one-year extensions possible. The Request for Proposals detailing the required services can be found in **Appendix C-2: ES2M REQUEST FOR PROPOSAL** and information regarding the status of the contracts can be found at: https://mmp.delaware.gov/Contracts/Details/6421.

- DelDOT maintains an Erosion, Sediment & Stormwater Wiki page to assist DelDOT and consultant designers with developing plans and stormwater management reports. The page can be found here: https://es2mdesignguide.deldot.gov/index.php/Main_Page.

- DelDOT requires that a copy of the approved plan to be onsite, either in physical or electronic format, as well as Notice of Intent (NOI) Posting Signage to be visible at the construction site. This is reviewed by DelDOT staff and our Certified Construction Reviewers (CCR).

Annual Report:

- DelDOT's annual report will contain:
  - Number of sediment and stormwater management plans reviewed.
  - Number of sediment and stormwater management plans approved.
  - Any updates the consultants used for review assistance.

BMP 4-3: Erosion and Sediment Controls, Inspection and Enforcement (Part II.D.4.b and c)

Requirements:

- *Maintain a program that includes:*
  - *Requirements for the use and maintenance of appropriate structural and nonstructural erosion and sediment controls to reduce polluted discharges to the MS4 during the time when construction is underway. The permittee or Delegated Agency will inspect the construction and maintenance of the erosion and sediment controls at critical stages to verify compliance with the approved plans [7 De Admin. Code 5101 Section 6.0].*
  - *Requirements and procedures for the inspection and enforcement of erosion and sediment controls during construction to ensure that polluted runoff from the construction site is not occurring during active construction, and enforcement, if necessary, as per the Delaware Sediment and Stormwater Regulations a Certified Construction (CCR) shall be utilized as outlined in the Delaware Sediment and Stormwater Regulations. All inspection reports shall be provided on site, which may include electronic. The permittee or Delegated Agency shall review plans to ensure that pollution prevention measures are included in the Sediment and Stormwater Management Plan and that CCR inspections include pollution prevention measure reviews consistent with Delaware Sediment and Stormwater Regulations.*

Timeline:

- Annually after the SWMP submittal.

SWMP Plan:

- DelDOT's Water Resources Section in the Division of Transportation Solutions oversees the oversight of all erosion and sediment control implementation for construction sites under the jurisdiction of DelDOT.

- To support DelDOT in reviewing construction sites, DelDOT has two consultants available to serve as CCRs. Currently these two consultants are AECOM Technical Services Inc (AECOM) and Century Engineering LLC, a Kleinfelder Company (Century). Both were awarded 08/10/20 and valid through 08/10/23, with two one-year extensions possible. Due to these extensions, the contracts are valid through 08/06/25. The Request for Proposals detailing the required services can be found in **Appendix C-3: EROSION AND SEDIMENT CONTROL REQUEST FOR PROPOSAL** and information regarding the status of the contracts can be found at: https://mmp.delaware.gov/Contracts/Details/4937.

- DelDOT's CCRs inspect all active construction sites under the jurisdiction of DelDOT on a weekly basis. Copies of their reports are sent to the contractor and appropriate construction staff within 24-hours of the inspection via SWPPPTrack, a web database for compliance tracking.

- The construction site is graded as compliant or non-compliant, with deficiencies noted if non-compliant. An automated deficiency letter is sent to the Group Engineer if the same deficiency is not corrected after 14-days and 28-days (noted on two and four consecutive CCR inspections). The Group Engineer will make a determination of the enforcement action. If the deficiencies still remain, enforcement action as prescribed in Section 105 of the DelDOT Standard Specifications, including suspending all or part of the work, withholding progress payments, or performing maintenance work with other forces and deducting the cost from monies due to the contractor, may occur.

- DelDOT Water Resources staff monitor the status of construction sites' compliance through SWPPPTrack. Regular regulatory oversight inspections of active construction sites which are greater than 1-acre of disturbance and are active for a period greater than 2 months, are performed typically on a monthly basis, with frequency dependent on site conditions.

Annual Report:

- DelDOT's annual report will contain:
  - Number of active sites greater than 1 acre of disturbance;
  - Number of active sites inspected by a CCR;
  - Number of active sites inspected by DelDOT staff;
  - Percent of active construction sites inspected once;
  - Percent of active construction site inspected more than once;
  - Number and type of enforcement actions;
  - List of DelDOT staff certified or re-certified as a CCR, including date and hours of training;
  - Any updates to the consultants used for review assistance;
  - Effectiveness of the program and assessment of erosion and sediment BMP procedures.

BMP 4-4: Contractor Training Program (Part II.D.4.d)

Requirements:

- *Stormwater site contractors responsible for inspection shall be certified through a DNREC or DNREC-approved training pursuant to the regulation and CGP.*

Timeline:

- Annually after the SWMP submittal.

SWMP Plan:

- DelDOT requires all contractors to have a representative that has passed DNREC's Contractor Training Program (formerly Blue Card Program). Section 901 of the DelDOT Standard Specifications states:
  - *Provide documentation to certify that the responsible person, defined in Section 901.1.E, successfully completed the DNREC Contractor Training Program (Blue Card) before beginning land disturbing activities;*
  - *Ensure that the responsible person oversees implementation of the Sediment and Stormwater Management Plan and provides daily oversight and guidance to construction personnel during land disturbing activities.*

Annual Report:

- DelDOT's annual report will contain any changes to the above-mentioned language.

BMP 4-5: BMP Construction Checklists (Part II.D.4.e)

Requirements:

- *Ensure completion of stormwater BMP Construction Checklists by CCRs and submission to the permittee or Delegated Agency, as required in the Delaware Sediment and Stormwater Regulations. CCRs shall be on site during critical stages of BMP construction as required.*

Timeline:

- Annually after the SWMP submittal.

SWMP Plan:

- DelDOT has its CCRs complete BMP construction checklists for all Post-Construction Stormwater BMPs, which are reviewed by DelDOT Water Resources Staff.

- A copy of the BMP Checklists can be found in **Appendix C-4: BMP CHECKLISTS**.

Annual Report:

- DelDOT's annual report will contain any updates to the BMP Checklists.

BMP 4-6: Erosion and Sediment Control Enforcement (Part II.D.4.g)

Requirements:

- *Development and adoption of an ordinance or other regulatory and enforceable mechanisms for ensuring compliance with this section.*

Timeline:

- At time of SWMP submittal.

SWMP Plan:

- For plan review and approval, DelDOT is its own Delegated Agency reviewing our construction plans. Our regulatory mechanism for complying is through our five-year delegation by DNREC. Reference BMP 4-1, Construction Delegated Authority for additional information.

- For erosion and sediment control construction compliance, DelDOT has adopted Section 901 within the DelDOT Standard Specifications for ensuring that the contractor abides by all construction stormwater requirements. The most recent copy of the Standard Specifications can be found here: https://deldot.gov/Publications/manuals/standard_specifications/

Annual Report:

- N/A.

BMP 4-7: Public Consideration (Part II.D.4.h)

Requirements:

- *Procedures for receipt and consideration of information submitted by the public.*

Timeline:

- At time of SWMP submittal.

SWMP Plan:

- DelDOT has a Division of Community Relations that receives public comments and oversees responses.
  - DelDOT's "Contact Us" page is located at: https://deldot.gov/About/contact_info/index.shtml
  - Community Relations will confer with the NPDES Section and/or Water Resources Section on responses as appropriate.

Annual Report:

- N/A.

5. Post Construction Stormwater Management (Part II.D.5)

The permittee or delegated agency shall continue to implement its Post-Construction Stormwater Management Program. All local regulatory mechanisms shall be reviewed and updated in accordance with Title 7 Delaware Code Chapter 40. Any modifications or updates to the Delaware Sediment and

BMP 5-1: Post-Construction Delegated Authority (Part II.D.5)

Requirements:

- *The permittee is required to maintain an acceptable SWMP plan in accordance with Delaware Administrative Code 5101, Sediment and Stormwater Regulations to reduce the discharge of pollutants from post construction BMP facilities. The permittee may fulfill some of their requirements under this MCM through an MOU with a Delegated Agency in accordance with Delaware Administrative Code 5101, Sediment and Stormwater Regulations. If the permittee chooses to rely on a Delegated Agency, it shall indicate this in the SWMP plan and ensure that the MOU with the Delegated agency clearly describes each of the participant's responsibilities to coincide with 40 C.F.R. part 122 and that the cooperative agreement is appended to the SWMP plan.*

Timeline:

- At time of SWMP submittal.

SWMP Plan:

- DelDOT is a Delegated Agency under the DNREC Sediment and Stormwater Program's authority, with the last delegation received on March 12, 2020, valid through June 30, 2025. A copy of our delegation letter can be found in **Appendix D-1: DELDOT DELEGATION LETTER**.

Annual Report:

- Any changes to DelDOT's Delegated Agency status will be highlighted in the annual report.

BMP 5-2: BMP Inspection and Maintenance within MS4 (Part II.D.5.a)

Requirements:

- *Establish procedures to conduct annual visual inspections of all publicly and privately owned and operated stormwater management systems within the MS4 jurisdiction of the permittee and develop a maintenance program to prioritize repairs in accordance with 7 DE Admin. Code 5101 Section 7.0. A summary of the inspections and corrective actions shall be submitted in the annual report.*

Timeline:

- Annually after the SWMP submittal.

SWMP Plan:

- DelDOT's NPDES Section in the Division of Maintenance and Operations oversees annual inspection of all stormwater best management practices (BMPs) within DelDOT's rights-of-way.

- To support DelDOT in inspecting the BMPs, DelDOT has a contract with KCI Technologies Inc (KCI) awarded on 11/09/22 and valid through 11/09/25, with two one-year extensions possible. The Request for Proposals detailing the required services can be found in **Appendix D-2: AGREEMENT 2056 REQUEST FOR PROPOSAL** and information regarding the status of the contracts can be found at: https://mmp.delaware.gov/Contracts/Details/5871.

- DelDOT, via the BMP consultant, maintains an NPDES Database that shows the location of DelDOT BMPs and their inspection reports. The page can be found here: https://newarkgis.kci.com/deldotwebviewer/index.html#login.

- The Stormwater BMP Field Inventory and Inspection SOP located in **Appendix D-3: BMP INVENTORY AND INSPECTION SOP** contains the procedures for reviewing a BMP and determining its maintenance needs. All BMPs are given an overall letter grade at the time of the inspection, summarized below:
  - A: No maintenance, besides routine mowing is warranted;
  - B: Minor maintenance is required;
  - C: Major maintenance is required;
  - D: Failing / retrofit is required.

- When a BMP receives an overall B rating, the minor maintenance needs are submitted to the applicable maintenance yard by the BMP consultant via our Maximo work order tracking software.

- When a BMP receives an overall C or D rating, the BMP is sent to the NPDES Section for contracting to a third party.

Annual Report:

- A summary of the inspections of BMPs within the DelDOT MS4 will be included in the annual report.

- A summary of the corrective actions performed will be included in the annual report.

BMP 5-3: BMP Inspection Discharging to MS4 (Part II.D.5.b)

Requirements:

- *The permittee shall identify and map all stormwater management systems which may discharge to the MS4 jurisdiction, and each year conduct a visual inspection of a representative sample of these stormwater management systems in such a manner as to ascertain proper function. A summary of the inspections and findings shall be submitted in the annual report. All stormwater management systems are to be inspected in this manner at a minimum of once every permit term.*

Timeline:

- Annually after the SWMP submittal.

SWMP Plan:

- The Kent Conservation District (KCD) provided all stormwater BMPs under their jurisdiction to DelDOT on 02/21/24. This list will be asked for yearly to ensure any new BMPs are accounted for.

- Based on the provided data, there are 13 BMPs under the jurisdiction of KCD that discharge into the DelDOT Phase II MS4 system.
  - Reference **Appendix D-4: KENT COUNTY CONSERVATION DISTRICT MOA** for the agreement that states KCD will inspect all non-DelDOT BMPs draining into the DelDOT Phase II MS4 system at least once a permit term and will provide that data to DelDOT.

- DelDOT typically inspects non-MS4 BMPs owned by DelDOT that discharge into the DelDOT Phase MS4 system annually. The inspection rate is dropped to once every three years if a C or D rating is given the year before, until major maintenance is performed. At such time, the inspection timeframe would go back to once a year. Therefore, at minimum, all non-MS4 BMPs owned by DelDOT will be inspected at least once a permit term.

- Reference **Appendix D-5: BMPS DRAINING TO DELDOT PHASE II AREA** for the map and **Appendix D-6: BMPS DRAINING TO DELDOT PHASE II AREA SUMMARY TABLE** for summary tables for the BMPs discharging into DelDOT's Phase II MS4 system.

Annual Report:

- A summary of the inspections of BMPs draining into the DelDOT Phase II MS4 will be included.

- Any changes to the number of BMPs draining into the DelDOT Phase II MS4 will be updated.

- Any changes to the MOA with KCD will be updated.

BMP 5-4: Post Construction Operation and Maintenance (Part II.D.5.c)

Requirements:

- *The permittee shall update, implement, and enforce a program to address post-construction runoff from new development and redevelopment projects to ensure adequate long-term operation and maintenance of stormwater management systems in accordance with 7 Admin. Code 5101.*

Timeline:

- Annually after the SWMP submittal.

SWMP Plan:

- This permit requirement is applicable to municipal MS4s having jurisdiction over new development and redevelopment. This was confirmed by correspondence from DNREC on 07/26/24. Reference **Appendix D-7: JULY 26, 2024 DELDOT AND DNREC CORRESPONDENCE** for the correspondence.

- DelDOT will comply with the design requirements for BMPs as stated in BMP 4-2, Review and Approval of Sediment and Stormwater Plans (Part II.D.4.a), and the maintenance requirements in BMP 5-2, BMP Inspection and Maintenance within MS4 (Part II.D.5.a).

Annual Report:

- N/A.

BMP 5-5: BMP Training (Part II.D.5.d)

Requirements:

- *The permittee shall update, implement, and enforce a program to ensure appropriate staff are trained in proper BMP design, performance, inspection, and routine maintenance.*

Timeline:

- Annually after the SWMP submittal.

SWMP Plan:

- DelDOT offers a range of training options including:
  - Maintenance Crews: Annual training videos which includes a section on BMP nomenclature and maintenance; Onsite guidance for crews at a particular BMP.
  - Stormwater Staff (both NPDES and Water Resources Sections): Conferences such as AASHTO, NHI, StormCon, or National Stormwater Practitioners; Trainings such as DNREC Sediment and Stormwater Trainings, University Continuing Education Classes, or Webinars; Participation in Technical Advisory Committees, and TRB/NCHRP panels.
  - General Design Staff: DelDOT Stormwater Trainings at Winter Workshop, Lessons Learned or Stand-Alone; DelDOT Stormwater Wiki Page; One-on-One Guidance.

Annual Report:

- A summary of the trainings provided will be included in the annual report.

6. Pollution Prevention and Good Housekeeping (Part II.D.6)

Permittees are required to update and implement an operations and maintenance program to prevent or reduce to the maximum extent practicable pollutant runoff from municipal operations in accordance with 40 C.F.R. §122.34(b)(6). The permittee will satisfy this MCM by updating, implementing, and maintaining procedures for pollution prevention and good housekeeping at permittee owned or operated facilities, including municipal operations and activities within the MS4 jurisdiction.

BMP 6-1: Employee Training (Part II.D.6.a)

Requirements:

- *Ensure that appropriate staff receive training at least annually. The training must be designed to reduce or eliminate the discharge of pollutants during municipal operations. Training may include in-person, online, on-the-job, or other formats, and the permittees may build on existing training activities to fulfill this requirement. Trainings may be coordinated with other MS4 permittees, where appropriate. Topics shall include spill prevention and response, proper disposal of waste, and how to conduct periodic visual inspections to detect and correct potential discharges at properties owned or operated by the permittee. Details of trainings, including date, topic, and attendees, shall be included in the annual report.*

Timeline:

- Annually after SWMP submittal.

SWMP Plan:

- DelDOT has two training videos for their maintenance yard staff to watch annually:
  - Environmental Compliance at the Maintenance Yard
    - NPDES Overview including SWPPP and SPCC overviews
    - Good Housekeeping Practices
    - Required Inspections
    - Above-Ground Storage Tanks
    - Spill Prevention
  - Environmental Compliance along DelDOT Roadways
    - Pollution Overview
    - Vegetation
    - BMP Overview
    - BMP Maintenance
    - Stormwater Contamination
      - A Minor or Major Traffic Event Resulting in a Spill
      - Detection of a Spill or Hazardous Materials During Work Activities
      - Detection of Contamination in Drainage Systems

    - Refueling Activities
    - Illicit Discharges
  - Good Housekeeping Practices

❖ DelDOT's NPDES Section provides a comprehensive training for all new Supervisor or Assistant Supervisors as needed.

Annual Report:

❖ A summary of the trainings provided will be included in the annual report, including date, topic and attendees.

BMP 6-2: Good Housekeeping (Part II.D.6.b)

Requirements:

❖ *Maintain (or update as needed) a good housekeeping plan for permittee owned or operated properties that could contribute to the discharge of pollutants from the MS4. Properties include buildings, roadways, parks, and other locations where the following activities are performed: vehicle or heavy equipment maintenance, storage and use of deicers, fertilizers, pesticides, road maintenance materials, litter or debris, petroleum products or hazardous materials. A standard plan may be created to address multiple properties where similar activities are conducted.*

The plan must include:

1) *A description of site activities;*
2) *A list of potential pollutants, including their sources and locations on the site. The plan must consider conveyance of stormwater entering, flowing through, and leaving the site;*
3) *Written good housekeeping procedures designed to prevent the discharge of pollutants into the permittee's MS4 that includes regular visual inspections to detect potential discharges and any maintenance requirements, with all outfalls and stormwater facilities inspected at least once each permit term.*
4) *Written procedures for corrective actions to address any release, spill, or leak on site.*
5) *Documentation of any discharge, release, leak, or spill, including the date, findings of investigation, and response actions.*

Timeline:

❖ Annually after SWMP submittal.

SWMP Plan:

❖ DelDOT has a Stormwater Pollution Prevention Plan (SWPPP) for each of its major maintenance yards that describes the drainage area, the site activities, potential pollutants, good housekeeping practices to prevent pollution, and corrective actions for any spills or leaks.

- All inspections – quarterly, comprehensive and wet weather monitoring – are included.
- A record to document any major spills or leaks is included.
- The SWPPPs are kept in the maintenance yard administration building and are checked twice annually by the NPDES Section.
- The SWPPP text for Area 7/21 Magnolia, Area 8 Cheswold and the Central District Maintenance Shop in Dover are included in **Appendix E-1: MAGNOLIA, CHESWOLD, AND DOVER MAINTENANCE SHOP SWPPP TEXT**, and the full documentation is located onsite at each facility.

- DelDOT also has a Spill Prevention, Control and Countermeasure Plan (SPCC) for each maintenance yard that store more than 1,350 gallons of petroleum based products per the EPA regulations. The SPCC plans outline the Above-Ground Storage Tanks (ASTs) kept at the yard and ways to minimize the possibility and severity of a spill. The SPCCs are checked twice annually by the NPDES Section, and the ASTs have a comprehensive inspection performed annually. The SPCCs for Area 7/21 Magnolia, Area 8 Cheswold and the Central District Maintenance Shop in Dover are not included, but are located onsite at each facility.

- Minor maintenance yards that do not have any crews stationed at the yard are reviewed annually by the NPDES Section to ensure good housekeeping compliance and that the location still meets a minor maintenance yard. Any deficiencies are reported to the applicable maintenance district for remediation. A copy of the minor maintenance inspection form is included in **Appendix E-2: MINOR MAINTENANCE INSPECTION FORM.**

Annual Report:

- A copy of all SWPPP inspections will be included in the annual report (both for major and minor maintenance yards).

- Updates to the SWPPPs for the major maintenance yards will be included.

BMP 6-3: Street Sweeping (Part II.D.6.c.1)

Requirements:

- *Permittees that own, operate, or maintain roads shall develop a street sweeping program which shall be described within the SWMP Plan. Permittees must demonstrate by research, modeling, or otherwise appropriate scientific literature that substantiates the adequacy for pollutant removal and improved water quality. The SWMP Plan shall also describe procedures for the proper disposal of street sweeping debris and waste. All street sweeping activities should be summarized in an annual report and include information about size, location, and frequency, of area swept. All curbed streets with storm drains owned or operated by the permittee shall be swept a minimum of four times annually, weather and surface conditions permitting, unless and until it is demonstrated that pollutant removal and improved water quality would be adequately achieved otherwise.*

Timeline:

- Annually after SWMP submittal.

SWMP Plan:

- DelDOT will follow the four times per year requirement for all curbed roads within DelDOT's road inventory and maintenance responsibility[4] with the following exceptions:
  - Curbed subdivision streets accepted into DelDOT's road inventory will be swept one time a year per the Alternative Compliance Request in **Appendix E-3: STREET SWEEPING ALTERNATIVE COMPLIANCE REQUEST** submitted February 26, 2025, based on the following rationale:
    - Subdivisions have significantly reduced average daily traffic (ADT) compared to traditional roadways. Therefore, there is less grit and debris being generated due to the lower number of vehicles.
    - Subdivisions have a higher percentage of having onsite stormwater management facilities compared to traditional state-numbered roadways, which provide additional treatment prior to discharge compared to direct outfalls.[5]
    - Subdivision streets are approved by a local landuse authority, ie, in Phase II by the Kent County Levy Court. By state law, DelDOT is required to accept newly approved subdivision streets into our roadway inventory if they are built to

[4] Sweeping responsibility on state numbered roadways within municipalities varies depending on the town agreements.
[5] From a GIS analysis performed by KCI: 70% of the roadways in Phase II communities were built after the 1992 Sediment and Stormwater Regulations, while only 12% of state numbered roadways within the Phase II area were built after 1992.

DelDOT design standards. However, DelDOT has no control over the rate of subdivision streets being added.[6]

- Isolated curbed sections approximately a 1,000 feet or less will be excluded. These are typically at subdivision entrances and will be swept when DelDOT sweeps that subdivision's roadways.

❖ In addition to curbed roads as identified above, DelDOT also volunteers the following street sweeping:
- Non-curbed subdivisions accepted into DelDOT's road inventory will be swept once a year, so that they are swept at the same frequency as the curbed subdivisions and at the same frequency as the previous permit.
- A large section of Route 13 outside of the permitted area in order to connect permitted sections of Route 13, and a non-curbed section of Route 1 that receives frequent debris accumulation due to its grading.
- Non-curbed sections of roadway that connect nearby sections of curbed roadway. This additional mileage has not been individually accounted for in Table 1.

❖ Reference **Appendix E-4: STREET SWEEPING MAP** for the Initial All-Curbed Roads 4x/Year Map and the Final All-Curbed Roads 4x/Year Map based on the above-mentioned modifications.

Table 1: Phase II Street Sweeping Plan[7]

❖ Roadway Type	❖ Annual Frequency	❖ Final Annual Sweeping Annual Miles[8]
❖ Curbed DelDOT Roadways	❖ 4	❖ 568.24
❖ Curbed Subdivision Roadways	❖ 1	❖ 238.58
❖ Voluntary DelDOT Roadways	❖ 4	❖ 30.28
❖ Voluntary Non-Curbed Subdivision Roadways	❖ 1	❖ 99.38
❖ Total Miles		❖ 936.48

❖ DelDOT tracks the street sweeper mileage compliance through completed street sweeping workorders entered into Maximo.

[6] In the previous permit, DelDOT provided once a year sweeping without fully analyzing the impacts. If more than one time a year of street sweeping is now required, DelDOT would look to cost share the street sweeping with Kent County Levy Court, as the entity responsible for approving the roadways. However, at this time, Kent County is not a regulated MS4.

[7] Reference **Appendix E-4: STREET SWEEPING MAP** for the Initial and Final mapping.

[8] Final mileage after the modifications noted have been made.

- Annually, DelDOT submits for Special Waste Disposal Approval from the Delaware Solid Waste Authority (DSWA) to dispose of the collected street sweeper waste. Unless there are extenuating circumstances, all street sweeper waste collected in the Phase II area is taken to the Sandtown landfill. A copy of the current street sweeper disposal approval is included in **Appendix E-5: DSWA APPROVAL LETTER**.

- DelDOT stores street sweeper waste at our major maintenance yards in designated areas, until enough has accumulated to make a disposal trip to a DSWA landfill. All dump tickets for the street sweeper waste are kept to analyze the amount disposed of at the landfill.
  - Using the dry weight of the tonnage disposed, the approximate amount of nitrogen and phosphorus removed from the environment can be estimated using 0.0025 lbs/lbs dry weight and 0.001 lbs/lbs dry weight conversion ratio, respectively.
  - Note: The street sweeper waste piles also include waste form catchbasin and pipe cleanings, and is not specific to just sweeper waste.

- Street sweeping will be performed by a single, regenerative air sweeper. Mechanical sweepers may be used on occasion for incident clean-up or in tandem to the regenerative air sweeper if warranted by the condition of the road.

Annual Report:

- The annual report will include:
  - Percent completion of roadway sweeping for the calendar year;
  - Tonnage delivered to a DSWA landfill, and the estimated amount of nitrogen and phosphorus removed;
  - Most recent DSWA disposal approval;
  - Any updates to our street sweeping strategies or mapping.

BMP 6-4: Catchbasin Inspection and Cleaning (Part II.D.6.c.2)

Requirements:

- *If the permittee's MS4 contains catch basins, the permittee shall maintain a risk-based program to prioritize catch basin inspection and maintenance. Permittees may use analysis of past data, weather patterns, public complaints, and observations incidental to other field operations to prioritize catch basin inspections so long as this analysis is included in the SWMP plan. A map of the locations of catch basins, a summary of the amount of solids removed and maintenance performed to comply with this permit shall be included in the annual report. All catch basins must be inspected and maintained as necessary and at a minimum of once during the term of this permit.*

Timeline:

- Annually after SWMP submittal.

SWMP Plan:

- Catch basins, or all drainage inlets, will undergo an above-the-ground assessment as part of the IDDE process detailed in BMP 3-5, IDDE Screening Program.
  - The same IDDE Areas will be used to determine which 20% of inlets will be screened per year.
  - Inlets may not necessarily follow the same dry weather requirements as required for the outfalls.
  - Inlets with accumulated sediment will be reported to DelDOT maintenance staff for cleaning following **Appendix E-6: WORK ORDER PROTOCOL SOP.**
    - This entails removing the grate, taking measurements, using a pole-mounted camera to inspect pipes, and creating work orders.
  - Some structures will not be able to be safely accessed due to their location within a roadway. These structures will be assessed based on downstream conditions and sediment accumulation.
    - If no issues are suspected, assumed the upstream structure is in good condition.
    - If issues are suspected, Maintenance of Traffic (MOT) safety precautions or robot video recording will be utilized to inspect the inaccessible structure.

Annual Report:

- The annual report will include:
  - Database extract of DelDOT's stormdrain inventory;
  - Overview map of the permit areas inventoried and inspected;
  - Work orders for catchbasins with sediment accumulation;
  - Estimated amount of solids removed based on the size of the catchbasin and the percent full. Note: The solids from vacuum trucks used to clean stormdrain infrastructure, both catchbasins and the pipes themselves, are added to our sweeper waste piles for disposal at DSWA landfills. Therefore, the physical amount of solids from just catchbasins will be impossible to separate.

BMP 6-5: Pesticides and Herbicides (Part II.D.6.d)

Requirements:

- *Update and maintain a standard operating procedures for proper pesticide/herbicide application, storage, and disposal such as integrated pest management plans or alternative techniques.*

Timeline:

- Annually after SWMP submittal.

SWMP Plan:

- Reference **Appendix E-7: PESTICIDE SOP** for DelDOT's Pesticide Standard Operating Procedure outlining procedures for the storage, application and disposal of pesticides. Note that the term pesticide classifies all products to control unwanted organisms, also including herbicides, insecticides, and fungicides.

Annual Report:

- The annual report will include any updates to the SOP.

BMP 6-6: Fertilizer (Part II.D.6.e)

Requirements:

- *Update and maintain a standard operating procedure for fertilizer application such as chemical storage, landscaping with low maintenance/native species, and application procedures.*

Timeline:

- Annually after SWMP submittal.

SWMP Plan:

- DelDOT M&O does not use fertilizer, therefore a SOP has not been developed.

- The only fertilizer used within DelDOT rights-of-way is during construction by contractors to establish newly seeded or planted areas. All such applications follow the requirements in DelDOT Standard Specifications Section 911 – Plantings, latest edition.

Annual Report:

- The annual report will include any updates to the above.

BMP 6-7: Snow and Ice Control (Part II.D.6.f)

Requirements:

- *Update and maintain standard operating procedures for snow and ice control such as use of pretreatment, truck calibration and storage, and salt dome storage and containment.*

Timeline:

- Annually after SWMP submittal.

SWMP Plan:

- Reference **Appendix E-8: DELDOT SALT BEST MANAGEMENT PRACTICES** for DelDOT's Statewide Salt Best Management Practices outlining procedures for the storage and application salt and anti-icing operations.

Annual Report:

- The annual report will include any updates to the SOP.

BMP 6-8: Litter and Floatables (Part II.D.6.g)

Requirements:

- *Update and maintain a program for litter and floatables that could enter the MS4. Program activities may include marking and maintaining storm drain inlets, inspecting and litter collection of streams and waterbodies, household hazardous waste collection, municipal composting programs, street curb maintenance and sidewalk sweeping. Provide an analysis of the progress toward implementing litter reduction strategies in the annual report. The analysis shall describe the status of trash elimination efforts including resources (e.g., personnel and financial) expended and the effectiveness of all program components.*
- *As part of the public education and outreach strategies, permittees shall incorporate litter control education, outreach, and participation for encouraging an increase in residential and commercial recycling rates, improving trash management, and reducing littering. The permittees are encouraged to coordinate efforts with the Delaware Solid Waste Authority (DWSA), DNREC and local organizations.*

Timeline:

- Annually after SWMP submittal.

SWMP Plan:

- DelDOT's inventory and inspection consultant applies "Only Rain Down the Drain" placards on all inlets located next to a curb that are inspected, including the replacement of any damaged or faded placards that are found.

- DelDOT funds and sponsors numerous litter reduction activities, currently including:
  - M&O led litter clean-ups using DelDOT employees, Department of Justice (DOJ) Violators of Parole (VOP) crews, and paid contractors;
  - Adopt-a-Highway clean-ups (part of BMP 2-3, Public Participation Activities)
  - Sponsor-a-Highway clean-ups
  - Work-a-Day, Earn-a-Pay clean-ups (part of BMP 2-3, Public Participation Activities)

- Notes:
  - Reference BMP 1-3 for DelDOT's Public Education and Outreach plan.
  - Reference BMP 6-3 for DelDOT's Street Sweeping plan.
  - DelDOT's authority is limited to our road rights-of-way and owned parcels. As a non-municipal MS4 we cannot offer household hazardous waste collection or composting services. However, our website does include helpful information for State of Delaware residents.

Annual Report:

- The annual report will include:
  - Any updates to the litter and floatables reduction initiatives;
  - The number of "Only Rain Down the Drain" placards installed that year and the total number of placards;
  - The amount of trash collected by each type of litter reduction campaigns;
  - The amount of funds invested into litter reduction campaigns.

BMP 6-9: Runoff Reduction and Green Infrastructure (Part II.D.6.h)

Requirements:

- *Consider incorporating runoff reduction techniques and green infrastructure in the routine upgrade of existing stormwater conveyance systems and municipal properties. Examples may include replacement of closed drainage with grass swales, replacement of existing islands in parking lots with rain gardens or curb cuts to route the flow through below-grade infiltration areas or other low-cost improvements that provide runoff treatment or reduction. The decision to incorporate runoff reduction techniques is at the discretion of the permittee, and the decision to not incorporate shall not be a permit violation.*

Timeline:

- Annually after SWMP submittal.

SWMP Plan:

- Implementation of runoff reduction practices and green infrastructure that exceeds the requirements of the Delaware Sediment and Stormwater Regulations will be considered part of the Pollution Reduction Plan (PRP). This may include:
    - Retrofits to DelDOT owned facilities to incorporate green infrastructure;
    - Retrofits to DelDOT stormwater BMPs for enhanced runoff reduction;
    - Conversion of turf grass areas within DelDOT rights-of-way and DelDOT owned facilities to pollinator habitat will be considered for enhanced runoff reduction and environmental benefits;
    - Daylighting existing closed drainage systems where possible.

Annual Report:

- After the PRP is submitted, the annual report will include a summary of any runoff reduction strategies and/or green infrastructure initiatives enacted, designed and/or installed.

SECTION III: POLLUTION REDUCTION PLAN (PRP)

The permit requires a PRP to be developed within twenty-four (24) months from the date of written NOI authorization to discharge issued by DNREC (by March 14, 2026), for one watershed with an approved TMDL, and the assessment of the PRP in subsequent annual reports.

The PRP that will address all permit requirements within Part II.E will be developed as a separate document and included as an Appendix once developed.

APPENDIX A – GENERAL REQUIREMENTS

APPENDIX A

A-1: AUTHORIZATION TO SIGN

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

SHANTÉ HASTINGS
SECRETARY

MEMORANDUM

TO: Shanté Hastings Secretary

VIA: Charlanne Clymer, Deputy Secretary

VIA: Anne Brown, Director, Maintenance & Operations

FROM: Brian Urbanek, Assistant Director, Statewide Support Services

DATE: February 3, 2025

SUBJECT: Record of Decision – Authorization to Sign NPDES MS4 Documents

---

The purpose of this memorandum is to document that I've been designated to sign National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Notice of Intent (NOI) permit applications, Storm Water Management Program (SWMP) documents, and MS4 Annual Reports on behalf of the Secretary of Transportation per Title 40 Code of Federal Regulations (CFR) § 122.22(a)(3), which states "All permit applications shall be signed as follows: **For a municipality, State, Federal, or other public agency,** either a principal executive officer or ranking elected official."

This delegation of signature authority is made pursuant to 29 *Del. C.* §8404(7), which authorizes the Secretary of the Department of Transportation to delegate certain powers, duties and functions.

These documents are required for the Delaware Department of Transportation to remain in compliance with our NPDES MS4 Phase I and II Permits. Please note this is not a new process as the authority to sign these agreements has historically been handled by the manager responsible for the NPDES program. However, the Environmental Protection Agency (EPA) has implemented an eReporting requirement which clarified the Authority to Sign requirement.

APPROVED: _____ DATE: 2/6/2025

Shanté Hastings
Secretary

BU:
cc: Sara Esposito, NPDES Program Manager
Skip Sanders, NPDES Engineer
File

DelDOT

APPENDIX A

A-2: NOTICE OF INTENT

State of Delaware
Department of Natural Resources & Environmental Control
Division of Water/Surface Water Discharge Section/MS4
89 Kings Highway Dover, DE 19901 | (302) 739-9946

NOTICE OF INTENT (NOI)
Under Phase II MS4 General
Permitting Program

MS4 Entity Information

MS4 Name: Deldot In Kent County

MS4 Operator: Deldot

MS4 Class: Phase II: Small | **Operator Type:** State | **MS4 Entity Type:** Transportation System

City: Dover | **County:** Kent | **MS4 State/Territory:** Delaware

Designation Date: 02/07/2000 | **Designation Type:** Automatic Nationwide | **Population:** | **Source:**

MS4 Identifier: MS4-DE-SM-ST-2000-0003 | **NPDES ID:** Assigned on Certification | **MGP Number:** DE0051195 | **Joint Coverage:** No

Latitude: 39.15006°N | **Longitude:** 75.50406°W

Description of Location:

MS4 Contact Information

MS4 Program Coordinator Information

First Name: Sara | **Middle Initial:** | **Last Name:** Esposito

Title: NPDES Program Manager

Phone: 302-760-2346 | **Phone Ext:** | **Email:** sara.esposito@delaware.gov

MS4 Mailing Address

Address Line 1: 800 S BAY RD

Address Line 2:

City: DOVER | **State:** Delaware | **ZIP/Postal Code:** 19901

MS4 General Information

MS4 Regulated Area Map

Upload MS4 Location Map:

Name	Uploaded Date	Size
2024-02-28 Kent County Phase II Tier I Area Shapefile.zip (attachment/111)	02/29/2024	126.02 KB
2024-02-28 Kent County Phase II Tier I Area KMZ.kmz (attachment/110)	02/29/2024	998.14 KB
2024-02-28 Kent County Phase II Tier I Area.pdf (attachment/109)	02/29/2024	971.80 KB

Other MS4 Information

Describe MS4 boundaries:

The 2010 Urbanized Area layer from First Map was utilized as the Phase II boundary in Kent County. DelDOT has jurisdiction over the road rights-of-way within the boundary, excluding any private roadways and municipally maintained roadways. Discussions with municipalities on stormwater and street sweeping responsibility are on-going and will be updated in the SWMP submittal. The following modifications were made to the 2010 Urbanized Area layer: Dover Air Force Base parcels and internal roadways removed; New Castle County parcels and roadways removed; and the outer boundary was smoothed to generally reflect roadways that are either "all in" or "all out". As presented from First Map, for most roadways along the perimeter, the MS4 boundary would not completely encompass the roadway centerline, and would often bisect it multiple times. For these roadways, the roadway adjacent to the MS4 boundary was looked at. If the MS4 boundary crossed the centerline for more than 50% of that section of the road, than the roadway was placed inside the MS4 boundary. If it crossed less than 50% of the roadway than the roadway was removed. The main exception to this process was when a large section of the roadway was not bounded by MS4 on either side of the roadway, than that section was removed. Please see the Notes and Additional Information Section for more detailed information on the smoothing out process. The below square mileage includes all road rights-of-way (DelDOT, municipal, and private), as well as adjacent land parcels, of which DelDOT does not have jurisdiction over. As mentioned above, DelDOT will be working with municipalities during the SWMP process to better define responsibility and updated mapping will be provided at the SWMP submittal.

Identify other MS4 boundaries within the boundary of your MS4:

City of Dover (Tier I), Town of Smyrna (Tier II), Town of Camden (Tier II), Kent County (Tier II). In addition the following MS4s may be applicable in the future: Town of Frederica (Tier II, Waived), Town of Felton (Tier II, Waived), Town of Wyoming (Tier II, Waived), Town of Magnolia (Tier II, Waived), Town of Viola (Tier II, Waived), Town of Woodside (Tier II, Waived), Town of Cheswold (Tier II, Waived), Town of Clayton (Tier II, Waived).

Total Area Covered by MS4 (square miles): 70.38 **Area Incorporated (square miles):** 26.88 **Area Unincorporated (square miles):** 43.5

Watershed: Delaware Bay

Are you requesting co-permittee status with another entity? No

Storm Drainage Infrastructure

Storm Sewers: 750096 **Storm Sewer Unit:** Feet **Open Ditches/Tax Ditches:** 1006027 **Ditch Unit:** Feet

Outfalls: 980 **Catch Basins:** 110 **Retention Basins:** 24 **Detention Basins:** 6

Receiving Waters Information

Waterbody Identification

Identify waterbody segments within your MS4 and list any impairments. For this section, please refer to the appropriate mapping (e.g. http://store.usgs.gov (http://store.usgs.gov)), the State of Delaware Surface Water Quality Standards (http://water.epa.gov/scitech/swguidance/standards/wqslibrary/upload/dewqs.pdf), and the most recent State of Delaware Combined Watershed Assessment Report 305(b) Report and 303(d) List. (https://dnrec.alpha.delaware.gov/watershed-stewardship/assessment/reports/)

Waterbody Name: Lower Leipsic River

Designated Use: Industrial Water Supply, Primary Contact Recreation, Secondary Contact Recreation, Fish/Aquatic/Wildlife, Agricultural Water Supply (Freshwater), Fish Consumption

Is this Waterbody impaired (on the CWA 303(d) list)? Yes

List the pollutant(s) that are causing the impairment:

Pollutant or Stressor:	Source of Pollutant or Stressor:
Bacteria	NPS
Dissolved Oxygen	NPS
Nutrients	NPS

Waterbody Name: Dyke Branch

Designated Use: Industrial Water Supply, Primary Contact Recreation, Secondary Contact Recreation, Fish/Aquatic/Wildlife, Agricultural Water Supply (Freshwater), Fish Consumption

Is this Waterbody impaired (on the CWA 303(d) list)? Yes

List the pollutant(s) that are causing the impairment:

Pollutant or Stressor:	Source of Pollutant or Stressor:
Bacteria	NPS
Dissolved Oxygen	NPS
Nutrients	NPS

Waterbody Name: Muddy Branch

Designated Use: Industrial Water Supply, Primary Contact Recreation, Secondary Contact Recreation, Fish/Aquatic/Wildlife, Agricultural Water Supply (Freshwater), Fish Consumption

Is this Waterbody impaired (on the CWA 303(d) list)? Yes

List the pollutant(s) that are causing the impairment:

Pollutant or Stressor:	Source of Pollutant or Stressor:
Bacteria	NPS
Dissolved Oxygen	NPS

Nutrients	NPS

Waterbody Name: Garrisons Lake

Designated Use:
Industrial Water Supply, Primary Contact Recreation, Secondary Contact Recreation, Fish/Aquatic/Wildlife, Agricultural Water Supply (Freshwater), Fish Consumption

Is this Waterbody impaired (on the CWA 303(d) list)? Yes

➔ **List the pollutant(s) that are causing the impairment:**

Pollutant or Stressor:	Source of Pollutant or Stressor:
Bacteria	NPS
Dissolved Oxygen	NPS
Nutrients	NPS

Waterbody Name: Mill Creek

Designated Use:
Industrial Water Supply, Primary Contact Recreation, Secondary Contact Recreation, Fish/Aquatic/Wildlife, Agricultural Water Supply (Freshwater), Fish Consumption

Is this Waterbody impaired (on the CWA 303(d) list)? Yes

➔ **List the pollutant(s) that are causing the impairment:**

Pollutant or Stressor:	Source of Pollutant or Stressor:
Bacteria	NPS
Dissolved Oxygen	NPS
Nutrients	NPS

Waterbody Name: Lake Como

Designated Use:
Industrial Water Supply, Primary Contact Recreation, Secondary Contact Recreation, Fish/Aquatic/Wildlife, Agricultural Water Supply (Freshwater), Fish Consumption

Is this Waterbody impaired (on the CWA 303(d) list)? Yes

➔ **List the pollutant(s) that are causing the impairment:**

Pollutant or Stressor:	Source of Pollutant or Stressor:
Bacteria	NPS
Dissolved Oxygen	NPS
Nutrients	NPS

Waterbody Name: Lower St. Jones

Designated Use:
Industrial Water Supply, Primary Contact Recreation, Secondary Contact Recreation, Fish/Aquatic/Wildlife, Agricultural Water Supply (Freshwater), Fish Consumption

Is this Waterbody impaired (on the CWA 303(d) list)? Yes

➔ **List the pollutant(s) that are causing the impairment:**

Pollutant or Stressor:	Source of Pollutant or Stressor:
Bacteria	NPS
Dissolved Oxygen	NPS
Nutrients	NPS

Waterbody Name: Upper St. Jones

Designated Use:

Industrial Water Supply, Primary Contact Recreation, Secondary Contact Recreation, Fish/Aquatic/Wildlife, Agricultural Water Supply (Freshwater), Fish Consumption

Is this Waterbody impaired (on the CWA 303(d) list)? Yes

➔ **List the pollutant(s) that are causing the impairment:**

Pollutant or Stressor:	Source of Pollutant or Stressor:
Bacteria	NPS
Dissolved Oxygen	NPS
Nutrients	NPS

Waterbody Name: Issac Branch

Designated Use:

Industrial Water Supply, Primary Contact Recreation, Secondary Contact Recreation, Fish/Aquatic/Wildlife, Agricultural Water Supply (Freshwater), Fish Consumption

Is this Waterbody impaired (on the CWA 303(d) list)? Yes

➔ **List the pollutant(s) that are causing the impairment:**

Pollutant or Stressor:	Source of Pollutant or Stressor:
Bacteria	NPS
Dissolved Oxygen	NPS
Nutrients	NPS

Waterbody Name: Fork Branch

Designated Use:

Industrial Water Supply, Primary Contact Recreation, Secondary Contact Recreation, Fish/Aquatic/Wildlife, Agricultural Water Supply (Freshwater), Fish Consumption

Is this Waterbody impaired (on the CWA 303(d) list)? Yes

➔ **List the pollutant(s) that are causing the impairment:**

Pollutant or Stressor:	Source of Pollutant or Stressor:
Bacteria	NPS
Dissolved Oxygen	NPS
Nutrients	NPS

Waterbody Name: Tidbury Branch

Designated Use:

Industrial Water Supply, Primary Contact Recreation, Secondary Contact Recreation, Fish/Aquatic/Wildlife, Agricultural Water Supply (Freshwater), Fish Consumption

Is this Waterbody impaired (on the CWA 303(d) list)? Yes

➔ **List the pollutant(s) that are causing the impairment:**

Pollutant or Stressor:	Source of Pollutant or Stressor:
Bacteria	NPS
Dissolved Oxygen	NPS
Nutrients	NPS

Waterbody Name: Moores Lake

Designated Use:

Industrial Water Supply, Primary Contact Recreation, Secondary Contact Recreation, Fish/Aquatic/Wildlife, Agricultural Water Supply (Freshwater), Fish Consumption

Is this Waterbody impaired (on the CWA 303(d) list)? Yes

➔

List the pollutant(s) that are causing the impairment:

Pollutant or Stressor:	Source of Pollutant or Stressor:
Bacteria	NPS
Dissolved Oxygen	NPS
Nutrients	NPS

Waterbody Name: Silver Lake

Designated Use:
Industrial Water Supply, Primary Contact Recreation, Secondary Contact Recreation, Fish/Aquatic/Wildlife, Agricultural Water Supply (Freshwater), Fish Consumption

Is this Waterbody impaired (on the CWA 303(d) list)? Yes

List the pollutant(s) that are causing the impairment:

Pollutant or Stressor:	Source of Pollutant or Stressor:
Bacteria	NPS
Nutrients	NPS

Waterbody Name: Derby Pond

Designated Use:
Industrial Water Supply, Primary Contact Recreation, Secondary Contact Recreation, Fish/Aquatic/Wildlife, Agricultural Water Supply (Freshwater), Fish Consumption

Is this Waterbody impaired (on the CWA 303(d) list)? Yes

List the pollutant(s) that are causing the impairment:

Pollutant or Stressor:	Source of Pollutant or Stressor:
Bacteria	NPS
Nutrients	NPS

Waterbody Name: Upper Little River

Designated Use:
Industrial Water Supply, Primary Contact Recreation, Secondary Contact Recreation, Fish/Aquatic/Wildlife, Agricultural Water Supply (Freshwater), Fish Consumption

Is this Waterbody impaired (on the CWA 303(d) list)? Yes

List the pollutant(s) that are causing the impairment:

Pollutant or Stressor:	Source of Pollutant or Stressor:
Bacteria	NPS
Dissolved Oxygen	NPS
Nutrients	NPS

Waterbody Name: Spring Creek

Designated Use:
Industrial Water Supply, Primary Contact Recreation, Secondary Contact Recreation, Fish/Aquatic/Wildlife, Agricultural Water Supply (Freshwater), Fish Consumption

Is this Waterbody impaired (on the CWA 303(d) list)? Yes

List the pollutant(s) that are causing the impairment:

Pollutant or Stressor:	Source of Pollutant or Stressor:
Nutrients	NPS, PS
Dissolved Oxygen	NPS, PS

Waterbody Name: Mid Murderkill River

Designated Use:
Industrial Water Supply, Primary Contact Recreation, Secondary Contact Recreation, Fish/Aquatic/Wildlife, Agricultural Water Supply (Freshwater), Fish Consumption

Is this Waterbody impaired (on the CWA 303(d) list)? Yes

➜ **List the pollutant(s) that are causing the impairment:**

Pollutant or Stressor:	Source of Pollutant or Stressor:
Nutrients	NPS, PS

Waterbody Name: Upper Murderkill River (Fan Branch to Murderkill)

Designated Use:
Industrial Water Supply, Primary Contact Recreation, Secondary Contact Recreation, Fish/Aquatic/Wildlife, Agricultural Water Supply (Freshwater), Fish Consumption

Is this Waterbody impaired (on the CWA 303(d) list)? Yes

➜ **List the pollutant(s) that are causing the impairment:**

Pollutant or Stressor:	Source of Pollutant or Stressor:
Dissolved Oxygen	NPS

Waterbody Name: McGinnis Pond

Designated Use:
Industrial Water Supply, Primary Contact Recreation, Secondary Contact Recreation, Fish/Aquatic/Wildlife, Agricultural Water Supply (Freshwater), Fish Consumption

Is this Waterbody impaired (on the CWA 303(d) list)? Yes

➜ **List the pollutant(s) that are causing the impairment:**

Pollutant or Stressor:	Source of Pollutant or Stressor:
Nutrients	NPS
Dissolved Oxygen	NPS

Watershed Identification

Identify watersheds within your MS4 and list any TMDLs. For this section, please refer to the appropriate mapping (e.g. http://store.usgs.gov (http://store.usgs.gov)), the State of Delaware Surface Water Quality Standards (http://water.epa.gov/scitech/swguidance/standards/wqslibrary/upload/dewqs.pdf), and the most recent State of Delaware Combined Watershed Assessment Report 305(b) Report and 303(d) List. (https://dnrec.alpha.delaware.gov/watershed-stewardship/assessment/reports/)

Watershed Name: Smyrna River

Has a TMDL been completed for this Watershed? Yes

➜ **Provide the pollutants/parameters for which there is a TMDL:**

Pollutant/Parameter Addressed:	Reduction Required throughout watershed (%):	Reduction allocated to nonpoint source:
Nitrogen	40	40
Phosphorous	40	40
Bacteria	75	75

Watershed Name: Leipsic River

Has a TMDL been completed for this Watershed? Yes

➜ **Provide the pollutants/parameters for which there is a TMDL:**

Pollutant/Parameter Addressed:	Reduction Required throughout watershed (%):	Reduction allocated to nonpoint source:
Nitrogen	40	40

Phosphorous	40	40
Bacteria	75	75

Watershed Name: St. Jones River

Has a TMDL been completed for this Watershed? Yes

Provide the pollutants/parameters for which there is a TMDL:

Pollutant/Parameter Addressed:	Reduction Required throughout watershed (%):	Reduction allocated to nonpoint source:
Nitrogen	40	40
Phosphorous	40	40
Bacteria	90	90

Watershed Name: Little Creek

Has a TMDL been completed for this Watershed? Yes

Provide the pollutants/parameters for which there is a TMDL:

Pollutant/Parameter Addressed:	Reduction Required throughout watershed (%):	Reduction allocated to nonpoint source:
Nitrogen	40	40
Phosphorous	40	40
Bacteria	75	75

Watershed Name: Murderkill River

Has a TMDL been completed for this Watershed? Yes

Provide the pollutants/parameters for which there is a TMDL:

Pollutant/Parameter Addressed:	Reduction Required throughout watershed (%):	Reduction allocated to nonpoint source:
Bacteria (Fresh Water)	32	32
Bacteria (Marine Water)	67	67

SWMP Information

A permittee renewing coverage under this permit shall continue to operate pursuant to its current SWMP plan. The permittee shall review its current SWMP plan and revise as needed to be in compliance with this permit. Please attach or provide a link to your current SWMP in the space provided below. The permittee shall submit a revised SWMP plan for the Department to review within 12 months of submitting an NOI. The Department shall provide comments and recommendations within 60 days of receipt of updated SWMP plan.

Use the space below to upload a copy of your SWMP:

Name	Uploaded Date	Size
DelDOT Revised Phase II SWMP 2007 to 2017.pdf (attachment/34)	01/23/2024	164.38 KB

More Information

Use the space below to provide any additional information to your Permitting Authority

Attached is our current SWMP based on the 2003 permit. It will remain in effect until our new SWMP based on the 2024 permit is submitted.

Notes and Additional Information

Do you have any notes or additional information for your MS4? Yes

Provide any additional information about your MS4 program:

1. As described in the MS4 General Information section, editing of the 2010 Urbanized Area layer from First Map was performed. The attached file describes those changes in more detail. 2. Also attached is the Authorization to Sign NPDES MS4 Documents from DelDOT's Secretary. 3. Clarification to statistics provided in the MS4 General Information Section: - Area statistics include private and municipal roadway rights-of-way, and land area not under the jurisdiction of DelDOT; - Storm sewer data excludes: driveway culverts, guardrail culverts, and roadway underdrains. It includes connected stormdrain pipes and roadway culverts currently inventoried and maintained by DelDOT. - The number of outfalls are for all pipe ends and swale ends that are the ultimate point of discharge currently inventoried and maintained by DelDOT. Pipe ends that discharge into a swale are excluded. - The number of catch basins provided is for all inlets with a grate currently inventoried and maintained by DelDOT that meet the catch basin definition as defined in the permit as "provides a means of containment for and prevents the uncontrolled discharge of collected liquid". We assumed this to mean all catch basins with a sump > 2". The total number of inlets with a grate excluding the sump requirement is 5,365, however these do not provide a means of containment or other flow control. - The number of retention basins assumes all wet ponds currently accepted and maintained by DelDOT; The number of detention basins assumes all dry ponds currently accepted and maintained by DelDOT. The total number of stormwater best management practices (BMPs) currently accepted and maintained by DelDOT within the Phase II boundary is 46. - Please note: All reported quantities maintained by DelDOT may change as discussions with municipalities continue. Statistics to be updated in Annual Reports as needed.

Use the space below as needed to attach files to your NOI:

Name	Uploaded Date	Size
Kent County Phase II Tier I Area Notes for NOI Submission.docx (attachment/113)	02/29/2024	12.01 MB
NPDES MS4 - Authorization to Sign (Urbanek) 2024 - Legal revised.pdf (attachment/112)	02/29/2024	260.44 KB

Certification Information

I certify under penalty of law that this document and all attachments were prepared under my direction, or supervision, in accordance with a system designed to assure that qualified personnel gathered and evaluated the information submitted. Based upon my inquiry of the person(s) directly responsible for gathering the information, the information submitted is, to the best of my knowledge, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment for willful violations.

Certified By: Brian T. Urbanek

Certifier Title: Assistant Director

Certifier Email: brian.urbanek@delaware.gov

Certified On: 02/29/2024 1:58 PM ET

APPENDIX A

A-3: NOTICE OF INTENT APPROVAL

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
DIVISION OF WATER
RICHARDSON & ROBBINS BUILDING
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

COMMERCIAL & GOVERNMENT SERVICES: WASTEWATER, STORMWATER, & BIOSOLIDS MANAGEMENT

PHONE
(302) 739-9946

AUTHORIZATION FOR STORMWATER DISCHARGES FROM SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4) UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PHASE II MS4 TIER I GENERAL PERMIT

March 14, 2024

Brian Urbanek, Assistant Director of Statewide Support Services
State of Delaware Department of Transportation
800 Bay Road
P.O. Box 778
Dover, DE 19903

RE: Authorization to Discharge under the Phase II MS4 Tier I General Permit NPDES DE 0051195, Delaware Department of Transportation

Dear Mr. Urbanek,

The Delaware Department of Natural Resources and Environmental Control (DNREC) MS4 Program has received your Notice of Intent (NOI) requesting coverage for the Delaware Department of Transportation, under the DNREC Tier I General Permit (GP) for Phase II small MS4s (NPDES DE0051195 State Permit Number: WPCC 3212/20). This GP is in compliance with the provisions of the Federal Water Pollution Control Act as amended by the Clean Water Act of 1977 and the Water Quality Act of 1987 (33 U.S.C. §§ 1251 et seq.) and pursuant to the provisions of Title 7, Del C., § 6003.

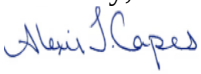
The Delaware Department of Transportation is hereby authorized to discharge stormwater to waters of the State of Delaware in accordance with the terms and conditions of the Phase II MS4 Tier I GP. Your authorization under the MS4 GP became effective March 11, 2024, and will expire December 31, 2028.

Eligibility for permit coverage is based on the information you provided on the February 29, 2024, NOI submission. Your electronic signature on the NOI certifies that you have read, understood, and are implementing all of the applicable requirements to be eligible for coverage under this permit.

More information about the Delaware MS4 Program, including a copy of the MS4 GP and other available resources can be found at: Municipal Separate Storm Sewer Systems - DNREC . https://dnrec.delaware.gov/water/commercial-government/npdes/ms4/

If you have any questions or require further assistance, please contact Alexis Capes at (302) 612-1441 or by email at alexis.capes@delaware.gov.

Sincerely,



Alexis T. Capes
Environmental Scientist
MS4 Program
Division of Water, DNREC

APPENDIX A

A-4: WATERSHEDS THAT RECEIVE RUNOFF

Phase II Watersheds that Receive Runoff from DelDOT Rights-of-Way

Watershed	Number of Outfalls	Designated Use[1]	Contains Impaired Waterbody on the 303(d) List[2]	TMDL or Pollutant Attainment Classification[2]	Pollutant(s) or Stressor(s) Causing Impairment[2]	Probable Source of Pollutant(s) or Stressor(s) per the 303d List[2]	Pollution Control Strategies or Watershed Plans[3]	Potential DelDOT Sources of Pollutants
Leipsic River	332	Industrial Water Supply, Primary Contact Recreation, Secondary Contact Recreation, Fish/Aquatic/Wildlife, Agricultural Water Supply (Freshwater)	Yes	5	Biological Integrity; Habitat Assessment	Not Listed	Not Listed	All: Sediment; Salt; Trash;
Little Creek	83	Industrial Water Supply, Primary Contact Recreation, Secondary Contact Recreation, Fish/Aquatic/Wildlife, Agricultural Water Supply (Freshwater)	Yes	5	Biological Integrity; Habitat Assessment	Not Listed	Not Listed	All: Sediment; Salt; Trash;
Murderkill River	664	Industrial Water Supply, Primary Contact Recreation, Secondary Contact Recreation, Fish/Aquatic/Wildlife,	Yes	5	Biological Integrity; Habitat Assessment; Dissolved	Not Listed	Pollution Control Strategy, 2012	Biological & Habitat: Sediment; Salt; Trash; Copper:Tires/Automobiles

[1] Per DNREC Regulations 7401 Surface Water Quality Standards, Section 3.0, Stream Basins and Designated Uses, https://regulations.delaware.gov/AdminCode/title7/7000/7400/7401.shtml

[2] Per DNREC's "State of Delaware 2022 Combined Watershed Assessment Report (305(b)) and Determination for the Clean Water Act Section 303(d) List of Waters Needing TMDLS (The Integrated Report)", dated May 2022, https://documents.dnrec.delaware.gov/Watershed/Assessment/Reports/2022-Delaware-Final-IR-with-appendices.pdf, Appendix 5

[3] Per DNREC's website, https://dnrec.alpha.delaware.gov/watershed-stewardship/assessment/plans-and-strategies/

		Agricultural Water Supply (Freshwater)			Oxygen; Copper			
Smyrna River	83	Industrial Water Supply, Primary Contact Recreation, Secondary Contact Recreation, Fish/Aquatic/Wildlife, Agricultural Water Supply (Freshwater)	Yes	5	Biological Integrity; Habitat Assessment	Not Listed	Not Listed	All: Sediment; Salinity; Trash;
St. Jones River	945	Industrial Water Supply, Primary Contact Recreation, Secondary Contact Recreation, Fish/Aquatic/Wildlife, Agricultural Water Supply (Freshwater)	Yes	5	Biological Integrity; Habitat Assessment; Dieldrin[4]; Furan Compounds; Dioxin; Mercury;	Not Listed	Pollution Control Strategy, 2012; Watershed Based Plan, 2011	Biological & Habitat: Sediment; Salt; Trash; Tires/Automobiles Dieldrin: None. Furan: None. Mercury: None

[4] 5mnr

APPENDIX A

A-5: CITY OF DOVER MS4 MAINTENANCE MAP

City of Dover MS4 Maintenance

DelDOT

August 2024

Miscellaneous

City of Dover ☆ BMP ○ Bridge

Maintenance Agreement

DelDOT Municipality Undetermined No Agreement

Maintenance per 2024 Discussions

DelDOT Dover Dover / DelDOT Private

Roadway Maintenance Responsibility

Municipal Road Maintained by Municipal Forces
Municipal Road Maintained by Other Forces
Suburban Road Maintained by Other Forces
State Road Maintained by State
Suburban Road Maintained by State

0 1,350 2,700 5,400 Feet

1 inch = 2,083 feet

Notes

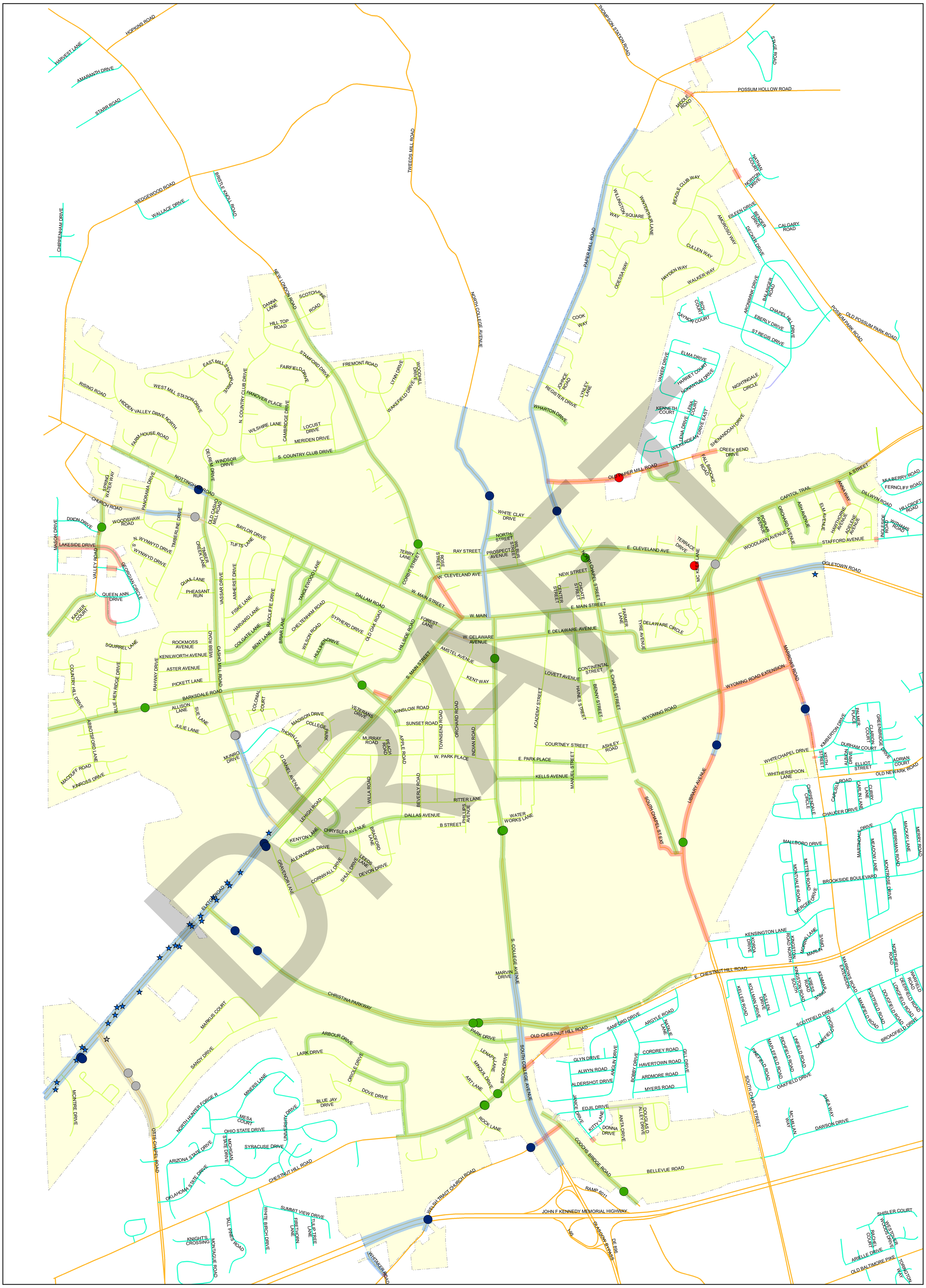
Document formatted to fit 24"w x 36"h sheet
Basemap layers were obtained from FirstMap
BMP and bridge color based on maintenance agreement

Closed Drainage - Dover
Open Drainage - DelDOT

Overall Map

APPENDIX A

A-6: CITY OF NEWARK MS4 MAINTENANCE MAP



City of Newark MS4 Maintenance

DelDOT
August 2024

Miscellaneous
City of Newark ☆ BMP ○ Bridge

Maintenance Agreement
DelDOT | Municipality | Undetermined | No Agreement

Roadway Maintenance Responsibility
- Municipal Road Maintained by Municipal Forces
- Municipal Road Maintained by Other Forces
- Suburban Road Maintained by Other Forces
- State Road Maintained by State
- Suburban Road Maintained by State

0 750 1,500 3,000 Feet

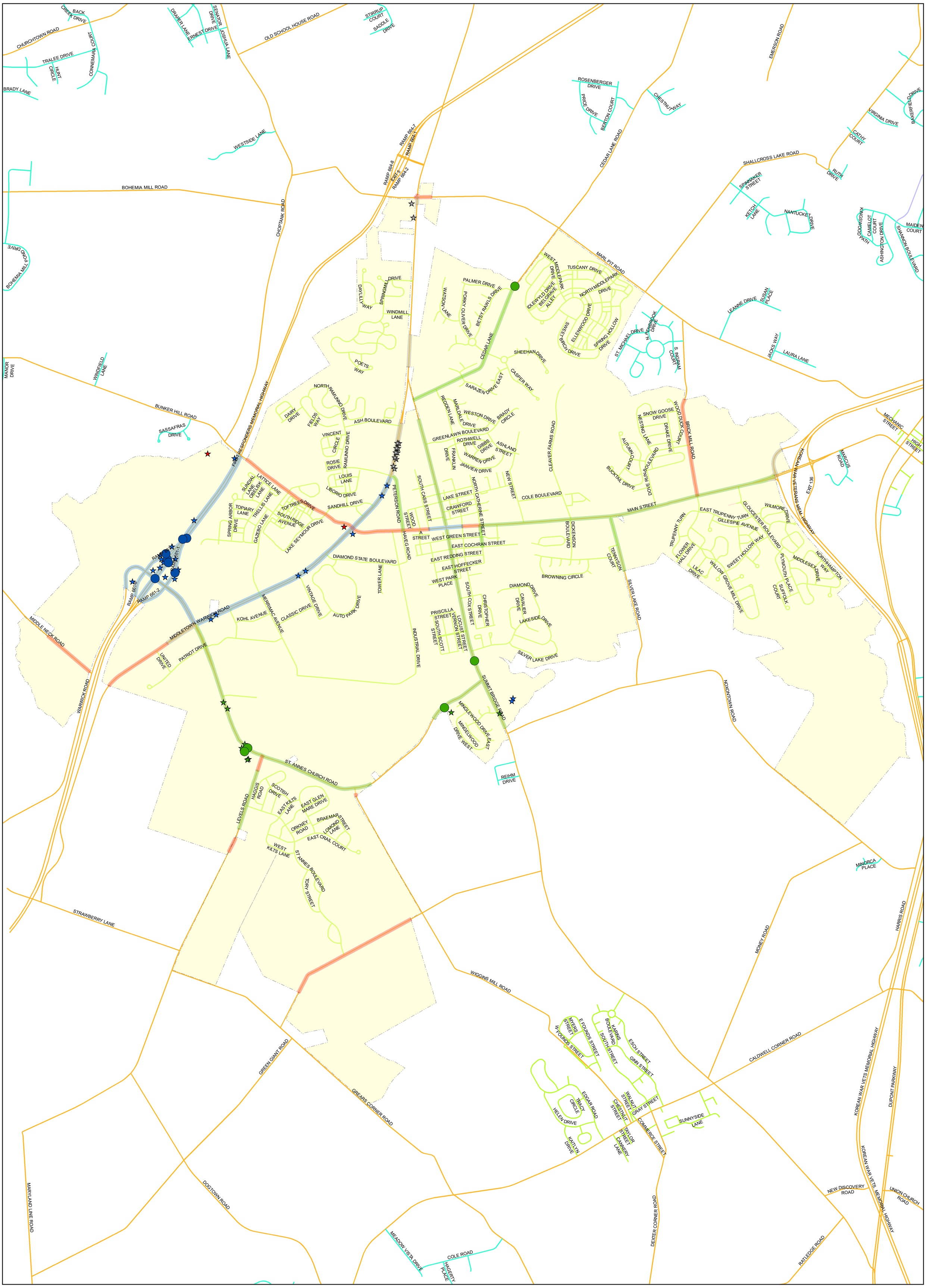
1 inch = 1,146 feet

Notes
Document formatted to fit 24"w x 36"h sheet
Basemap layers were obtained from FirstMap
BMP and bridge color based on maintenance agreement

Overall Map

APPENDIX A

A-7: TOWN OF MIDDLETOWN MS4 MAINTENANCE MAP



Town of Middletown Storm Drain Maintenance

May 2024

Miscellaneous

Town of Middletown ☆ BMP ○ Bridge

Maintenance Agreement

DelDOT | Municipality | Undetermined | No Agreement

Roadway Maintenance Responsibility

- Municipal Road Maintained by Municipal Forces
- Municipal Road Maintained by Other Forces
- Suburban Road Maintained by Other Forces
- State Road Maintained by State
- Suburban Road Maintained by State

0 1,150 2,300 4,600 Feet

1 inch = 1,765 feet

Notes

Document formatted to fit 24"w x 36"h sheet
Basemap layers were obtained from FirstMap
BMP color based on maintenance agreement

Overall Map

APPENDIX A

A-8: TOWN OF SMYRNA MS4 MAINTENANCE MAP

Town of Smyrna Storm Drain Maintenance

DelDOT
November 2024

Miscellaneous
Town of Smyrna | County | ☆ BMP

Maintenance Agreement
DelDOT | Municipality | Undetermined | No Agreement

Maintenance per 2024 Discussions
DelDOT | Municipality

Roadway Maintenance Responsibility
- Municipal Road Maintained by Municipal Forces
- Municipal Road Maintained by Other Forces
- Suburban Road Maintained by Other Forces
- State Road Maintained by State
- Suburban Road Maintained by State

0 850 1,700 3,400 Feet

1 inch = 1,329 feet

Notes
Document formatted to fit 24"w x 36"h sheet
Basemap layers were obtained from FirstMap
BMP and bridge color based on maintenance agreement

Overall Map

APPENDIX A

A-9: TOWN OF CLAYTON MS4 MAINTENANCE MAP

Town of Clayton Storm Drain Maintenance

DelDOT
January 2025

New Castle County

Kent County

CLAYTON DELANEY ROAD
CLAYTON GREENSPRING ROAD
DUCK CREEK PARKWAY
GREENS BRANCH LANE
PAUL DRIVE
ROBERTS DRIVE
HIGH STREET EXTENDED
EAGLE WAY
SUMMER DRIVE
ARTIC LANE
LONGWOOD LANE NORTH
LONGWOOD LANE SOUTH
DUCK CREEK ROAD
DUMP ROAD
N. BASSETT STREET
APRICOT ALLEY
WILSON AVENUE
CHERRY ALLEY
COLEMAN STREET
EAST STREET
RAILROAD AVENUE
CLAYTON AVENUE
PEACH ALLEY
WASHINGTON AVENUE
HIGHLAND AVENUE
WEST STREET
APPLE ALLEY
STATE ALLEY
ALLEY STREET
WEST DUCK CREEK ROAD
MAIN STREET
ROTH ALLEY
SMYRNA AVENUE
PEAR ALLEY
KIRKWOOD STREET
PLUM ALLEY
HASLETT STREET
BASSETT STREET
RODNEY STREET
ANNE GILLIS LANE
WHEELER CIRCLE
TRALA STREET
FOXWOOD DRIVE
NUGENT LOOP
INDUSTRIAL PARKWAY
REED STREET
SPELT DRIVE
SMYRNA-CLAYTON BOULEVARD
WEST GLENWOOD AVENUE
N. CARTER ROAD
DEAK DRIVE
TAMARA DRIVE
DICKERSON STREET
TREATY LANE
SCHOOL LANE
PRESTON LANE
ARTISAN DRIVE
HUNTINGTON DRIVE
MILLINGTON ROAD
WIND SONG DRIVE
COOL BREEZE DRIVE
INTEGRO DRIVE
WHEATLEYS FARM DRIVE
SAMMON DRIVE
WHEATLEYS POND ROAD
WEST RADISON RUN
TRACER DRIVE
EAST RADISON RUN
ALTON AVENUE
WINDHAM WAY
RIVERDALE LANE
MAYWOOD DRIVE
SMYRNA CREEK DRIVE
SUMTER COURT
MACON LANE
SOUTHERN VIEW DRIVE
NORTH CANVASBACK COURT
HUNTING WAY
GRAVELLY RUN BRANCH
PENROSE BRANCH ROAD
CHESAPEAKE LANE
CHRISTIANA RIVER DRIVE
COLDWATER DRIVE
ISLAND LANE
SHADY CREEK LANE
STONEY CREEK LANE
SNOW BRANCH ROAD
DELAWARE RIVER DRIVE
ANDOVER BRANCH ROAD
MASSEY BRANCH ROAD
SWEETBRIAR LANE
WHISTLEFIELD WAY
UNDERWOODS CORNER ROAD
SUNRISE DRIVE
STIRRUP ROAD
ALLEY CORNER ROAD
SUNNYSIDE ROAD
RYAN ROAD
HILLYARD ROAD

Left Side - Municipality
Right Side - DelDOT

Left Side - DelDOT
Right Side - Municipality

Miscellaneous
Town of Clayton | County | Bridge | ☆ BMP

Maintenance Agreement
DelDOT | Municipality | Undetermined | No Agreement

Maintenance per 2025 Discussions
DelDOT | Municipality

Roadway Maintenance Responsibility
Municipal Road Maintained by Municipal Forces
Municipal Road Maintained by Other Forces
State Road Maintained by State
Suburban Road Maintained by State

0 420 840 1,680 Feet
1 inch = 640 feet

Notes
Document formatted to fit 24"w x 36"h sheet
Basemap layers were obtained from FirstMap
BMP and bridge color based on maintenance agreement

Overall Map

APPENDIX B – ILLICIT DISCHARGE DETECTION AND ELIMINATION

APPENDIX B

B-1: AGREEMENT 2056 REQUEST FOR PROPOSAL

Delaware Department of Transportation

REQUEST FOR PROPOSALS
PROFESSIONAL SERVICES

RFP Number: **2056F**

NPDES INVENTORY AND INSPECTION

Submission Due Date/Time: **Thursday, September 22, 2022, no later than 2:00 P.M. Local Time**

Three (3) year term with Two (2) possible one-year extensions

Agreement Type: Project Specific

One agreement may be awarded from this solicitation

Funding: State & Federal

The anticipated method of payment is cost plus fixed fee

29 Del.C. §6981, 2 CFR part 200

PROJECT INFORMATION

This Request for Proposal (RFP) issued by the Delaware Department of Transportation (DelDOT) is for the purpose of acquiring Proposals from interested firms to assist the National Pollutant Discharge Elimination System (NPDES) Program with inventory and inspection services related to compliance with the NPDES Municipal Separate Storm Sewer System (MS4) Permit Program, and statewide inventory and inspection of DelDOT-owned stormdrain infrastructure and stormwater best management practices (BMPs).

PROJECT DESCRIPTION

Services may include but are not limited to Inspections; Environmental Services; GIS-Systems Analysis and Management.

The awarded firm will assist with the asset management of DelDOT's stormwater system including the inventory and inspection of closed stormdrain infrastructure (inlets, manholes, pipes), open drainage system (outfalls, swales) and stormwater BMPs (ponds, sand filters, bioswales, etc.) statewide, with particular emphasis on Phase I and Phase II MS4 permitted areas.

DelDOT will focus this agreement's efforts on the following tasks:

1. Re-inspect portions of the stormdrain system in the Phase I and II areas, as specified within the Phase I and Phase II MS4 permits.
2. Assist with drainage investigations and re-inspections of the stormdrain system statewide.
3. Inventory, and as needed, inspection of newly accepted stormdrain infrastructure in subdivision and state-owned roads statewide.
4. Annual BMP inspections.
5. Pre-acceptance compliance inspections of BMPs.
6. Maintain and update the inventory/inspection database and map viewer application.
7. Identify, create and submit work orders for portions of the infrastructure requiring maintenance.

8. Stormdrain system inventory and inspection:
    a. Develop and compile an inventory of all parts of the DelDOT-owned stormwater drainage system statewide.
    b. Locate the drainage system using Global Positioning System (GPS) techniques, with sub-meter accuracy.
    c. Inspect all respective parts of DelDOT's conveyance system to verify inventory data, and structural integrity and identify maintenance needs. Work is to include external and internal visual inspections of all drainage inlets, catch basins, manholes, junction boxes, flow diverters, stream channels, ditches, and pipes.
    d. Report illicit discharges or any odors or visual clues that would indicate the presence of non-stormwater discharges (actual investigation not part of scope).
    e. Mark those drainage inlets that are readily visible to the general public (i.e. within a subdivision, close to sidewalks, etc.) upon completion of the inspection work with a Departmentally approved decal. Each such mark shall display a public message related to protecting water quality.
9. Stormwater BMP inventory and inspection:
    a. Inventory any new DelDOT-owned stormwater BMPs statewide to include stormwater ponds, media filters, bio-filtration, sedimentation devices, bio-retention, infiltration basins and trenches, check dams, etc.
    b. Locate each BMP using Global Positioning System (GPS) techniques, with sub-meter accuracy.
    c. Perform inspections of all components of DelDOT-owned BMPs.
    d. Perform initial, primary and pre-acceptance inspections of newly constructed BMPs prior to their acceptance into the state system.
10. Maintenance work orders:
    a. Prepare maintenance work orders for deficient elements of the stormwater conveyance system and stormwater BMPs upon discovery.
    b. Work orders shall be submitted to the appropriate sections of DelDOT in a format compatible with existing maintenance management systems.
11. Database maintenance and GIS support:
    a. Provide routine updates of inventories and inspections to the database; the consultant shall ensure the quality and accuracy of the data prior to submitting
    b. Make modifications to map viewer at the request of the DelDOT project manager
    c. The consultant shall be capable to host the database and have it available to DelDOT through the internet.
    d. Any and all data or source code developed for this project shall become the property of DelDOT for its use and shall be submitted to DelDOT as it is developed or upon the request of DelDOT's project manager. The consultant must submit the information in such format as will enable DelDOT to add information or modify the database independently, as it sees fit, as requirements and needs change.
    e. Assist in determining ownership or maintenance responsibility.
    f. GIS and database analysis.

12. Progress reports and submittals:
    a. Attend regular progress meetings with DelDOT NPDES Program. The frequency of meetings will be determined by the DelDOT Project Manager.
    b. Submit annual summary reports for inclusion in DelDOT's annual report.
    c. Assist with compiling stormdrain infrastructure and BMP statistics as requested.

Deliverables:

1. Monthly invoices including monthly summary reports of inventory and inspection efforts.
2. Annual reports of all consultant activities and data to be incorporated into DelDOT's annual reports to DNREC.
3. DelDOT's Phase I and Phase II Annual Reports to DNREC.
4. GIS maps as required.
5. SOPs as required.
6. Meeting minutes.

QUESTIONS

Questions must be submitted before the due date identified in the Procurement Schedule for this RFP. All inquiries must be submitted in the Q/A section of the project listing in the Bonfire Procurement Portal.

The Department's response to questions will be posted, according to the procurement schedule, under the project listing in Bonfire and to the State of Delaware Bid Solicitation Directory Website: http://www.bids.delaware.gov/.

DISADVANTAGED BUSINESS ENTERPRISE

A DBE goal will be established on a task-by-task basis for the sum total of all federally-funded tasks associated with this Agreement. The Department will require ongoing reviews and approval of *good faith efforts* before a Notice to Proceed is issued. Department DBE Program staff will monitor this Agreement to ensure that good faith efforts are being made to meet the DBE goal. DBE firms must be certified through DelDOT's DBE Program in order to qualify toward meeting the goal.

PROCUREMENT SCHEDULE

Action Item	Date	Time
Deadline for Questions to ensure response:	Ten (10) business days prior to the proposal due date	2:00 P.M. Local Time
Final Response to Questions posted by:	Five (5) business days prior to the proposal due date	2:00 P.M. Local Time
Proposals Due no later than:*	**Thursday, September 22, 2022**	2:00 P.M. Local Time

NOTE: Only asterisk (*) marked date changes will be communicated (via posted Addendums).

PROPOSAL REQUIREMENTS

Interested firms must submit the material required herein or they may not be considered for the project:

1. Proposals must be received before the Proposal Due Date and Time, as identified in the Procurement Schedule for this RFP. Responses submitted by hard copy, mail, facsimile, or e-mail will not be accepted. Responses received after the Proposal Due Date and Time will not be considered.

2. **Upload your submission at**: https://deldot.bonfirehub.com/portal/

   Important Notes:
   - Logging in and/or uploading the file(s) does not mean the response is submitted. Users must successfully upload all the file(s) and MUST click the submit button before the proposal due date and time.
   - Users will receive an email confirmation receipt with a unique confirmation number once the submission has been finalized. This will confirm that the proposal has been submitted successfully.
   - Each submitted item of Requested Information will only become visible to DelDOT after the proposal due date and time.
   - If the file is mandatory, you will not be able to complete your submission until the requirement is met.
   - Uploading large documents may take significant time depending on the size of the file(s) and your Internet connection speed. The maximum upload file size is 1000 MB.
   - Minimum system requirements: Internet Explorer 11, Microsoft Edge, Google Chrome, or Mozilla Firefox. Java Script must be enabled.

   Need Help? Please contact Bonfire directly at Support@GoBonfire.com for technical questions related to your submission. You can also visit their help forum at https://bonfirehub.zendesk.com/hc.

3. **The Prime Consultant must be Registered,** or submit application for registration, with DelDOT at or before the time of submission in order to be considered. For registration information, click here.

4. **Submit one (1) Original and one (1) Redacted copy** of the Proposal. The original must be a .pdf file of the original signed proposal and should be clearly marked "Original" on the first page of the document. The redacted copy must be a .pdf file of the original signed proposal with any proprietary or confidential information redacted, and this copy should be clearly marked as "Redacted" on the first page of the document. The redacted copy is required even if the submission contains no proprietary or confidential information.

   To determine what information may be considered proprietary or confidential and may be redacted from their Proposal, firms should review Delaware's Freedom of Information Regulations here; http://regulations.delaware.gov/AdminCode/title8/1400.shtml#TopOfPage. Under Delaware FOIA law, 29 Del. C, §10002(l)(2), "Trade secrets and commercial or financial information…which is of a privileged or confidential nature" are "records that shall not be deemed public" and are therefore exempt from disclosure under FOIA.

5. **Architect-Engineer Qualifications**; **GSA SF330:**

http://www.gsa.gov/portal/forms/download/116486

Follow instructions for the SF330, and add the following Individual Agency Instructions:

A. Part I Section C 11, Proposed Team;
Indicate if the firm is a DBE and provide the approximate percentage of the contract cost they will perform.

B. Part I Section E, Resumes of Key Personnel Proposed for this Contract;
Resume information is limited to eight (8) individuals regardless of affiliation.

C. Part I Section F, Example Projects;
Example Projects provided are limited to ten (10).

D. Part I Section H 30, Additional Information;
(The Department recommends formatting this section using Times New Roman, 12 pt. font)
1) The Prime consultant must indicate the current workload with the Department by listing the following in a table format:
Agreement No.; Agreement Title; Consultant PM; Prime or Sub; Total Dollars paid to date; current number of Tasks issued; and date of contract expiration.
2) List any DelDOT agreement number your firm has been selected for and not included above.
3) Firms may include a "Rating Criteria Support Information" Section, limited to four pages, within Section H, that covers any information that directly relates to the firm's ability to meet the specific rating criteria listed in this RFP.

Note: Letters of Interest should not be included.

6. **Joint venture** submissions will not be considered.

7. DelDOT reserves the right to reject any and all submissions. Submissions become property of the Department and shall be retained electronically for a minimum period of three (3) years from the date of receipt. DelDOT reserves the right to any and all ideas included in this response without incurring any obligations to the responding firms or committing to procurement of the proposed services.

8. **Required Certification Forms.** All firms responding to the RFP must complete and return the submission forms located in 'Appendix A' of this document.

No promotional materials or brochures are to be included as part of the submission.

RATING CRITERIA

#	**Criteria Description**:	**Weight**
1	Firm's experience pertaining to BMP inventory and inspection, assessing deficiencies that affect performance and water quality, and recommending maintenance and/or retrofit solutions.	25%
2	Firm's experience pertaining to stormwater system inventory, inspections, and condition assessment.	25%
3	Firm's experience providing GIS-based database management and the resources needed to house and maintain such databases.	25%
4	Staff capabilities and workload capacity to accomplish proposed work on schedule and on-call as needed.	25%
	TOTAL :	**100%**

OVERVIEW OF SELECTION PROCESS –PROJECT SPECIFIC

- This is a project-specific agreement where the services as described in this RFP will be provided over the life of the project.
- This is a single-phase solicitation process with the availability for discussions with up to three (3) of the most highly qualified firms. Based upon the listed criteria and evaluation of each firm's submitted proposal, the Selection Committee may decide if a small sample task and/or discussions will be held with the most highly qualified consultants. If discussions are held, they will serve to clarify the technical approach, qualifications, and capabilities provided in response to the RFP, after which the committee will determine the ranking of the candidate firms.
- Selection Committee members will individually score each firm's submitted proposal which determines individual ranking. The Department's ranking is the combined ranking of all Committee members. Firms, in order of ranking, will have the opportunity to negotiate an agreement with the Department. If the Department cannot reach agreement with the highest ranked firm(s), the Department terminates negotiations and begins negotiations with the next highest ranked firm, and so on until an agreement is reached. The Department notifies via email the awarded firm(s) of the opportunity to enter into an agreement with the Department. This notification also includes information on the next steps for the agreement process.
- After the ranking process has been completed, applicable price information will be requested from the successful candidate firm(s), such as; salary rates for various classifications of personnel; and an indirect cost derivation for the most current accounting period.
- Payroll burden and overhead will be computed on direct salary costs only (not including overtime) at the consultant's audited rate, as per Federal Acquisition Regulations Part 31, and Department policies. Computer and CADD costs are not allowable as a direct cost to this project. Rate determination and applicability is subject to audit by the Department. Additionally, candidates should be prepared for the Department to work with your current accounting firm to provide information and backup documentation. Full and immediate cooperation is required to avoid delays in execution of an agreement. Failure to cooperate may result in breaking off of negotiations and moving to the next ranked firm.
- Selection Committee membership appointments are confidential. The Department's Professional Services Procurement Manual may be viewed here.

INSURANCE REQUIREMENTS

The selected firm(s) must obtain at its own cost and expense and keep in force and effect during the term of the agreement, including all extensions, the minimum coverage limits specified below with a carrier satisfactory to the State.

a. Worker's Compensation and Employer's Liability Insurance in accordance with applicable law.

b. Commercial General Liability - $1,000,000 per occurrence/$3,000,000 per aggregate.

c. Miscellaneous Errors and Omissions - $1,000,000 per occurrence/$3,000,000 per aggregate.

d. Automotive Liability Insurance covering all automotive units used in the work (including all units leased from and/or provided by the State to Vendor pursuant to this Agreement as well as all units used by Vendor, regardless of the identity of the registered owner, used by Vendor for completing the Work required by this Agreement to include but not limited to transporting Delaware clients or staff), providing coverage on a primary non-contributory basis with limits of not less than:

1. $1,000,000 combined single limit each accident, for bodily injury;
2. $250,000 for property damage to others;
3. $25,000 per person per accident Uninsured/Underinsured Motorists coverage;
4. $25,000 per person, $300,000 per accident PIP benefits if carrying any of our clients or employees; and
5. Comprehensive coverage for all vehicles leased from the State of Delaware Fleet Services which shall cover the replacement cost of the vehicle in the event of collision, damage or other loss.

Certificate of Insurance and/or copies of the insurance policies will be requested at time of award.

In no event shall the State of Delaware be named as an additional insured on any policy required under this agreement.

MISCELLANEOUS

The Department is not liable for any cost incurred by the consultant in the preparation or presentation of the Proposal.

Any individual, business, organization, corporation, consortium, partnership, joint venture, or any other entity including subconsultants currently debarred or suspended is ineligible to participate as a candidate for this process. Any entity ineligible to conduct business in the State of Delaware for any reason is ineligible to respond to the RFP.

The Department of Transportation will affirmatively insure individuals and businesses will not be discriminated against on the grounds of race, creed, color, sex, or national origin in consideration for an award. Minority business enterprises will be afforded full opportunity to submit bids/proposals in response to this invitation.

Department of Transportation
State of Delaware
By: Nicole Majeski
Secretary
Dover, DE

FEDERAL CONTRACT PROVISIONS

FTA's Master Agreement contains a current, but not all-inclusive, description of statutory and regulatory requirements that may affect a recipient's procurement (such as Disadvantaged Business Enterprise (DBE) and Clean Air requirements). The Master Agreement states that applicable Federal requirements will apply to project participants to the lowest tier necessary to ensure compliance with those requirements. The recipient will need to include applicable Federal requirements in each sub-agreement, lease, third party contract, or other document as necessary. For specific guidance on cross-cutting requirements administered by other Federal agencies, FTA recommends that the recipient contact those agencies. The requirements listed herein must be adhered to by any firms selected to perform work required under these agreements.

1. AUDIT AND INSPECTION OF RECORDS

The Contractor agrees to provide the Delaware Department of Transportation (Department), the FTA Administrator, the Comptroller General of the United States or any of their authorized representatives' access to any books, documents, papers and records of the Contractor which are directly pertinent to this contract for the purposes of making audits, examinations, excerpts and transcriptions. Contractor also agrees, pursuant to 49 C. F. R. 633.17 to provide the FTA Administrator or his authorized representatives including any PMO Contractor access to Contractor's records and construction sites pertaining to a major capital project, defined at 49 U.S.C. 5302(a)1, which is receiving federal financial assistance through the programs described at 49 U.S.C. 5307, 5309 or 5311. By definition, a major capital project excludes contracts of less than the simplified acquisition threshold. The Contractor agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.

2. ACCESS REQUIREMENTS FOR INDIVIDUALS WITH DISABILITIES

The Contractor agrees to comply with all applicable requirements of the Americans with Disabilities Act of 1990 (ADA), 42 U.S.C. Section 12101 *et seq.* And 49 U.S.C. Section 322; Section 504 of the Rehabilitation Act of 1973, as amended, 29 U.S.C. Section 794; Section 16 of the Federal Transit Act, as amended, 49 U.S.C. App. Section 1612; and implementing regulations, as may be amended

3. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, AND OTHER RESPONSIBILITY MATTERS – Lower Tier Covered Transactions (Third Party Contracts over $25,000)

a) By signing and submitting this bid or proposal, the prospective lower tier participant is providing the signed certification set out below.

b) The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the Department may pursue available remedies, including suspension and/or debarment.

c) The prospective lower tier participant shall provide immediate written notice to the Department if at any time the prospective lower tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

d) The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "persons," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549 [49 CFR Part 29]. You may contact the Department for assistance in obtaining a copy of those regulations.

e) The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized in writing by the Department.

f) The prospective lower tier participant further agrees by submitting this proposal that it will include the clause "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transaction", without modification, in all lower tier covered transactions.

g) A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that it is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the No procurement List issued by the U. S. General Service Administration.

h) Nothing contained in the foregoing shall be construed to require establishment of system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i) Except for transactions authorized under Paragraph E of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible or voluntarily excluded from participation in this transaction, in addition to all remedies available to the Federal Government, the Department may pursue available remedies including suspension and/or debarment.

j) The prospective lower tier participant certifies, by submission of this bid or proposal, that neither it nor its "principals" [as defined at 49 CFR §29.105(p)] is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

k) When the prospective lower tier participant is unable to certify to the statements in this certification, such prospective participant shall attach an explanation to this proposal.

4. CLEAN WATER REQUIREMENTS

The Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 *et seq.* The Contractor agrees to report each violation to the Department and understands and agrees that the Department will, in turn, report each violation as required to assure notification to FTA and the appropriate EPA Regional Office. (2)The Contractor also agrees to include these requirements in each subcontract exceeding $100,000 financed in whole or in part with Federal assistance provided by FTA.

5. FEDERAL CHANGES

Contractor shall at all times comply with all applicable FTA regulations, policies, procedures and directives, including without limitation those listed directly or by reference in the Master Agreement between the Department and FTA, as they may be amended or promulgated from time to time during the term of this contract. Contractor's failure to so comply shall constitute a material breach of this contract.

6. CLEAN AIR

The Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. §§ 7401 *et seq*. The Contractor agrees to report each violation to the Department and understands and agrees that the Department will, in turn, report each violation as required to assure notification to FTA and the appropriate EPA Regional Office. (2) The Contractor also agrees to include these requirements in each subcontract exceeding $100,000 financed in whole or in part with Federal assistance provided by FTA.

7. ENERGY CONSERVATION

The Contractor shall recognize mandatory standards and policies relating to energy efficiency which are contained in the State Energy Conservation Plan issued in compliance with the Energy Policy and Conservation Act (42 US Section 321 *et seq.*).

8. CONTRACT TERMINATION

a) Termination for Convenience

The Department may terminate this contract, in whole or in part, at any time by written notice to the Contractor. The Contractor shall be paid its costs, including contract close-out costs, and profit on product delivered up to the time of termination. The Contractor shall promptly submit its termination claim for payment. If the Contractor has any property in its possession belonging to the Department, the Contractor will account for the same and dispose of it in the manner the Department directs.

b) Termination for Default

If the Contractor does not deliver supplies in accordance with the contract delivery schedule, or, if the contract is for services, the Contractor fails to perform in the manner called for in the contract, or if the Contractor fails to comply with any other provisions of the contract, the Department may terminate this contract for default. Termination shall be affected by serving a notice of termination on the Contractor setting forth the manner in which the Contractor is in default. The Contractor will only be paid the contract price for supplies delivered and accepted, or services performed in accordance with the manner of performance set forth in the contract.

If it is later determined that the Contractor had an excusable reason for not performing, such as a strike, flood, events which are not the fault of or are beyond the control of the Contractor, the Department, after setting up a new delivery or performance schedule, may allow the Contractor to continue work, or treat the termination as a termination of convenience.

In the event the Department exercises its right of termination for default, and if an amount for liquidated damages is set forth, the Contractor shall be liable to the Department for excess costs and, in addition, for liquidated damages in the amount set forth, as fixed, agreed, and liquidated damages for each calendar day of delay, until such time as the Department may reasonably obtain delivery or performance of similar supplies or services.

If the contract is so terminated, the Contractor shall continue performance and be liable to the Department for such liquidated damages for each calendar day of delay until the supplies are delivered or services performed.

The Contractor shall not be liable for liquidated damages resulting from delays such as acts of God, strikes, fire or flood, and events which are not the fault of, or are beyond the control of the Contractor.

9. CIVIL RIGHTS

(1) Nondiscrimination - In accordance with Title VI of the Civil Rights Act, as amended, 42 U.S.C. § 2000d, section 303 of the Age Discrimination Act of 1975, as amended, 42 U.S.C. § 6102, section 202 of the Americans with Disabilities Act of 1990, 42 U.S.C. § 12132, and Federal transit law at 49 U.S.C. § 5332, the Contractor agrees that it will not discriminate against any employee or applicant for employment because of race, color, creed, national origin, sex, age, or disability. In addition, the Contractor agrees to comply with applicable Federal implementing regulations and other implementing requirements FTA may issue.

(2) Equal Employment Opportunity - The following equal employment opportunity requirements apply to the underlying contract:

(a) Race, Color, Creed, National Origin, Sex - In accordance with Title VII of the Civil Rights Act, as amended, 42 U.S.C. § 2000e, and Federal transit laws at 49 U.S.C. § 5332, the Contractor agrees to comply with all applicable equal employment opportunity requirements of U.S. Department of Labor (U.S. DOL) regulations, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor," 41 C.F.R. Parts 60 *et seq*., (which implement Executive Order No. 11246, "Equal Employment Opportunity," as amended by Executive Order No. 11375, "Amending Executive Order 11246 Relating to Equal Employment

Opportunity," 42 U.S.C. § 2000e note), and with any applicable Federal statutes, executive orders, regulations, and Federal policies that may in the future affect construction activities undertaken in the course of the Project. The Contractor agrees to take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, creed, national origin, sex, or age. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.

(b) Age - In accordance with section 4 of the Age Discrimination in Employment Act of 1967, as amended, 29 U.S.C. § 623 and Federal transit law at 49 U.S.C. § 5332, the Contractor agrees to refrain from discrimination against present and prospective employees for reason of age. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.

(c) Disabilities - In accordance with section 102 of the Americans with Disabilities Act, as amended, 42 U.S.C. § 12112, the Contractor agrees that it will comply with the requirements of U.S. Equal Employment Opportunity Commission, "Regulations to Implement the Equal Employment Provisions of the Americans with Disabilities Act," 29 C.F.R. Part 1630, pertaining to employment of persons with disabilities. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.

(3) The contractor agrees to comply with all applicable requirements of the Americans with Disabilities Act of 1990 (ADA), 42 U.S.C. Section 12101 *et seq.* And 49 U.S.C. Section 322; Section 504 of the Rehabilitation Act of 1973, as amended, 29 U.S.C., Section 794; Section 16 of the Federal Transit Act, as amended, 49 U.S.C. App. Section 1612; and implementing regulations, as may be amended.

(4) The Contractor also agrees to include these requirements in each subcontract financed in whole or in part with Federal assistance provided by FTA, modified only if necessary to identify the affected parties.

10. DISADVANTAGED BUSINESS ENTERPRISES

It is the policy of the Department of Transportation that Disadvantaged Business Enterprises as defined in 49 CFR Part 26 shall have the opportunity to participate in the performance of contracts financed in whole or part with Federal funds under this contract. Consequently the DBE Requirements of 49 CFR Part 26 apply to this contract. The recipient or its contractor agrees to ensure that Disadvantaged Business Enterprises as defined in 49 CFR Part 26 have the opportunity to participate in the performance of contracts and subcontracts financed in whole or in part with Federal funds provided under this contract. In this regard all recipients or contractors shall take all necessary and reasonable steps in accordance with 49 CFR Part 26 to ensure that Disadvantaged Business Enterprises have the opportunity to compete for and perform contracts. The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of FTA assisted subcontracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy, as the Department deems appropriate.

The successful bidder agrees to comply with the following clauses:

Prompt Payment: The prime contractor agrees to pay each subcontractor under this prime contract for satisfactory performance of its contract no later than 30 days from the receipt of each payment the prime contractor receives from the Department. This clause applies to both DBE and Non-DBE subcontractors.

Retainage: The prime contractor agrees to return retainage payments to each subcontractor within 30 days after the subcontractor's work is satisfactorily completed. Any delay or postponement of payment from the above referenced time frame may occur only for good cause following written approval of the Department. This clause applies to both DBE and non-DBE subcontractors. The specific goal for this contract is shown above under Disadvantaged Business Enterprise.

11. ENVIRONMENTAL VIOLATIONS

The Contractor agrees to comply with all applicable standards, orders, or requirements issued under Section 306 of the Clean Air Act (42 USC 1857 (h)), Section 508 of the Clean Water Act (33 USC 1368), Executive Order 11378, and Environmental Protection Agency regulations: (40 CFR, Part 15) which prohibit the use under nonexempt Federal contracts, grants or loans, of facilities included on the EPA List for Violating Facilities. The Contractor shall report violations to the FTA.

12. EQUAL EMPLOYMENT OPPORTUNITY

In connection with the execution of this contract, the Contractor shall not discriminate against any employee or applicant for employment because of race, creed, religion, color, national origin, age, sex or disability. The Contractor shall take affirmative action to insure that applicants are employed, and that employees are tested during their employment without regard to their race, creed, religion, color, national origin, age, sex or disability. Such actions shall include, but not b limited to the following, employment, upgrading, demotion, or transfer, recruitment or recruitment advertising, layoff or termination; rates of pay, or other forms of compensation. The Contractor further agrees to insert a similar provision in all subcontracts, except subcontracts for standard commercial supplies or raw materials.

13. FTA FUNDING REQUIREMENTS

This project may be financed in part by funds from the Federal Transit Administration. Contractor shall at all times comply with all applicable FTA regulations, policies, procedures and directives, including without limitation those listed directly or by reference in the Master Agreement between the Department and FTA, as they may be amended or promulgated from time to time during the term of this contract. Contractor's failure to so comply shall constitute a material breach of this contract.

14. INCORPORATION OF FEDERAL TRANSIT ADMINISTRATION (FTA) TERMS

The preceding provisions include, in part, certain Standard Terms and Conditions required by DOT, whether or not expressly set forth in the preceding contract provisions. All contractual provisions required by FTA, as set forth in FTA Circular 4220.1F are hereby incorporated by reference. Anything to the contrary herein notwithstanding, all FTA mandated terms shall be deemed to control in the event of a conflict with other provisions contained in this Agreement. The Contractor shall not perform any act, fail to perform any act, or refuse to comply with any Department requests which would cause the Department to be in violation of the FTA terms and conditions.

15. LOBBYING:

The Contractor is required to certify using the Certification of Restrictions on Lobbying Form included that, to the best of his or her knowledge and belief:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for making lobbying contacts to an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form--LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions [as amended by "Government wide Guidance for New Restrictions on Lobbying," 61 Fed. Reg. 1413 (1/19/96). Note: Language in paragraph (2) herein has been modified in accordance with Section 10 of the Lobbying Disclosure Act of 1995 (P.L. 104-65, to be codified at

2 U.S.C. 1601, *et seq*.)]

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly. The certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of the certification is a prerequisite for making or entering into this transaction imposed by 31, U.S.C. § 1352 (as amended by the Lobbying Disclosure Act of 1995). Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure. Pursuant to 31 U.S.C. § 1352(c)(1)-(2)(A), any person who makes a prohibited expenditure or fails to file or amend a required certification or disclosure form shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such expenditure or failure.

16. NO GOVERNMENT OBLIGATION TO THIRD PARTIES

(1) The Department and Contractor acknowledge and agree that, notwithstanding any concurrence by the Federal Government in or approval of the solicitation or award of the underlying contract, absent the express written consent by the Federal Government, the Federal Government is not a party to this contract and shall not be subject to any obligations or liabilities to the Department, Contractor, or any other party (whether or not a party to that contract) pertaining to any matter resulting from the underlying contract.

(2) The Contractor agrees to include the above clause in each subcontract financed in whole or in part with Federal assistance provided by FTA. It is further agreed that the clause shall not be modified, except to identify the subcontractor who will be subject to its provisions.

17. PROGRAM FRAUD AND FALSE OR FRAUDULENT STATEMENTS AND RELATED ACTS

(1) The Contractor acknowledges that the provisions of the Program Fraud Civil Remedies Act of 1986, as amended, 31 U.S.C. § 3801 *et seq*. and U.S. DOT regulations, "Program Fraud Civil Remedies," 49 C.F.R. Part 31, apply to its actions pertaining to this Project. Upon execution of the underlying contract, the Contractor certifies or affirms the truthfulness and accuracy of any statement it has made, it makes, it may make, or causes to be made, pertaining to the underlying contract or the FTA assisted project for which this contract work is being performed. In addition to other penalties that may be applicable, the Contractor further acknowledges that if it makes, or causes to be made, a false, fictitious, or fraudulent claim, statement, submission, or certification, the Federal Government reserves the right to impose the penalties of the Program Fraud Civil Remedies Act of 1986 on the Contractor to the extent the Federal Government deems appropriate.

(2) The Contractor also acknowledges that if it makes, or causes to be made, a false, fictitious, or fraudulent claim, statement, submission, or certification to the Federal Government under a contract connected with a project that is financed in whole or in part with Federal assistance originally awarded by FTA under the authority of 49 U.S.C. § 5307, the Government reserves the right to impose the penalties of 18 U.S.C. § 1001 and 49 U.S.C. § 5307(n)(1) on the Contractor, to the extent the Federal Government deems appropriate.

(3) The Contractor agrees to include the above two clauses in each subcontract financed in whole or in part with Federal assistance provided by FTA. It is further agreed that the clauses shall not be modified, except to identify the subcontractor who will be subject to the provisions.

18. PROTEST PROCEDURES

Protests based upon the award of the contract shall be made in writing to the Contract Services Administrator no later than ten (10) calendar days following the award of the contract. The protest must clearly specify in writing the grounds and evidence on which the protest is based. The protest will be reviewed and decided pursuant to; the proposal documents issued by the Department, the Delaware Code, and the Federal Transit Authority's regulations.

19. RECORD RETENTION

The Contractor agrees to maintain all books, records, accounts and reports required under this contract for a period of not less than three years after the date of termination or expiration of this contract, except in the event of litigation or settlement of claims arising from the performance of this contract, in which case Contractor agrees to maintain same until the Department, the FTA Administrator, the Comptroller General, or any of their duly authorized representatives, have disposed of all such litigation, appeals, claims or exceptions related thereto. Reference 49 CFR 18.39(i)(11).

20. SEISMIC SAFETY

The contractor agrees that any new building or addition to an existing building will be designed and constructed in accordance with the standards for Seismic Safety required in Department of Transportation Seismic Safety Regulations 49 CFR Part 41 and will certify to compliance to the extent required by the regulation. The contractor also agrees to ensure that all work performed under this contract including work performed by a subcontractor is in compliance with the standards required by the Seismic Safety Regulations and the certification of compliance issued on the project.

21. TITLE VI COMPLIANCE

During the performance of any Contract entered into pursuant to these specifications, the Contractor, for itself, its assignees and successor in interest, agrees that it shall comply with Title VI of the Civil Rights Act of 1964 (42 U.S.C. section 2000d) and the Regulations relative to nondiscrimination in federally assisted programs of the Department of Transportation, Title 49, Code of Federal Regulations Part 21, as they may be amended from time to time which are incorporated by reference and made a part of this contract.

22. INTELLIGENT TRANSPORTATION SYSTEMS

Intelligent transportation system (ITS) property and services must comply with the National ITS Architecture and Standards to the extent required by Section 5307(c) of SAFETEA-LU, FTA Notice, "FTA National ITS Architecture Policy on Transit Projects," 66 FR 1455 *et seq.*, January 8, 2001, and later published policies or implementing directives FTA may issue. Consequently, third party contracts involving ITS are likely to require provisions to ensure compliance with Federal requirements.

23. RESOLUTION OF DISPUTES, BREACHES, OR OTHER LITIGATION

(a) FTA Interest. FTA has a vested interest in the settlement of any violation of federal law, regulation, or requirement, or any disagreement involving the Award, the accompanying Underlying Agreement, and any Amendments thereto including, but not limited to, a default, breach, major dispute, or litigation, and FTA reserves the right to concur in any settlement or compromise.

(b) Notification to FTA; Flow Down Requirement. If a current or prospective legal matter that may affect the Federal Government emerges, the Recipient must promptly notify the FTA Chief Counsel and FTA Regional Counsel for the Region in which the Recipient is located. The Recipient must include a similar notification requirement in its Third Party Agreements and must require each Third Party Participant to include an equivalent provision in its subagreements at every tier, for any agreement that is a "covered transaction" according to 2 C.F.R. §§ 180.220 and 1200.220.

Appendix A - REQUIRED FORMS

The following completed forms are required to be returned with each proposal:

- Certification of Eligibility
- Certificate of Non-Collusion
- Certification of Primary Participant Regarding Debarment, Suspension, and Other Responsibility Matters
- Certification of Restrictions on Lobbying

CERTIFICATION OF ELIGIBILITY

Delaware Department of Transportation

Request for Proposal 2056F – NPDES Inventory and Inspection

We have read Request for Proposal number 2056F and fully understand the intent of the RFP as stated, certify that we have adequate personnel and knowledge to fulfill the requirements thereof, and agree to furnish such services in accordance with the contract documents as indicated should we be awarded the contract.

_____ hereby certifies that it is not included on the United States Comptroller General's Consolidated List of Persons or Firms Currently Debarred for Violations of Various Public Contracts Incorporating Labor Standard Provisions.

_____Signature of the Bidder or Offeror's Authorized Official

_____Name and Title of the Bidder or Offeror's Authorized Official

_____Date

Sworn and subscribed before me this _____ day of _____, 20___

_____ My commission expires: _____ / _____ / 20___

Notary Public Month Day Year

CERTIFICATE OF NON-COLLUSION

By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid, each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:

1) The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement for the purpose of restricting to such prices, with any other bidder or with any competitor;

2) Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the Bidder and will not knowingly be disclosed by the Bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and

3) No attempt has been made or will be made by the Bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

_____Signature of the Bidder or Offeror's Authorized Official

_____Name and Title of the Bidder or Offeror's Authorized Official

_____Date

Sworn and subscribed before me this _____ day of _____, 20___

_____ My commission expires: _____ / _____ / 20___

Notary Public Month Day Year

CERTIFICATION OF PRIMARY PARTICIPANT REGARDING DEBARMENT, SUSPENSION, AND OTHER RESPONSIBILITY MATTERS

The Primary Participant (applicant for an FTA grant or cooperative agreement, or potential contractor for a major third party contract), _____ certifies to the best of its knowledge and belief, that it and its principals:

1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or Local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or Local) with commission of any of the offenses enumerated in paragraph (2) of this certification; and
4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or Local) terminated for cause or default.

If the primary participant (applicant for an FTA grant or cooperative agreement, or potential third party contractor) is unable to certify to any of the statements in this certification, the participant shall attach an explanation to this certification.

The Primary Participant (applicant for an FTA grant or cooperative agreement, or potential contractor for a major third party contract), _____ certifies or affirms the truthfulness and accuracy of the contents of the statements submitted on or with this certification and understands that the provisions of 31 U.S.C. Sections 3801 *et seq.*, are applicable thereto.

_____Signature of the Bidder or Offeror's Authorized Official

_____Name and Title of the Bidder or Offeror's Authorized Official

_____Date

CERTIFICATION OF RESTRICTIONS ON LOBBYING

The Bidder or Offeror certifies, to the best of its knowledge and belief, that:

1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of a Federal department or agency, a Member of the U.S. Congress, an officer or employee of the U.S. Congress, or an employee of a Member of the U.S. Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification thereof.

2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for making lobbying contacts to an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form--LLL, "Disclosure Form to Report Lobbying", in accordance with its instructions (as amended by "Government wide Guidance for New Restrictions on Lobbying," 61 Fed. Reg. 1413 (1/19/96). Note: Language in paragraph (2) herein has been modified in accordance with Section 10 of the Lobbying Disclosure Act of 1995 (P.L. 104-65, to be codified at 2 U.S.C. 1601, *et seq.*)).

3) The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including subcontracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31, U.S.C. § 1352 (as amended by the Lobbying Disclosure Act of 1995). Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

THE BIDDER OR OFFEROR, _____, CERTIFIES OR AFFIRMS THE TRUTHFULNESS AND ACCURACY OF EACH STATEMENT OF ITS CERTIFICATION AND DISCLOSURE, IF ANY. IN ADDITION, THE BIDDER OR OFFEROR UNDERSTANDS AND AGREES THAT THE PROVISIONS OF 31 U.S.C. §§ 3801 *ET SEQ.* APPLY TO THIS CERTIFICATION AND DISCLOSURE, IF ANY.

_____Signature of the Bidder or Offeror's Authorized Official

_____Name and Title of the Bidder or Offeror's Authorized Official

_____Date

APPENDIX B

B-2: INVENTORY AND INSPECTION STANDARD OPERATING PROCEDURE

DELDOT AGREEMENT 2056

STATEWIDE MS4/BMP INVENTORY/INSPECTION

FIELD DATA COLLECTION APPLICATION
STANDARD OPERATING PROCEDURES

Prepared For

Delaware Department of Transportation

National Pollutant Discharge Elimination System Program

Prepared By

KCI Technologies, Inc.

Delaware Water Resources Practice

KCI Project 00008105_00001

SEPTEMBER 2024

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Appendix A Catch Basin, Grate and Cover Photographs

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1.0 INTRODUCTION

This document serves as the Standard Operating Procedures (SOP) for use of the Field Data Collection Application (Field Application). The SOP documents the methodologies and protocol to be used by field staff while conducting Municipal Separate Storm Sewer System (MS4) and Best Management Practices (BMP) inventory and inspection via the Field Application.

MS4/BMP inventory and inspection of DelDOT-owned structures includes the following primary services:

- Determine DelDOT's limits of ownership.
- Field-verify inventory.
- Perform detailed maintenance inspection.
- Prepare maintenance work orders for deficient elements.

The standardized procedures outlined herein assist the Delaware Department of Transportation (DelDOT) with decisions regarding inspection, maintenance, repair, and/or retrofit of their MS4/BMP stormwater infrastructure, in compliance with their National Pollutant Discharge Elimination System (NPDES) Phase I and Phase II Permits.

Additional details are provided in the Appendices:

- Appendix A - Catch Basin and Grate Photographs
- Appendix B - Standard Details
- Appendix C - Maintenance Work Orders
- Appendix D - Special Case Drainage Scenarios

2.0 TABS

2.1 Table of Contents (TOC)

The Field Application can depict different layers in the area being inspected. These layers are helpful in locating the current position and in using the search option:

Workarea Boundary – Displays the user-defined boundary within which the user has the capability to edit structures, conveyances, and BMPs.

Graphics Layer – Displays graphics, including selected features, on the map.

BMP_DRAINAGE_AREA – Displays delineated drainage areas for BMPs.

STRUCTURE_DRAINAGE_AREAS – Displays delineated drainage areas for structures.

PID_POINTS – Displays location of Potential Illicit Discharges that are not directly associated with a stormwater feature.

STRUCTURES – Displays location of stormwater structures that have been collected as points.

CONVEYANCES – Displays all driveway culverts, guardrail culverts, hydraulic connections, pipes, roadway culverts, swales, and underdrains that have been collected as line features.

guardrail – Displays location of guardrails along a roadway.

BMPs – Displays all BMPs that have been collected as polygon features.

deldot_migration2.DBO.BARREL_CONVEYANCE – Displays barrel conveyances within a system.

Contours Sussex – Displays the elevation contours within Sussex County in 2 ft. increments.

Contours NewCastle – Displays the elevation contours in New Castle County in 2 ft. increments.

Contours Kent – Displays the elevation contours within Kent County in 2 ft. increments.

Bridges – Displays bridges as point features as provided by DelDOT.

Non-DelDot Ponds – Displays New Castle County owned BMPs that are ponds.

Non-DelDot BMPs – Displays New Castle County owned BMPs that are not ponds.

Centerlines – Displays statewide roadways as line features as provided by DelDOT.

Flowlines – Displays stream segments or reaches that comprise Delaware's surface water drainage system (used for NPDES classification as waters of the US).

Tax Ditch Layer – Displays the location of ditches created as the result of a prescribed legal process in Superior Court.

State Parcels – Displays polygon features representing parcels of land throughout Delaware based on ownership.

Delaware Wetlands – Displays the names and boundaries of each wetland in Delaware.

ZIP Codes – Contains all the ZIP codes throughout Delaware.

BaseMaps – Displays the following base data as one combined layer:

- **Communities** – Displays the name and boundary of each subdivision throughout Delaware.
- **Watershed_HUC8** – Displays the Federal Watershed layer and associated 8-digit hydraulic unit code.
- **Municipalities** – Displays the boundaries of all incorporated municipal areas.
- **Districts** – Displays the boundaries of all DelDOT Districts.
- **Maintenance_Areas** – Displays the boundaries of all DelDOT Maintenance Areas.
- **DNREC_Watersheds** – Displays the boundaries of all the Delaware Watersheds.
- **Counties** – Displays the county boundaries within Delaware.

Ortho North – Displays aerial photography of New Castle County.

Ortho Center – Displays aerial photography of Kent County.

Ortho South – Displays aerial photography of Sussex County.

2.2 Selections

Used to search for features within a specified layer, based on geographic filter, or advanced query builder.

- **Select from Layer**: Enables the user to select the layer in which the "Select by Map" tool or query will operate (see **Section 3.0**).
- **Geographic Filters**: When a layer is selected under "Select by Layer", this tool filters stormwater features by geographic attributes such as county, subdivision, watershed, maintenance area, and maintenance district.
- **Advanced Query Builder**: When a layer is selected under "Select by Layer," the advanced query builder enables the user to search for all features with certain attributes. The user is required to select a field name, an operator, an input value, and a binding operator if applicable.

2.3 Feature List

Allows the user to add or zoom to a structure. The feature list also displays the query results from the Selections tab. Once the results are displayed, the user can open the result they wish to edit. The feature list is where the user makes those edits when the feature is opened.

2.4 Identify Results

Allows the user to select the layer the identify tool is to search for and displays the results when the identify tool identifies a feature within a layer. This is detailed in **Section 3.0**.

2.5 Settings/Tools

Contains the General, Bookmarks, Measure, and GPS tabs.

- **General:** Allows the user to identify the personnel and the last date of significant rainfall, based on the daily weather report.

- **Bookmarks:** Allows the user to save the current extent being viewed, delete previously saved bookmarks, and to toggle between saved bookmarks.

- **Measure:** Used to help measure the distance between two locations. First, select a Measure Type. Next, select a Measure Unit. Select the measure tool next to the Measure Unit drop down, then on the map click the first location. Click the map to draw a polygon or line to be measured, and double click on the final point to get the results.

- **GPS**: Allows the user to change and view GPS settings. This tab contains the Device, GPS Info, GPS Satellite view, and Messages tabs.

    - **Device**: Displays the GPS settings and allows the user to connect to the GPS unit. Map Auto Pan Mode should be set to Off. The COM port will change with each machine, but the baud rate for each machine will be 38400. Location Provider should be set to System Provider. Once the COM port is connected in the computer and the GPS settings are set, click the GPS Enabled check box and press Connect for the GPS to display on the map.

    - **GPS Info**: Once the GPS is enabled and connected, additional GPS info can be viewed in this tab.

    - **GPS Satellite view**: Displays an image of the satellites the GPS picks up and the satellites that are connected to the unit.

- **Messages**: Displays communication with the GPS unit. If the text box is filled with text, it means the GPS and the application are connected. A blank Messages tab indicates the GPS and application are not connected, and the user should verify that the unit is on, the COM ports are connected, and the settings under the Device tab are correct.

3.0 TOOL BAR

- **Add local GIS data (.SHP)**: Allows the user to add shapefile(s) to work area for viewing purposes only.

- **Full Extent**: Shows the entire state of Delaware.
  Note: It is not suggested that this view be used unless there is only one layer visible, as it will take a long time to load.

- **Fixed Zoom In:** Zooms in at a fixed extent.

- **Fixed Zoom Out:** Zooms out at a fixed extent.

- **Zoom In:** Zooms in on the area selected by the user.
  Note: Zoom tool is ultra-sensitive; only highlight area that needs to be made larger or smaller.

- **Zoom Out:** Zooms out of the area selected by the user.
  Note: Zoom tool is ultra-sensitive; only highlight area that needs to be made larger or smaller.

- **Clear all graphics:** Clears graphics that are shown on map work area. Most used to clear selections displayed on map.

- **Select by map:** Tool used to select features on the map such as BMPS, conveyances, PID_Points, and structures. Once the layer is established in the Selections tab, the user can use the Select by Map tool to select features.

- **Identify:** Quick way to view information in feature class for basemap layers, Contours Sussex, Contours NewCastle, Contours Kent, barrel conveyances, BMPs, conveyances, PID_Points and structures. This tool can be used after a layer is selected in the Identify Results tab.

- **Map Rotation**: Rotates map view.

4.0 INDEX OF SYMBOLS

Table of Contents

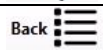
	BMP_DRAINAGE_AREA
	STRUCTURE_DRAINAGE_AREAS
	PID_POINTS
	Control Structure
	Culvert Point
	Culvert Point (Outfall)
	Dummy Point
	Dummy Point (Outfall)
	Inlet
	Inlet (Outfall)
	Junction Box
	Manhole
	Manhole (Outfall)
	Pipe Connection
	Pipe End
	Pipe End (Outfall)
	Swale Point
	Swale Point (Outfall)
	TEMPORARY DUMMY
	Underdrain Pipe End
	Underdrain Pipe End (Outfall)
	Driveway Culvert
	Guardrail Culvert
	Hydraulic Connection
	Pipe
	Roadway Culvert
	Swale
	Underdrain
	Guardrail
	BMP<all other values>
	Bay Saver
	Biofiltration
	Bioretention
	Check Dam

	Diverter Box
	Dry Pond
	Filter Strip
	Infiltration Basin
	Infiltration Trench
	Other
	Porous Pavement
	Sand Filter
	Sediment Forebay
	Shallow Marsh
	Storm Filter
	Underground Storage-Infiltration
	Wet Pond
	Wet Pond/Wetland
	deldot_migration2.DBO.BARREL_CONVEYANCE
	Contours Sussex
	Contours New Castle
	Contours Kent
	Bridges
	Non-DelDot Ponds
	Non-DelDot BMPS
	Centerlines
	Flowlines
	Tax Ditch
	State Parcels
	Delaware Wetlands
	Zip Codes
	Communities
	Watershed_HUC8
	Municipalities
	Districts
	Maintenance_Areas
	DNREC_Watersheds
	Counties

Toolbar Options

	Add local GIS data (.SHP)
	Full Extent
	Fixed Zoom In
	Fixed Zoom Out
	Zoom In
	Zoom Out
	Clear all graphics
	Select by map
	Identify
	Map Rotation

Helpful Tools

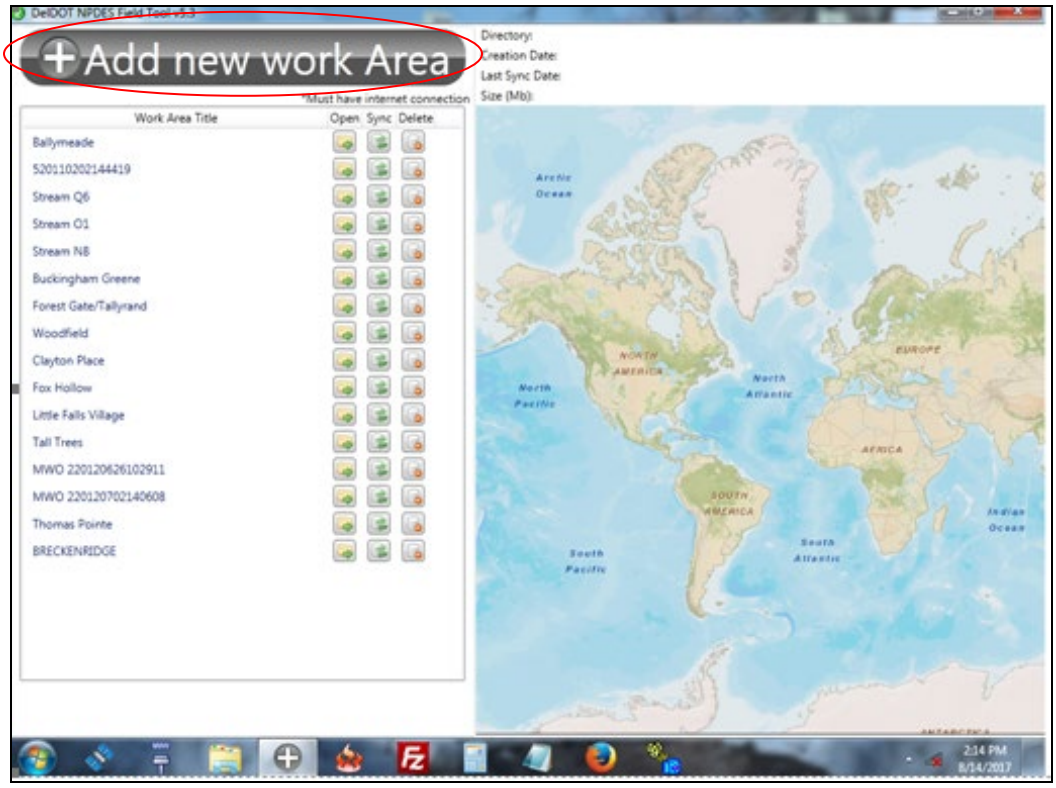
	Open Work Area
	Sync Work Area
	Delete Work Area
	Select
	New
	Zoom to Structure
	Back
	Cancel
	Delete
	Save
	Edit Geometry

5.0 BASIC APPLICATION OPERATION

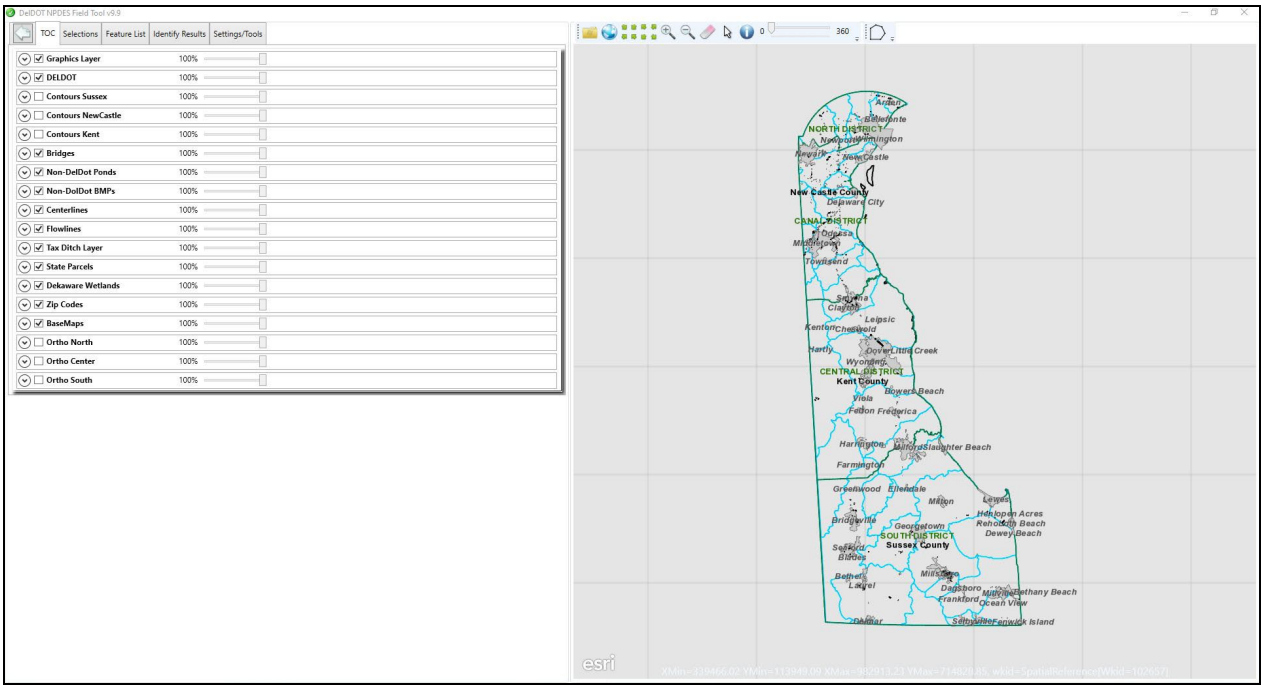
5.1 Add New Work Area

- Verify the computer is connected to the Internet, either via Wi-Fi or a hard wire connection.

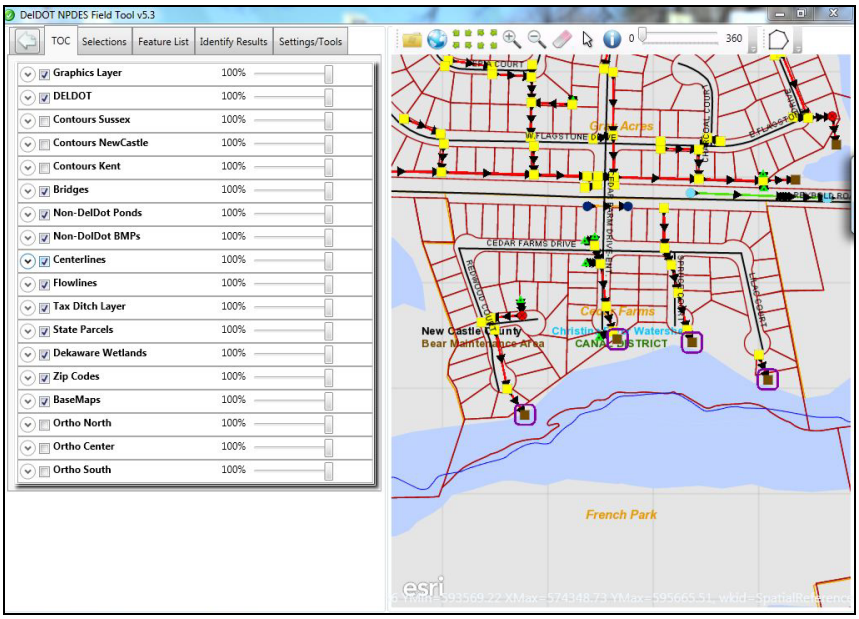
- To add a new Work Area, click on the "Add new work Area" button at the top of the page.



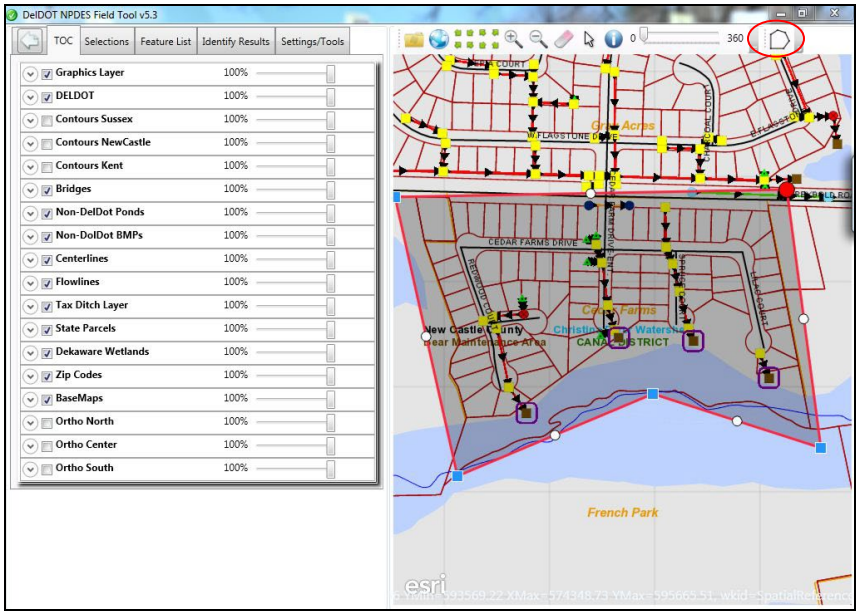
- A new screen will appear displaying the table of contents and additional tabs on the left and a map of Delaware and Tool Bar on the right. This may take a minute to load.



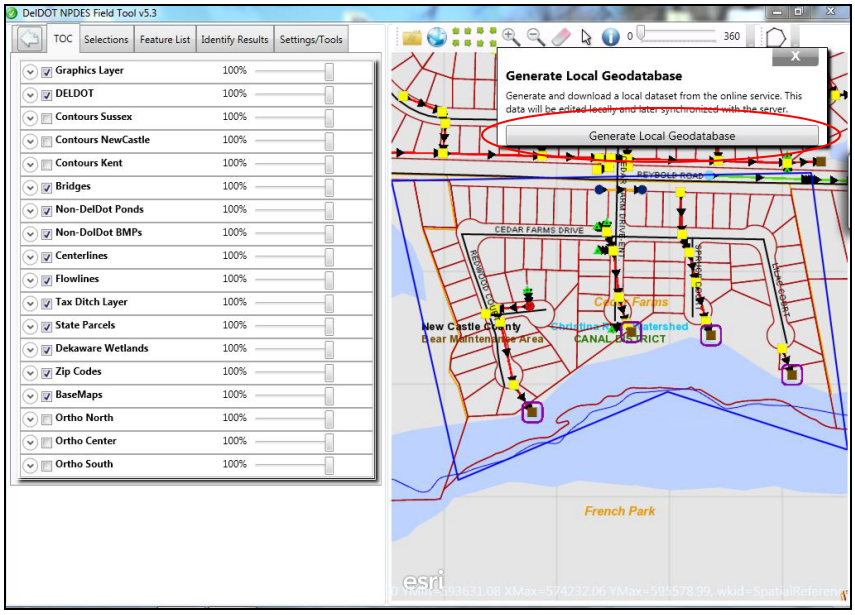
- Once fully loaded the user must use the zoom tool and pan to the area to be edited.



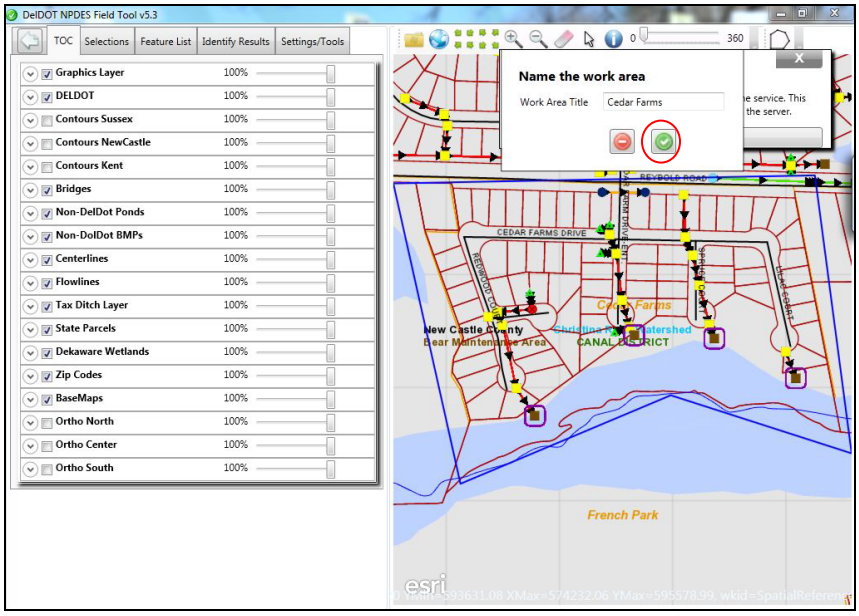
- After zoomed in, click the "Select work area by map" tool from the tool bar and click on the map to create a work area boundary.



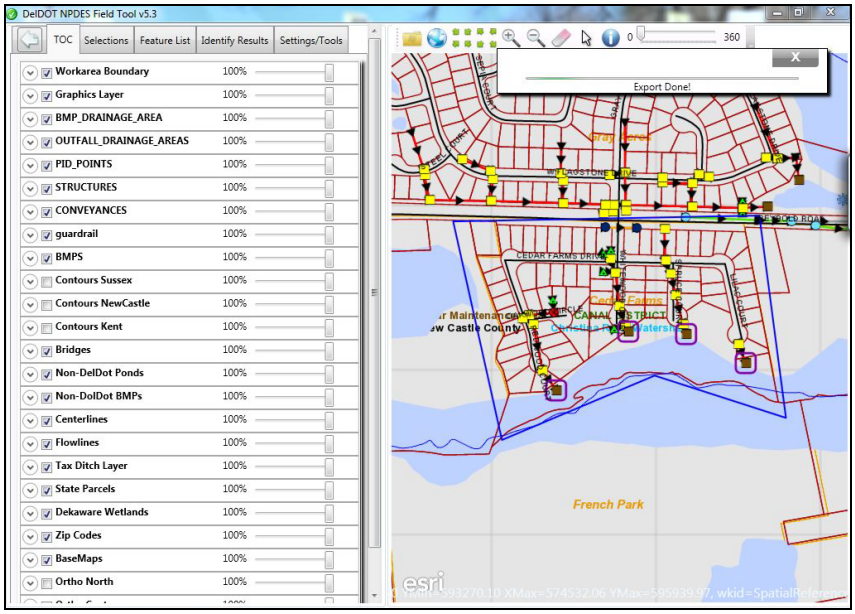
- When the polygon is completed double click the final point of the polygon, which will be denoted with a red dot. This will finalize the work area. The user will then press Generate Local Geodatabase in the top right corner of the screen.



- The application will prompt user to name the work area. Once a name is given, click the green check mark button to begin downloading the work area.



- When the work area has downloaded and is ready for use, the window at the top right of the application will change to say, “Export Done!”.



Note: If the “Generate Local Geodatabase” button does not go away when the work area download is complete, the newly downloaded work area is corrupt (likely too large) and needs to be deleted and re-downloaded.

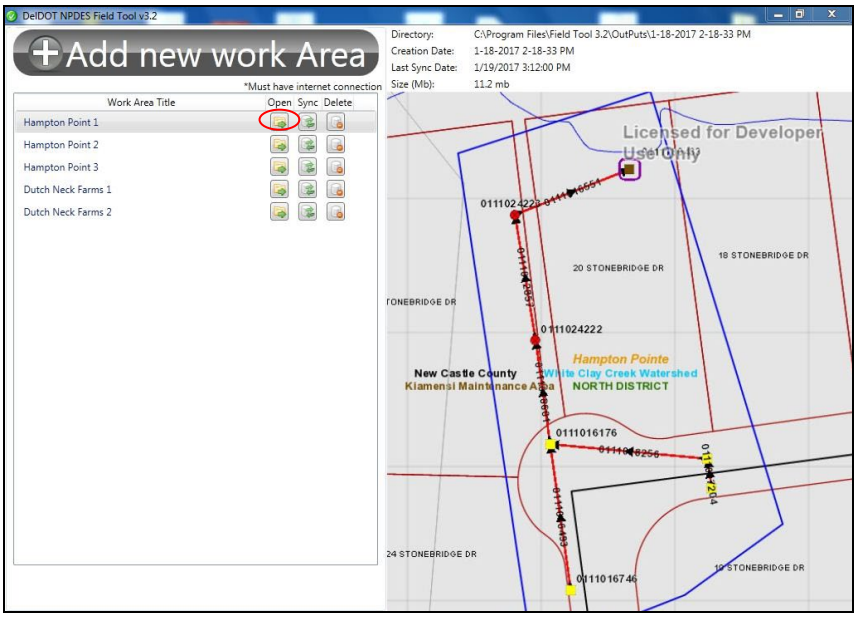
5.2 Opening Existing Work Area

- On the computer desktop, double-click the icon for DelDOT NPDES Field Tool v9.9. (This may take a few minutes to load).

- The application will open showing a global view on the right and any downloaded work areas on the left.

- To view a work area, click on one in the list on the left.

- Once the area is chosen, click the folder icon labeled open. (This also may take a few minutes to load).



- Once opened, the work area is ready for use.

5.3 GPS

- Verify that the Wi-Fi on the computer is turned on.

- Turn on the GPS unit and verify that Bluetooth is also turned on by looking for a blue flashing light on the unit.

- In the field tool, go to the GPS tab within the Settings/Tools tab.

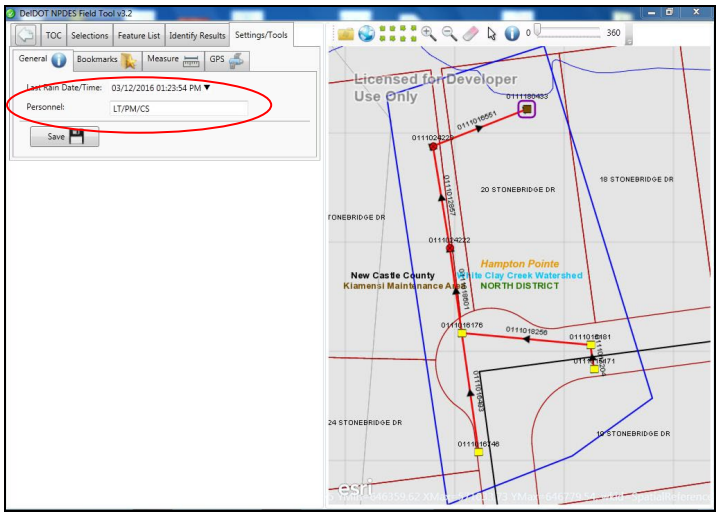
- Verify all the GPS settings are correct within the Device tab (see section 2.5), otherwise the unit and application will not connect.

- To enable the GPS, check the box next the GPS Enabled, and press Connect.
- After GPS is enabled, an arrow will appear on the map at current location.

5.4 Changing Settings

Personnel

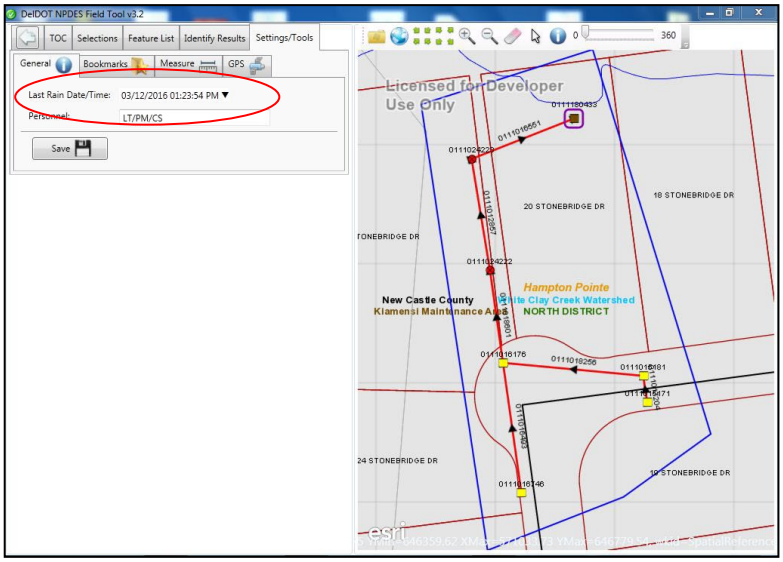
- Click the General tab within the Settings/Tools tab.
- Within the general tab there will be a Personnel box to enter current crew's initials.



- If two crew members are working together, the crew member who is running the computer will have their initials entered first, followed by the second crew member.

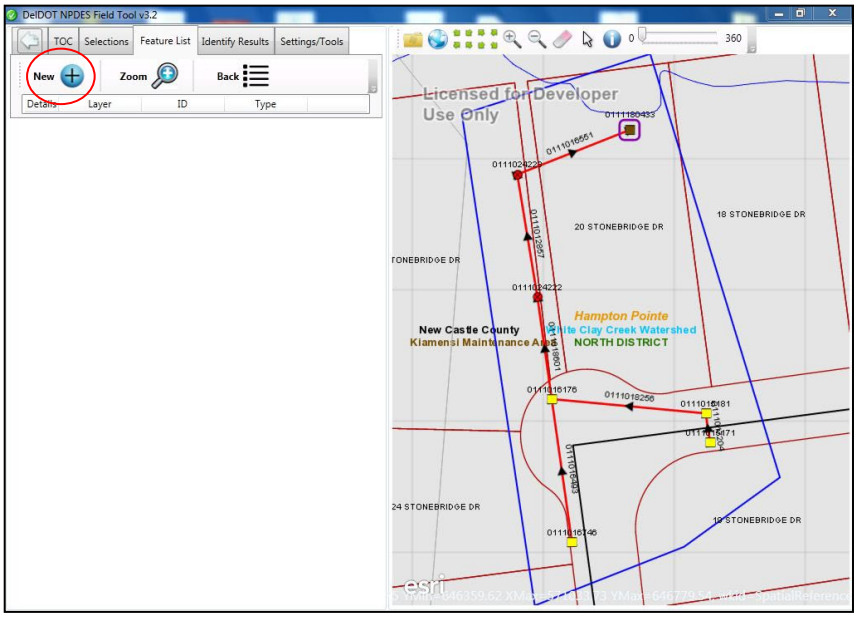
Last Rain Date/Time

- Under Last Rain Date/Time box enter the most recent time that it rained according to the daily weather report.

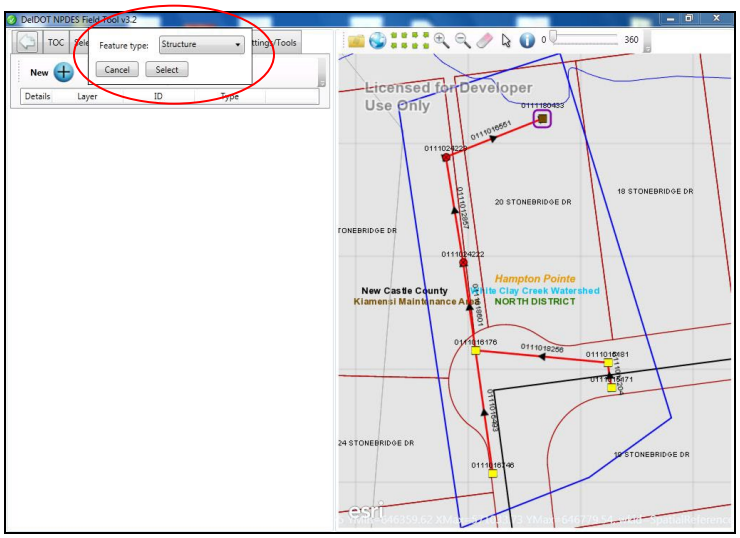


5.5 Adding a Structure

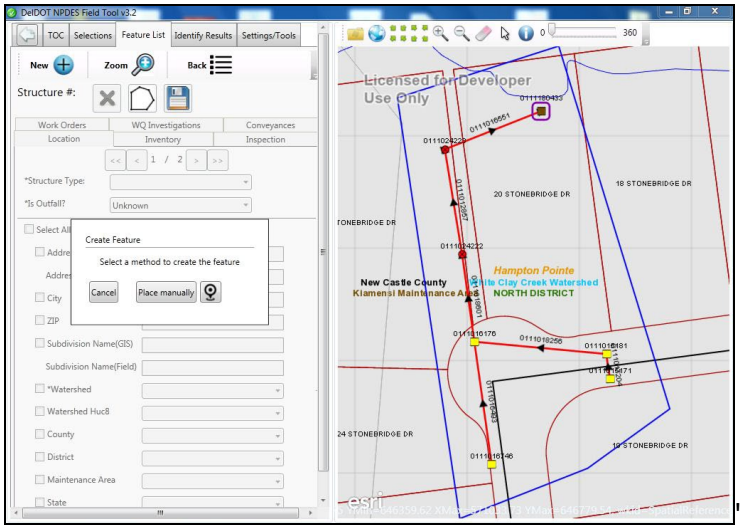
- Once in a work area, click the Features List tab on the top left of the screen and select the “New” icon.



- A window will appear asking which feature type needs to be created. Select “Structure” and click “Select”.



- A “Create Feature” window will appear that instructs the user to either place the structure manually or through GPS. Select “Place Manually,” then place point on map. If the location of the structure can be seen in the corresponding Ortho layer, place it where the layer indicates. If the structure is not visible on the Ortho layer, manually place the structure where the GPS arrow indicates the structure is located.



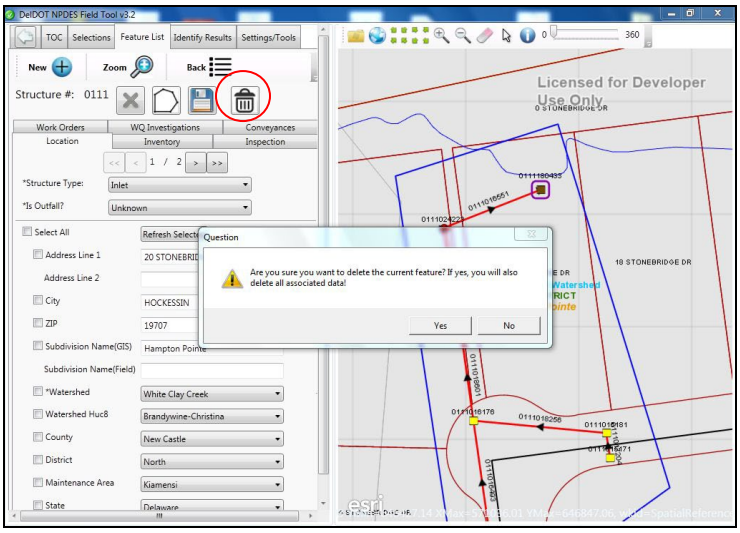
- To finalize creating the structure, all required fields in the location and inventory tabs within the structure must be filled out. Once those fields are filled out, the user will be able to save the structure.

- When the structure is saved, the structure symbology will appear on the map.

5.6 Deleting a Feature

- To delete an unwanted feature, select the feature using the Selections tab and the Select by Map tool.

- Once the feature is open, click the trash can icon to delete. A window will display asking if the user would like to delete feature; click yes. Another window will appear indicating the feature has been deleted; click ok.

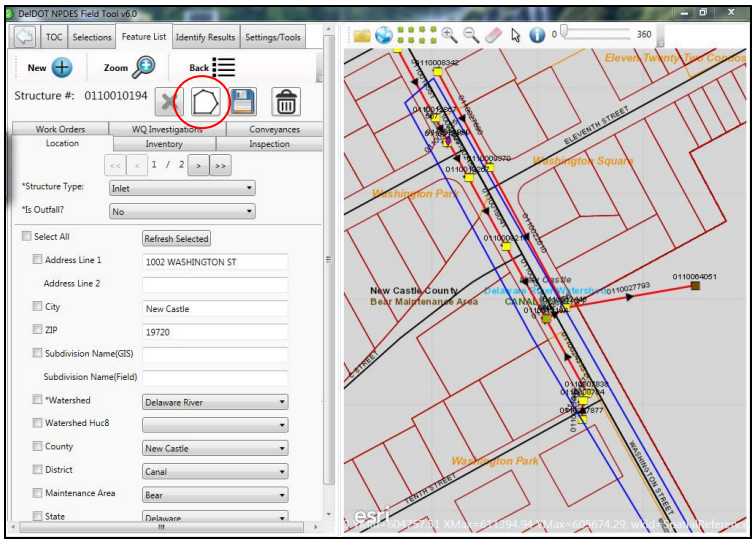


- After a few moments the feature will be removed, and the page will refresh itself.

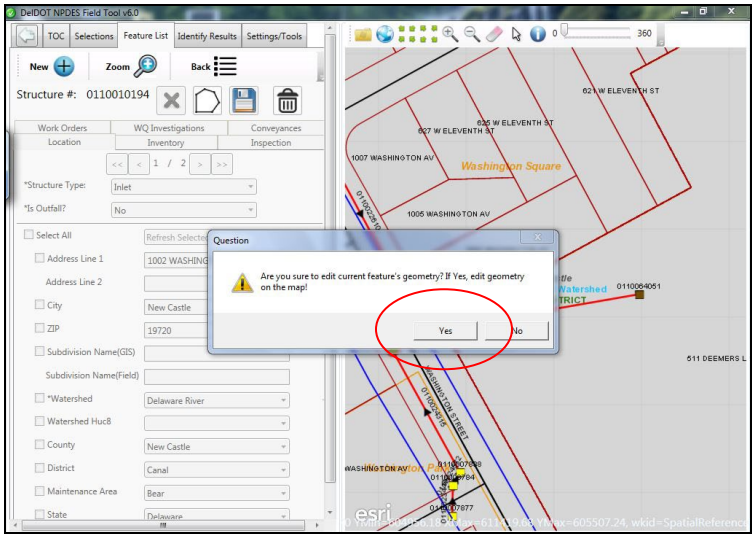
Note: If a structure has a convenance snapped to it, it will not delete. Make sure all conveyances snapped to the structure to be deleted are snapped to another structure before deleting.

5.7 Moving a Structure

- When a structure is opened in the Feature List, select the Edit Geometry icon.



- A confirmation window will appear, click yes.



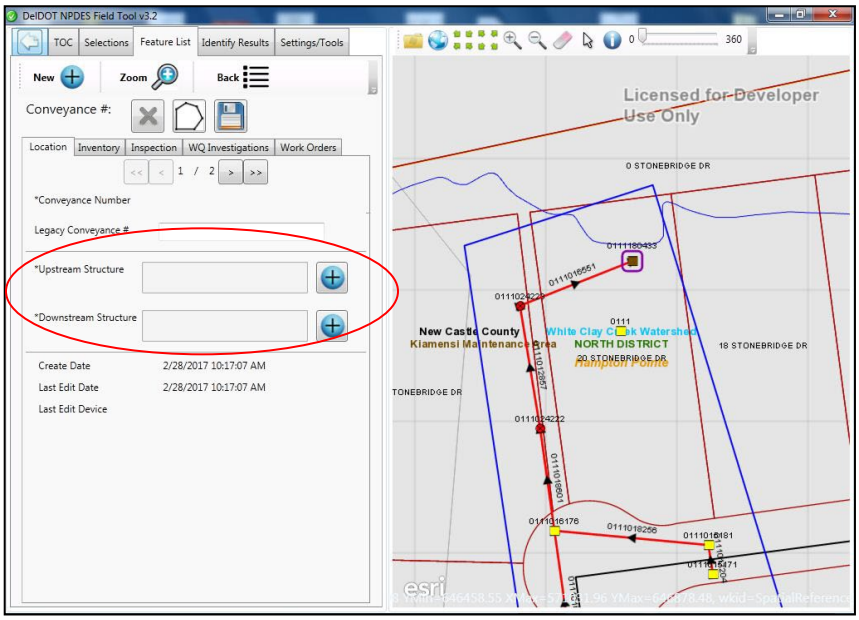
- The user can then select on the map where they would like the structure to be placed.

5.8 Adding a Conveyance

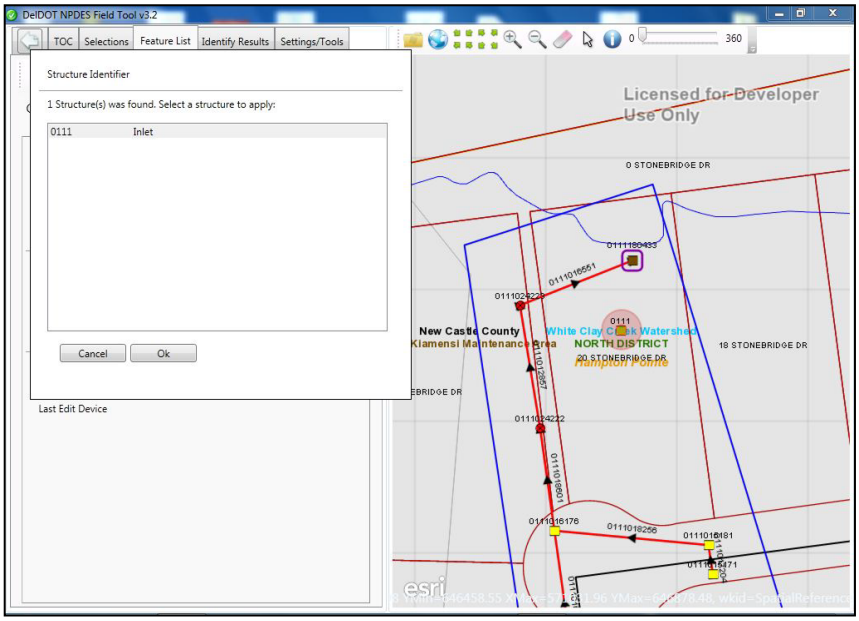
- While in a work area, click the Features List tab on the top left of the screen and select the “New” icon.

- A window will appear asking which feature type needs to be created. Select “Conveyance” and click “Select”.

- The first page of the location tab will contain two plus sign icons, one called upstream structure and the other downstream structure.



- Click the upstream structure plus sign icon in the left panel and select the upstream structure for the conveyance on the map in the right panel. A window will display with all structures near the location selected, the user should select the correct structure. The process is then repeated for the downstream structure for the conveyance.



- After the conveyance is snapped, all required fields should be filled out in the location and inventory tabs, then the feature can be saved.

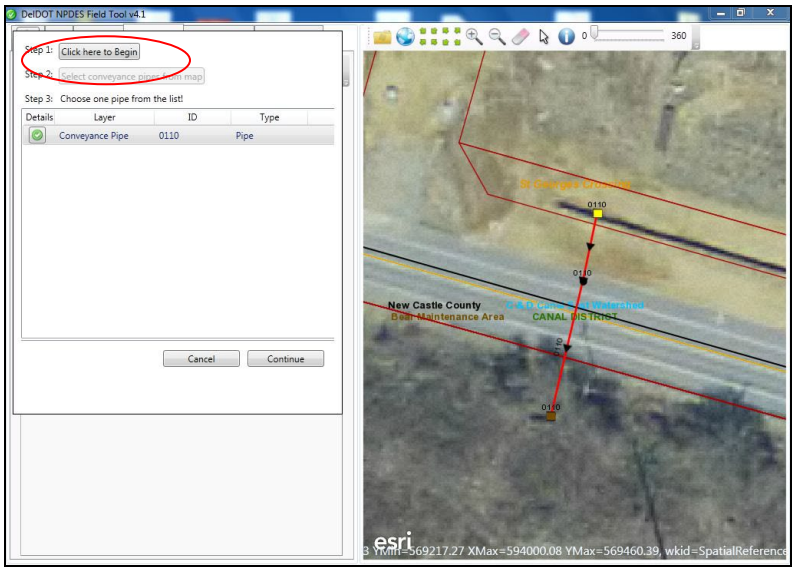
5.9 Adding a Barrel Conveyance

- To create a barrel conveyance, at least one segment that makes up the barrel conveyance must already be created. Refer to **Section 5.8** to create the segment.

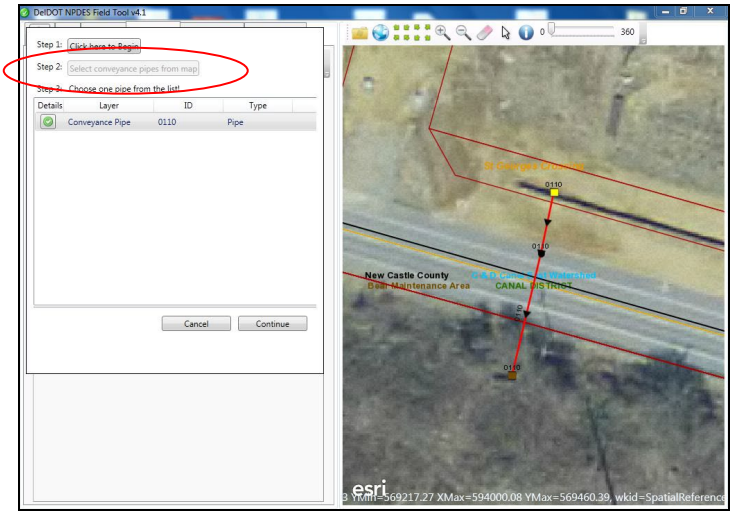
- Click the Features List tab on the top left of the screen and select the "New" icon.

- A window will appear asking which feature type needs to be created. Select "Barrel Conveyance" and click "Select."

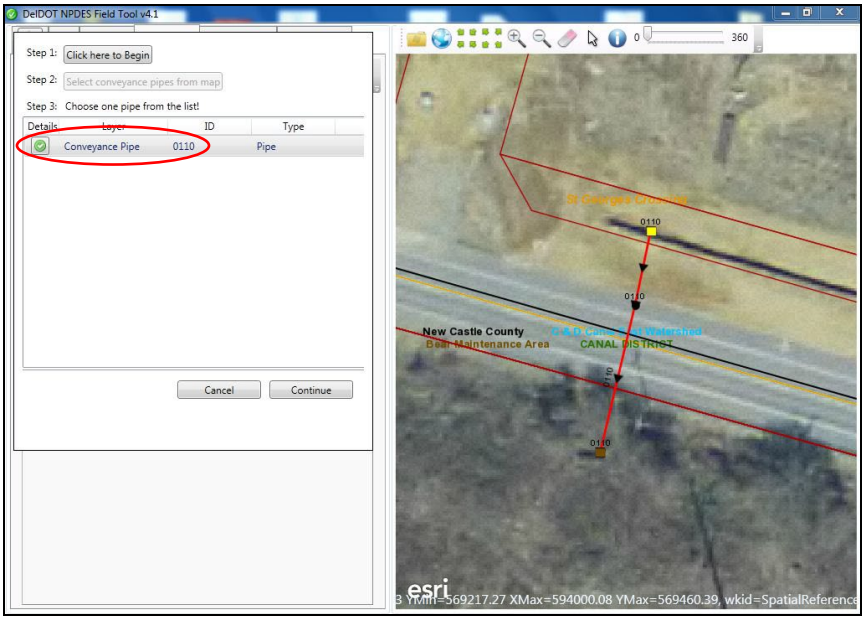
- On the left of the screen a box will appear detailing the steps to create a barrel conveyance. Complete Step 1 by clicking where it says, "Click here to Begin."



- For Step 2, select the "Select conveyance pipes from map" tool to select the segment to be added to the barrel conveyance (additional barrels/segments will be added in **Section 6.7**).



- After selecting a conveyance, it will appear in the box in the left panel. Click on the conveyance to select it and then click “Continue”.



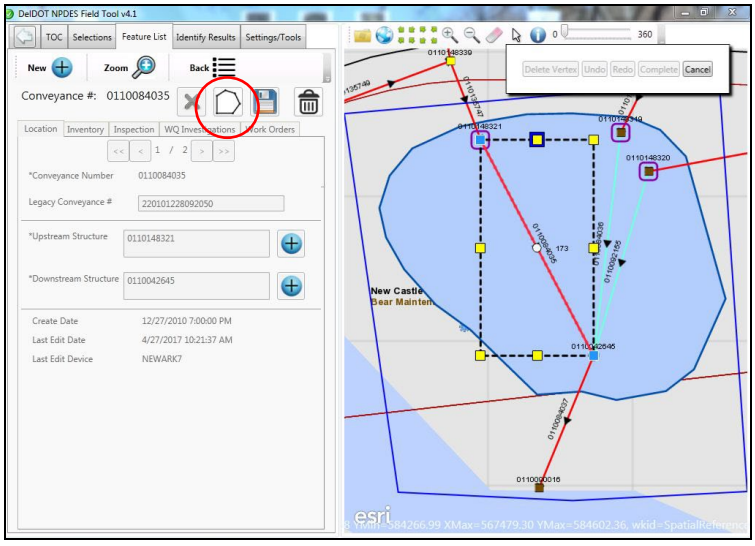
- The barrel conveyance must be saved at this time to make edits (see **Section 6.7**).

5.10 Moving a Conveyance

- In the Feature List tab, select the “Edit Geometry” icon.

- A window will appear, click “Yes”.

- In the top right corner of the map, there will be options for how the user would like to move the conveyance.



- Use the yellow squares to position the conveyance to the desired new location.

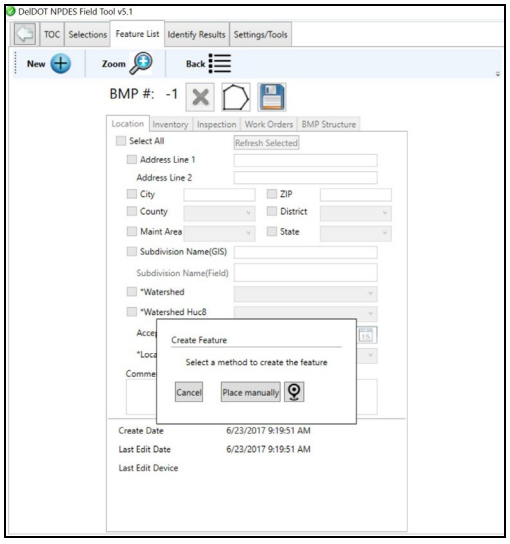
- **This methodology should not be used, as conveyances need to be snapped to structures on either end**.

5.11 Adding a BMP

- Click the Features List tab on the top left of the screen and select the “New” icon.

- A window will appear asking which feature type needs to be created. Select BMP and click “Select”.

- A “Create Feature” window will appear, this instructs the user to either place the polygon vertex manually or with a GPS. Select “Place Manually,” then begin to trace the perimeter of the BMP based upon the aerial photo if possible. If not, use the GPS as a guide to manually trace the BMP.



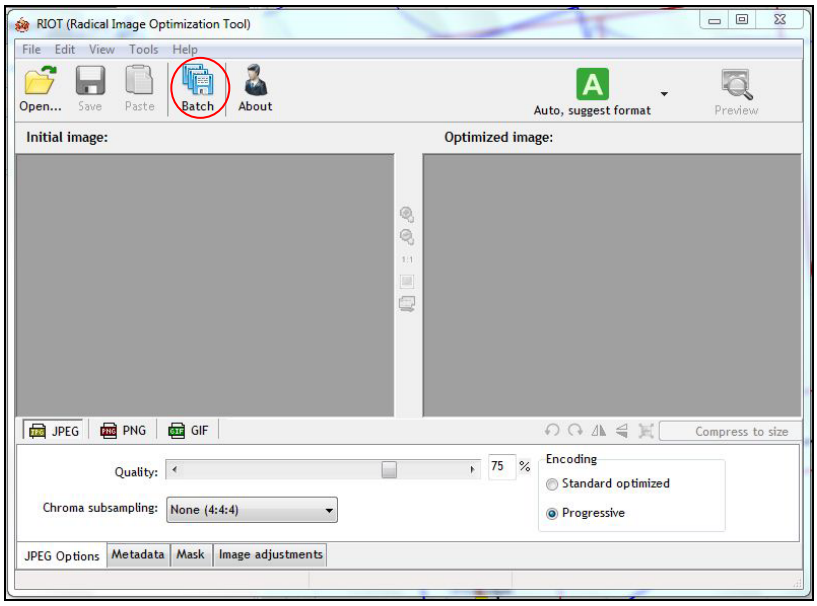
- Once the user is done tracing the perimeter of the BMP, double click on the last point to finish the polygon.

- When all required fields in the location and inventory tab are filled out, click save, and the BMP will appear on the map.

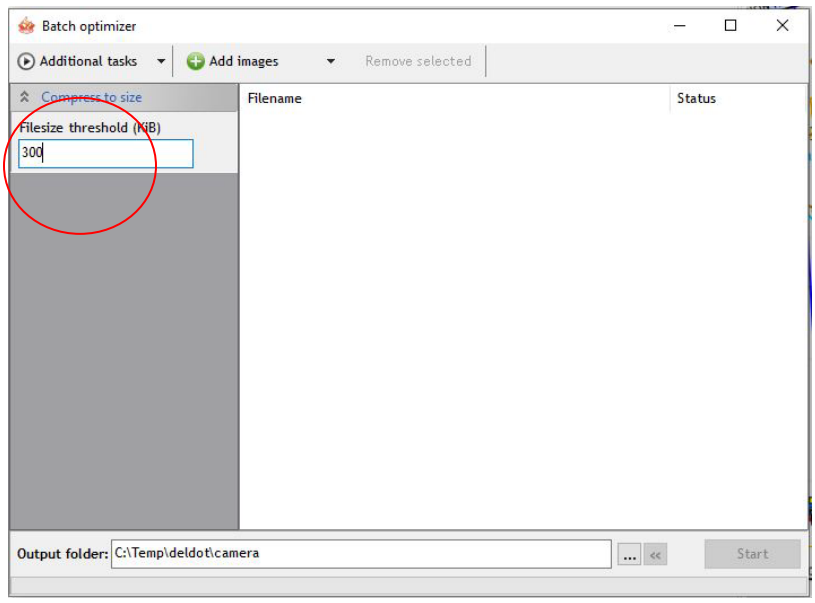
5.12 Adding a Photo

- Photos must be compressed in Riot before being added in the field application.

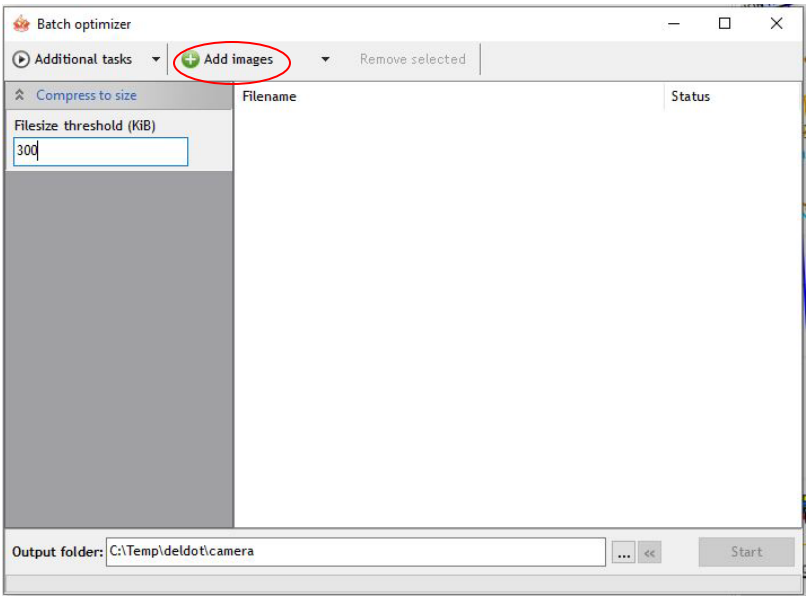
- To compress photos, open the Riot application on the computer. Click the "Batch" button (the floppy disc icon) to compress several pictures at once.



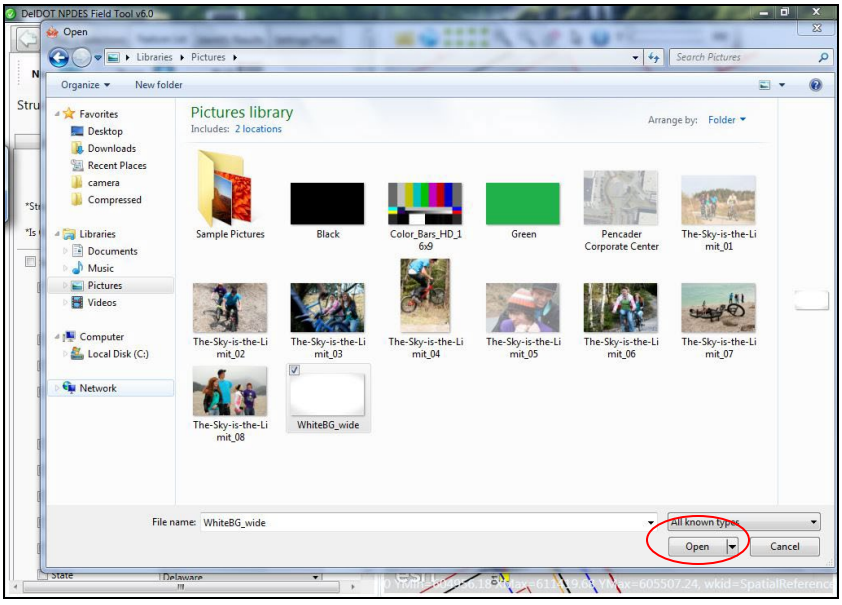
- Click on Additional task and select, "Compress to size". Make sure the file size threshold (KiB) is 300. (Source to Internal MS4 Meeting #30)



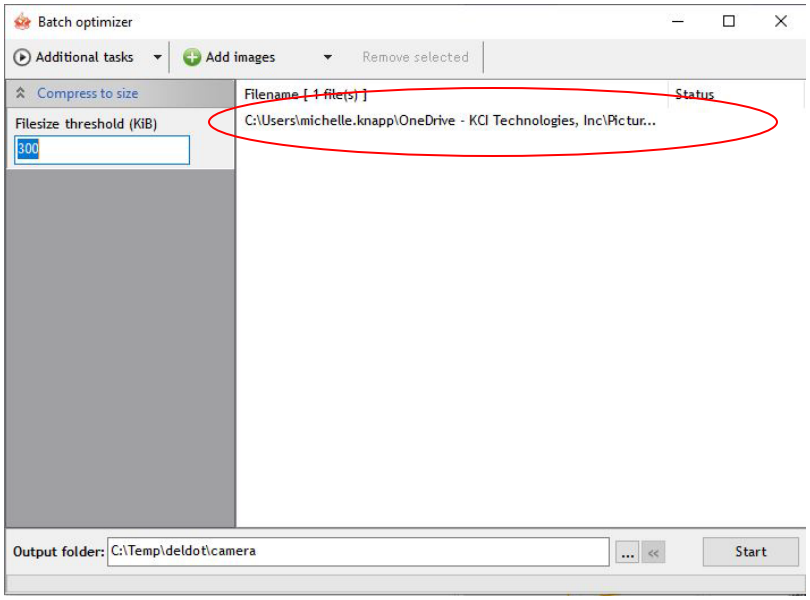
- Click “Add Images” at the top of the screen.



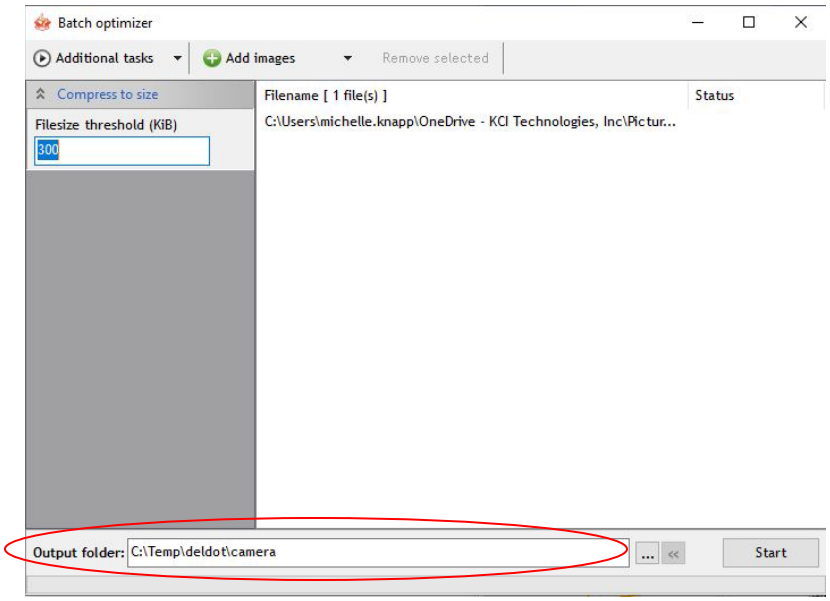
- Select photos that need to be compressed. They should be in the Uncompressed folder corresponding to the date the photos were taken. After photos are selected, click “Open”.



Files will appear on the right side of the application.



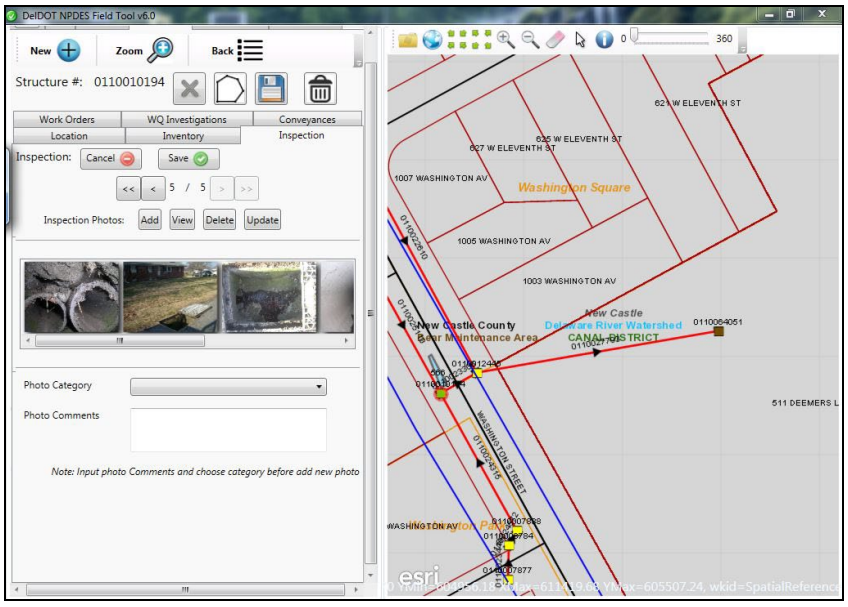
- Change the output folder at the bottom of the screen to that day's compressed folder within the camera folder. Then click "Start".



- Once the status for each picture says "ok," check the compressed folder to make sure compressed photos were properly added to the correct folder.

- Open the inspection for the feature you'd like to attach pictures to. For instructions on how to create an inspection (**see Sections 6.7, 6.8, 6.9, and 6.10**).

- To add a photo, go to the last page of the inspection created for that day.



- Select the photo category.

- Photo comments are limited to 8 characters and are only needed if something is extremely unusual.

- Select “Add” button to open the camera folder and navigate to that day’s compressed picture folder to select the image to be added.

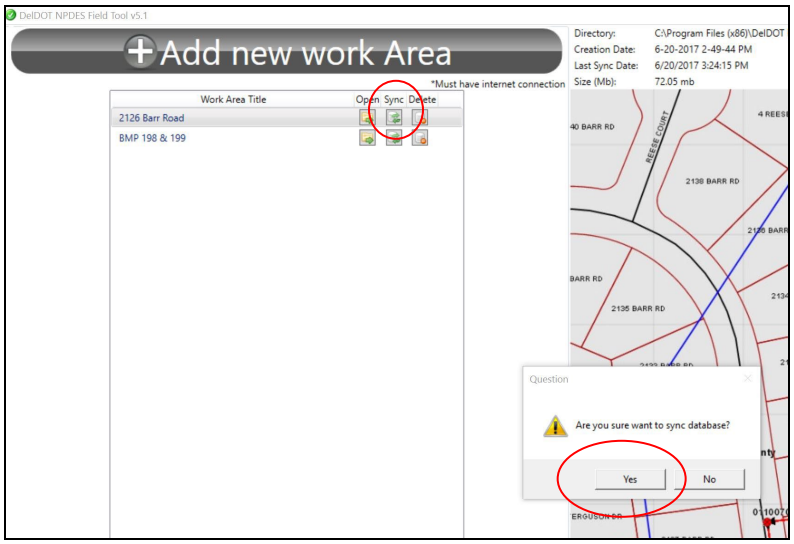
5.13 Syncing Data

- Verify the computer is connected to the internet, either with the Wi-Fi turned on or with a hard wire connection.

- On the home screen there will be a list of work areas.

- Select the work area to be synced.

- Click the Sync button to enable syncing. A window will ask you, “Are you sure you want to sync the database?” Select “Yes”.



- This may take a few minutes. During the syncing process a green bar at the bottom left corner of the page notifies the user that a sync is in progress.

- Once the Sync has successfully completed, the status will change to Sync Completed, and a window will also appear to confirm the sync has completed.

- If you delete a work area immediately after syncing without first closing the field tool, an error will occur, and all your work areas will disappear. To correct this issue,
    - Navigate on your device to C:\DMS\DelDot\OutPuts
    - Each folder within the Outputs folder represents a different work area. Each date and time represent the time each work area was downloaded, i.e. 2-11-2021 10-03-24 AM. Identify the date and time the work area you want to delete was downloaded and delete that folder from your Outputs folder.
    - Open the field tool. The remainder of your work areas should have returned to your home screen.
    - To avoid this process, be sure to close out of the field tool after syncing a work area and before deleting a work area.

6.0 COLLECTING MS4 INVENTORY/INSPECTION DATA

6.1 Structure Location

- **Location Tab Page 1**

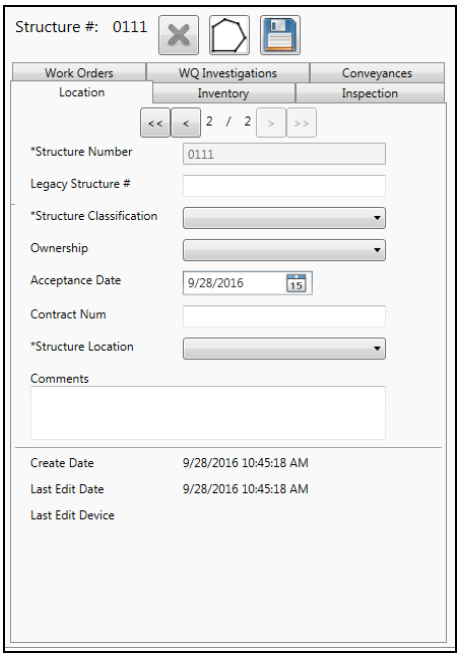
    - Fill out the structure type that best describes the structure being inventoried, based on Data Dictionary definitions.

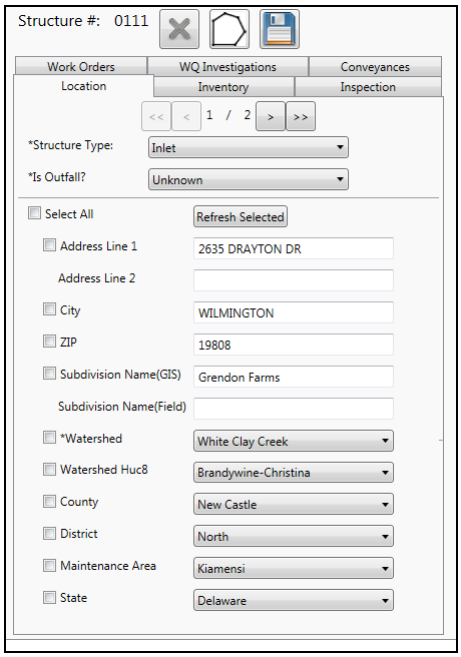
    - Mark Yes or No for the "Is Outfall" drop down, never leave it as blank or unknown. If left blank or Unknown, the structure's symbology will not appear on the map. If a structure enters a stream that overlays a tax ditch, the tax ditch is ignored, and the structure is treated as an outfall. If a structure enters a BMP, the structure is treated as an outlet (see **Page 1** of the Inventory Tab). A structure cannot be classified as both an outfall and an outlet.

    - There are check boxes next to each location information box. Click the "Refresh Selected" button on the top and it will auto populate fields checked on the left. Fields that the application does not auto populate or populates incorrectly should be manually filled out, except City, which gets auto populated on the back end.

    - Assign each structure an address based on the house whose property line it is closest to. If the structure is on a different street than the house it is associated with, the street the structure is on will go in the Address field and the house it is closest to will be referenced in the comment box on **Page 2** of the Location tab.

- For consistency purposes and to align closer with the parcel data, use the roadway name in the Address Line field for major roadways instead of the route number. For example, use Kirkwood Highway instead of SR-2. This does not apply to interstates or expressways, such as I-95.





- Do not touch the Subdivision Name(GIS) field, which will always be automatically populated if a subdivision name exists in the Communities GIS layer. If the subdivision name observed in the field differs from the Subdivision Name(GIS) box or if the subdivision name does not exist in the GIS layer, then enter the field observed name in the Subdivision Name(Field) field. If Subdivision Name(GIS) matches the subdivision name, the Subdivision Name(Field) field can be left blank.

- **Location Tab Page 2**

  - The legacy number will only be filled in if the structure was migrated from the previous NPDES database. This should not be touched while conducting inventory in the field.

  - Structure Classification indicates the type of change in ownership occurring at the structure. See Data Dictionary for definitions of all Structure Classification options.

  - Ownership will change depending on which contract the field crew is working on. Verify with field manager if ownership is unknown.

- Acceptance date is filled out primarily for subdivisions. It will either be retrieved from a roadway list or from the acceptance letter for the subdivision.

- Contract number does not get filled out, unless working on a specific construction project.

- Structure Location will indicate whether the structure is in a subdivision or not. If the structure is within a subdivision, select Subdivision, otherwise select Roadway.

- The comments section has a variety of uses. All comments will end with a period and be typed in all caps. Possible uses include:

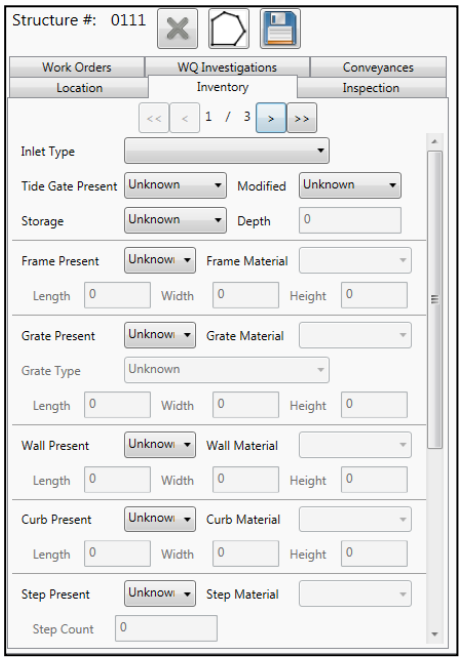
    - To describe the location of the structure more accurately in relation to the address associated with the structure, use comments such as BEHIND, SIDE OF, or ACROSS FROM. FRONT OF should not be used.

    - To describe the distance in feet of an outfall to a stream-fed wetland. This comment will start with a number followed by FEET TO WETLAND.

    - To state any other information that could be pertinent. See field manager with questions.

6.2 Structure Inventory

There are three pages to fill out.



Page 1 is specific to each structure type

- For an inlet and manhole, the application will ask for an inlet/manhole type as well as if there is storage, a tide gate, or if the structure is modified (refer to the Data Dictionary for descriptions of each field). If Storage is present, fill out Depth as well, which is the height in inches from the bottom of the basin to the bottom of the invert of the pipe. Below these fields will be the components. Mark the ones present as Yes and the ones not present as No (refer to the Data Dictionary for descriptions of each component material and instructions on how to measure each component).

- For a pipe end and underdrain pipe end, Pipe End Type, Is Outlet, and Tide Gate Present must always be filled out. A structure filled out as an outfall on **Page 1** of the location tab cannot also be an outlet, and a structure classified as an outlet cannot also be classified as an outfall. Discharge Downstream Type and Ownership Downstream will only be filled out if Is Outlet is Yes.

- For a junction box and pipe connection, all that needs to be filled out on **Page 1** is whether a tide gate is present.

- For a control structure, Control Structure Type, Trash Rack Present, and Tide Gate Present must be filled out.

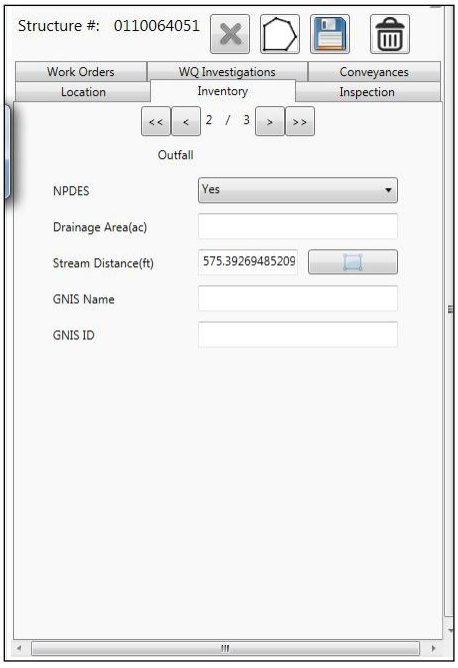
- For a swale point, indicate which type of swale point is being added. If the type is "end," if will then ask the user to fill out Is Outlet. If a swale ends within the right of way of a drainage system (i.e. was not designed to leave the right of way), it should not be classified as an outfall OR outlet. If the swale end is an outlet, Discharge Downstream Type and Ownership Downstream will also need to be filled out. If the connection type is Start, Midpoint, or Connection, all that needs to be filled out is Connection Type (for more information on these fields, see the Data Dictionary).

- For dummy points, temporary dummy points, and culvert points, this page will not exist.

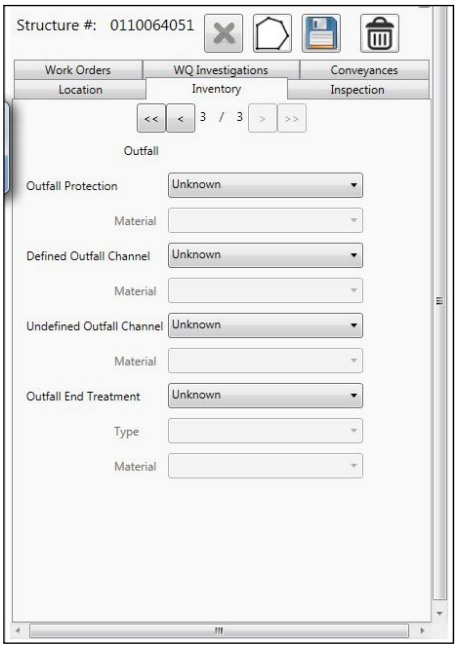
Page 2 will be grayed out except for structures that have Yes filled out for Is Outfall on Page 1 of the Location tab.

- Indicate whether the structure is NPDES, or within 100 feet of a stream or stream-fed wetland. A structure that flows into a BMP is not considered an NPDES outfall. If a structure enters a stream that overlays a tax ditch, the tax ditch is ignored, and the structure is treated as an outfall.

- Drainage Area (ac) will only be filled out if the drainage area is known.



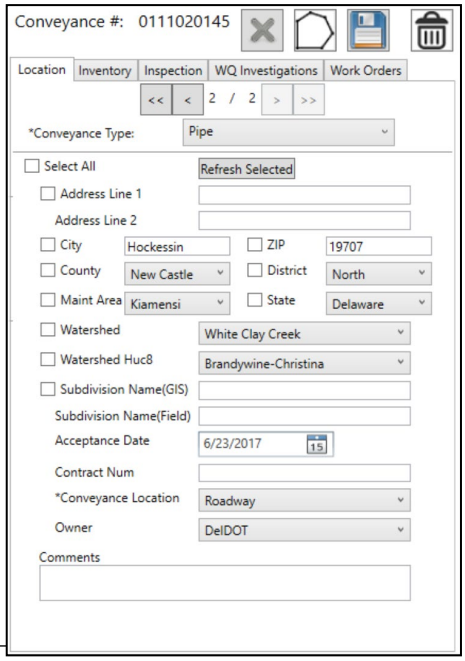
- To fill out Stream Distance(ft), GNIS Name, and GNIS ID, the user will use the measure tool on **Page 2** immediately next to the Stream Distance(ft) field. A window will pop up, select Yes to identify stream. The user will then draw a line from the structure to the closest stream following the pathway the water takes. The application will then display a window with the newly identified stream. Select the stream and press Ok. The application will then populate the Stream Distance(ft), GNIS Name, and GNIS ID fields. If the stream identifier window appears blank, click inside the box below GNIS ID and press ok. This means the stream has not been identified in the NHD GIS layer, and only the Stream Distance(ft) field will populate.



Page 3 will also only be filled out if the user indicates that the structure is an outfall on **Page 1** of the location tab. This page allows the user to state which outfall components are present, and if they are present, which material is most applicable. All pipe end and swale end outfalls should have either a defined or undefined outfall channel, except for swale ends where the water does not leave the right of way or pipe ends that directly enter a stream.

A structure also cannot have both a defined and undefined outfall channel. Natural should not be selected as the material for a Defined Outfall Channel. The material for an Undefined Outfall Channel should be Natural. If the outfall is a pipe end, Outfall End Treatment will be Yes and Type will be filled out with the same option chosen for Pipe End Type on Page 1 of the Inventory tab (see Data Dictionary for descriptions of each outfall component and materials).

6.3 Conveyance Location



- The **Page 1** of the location tab is to be used for snapping a conveyance to structures. Snapping conveyances follows the same methodology as adding a conveyance in **Section 5.8**.

- **Page 2** of the location tab is like that of a structure.

  - Fill out the conveyance type that best describes the conveyance being placed, based on the Data Dictionary definitions.

- There are check boxes next to each location information box. To auto populate boxes that were left blank, select the box(es) and click “Refresh Selected” button on the top.

- The Address field should be filled out as detailed in **Section 6.1**, except conveyances will not have a house number, only a street name, unless the conveyance has a work order.

- Do not touch the Subdivision Name(GIS) box, which will automatically populate when applicable. If the field observed subdivision name differs from the Subdivision Name(GIS) box, then enter what the sign reads in the field.

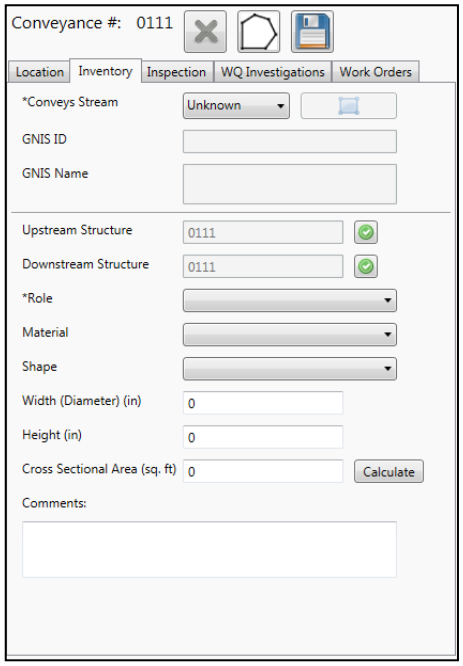
- Contract Number does not get filled out, unless working on a specific construction project.

- Conveyance Location will indicate whether the conveyance is in a subdivision or not. If the conveyance is within a subdivision, select Subdivision, otherwise select Roadway.

- The upstream end of a conveyance could have a different ownership than the downstream structure. The ownership of the conveyance will typically be the same as the upstream structure.

- The comment box should only have comments brought over from the migration or comments approved by the field manager.

6.4 Pipe, Driveway Culvert, Roadway Culvert, Guardrail Culvert, and Underdrain Inventory



- Conveys Stream will be “Yes” if the conveyance carries a stream from one side of the road to the other, otherwise it should be marked as “No.” The box next to this field allows you to select the stream being conveyed by the conveyance, like the process detailed in **Section 6.2** (Page 2 of the structure inventory tab). GNIS ID and GNIS Name will only be filled out if the conveyance conveys a stream, and it will auto populate after identifying the closest stream.

- Role indicates a change in ownership. If there is no change in ownership, select N/A.
- Material is the material of the pipe.
- Shape is the shape of the conveyance.
- After the width (diameter) and height are added, click the Calculate button to compute and populate the Cross Sectional Area in square feet.
- Use the comments box when advised by the field manager.

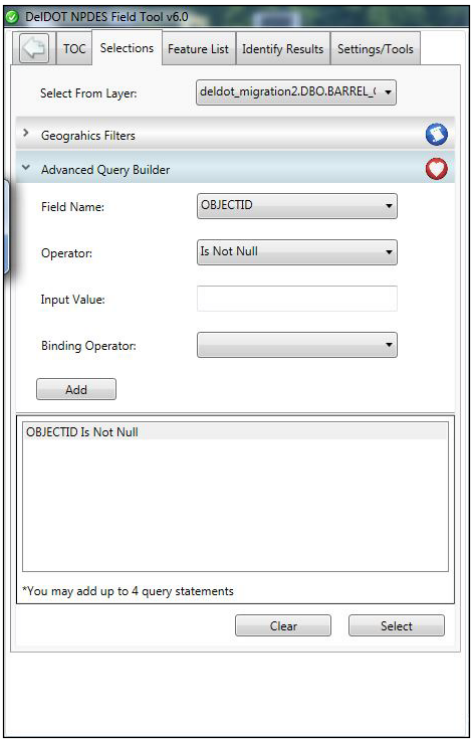
6.5 Swale Inventory

- Role should be filled out as described in **Section 6.4**.
- Material is the material of the swale.
- Shape is the shape of the swale.
- Top Width, Bottom Width, and Depth should be filled out as 0.
- Side slope is the steepness of the swale, as defined in the Data Dictionary.
- Do not use the comment box at the bottom.

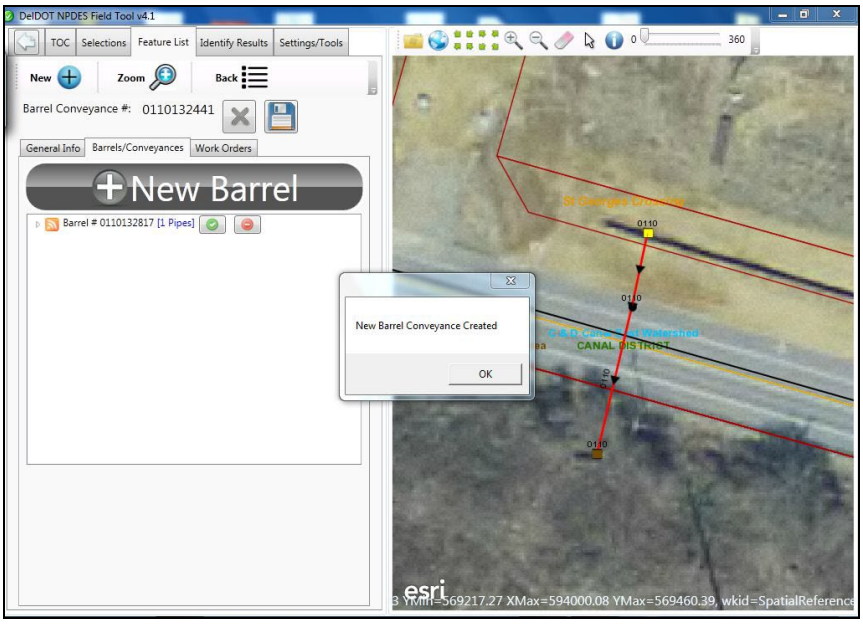
6.6 Hydraulic Connection Inventory

The only thing to be filled out in the Hydraulic Connection Inventory is Role, which will be filled out as described in **Section 6.4**.

6.7 Creating, Inventorying, and Inspecting a Barrel Conveyance

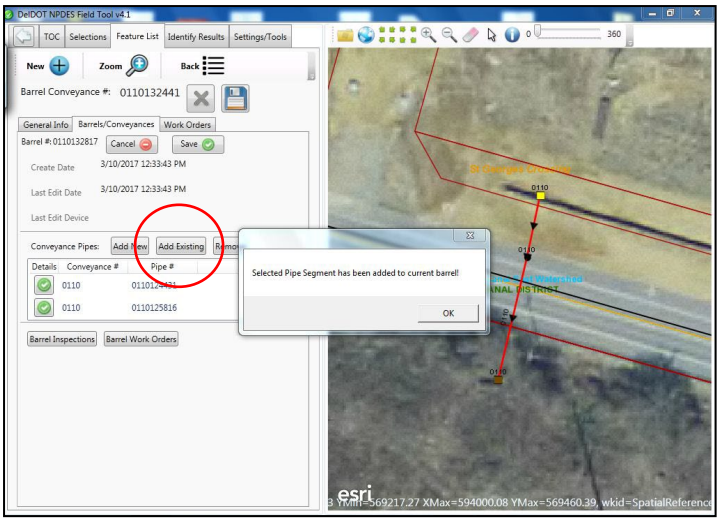


- Open the Barrel Conveyance to be edited:
  - Go to the Selections tab and under Select From Layer select deldot_migration2.DBO.BARREL_CONVEYANCE
  - Under Advanced Query Builder, select the field name as OBJECTID and Operator as Is Not Null. Select Add.
  - Your action should appear in the large field at the bottom. Click on the action and Select.
  - Select the barrel conveyance to be edited in the Feature List.
- Under the Barrels/Conveyances tab, barrels should appear displaying their assigned Barrel numbers.
- [x Pipes] should be displayed next to it representing the current number of segments within that barrel.

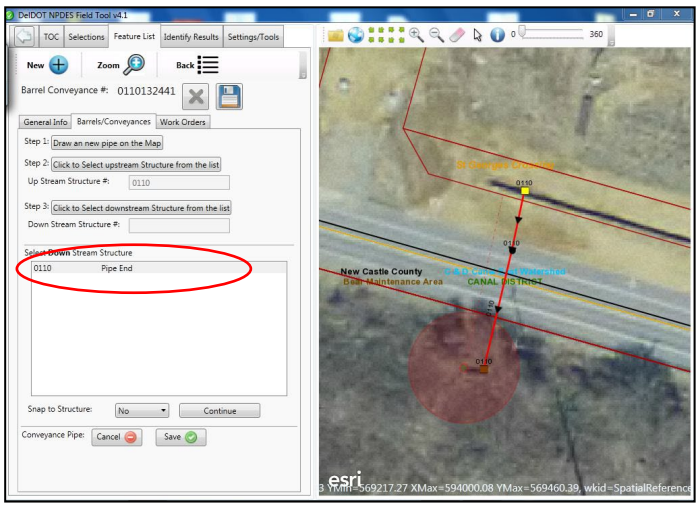


- Click the green checkmark located next to each barrel to open the corresponding barrel.

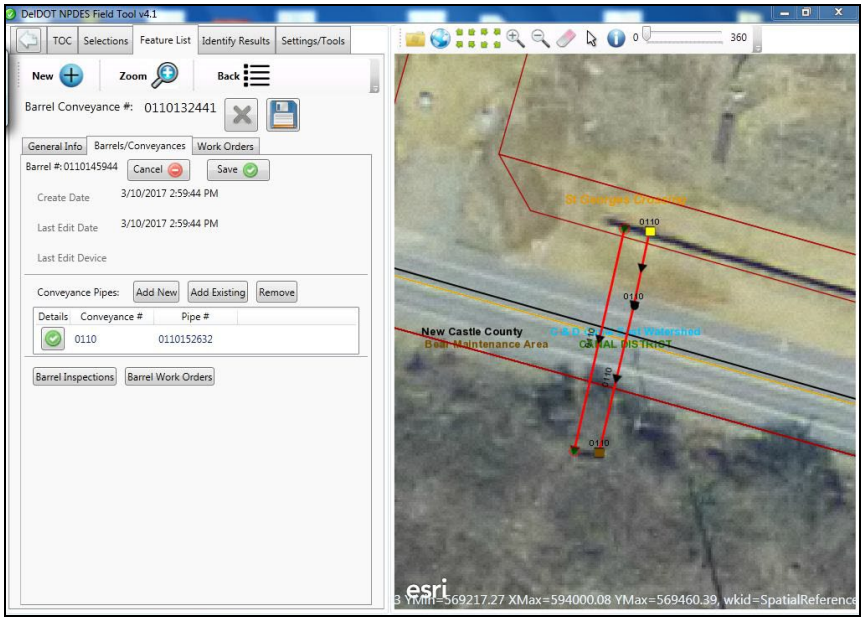
- To use the Add Existing method, the second pipe segment must already be drawn. Click on Add Existing and repeat Steps 1 and 2 from **Section 5.9** to select the second conveyance from the map to add an additional segment to the barrel. Repeat for any additional segments that make up the barrel.



- To use the Add New method, select Add New, and using your cursor, click and drag (without letting go) the approximate length of the additional barrel. Make sure it's drawn close enough to the upstream and downstream structures of the first barrel. There is a buffer used around the start and end points of the new barrel to associate it to a nearby structure. The application will prompt you to select the upstream and downstream structure the barrel will be associated with. Make sure "No" is selected for "Snap to structure" at the bottom of the window and then click "Continue".

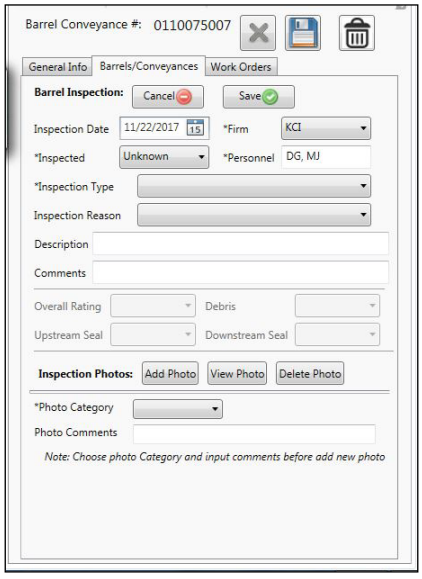


- Once added, the pipe segments that make up your barrel will appear under 'Conveyance Pipes'. If there are two pipe segments in your barrel, make sure they both appear within your barrel.



- Once all pipe segments and barrels have been added, open a barrel and click 'Barrel Inspections' at the bottom of the menu and click 'New' to create a barrel inspection.

  - The fields to be filled out are:
    - Inspection Date (should auto-populate, or can be back dated).
    - Firm (should auto-populate).
    - Inspected.
    - Personnel.
    - Inspection Type (which should be Field).
    - Inspection Reason (if barrel not inspected).
    - Overall Rating.
    - Debris.
    - Upstream Seal; Downstream Seal.



  - Barrels without a headwall on one of the seals will have that seal rated as N/A. Once the barrel inspection has been completed, click the green check mark to save and then the red 'Cancel' button to get out of the inspection. The new barrel inspection should appear in the window on the left. Each segment will also get its own inspection despite having a barrel inspection.

Note: Barrel Inspections are on hold and should not be created.

Once all the barrels and inspections have been completed, click the floppy disc icon to save the barrel conveyance a final time before exiting out of the page.

6.8 Structure Inspection

For inlets, pipe ends, manholes, control structures, swale points, culvert points, and underdrain pipe ends, an inspection needs to be created to rate its condition. See Section C of **Appendix D** for information on how to rate components.

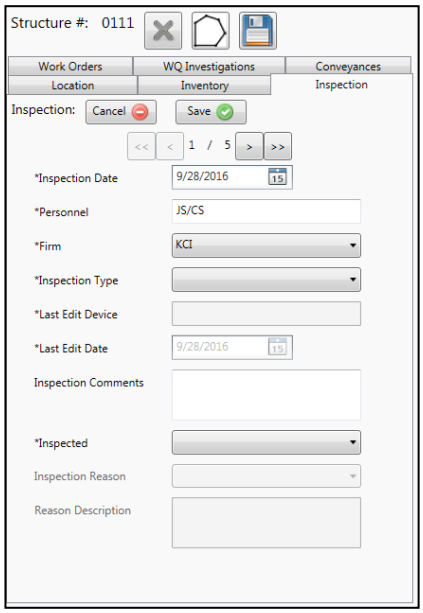
Junction boxes, pipe connections, dummy points, and temporary dummies do not receive inspections. The inspection tab will be blank.

To conduct an inspection, open the inspection tab.

Select “New Inspection”.

A new tab will appear with a new inspection containing five pages.

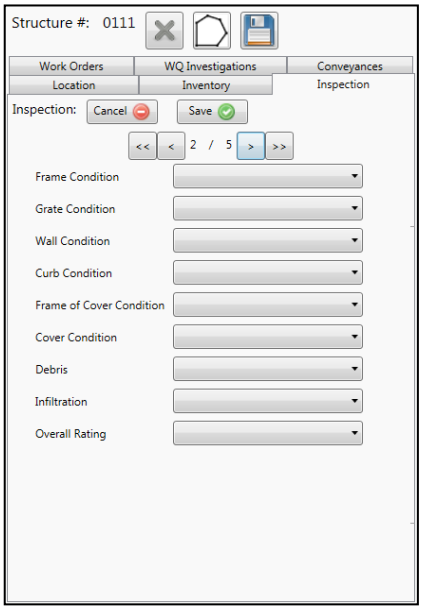
The first page details basic structure information:



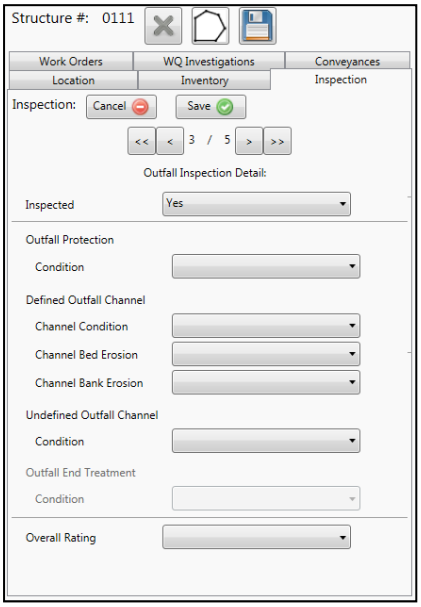
- Inspection Date will auto-populate with that day’s date. The user can change the date if the inspection being created pertains to data taken from a previous date.
- After date, a personnel field will be listed. This field will populate with the initials filled out in the General tab under the Settings/Tools tab.
- The firm should be KCI.
- The inspection type drop down will typically be field.
- Both last edit device and last edit date will be grayed out.
- In the comment section, only comments that pertain to the time at which the user was conducting the inspection should be entered (see the field manager with questions).

- For the Inspected drop down, populate either “Yes” or “No.” If the structure was not inspected, fill out ‘Inspection Reason’ with the appropriate reason the inspection was not completed. If none of the Inspection Reason comments are applicable, select “Other” and describe the situation in the Reason Description comment box. If the structure was inspected, the inspection reason and reason description will gray out.

Once Page 1 is completed select the first arrow to move to Page 2:



- The **Page 2** will vary depending on structure type.
- Fill out all applicable component ratings. However, only components marked as being present in the inventory section will be available to rate.
- **Page 2** of an inspection for a swale point will not display components, but instead will display “No Other Swale Connection inspection info needed.” Nothing needs to be filled out for this page.
- Rate the condition of each component as “Good,” “Fair,” “Poor,” or “Not Inspected.”
- Debris is rated in percentages. If there is 50% debris or more in a conveyance, Overall Rating should be Poor and a work order should be generated. See Maintenance Work Order SOP and **Section 6.14** for more information on work orders.
- Overall Rating will be the lowest rating used for a component (i.e. if all components for a structure are rated as Good except the wall which is rated Fair, the Overall Rating will be Fair). Structures that do not have components such as pipe ends, control structures, and culvert points will only have a rating for Overall Rating. For those points, Overall Rating will be used to describe the overall condition of the structure.
- Components will only be rated as Poor if the condition of the component warrants a work order. If a structure is rated as Poor, the field team should create a work order for that component. To determine if a component is poor, refer to the Maintenance Work Order SOP.



- Note: If a component is rated as Poor, Overall Rating should also be poor. For details on how to write a Work Order, view **Section 6.14**).

Page 3 is only for outfall inspections:

- If Is Outfall on **Page 1** of the location tab is No, this page will not be filled out. If Is Outfall is Yes, the user will fill this page out.

- It first asks if the outfall is inspected. Select "Yes" or "No", if "No" then everything else will gray out.

- If outfall is inspected, a rating needs to be reported in the drop down for all components indicated as present in Page 3 of the inventory tab (**Section 6.2**). For defined outfall channels, rate channel condition as well as channel bed and bank erosion based on a distance of 50 feet after the water leaves the pipe end (see data dictionary for more information).

- Once components are inspected, give the outfall an Overall Rating. Overall rating on **Page 3** of a structure inspection will be filled out the same way as **Page 2** – Overall Rating will always be the lowest rating of all the outfall components.

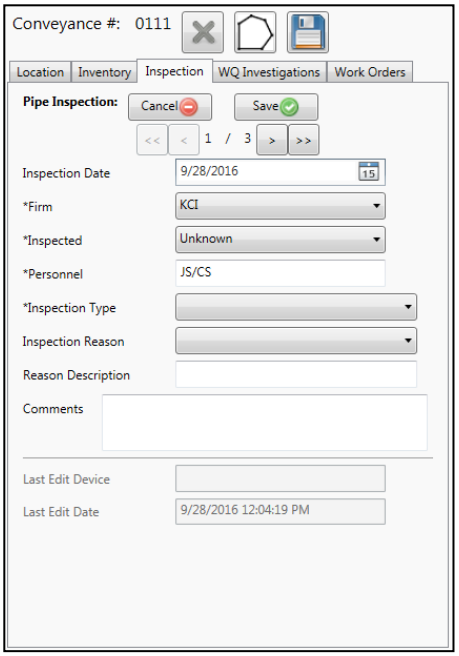
Page four contains water quality investigations:

For information on how to fill out page four, see **Section 6.13**.

Page five is adding the pictures for the inspections:

- These pictures will be the landscape and structure pictures for each structure. This has the same procedure as instructed in basic application operation **Section 5.12** adding a photo.

6.9 Pipe, Driveway Culvert, Roadway Culvert, Guardrail Culvert, and Underdrain Inspection

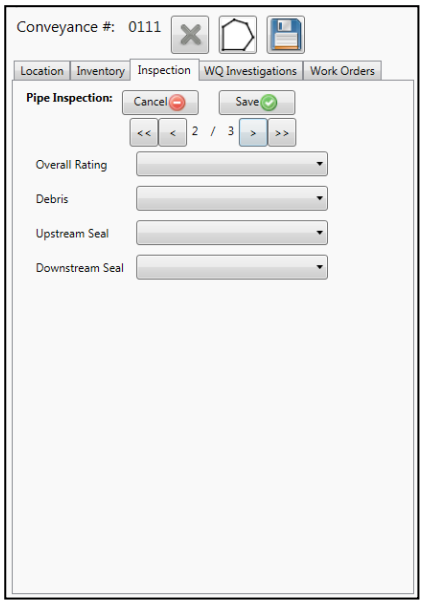


- To conduct an inspection, open the Inspection tab.
- Click the 'Create New Inspection' button.
- A new page will appear with an inspection containing three pages.

Page 1 details basic pipe information:

- 'Inspection Date' will auto-populate with that day's date. The user can change the date if the inspection being created pertains to data taken from a previous date.
- The 'Firm' should be KCI.
- 'Inspected' should either be "Yes" or "No," not "Unknown."
- Personnel will populate with the initials filled out in the General tab under the Settings/Tools tab.
- 'Inspection Type' drop down should be "Field".
- If the conveyance was inspected, the 'Inspection Reason' and 'Reason Description' will gray out. If the conveyance was not inspected, fill out 'Inspection Reason' with the appropriate reason as to why the conveyance was not inspected. If none of the available inspection reason comments are applicable, select "Other" and describe the situation in the 'Reason Description' box.
- The comments section should be used for observations that are specific to the inspection. See field manager with any questions.
- Both 'Last Edit Device' and 'Last Edit Date' will be grayed out and cannot be edited.
- Driveway culvert conveyances should be inspected to rate the pipes and record debris, but no pictures are necessary.

Once the Page 1 is completed select the first arrow to move to Page 2:



- Rate the condition of each component as “Good”, “Fair”, “Poor”, “Not Inspected”, or “N/A”.

- The ‘Overall Rating’ is the overall condition of the conveyance. Overall rating will be determined once the pole mounted camera is used to examine the pipe condition.

- ‘Debris’ is rated in percentages. If there is 50% debris or more in a conveyance, ‘Overall Rating’ should be noted as “Poor” and a work order should be generated, except for driveway culverts and underdrains. See Maintenance Work Order SOP and **Section 6.14** for more information on work orders.

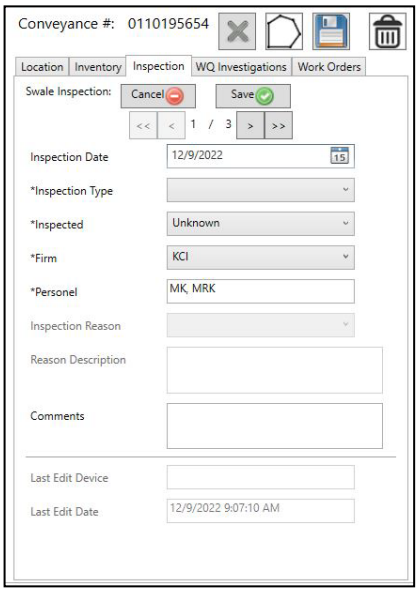
- ‘Upstream Seal’ and ‘Downstream Seal’ will describe the condition of the seal formed around each end of the pipe. If there is no wall creating a seal around the pipe (i.e. an inlet pipe or pipe end with no Endwall), these will be rated as “N/A.” If one of the seals cannot be inspected in the field, that field will be rated as “Not Inspected”.

After Page 2 is completed move to Page 3:

- Use this area to add Upstream and Downstream photos for the conveyance (see **Section 5.12** for general details on adding a photo to an inspection in the field application).

6.10 Swale Inspection

- To conduct an inspection, open the Inspection tab.
- Click the 'Create New Inspection' button.
- A new page will appear with an inspection containing three pages.



Page 1 details basic swale information:

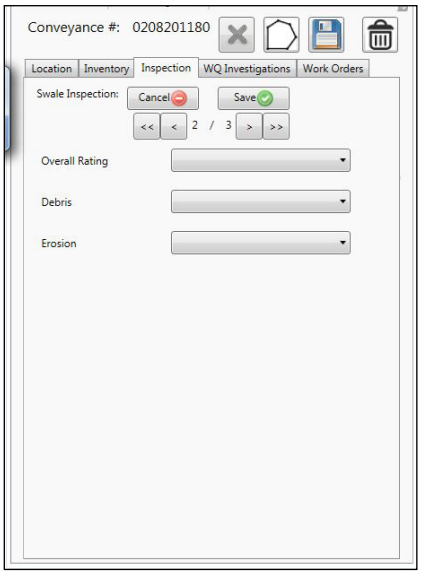
- 'Inspection Date' will be filled in automatically.
- 'Inspection Type' should be "Field".
- 'Inspected' should either be "Yes" or "No", not "Unknown".
- 'Firm' should be "KCI".
- Personnel will populate with the initials filled out in the General tab under the Settings/Tools tab.
- If the conveyance was inspected, the 'Inspection Reason' and 'Reason Description' will gray out. If the conveyance was not inspected, fill out 'Inspection Reason' with the appropriate reason as to why the conveyance was not inspected. If none of the available inspection reason comments are applicable, select "Other" and describe the situation in the 'Reason Description' box.
- The comments section should be used for observations that are specific to the inspection (see field manager with any questions).
- Both 'Last Edit Device' and 'Last Edit Date' will be grayed out and cannot be edited.

Once Page 1 is completed click the arrow to move to Page 2:

- 'Overall Rating' is the overall condition of the swale. If the swale requires a work order per the Maintenance Work Order SOP, the 'Overall Rating' should be "Poor" (see **Section 6.14** for more information on work orders).

- 'Debris' is rated in percentages. If there is 50% debris or more in a swale, the 'Overall Rating' should be "Poor" and a work order should be generated (see Maintenance Work Order SOP and **Section 6.14** for more information on work orders).

- 'Erosion' can be rated as "None", "Minor", "Moderate", "Severe", or "N/A". If a swale has severe erosion, a work order should be generated (see Maintenance Work Order SOP and **Section 6.14** for more information on work orders).



After Page 2 is completed move to Page 3:

- This is where swale pictures should be added for each swale. The process is the same as detailed in **Section 5.12**. 'Photo Category' for these pictures should be "General" with no comment needed in the Comments section (source to Internal Meeting #28).

6.11 Hydraulic Connection Inspection

No inspections will be created for hydraulic connections.

6.12 Pole-Mounted Camera

- To take a pipe picture using the pole-mounted camera, open the Sewerlink app located on each computer.

- Once Sewerlink is open, make sure the pictures taken will be save in the proper place.

  - Select the Settings tab, then the Projects and Directories tab.

  - Select "Work without automated project & folder management using custom base directory (Simple Mode)".

  - Under Photo Directory, navigate to the Uncompressed folder for the day.

- Connect to the pole mounted camera

  - Turn the pole mounted camera on. Once the light is solid green, it can connect to Sewerlink.

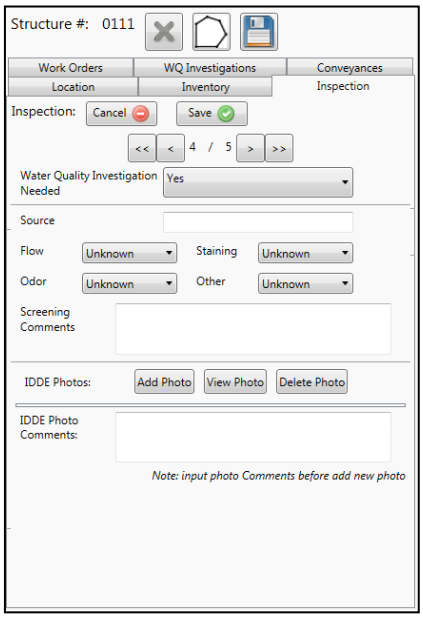
- Check that the computer connects to the camera via wifi.
- The camera will then appear on the Sewerlink home screen. Press the camera, then Connect.
- The pole can then be lowered into the structure.
- The team member operating the computer can then use Sewerlink to capture an appropriate picture of the pipe and/or seal.
- The pole-mounted camera also has a zoom option that should be used for each pipe to ensure the pipe is in good condition.

- Verify the photos that have been taken are saved in the Uncompressed folder for that day.
- Compress and attach the photos to the applicable conveyance as detailed in **Section 5.12**.

6.13 Preliminary Water Quality Investigation

- This will always be **Page 4** of any structure's inspection, regardless if it was filled out as having been inspected or not on **Page 1**.
- There is a drop down that asks, 'Water Quality Investigation Needed'. If the end of the system is flowing or a structure has odd stains, unusual smells, or any other signs of illicit discharge, it will require a water quality investigation. This field must be filled out as Yes or No and should not be left as Unknown.
- If a water quality investigation is needed, try to find the source. If the source is identified, enter the information into the Source box.
- There will also be drop downs for 'Flow', 'Staining', 'Odor' and 'Other'. If a water quality investigation is needed, one of these fields must be filled in as Yes.
- The comment section is if there is anything else that the outfall screening team needs to know in order to create a full water quality investigation. It is also used to describe the scenario if 'Other' is filled out as "Yes".
- Lastly, in this section, photos will be added if there is a water quality investigation needed. This has the same procedure as instructed in basic application operation **Section 5.12** regarding adding a photo.

- Any illicit discharge or questionable water conditions should be forwarded to the IDDE field crew immediately.



6.14 Work Orders

A work order should be created for any defect that is affecting the integrity of the structure, drainage, or poses a safety concern. For more information on structure defects, refer to the Maintenance Work Order SOP.

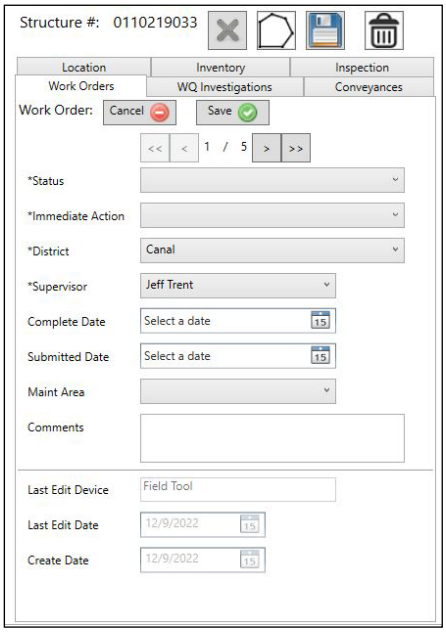
- To place a work order, select the “Work Orders” tab.
- Click “New Work Order”
- A new page will appear, providing the details of the work order.

There are five pages of the work order.

Page 1 has the general defect information:

- The first drop down is the ‘Status’ of the work order, which should be marked as “Open” unless notified otherwise by the field manager.
- Next is the ‘Immediate Action’ drop down, which should be “Yes” or “No,” not Unknown”.
- The ‘District’ and ‘Supervisor’ will automatically be filled out.

Do not change the 'Complete Date' or 'Submitted Date'.

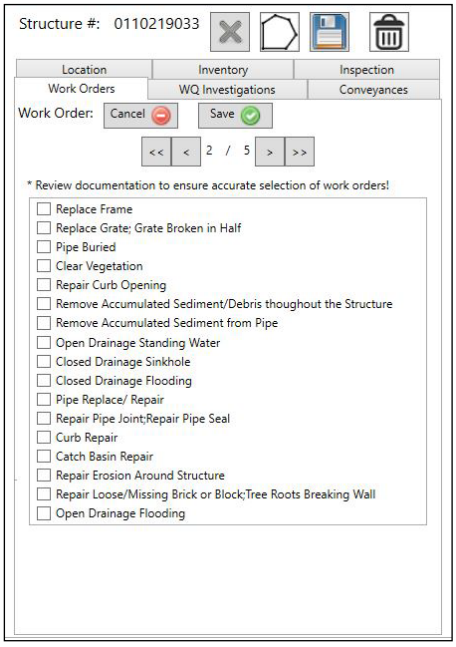


- Methodology for 'Maint Area' drop down is detailed in **Appendix D** of this Field Data Collection Application SOP.

- The 'Comments' section should include a description of the issue as well as the structure/conveyance ID. If there are multiple problems with a structure or conveyance, each problem gets their own comment separated by a period. (Source to Internal MS4 Meeting #32)

- The 'Last Edit Device', 'Last Edit Date' and 'Create Date' will be grayed out and cannot be modified.

Page 2 will have a list of reasons for the work order:



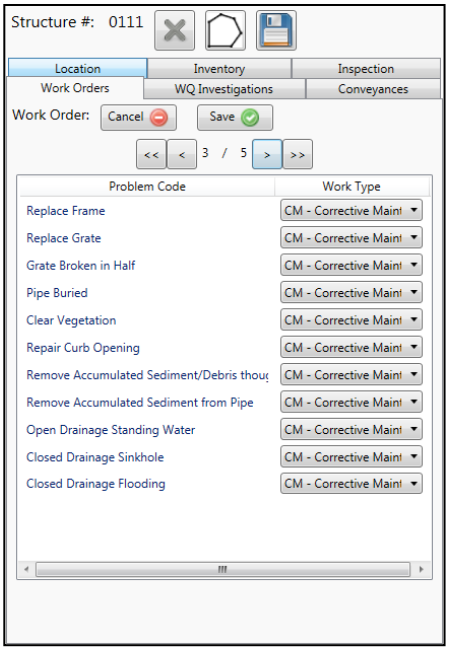
- Select all the boxes that apply to the defect for the work order.

- Use the Maintenance Work Order SOP to select the most appropriate problem code(s).

- **Note**: Some problem codes are only to be used with structures and some problem codes are only to be used with conveyances. Do not select a structure problem code if the work order is being generated for a conveyance, even though all options will appear on the screen. One work order per structure/conveyance even if there are multiple problems. (Source to Internal MS4 Meeting #33)

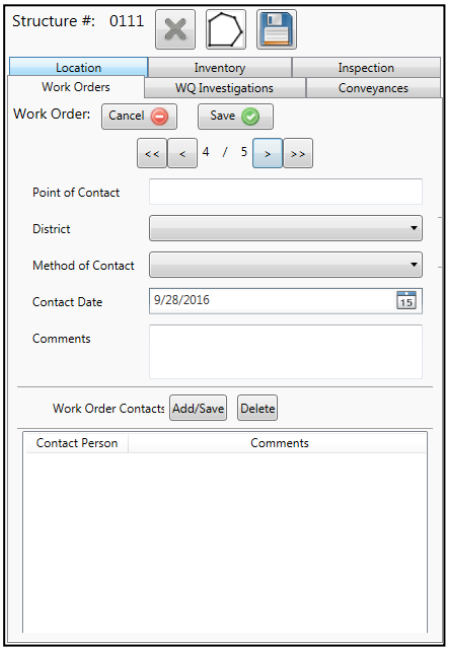
Page 3 is where the boxes that were checked on Page 2 will appear:

- Each defect checked will be listed under Problem Code.
- To the right of the Problem Codes are the Work Type. CM – Corrective Maintenance should be the default and should be selected if not already selected by the application.
- Currently, DelDOT wants KCI to focus on CM – Corrective Maintenance work orders. Preventative Maintenance (PM) should not be selected.



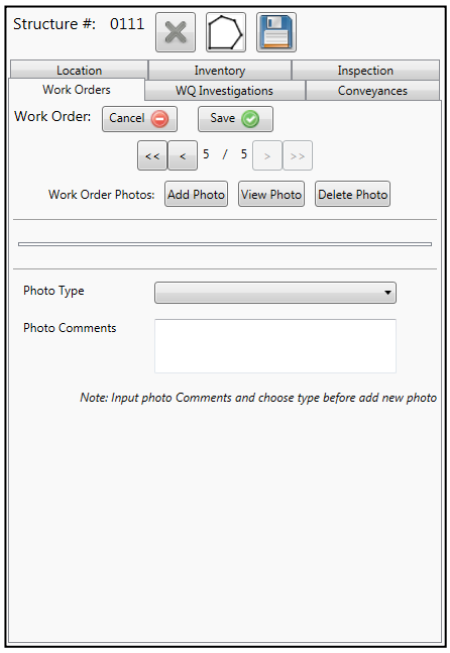
Page 4 is only for immediate work orders:

- Field manager will complete this section.
- This should not be completed in the field, proceed to Page 5.



Page 5 of the work order is for the photos:

- This is the same process as explained in basic application operation **Section 5.12** for adding a photo. However, there is currently not an update button. This means if a picture is added and labeled incorrectly, it will have to be deleted and uploaded again with the correct label.



Initial Inventory Work Orders

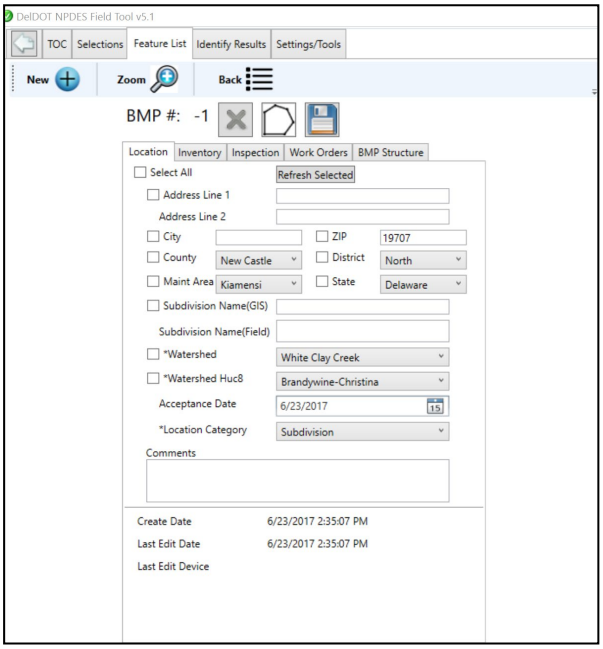
Work orders noted during the initial inventory-inspection of a subdivision within the 3-Year Warranty Period should be generated in the field application with minor modifications. The Maintenance Work Order SOP can be used as a guide in determining the details for the work order, however the extent does not have to be as severe. The rating process for features and components within the 3-Year Warranty Period should be more stringent. Additional modifications include:

- A comment must be left on **Page 1** of the work order tab stating "3 Year Warranty."
- All work orders created during an initial inventory should be labeled as 'Immediate Action.'
- A memo using the proper template should be generated in the office after completion and the field manager should be notified when it is ready for review.
- The field manager will update the immediate action related information (**Page 4** of work order tab) in the field tool application.

7.0 COLLECTING BMP INVENTORY/INSPECTION DATA

7.1 BMP Location

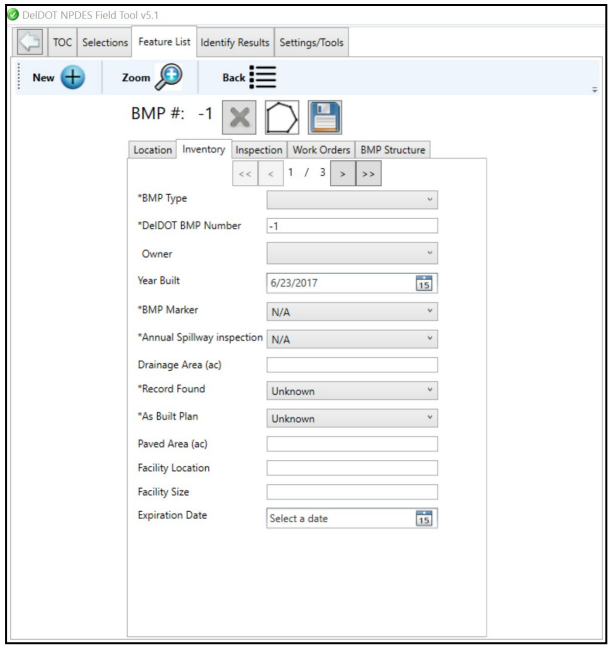
- Once a BMP is located, the Location tab needs to be filled out.
    - There are check boxes next to each location information box. Click the "Refresh Selected" button to auto populate boxes that were left blank. For convenience, a "Select All" button is available.
    - Location Category should be filled in depending on whether the BMP is located within a Subdivision or Roadway.



7.2 BMP Inventory

There are three pages in the Inventory to fill out:

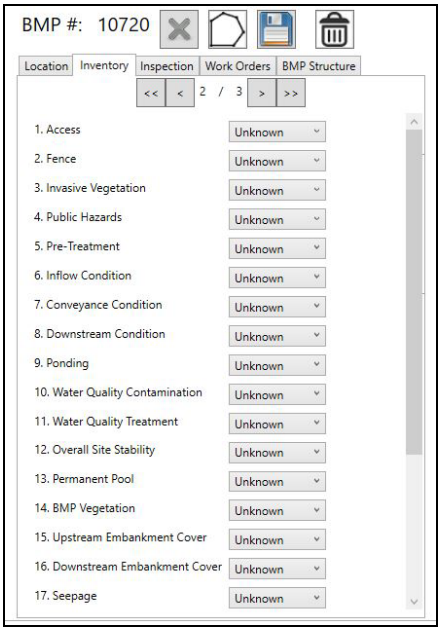
Page 1 requests general BMP information like BMP Number, BMP Type, etc.



- BMP Type refers to the category of BMPs (see Data Dictionary for descriptions).
- DelDOT BMP Number - fill in the appropriate number associated with a given BMP taken from the DelDOT BMP Master list.
- The Owner field should be filled in appropriately.
- Year Built should be the date the engineer signed/sealed the approved plans.
- BMP Marker should be filled out as Yes/No to note if the BMP has a marker placed on the Control Structure or not.
- Annual Spillway Inspection should be filled out as Yes/No to note if the spillway requires a yearly inspection.
- Drainage Area will be automatically filled out by the system based on the BMP drainage area layer.
- Record Found should be filled out as Yes/No to note whether there are plans for a particular BMP.
- As Built Plan should be filled out as Yes/No to note if there are As Built plans for a particular BMP.
- Paved Area should be automatically filled out by the system.
- Facility Location should be automatically filled out by the system.
- Facility Size should be automatically filled out by the system.
- Expiration Date should be filled out with dated stated on the plan.

Pages 2 requires the user to identify how many of the 24 BMP Inspection Parameters are applicable to the BMP being inspected:

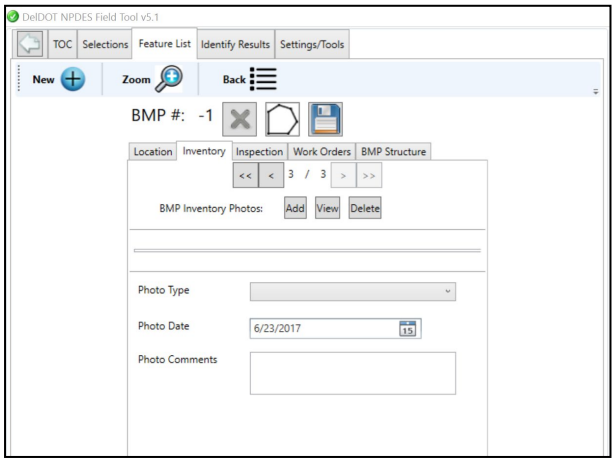
- Yes/No/Unknown should be filled out for each BMP Inspection parameter.



Page 3 is for adding the pictures for the initial or recently maintained BMPs ONLY:

- These pictures will be classified as, Structure, Riser, Pipe, Downstream, Swale, Upstream Photos.

- This has the same procedure as instructed in basic application operation **Section 5.12** for adding a photo.

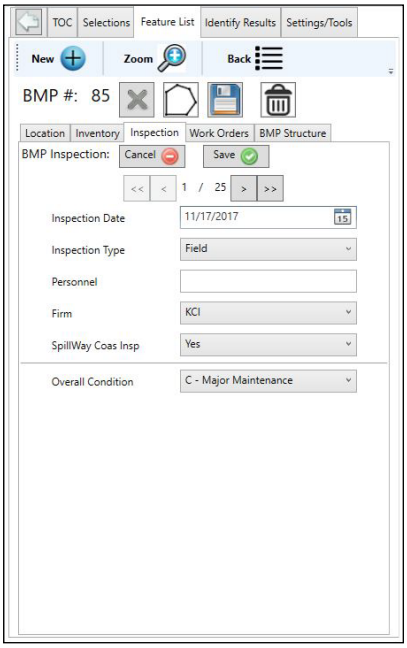


7.3 BMP Inspection

There are twenty-five pages in the Inspection to fill out:

Page 1 requests general inspection information about the inspection.

- BMP Inspection information should be filled out in accordance with the BMP Technical Manual guidelines.

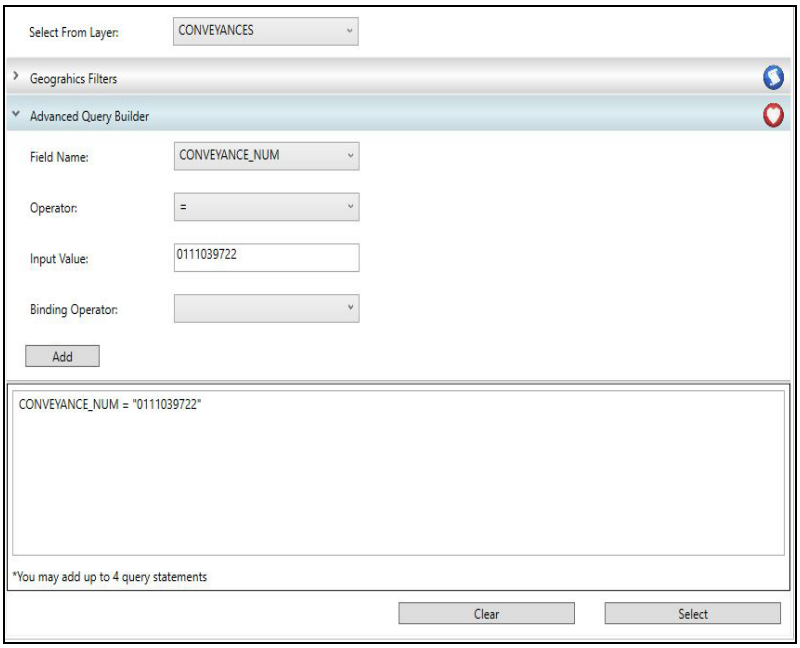


8.0 TROUBLESHOOTING

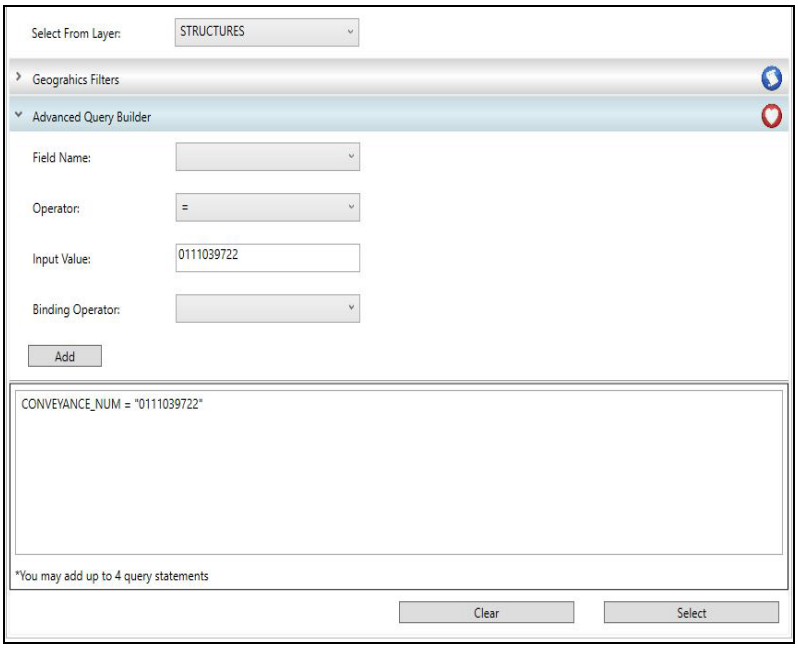
8.1 Specific Incorrect Workflows

After creating a query statement for a layer in the advanced query builder then change the selectable layer the field tool will crash after clicking select.

Example query statement:



Changed selectable layers to structure.



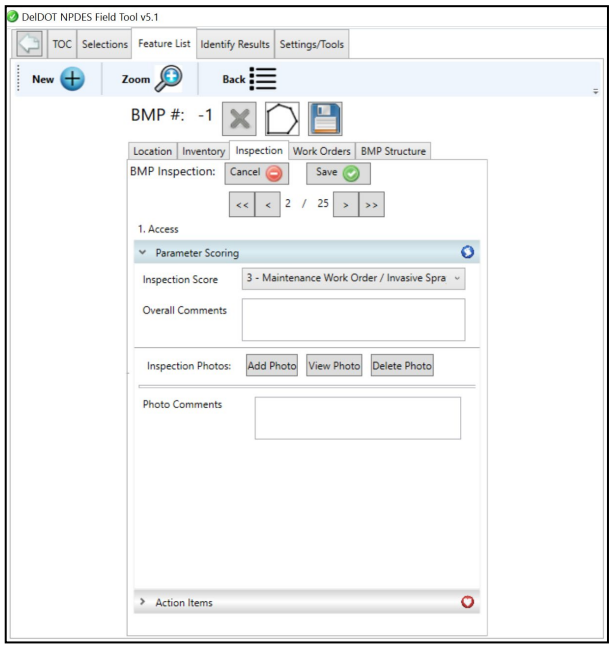
The twenty-four BMP Inspection parameters should be evaluated individually.

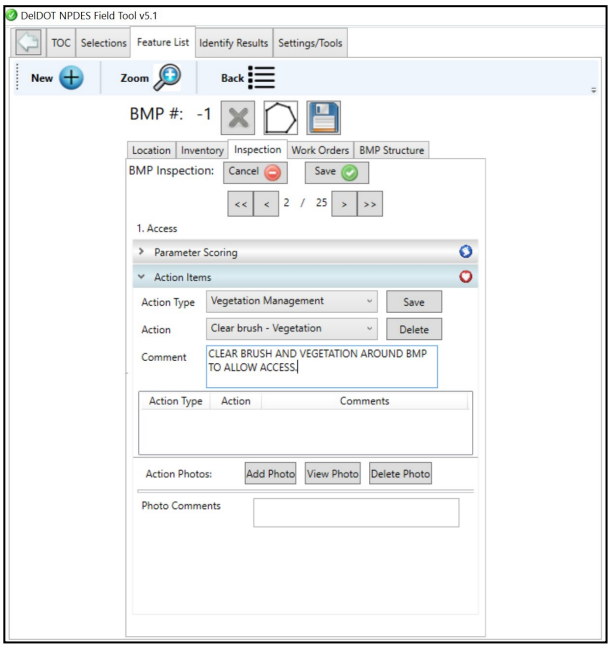
See below for an example:

- An inspection score of 1 – 5 should be assigned for each applicable inspection parameter.

- If a maintenance work order is needed, the user will need to associate an Action Item to the inspection parameter based upon the work needed.

- The user will then need to save the Action Type created.

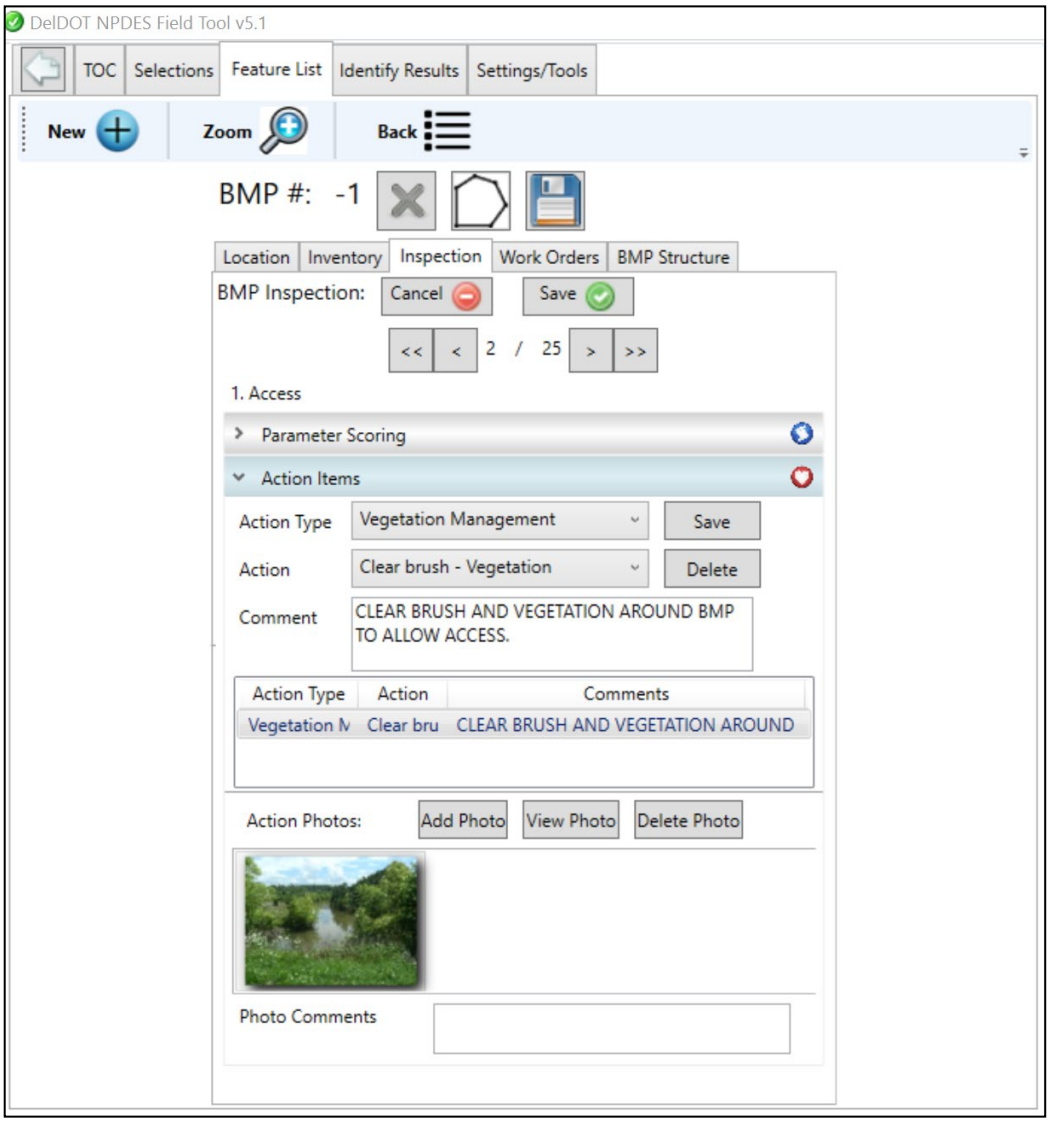




- Next the user will need to select the Action type within the bow below and select “Add Photo”.

- The user will then need to browse on the computer to where the photos are located and associate the appropriate photo.

- A photo needs to be associated to all Action Types.


DelDOT NPDES Field Tool v5.1
TOC
Selections
Feature List
Identify Results
Settings/Tools
New
Zoom
Back
BMP #: -1
Location
Inventory
Inspection
Work Orders
BMP Structure
BMP Inspection:
Cancel
Save
<<
<
2 / 25
>
>>
1. Access
Parameter Scoring
Action Items
Action Type
Vegetation Management
Save
Action
Clear brush - Vegetation
Delete
Comment
CLEAR BRUSH AND VEGETATION AROUND BMP TO ALLOW ACCESS.
Action Type
Action
Comments
Vegetation M
Clear bru
CLEAR BRUSH AND VEGETATION AROUND
Action Photos:
Add Photo
View Photo
Delete Photo
Photo Comments

DELDOT AGR. 2056

KCI PROJECT NO. 00008105_00001

FIELD DATA COLLECTION APPLICATION

STANDARD OPERATING PROCEDURES

APPENDIX A

CATCH BASIN, GRATE & COVER PHOTOGRAPHS

APPENDIX A

CATCH BASIN, GRATE AND COVER PHOTOS

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INLET TYPES

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Pipe…… A-3
Infiltration Pit…… A-4
Curb Cut…… A-4

GRATE TYPES

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Type 2 ..... A-5
Type 3 ..... A-6
Type 4 ..... A-6
Type 5 ..... A-7
Type 6 ..... A-7
Type 7 ..... A-8
PWBD-1, 2, 3, 4 ..... A-8
Round A-9
M1 ..... A-9
Bicycle Unfriendly A-10

INLET TYPES

Catch Basin – Structure with four walls and a grate allowing the inflow of water

Pipe – Inlet pipe that water flows into

Infiltration Pit – Structure with no pipe leaving that serves to store and/or facilitate infiltration of stormwater

Curb Cut – An opening along a curb that allows sheet flow to be discharged from the roadway

GRATES TYPES

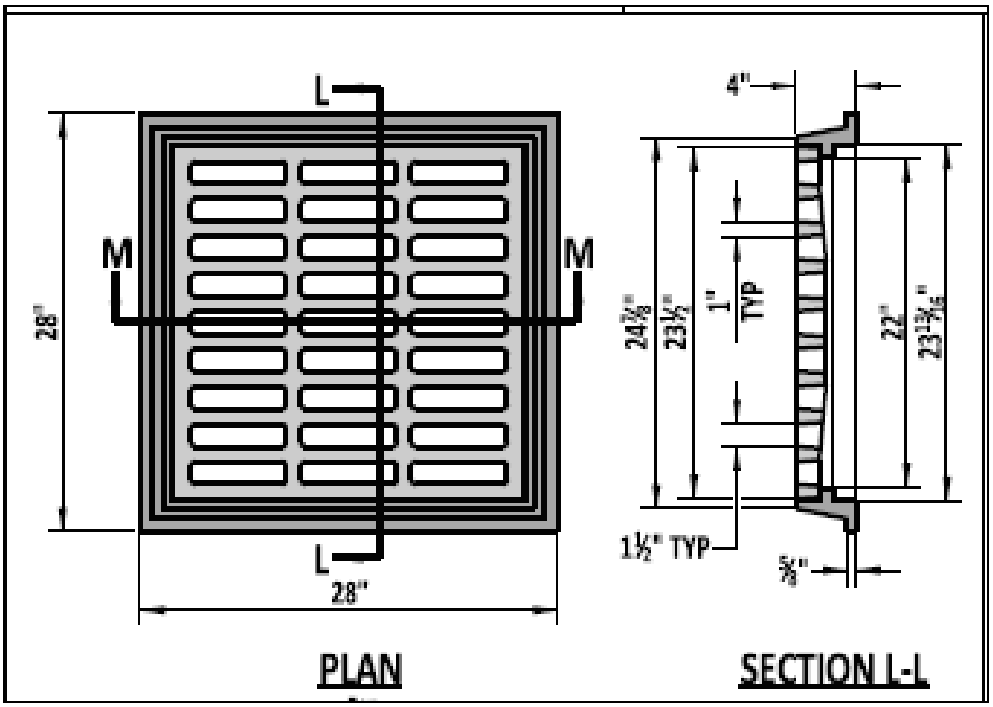
Type 1 – Cast iron grate with diagonal bars measuring 36 x 20 x 2

Type 2 – 36 x 20 x 2 Cast Iron Parallel Bar with a curved bottom

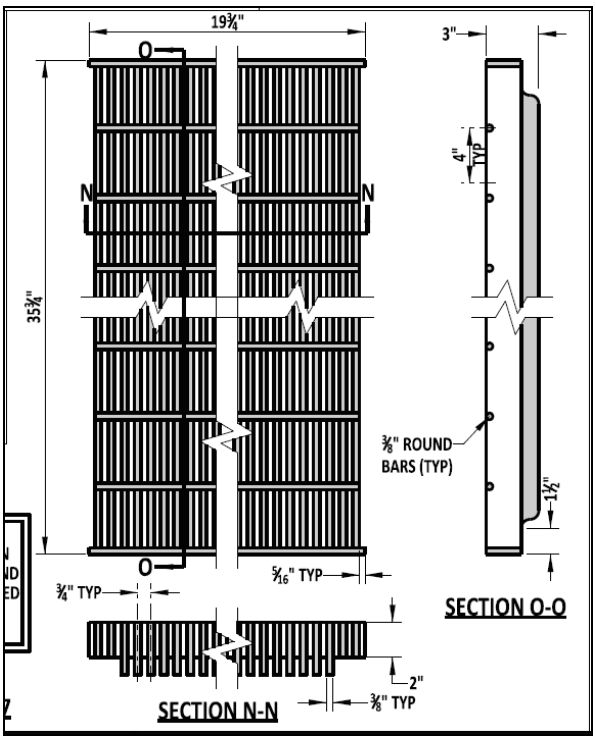
Type 3 – 36 x 20 x 2 Cast Iron Grid with a curved bottom

Type 4 – 36 x 20 x 2 Cast Iron Slotted Perpendicular Bar

Type 5 – 19 x 13 x 1½ Cast Iron Perpendicular bar



Type 6 – 28 x 28 x 4 Grid. See Standard Details



Type 7 – 35¾ x 19¾ x 3. See Standard Details

PWBD-1, 2, 3, 4 – Galvanized reticuline

Round

M1 – Sloted grate on the sides of an MD&MS basin

Bicycle Unfriendly – 36 x 20 x 2 with parallel bars measuring 1 5/8” between the bars

DELDOT AGR. 2056

KCI PROJECT NO. 00008105_00001

FIELD DATA COLLECTION APPLICATION

STANDARD OPERATING PROCEDURES

APPENDIX B

STANDARD DETAILS

APPENDIX B

STANDARD DETAILS

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STANDARD MEASUREMENTS

PWBD-1
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PWBD-4
Other
Cleanout
Standard Manhole
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Inlet Type 5
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Inlet Type 7
M1
Bicycle Unfriendly
Modified Inlet Type 1

STANDARD DETAILS

Types 1-7
M1
PWBD
Modified PWBD
Concrete Arch Pipe
Concrete Box Culvert
Concrete Elliptical Pipe
Arch Corrugated Metal Pipe

APPENDIX B

STANDARD DETAILS

STANDARD MEASUREMENTS

Structure Type: PWBD-1

Frame: Measure in field

Grate: 42x28x5

Structure Type: PWBD-2

Frame: Measure in field

Cover: 52x36x5

Structure Type: PWBD-3

Frame: Measure in field

Grate: 57x36x5

Structure Type: PWBD-4

(Parkway larger than PWBD-3)

Frame: Measure in field

Grate: 57x36x5

Structure Type: Other

(Parkway smaller than PWBD-3)

Frame: Measure in field

Grate: Measure in field

Structure Type: Cleanout **

Frame: 28x28x5

Grate: 22x22x2

Standard Manhole **

Frame: 26x26x7

Cover: 24x24x2

Inlet Types 1-4**

Frame: 38x22x4

Grate: 36x20x2

Inlet Type 5

Frame: 20x14x4

Grate: 19x13x2

Inlet Type 6

Frame: 28x28x4

Grate: 24x24x2

Inlet Type 7

Frame: Measure in field

Grate: 36x20x3

Structure Type: M1

Frame: Measure in field

Grate: Size of the PWBD grate

Structure Type: Bicycle Unfriendly

Frame: 38x22x4

Grate: 36x20x2

Modified Inlet Type 1 ***

Frame: 38x22x4

Grate: 35.5x19.5x2

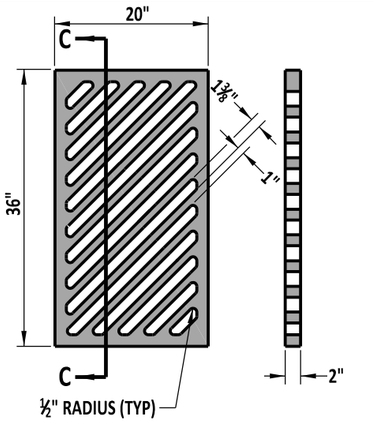
**

Please use these measurements as a guide, if a structure looks to be different please measure to make sure the correct measurements are taken.

***

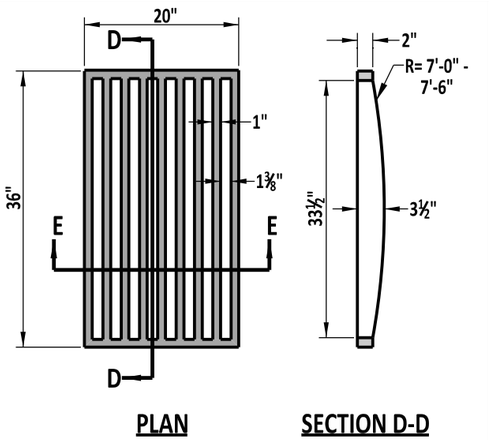
Even though this is not a standardized Type 1 size, Type 1 should be selected for Grate Type and Modified should be Yes.

SCALE : NTS



PLAN SECTION C-C

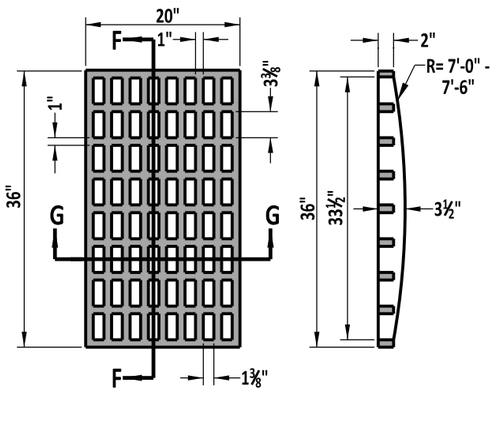
TYPE 1



PLAN SECTION D-D

SECTION E-E

TYPE 2

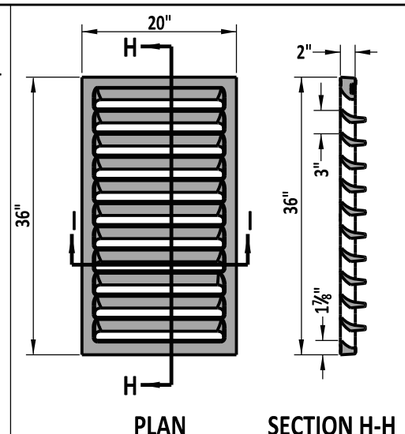


PLAN SECTION F-F

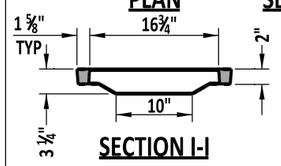
3½" 2"

SECTION G-G

TYPE 3

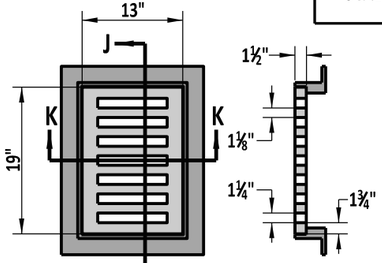


PLAN SECTION H-H

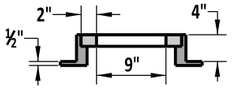


SECTION I-J

TYPE 4

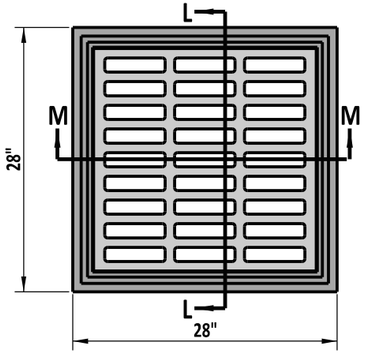


PLAN SECTION J-J

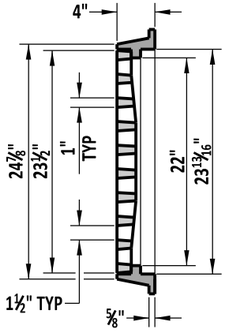


SECTION K-K

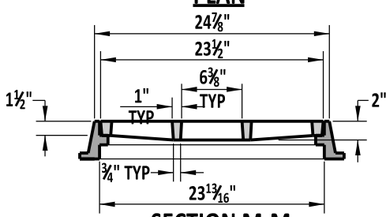
TYPE 5



PLAN



SECTION L-L

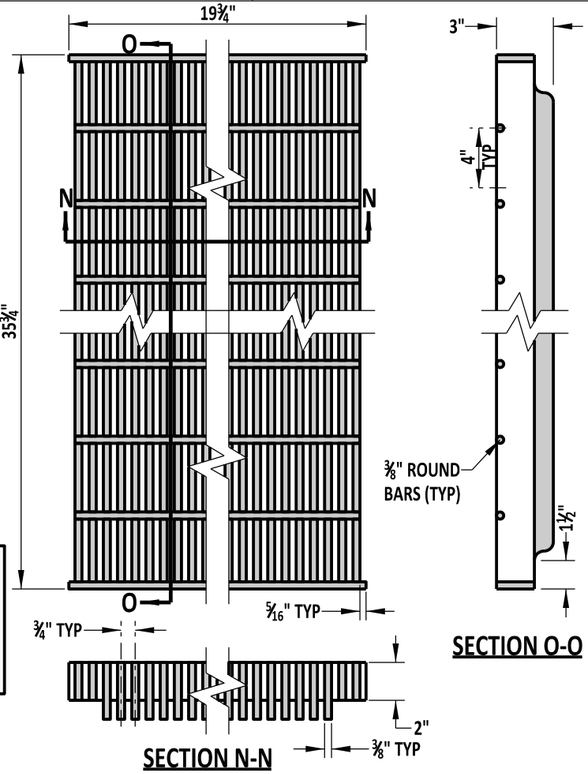


SECTION M-M

TYPE 6

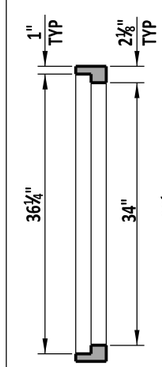
NOTE: THIS INLET GRATE IS ONLY TO BE USED WHEN SPECIFIED ON THE PLANS AND SHOULD NOT BE RETROFITTED WITHOUT APPROVAL BY THE ENGINEER.

TYPE 7

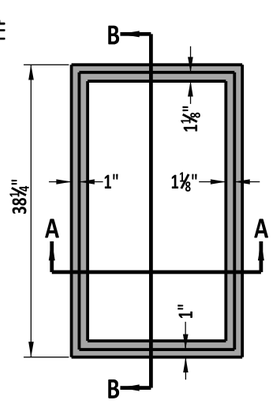


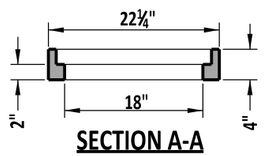
SECTION N-N

SECTION O-O



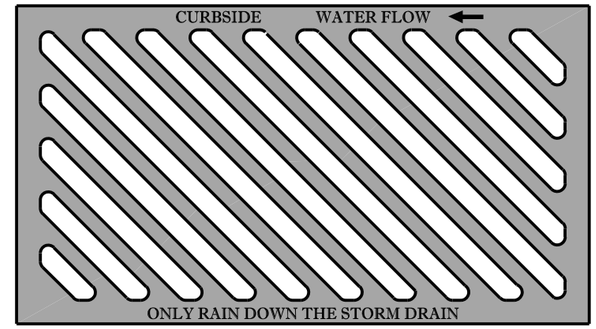
SECTION B-B





SECTION A-A

DRAINAGE INLET FRAME
THIS FRAME IS TO BE USED WITH TYPES 1 THROUGH 4 GRATES ONLY



DRAINAGE GRATE LABELING EXAMPLE DETAIL

NOTES:

1). ONLY INSTALL THE TYPE 2 DRAINAGE INLET GRATE WHERE BICYCLE TRAFFIC IS NOT EXPECTED TO BE PRESENT.
2). LABEL THE TOP OF ALL DRAINAGE INLET GRATES, EXCEPT TYPE 7, WITH "ONLY RAIN DOWN THE STORM DRAIN". ALSO, LABEL DRAINAGE INLET GRATES TYPE 1 AND TYPE 4 WITH "WATER FLOW" AND AN ARROW INDICATING FLOW DIRECTION AS SHOWN IN THE EXAMPLE DETAIL.
3). LABEL THE TOP AND BOTTOM OF THE TYPE 1 DRAINAGE INLET GRATE WITH "CURBSIDE" AS SHOWN ON THE EXAMPLE DETAIL.
4). ONLY USE THE TYPES 5 & 6 DRAINAGE INLET FRAME AND GRATE COMBINATIONS ON LAWN INLET DRAINAGE BOXES. SEE SCHEDULE ON DETAIL D-4, SHEET 1 FOR WHICH BOX SIZES ARE CONSIDERED LAWN INLET DRAINAGE BOXES.
5). THE TYPE 6 DRAINAGE INLET FRAME AND GRATE COMBINATION SHOWN IS THE NEENAH FOUNDRY FRAME AND GRATE COMBINATION MODEL NF-1878-A5G, AN ACCEPTABLE ALTERNATIVE IS THE EAST JORDAN IRON WORKS FRAME AND GRATE COMBINATION MODEL V-5622.

DELAWARE
DEPARTMENT OF TRANSPORTATION

DRAINAGE INLET FRAME AND GRATES

STANDARD NO. D-5 (2014) | SHT. 2 OF 9

APPROVED SIGNATURE ON FILE (CHIEF ENGINEER) 12/30/2014 (DATE)

RECOMMENDED SIGNATURE ON FILE (DESIGN ENGINEER) 12/11/2014 (DATE)

12/4/2014

COUNTY	CONTRACT	F.A.P. STA. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
		2	DEL.			

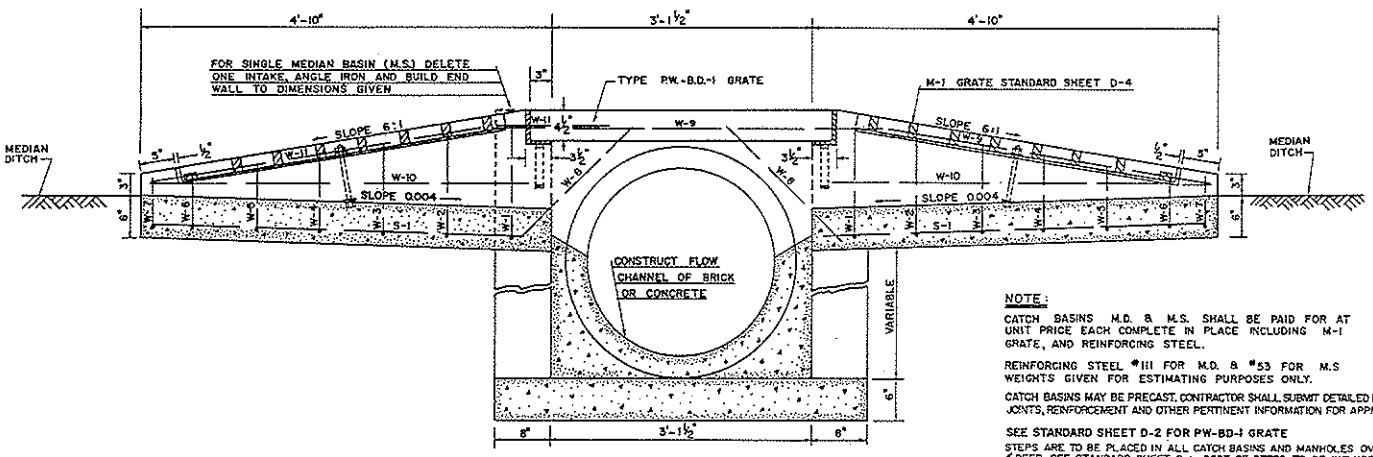
STANDARD SHEET D-6-6
CATCH BASIN M.D. & M.S.

PREL. TRACING T.N.C. DESIGN E.L.W. CHKD. W.T.B.

REVISIONS
1. 4/1/71, NOMENCLATURE CHANGES FOR A.I.S.C. SPEC., D.M.E.
2. 10/25/74, NOTE REFERRING TO STANDARD SHEET D-2, R.T.C.
3. STANDARDIZED DIMENSIONS 12-2-75 R.T.C.
4. REMOVED CUT-OFF WALL NOTE, 5-10-78 R.P.K.
5. ADDED STEP NOTE 7-30-81 R.P.K.

APPROVED [signature] DIRECTOR OF OPERATIONS 6-22-70 DATE

[signature] DEPUTY DIRECTOR-CHIEF ENGINEER 6/22/70 DATE



SECTION A-A

M.D. & M.S. CATCH BASINS

NOTE:

CATCH BASINS M.D. & M.S. SHALL BE PAID FOR AT UNIT PRICE EACH COMPLETE IN PLACE INCLUDING M-1 GRATE, AND REINFORCING STEEL.

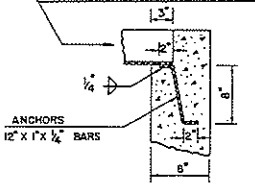
REINFORCING STEEL #111 FOR M.D. & #53 FOR M.S WEIGHTS GIVEN FOR ESTIMATING PURPOSES ONLY.

CATCH BASINS MAY BE PRECAST, CONTRACTOR SHALL SUBMIT DETAILED PLANS SHOWING SECTIONS, JOINTS, REINFORCEMENT AND OTHER PERTINENT INFORMATION FOR APPROVAL.

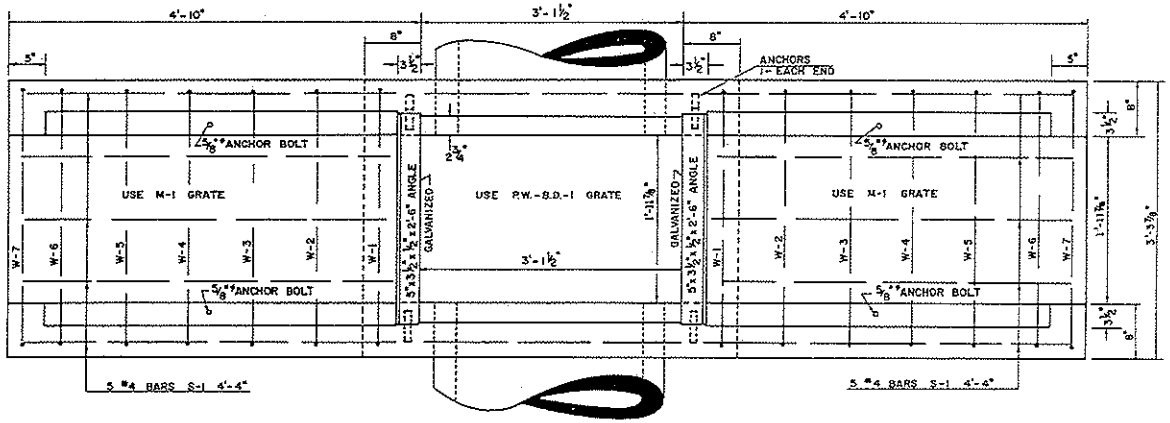
SEE STANDARD SHEET D-2 FOR PW-BD-1 GRATE

STEPS ARE TO BE PLACED IN ALL CATCH BASINS AND MANHOLES OVER 4 DEEP SEE STANDARD SHEET D-1. COST OF STEPS TO BE INCLUDED IN COST OF CATCH BASIN.

NOTE:
5"x3½"x½"x 2'-6" ANGLE (GALVANIZED)



ANCHOR DETAIL



PLAN

BAR SCHEDULE

STRAIGHT BARS – SIZE 4 #

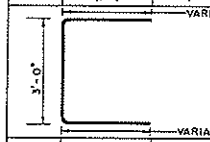
NO.	MARK	LENGTH	TOTAL LENGTH
10	S-1	4'-4"	43'-4"
2	W-11	6'-0"	12'-0" *
4	W-10	4'-4"	17'-4"
2	W-9	8'-2"	16'-4" *
4	W-8	2'-0"	8'-0"

* BEND THESE BARS IN FIELD

BAR SCHEDULE

BENT BARS – SIZE 4 #

MARK	BEND	TOTAL LENGTH
W-7	0'-7"	4'-2"
W-6	0'-8"	4'-4"
W-5	0'-10"	4'-8"
W-4	0'-11"	4'-10"
W-3	1'-1"	5'-2"
W-2	1'-3"	5'-6"
W-1	1'-4"	5'-8"



MARK	BEND	TOTAL LENGTH
W-1	1'-4"	5'-8"
W-2	1'-3"	5'-6"
W-3	1'-1"	5'-2"
W-4	0'-11"	4'-10"
W-5	0'-10"	4'-8"
W-6	0'-8"	4'-4"
W-7	0'-7"	4'-2"

M-D #111 M-S #52

COUNTY	CONTRACT	F.A.P. SEC. NO.	SHEET	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
		2	DET.			

STANDARD SHEET D-2-4

PARKWAY CATCH BASINS

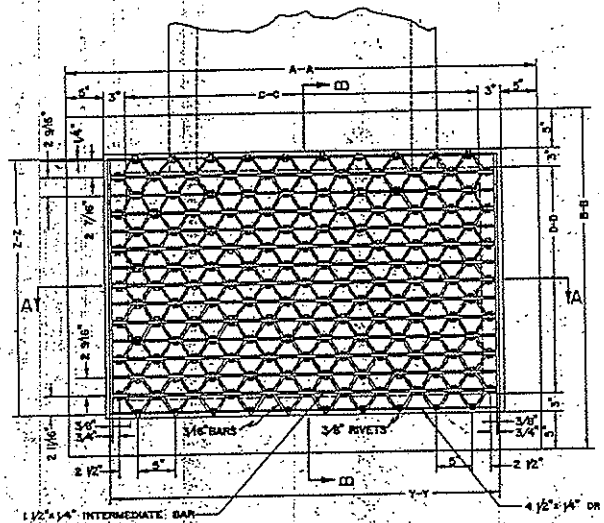
PREP. TRACING APPROVED ENGINEER F.T.W. CHKD. Y.T.S.

REVISIONS

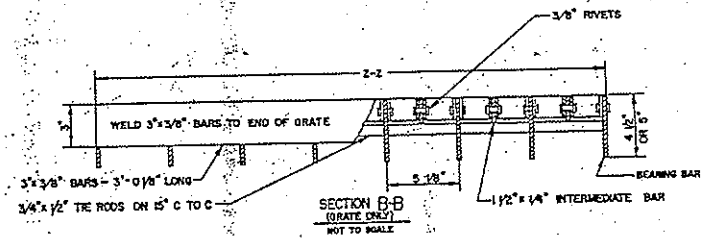
1. CLAMPED GRATE, AND BASIN DIMENSIONS AND ADDED NOTE TO BUTTER. 12-2-75 R.F.A.
2. REPLACED NOTE (8) 5-21-76 R.F.A.
3. ADDED NOTE (7) 1-31-77 R.F.A.
4. REVISED NOTE (5) ADDED NOTE (9) 1-30-81 R.F.A.

APPROVED _____ 6-22-70
DIRECTOR OF OPERATIONS DATE

_____ 6/22/70
DEPUTY DIRECTOR-CHIEF ENGINEER DATE

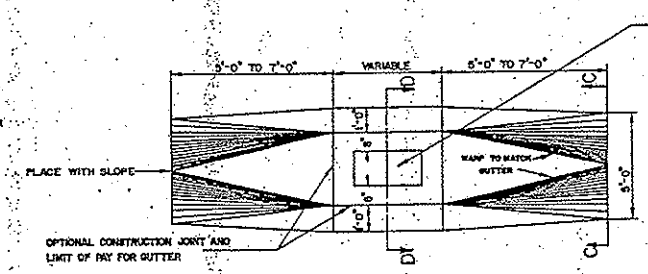


NOTE:
SEE CATCH BASIN AND GRATING DATA BELOW FOR SIZES.



SECTION B-B
(GRATE ONLY)
NOT TO SCALE

PARKWAY CATCH BASINS
P.W.-B.D. 1
P.W.-B.D. 2
P.W.-B.D. 3
P.W.-B.D. 4



CONC. GUTTER TO BE USED WITH PARKWAY CATCH BASINS.
NOT TO SCALE

NOTES:

(1) GUTTER USED ONLY WHEN NOTED ON PLANS.

(2) P.W.-B.D. C. BASIN WALLS TO BE BRICK, CONCRETE, OR SOLID CONCRETE BLOCK, EXCEPT FOR UPPER 12" WHICH IS TO BE OF CEMENT CONCRETE MASONRY.

(3) COST OF CONCRETE MASONRY TO BE INCLUDED IN UNIT PRICE BID FOR STRUCTURE COMPLETE.

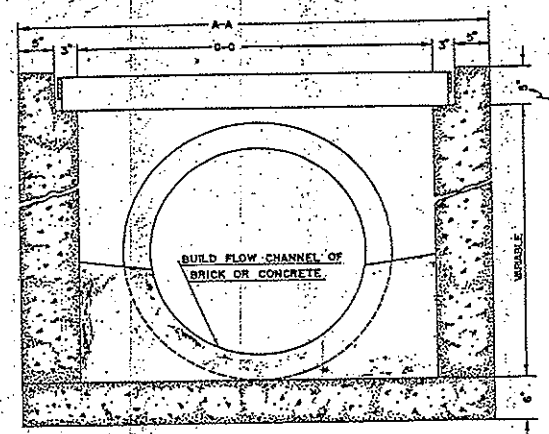
(4) GRATING INCLUDED IN UNIT PRICE BID FOR P.W.-B.D. CATCH BASIN GRATINGS TO BE GALVANIZED.

(5) PARGET BRICK OR BLOCK WITH 1/2" OF PORTLAND CEMENT MORTAR.

(6) P.C.C. GUTTER WILL BE PAID FOR UNDER SECTION 704, PORTLAND CEMENT CONCRETE GUTTER.

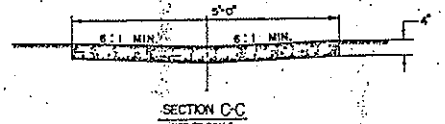
(7) CATCH BASINS MAY BE PRECAST. CONTRACTOR SHALL SUBMIT DETAILED PLANS SHOWING SECTIONS, JOINTS, REINFORCING AND OTHER PERTINENT INFORMATION FOR APPROVAL.

(8) STEPS ARE TO BE PLACED IN ALL CATCH BASINS & MANHOLE OVER 4' DEEP, SEE STANDARD SHEET D-L. COST OF STEPS TO BE INCLUDED IN COST OF CATCH BASIN OR MANHOLE.

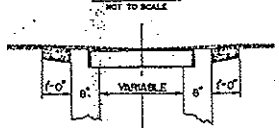


NOTE:
P.W.-B.D.3 AND P.W.-B.D.4 TO BE 5 1/2"

SECTION A-A
NOT TO SCALE



SECTION C-C
NOT TO SCALE



SECTION D-D
NOT TO SCALE

PARKWAY CATCH BASIN AND DRAIN GRATE DATA

NUMBER OF CATCH BASIN	LARGEST PIPE SIZE A-A	LARGEST PIPE SIZE B-B	CATCH BASIN DATA WALL THICK.	A-A OUTSIDE	B-B OUTSIDE	C-C INSIDE	D-D INSIDE	GRATING DATA GRATING MATL.	Y-Y	Z-Z	GRATING AREA & WEIGHT
P.W.-B.D. 1	30"	15"	8"	4'-5½"	3'-3⅞"	3'-1⅛"	1'-8⅞"	4½" x ¼"	3'-6⅛"	2'-4⅞"	8.39** 178 LBS.
P.W.-B.D. 2	36"	24"	8"	6'-3½"	3'-11½"	3'-11¼"	2'-7⅛"	4½" x ¼"	4'-1¼"	3'-0⅛"	13.10** 373 LBS.
P.W.-B.D. 3	42"	24"	8"	5'-8¼"	3'-11½"	4'-4¼"	2'-7⅛"	5" x ¼"	4'-9¼"	3'-0⅛"	14.34** 341 LBS.
P.W.-B.D. 4	48"	24"	8"	6'-1¼"	3'-11½"	4'-9¼"	2'-7⅛"	5" x ¼"	5'-2½"	3'-0⅛"	15.62** 334 LBS.

COUNTY	CONTRACT	R.S.S. NO.	SHEET NO.	PROJECT NO.	SHEET NO.	TOTAL SHEETS
			2 DEL.			

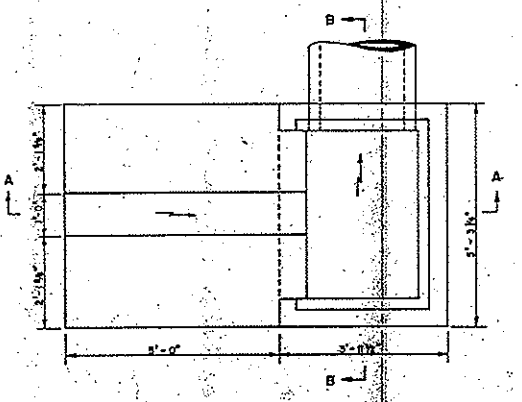
STANDARD SHEET D-3-4
P.W.-B.D.-2 MOD. CATCH BASINS 1 & 2

PREL. TRACING J.T.B. DESIGN E.I.W. CHECK J.T.B.

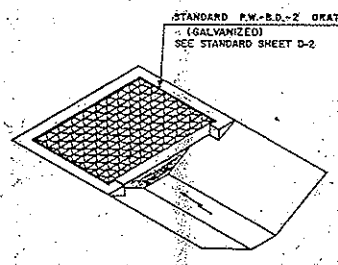
1. 10/25/71, NOTE REFERRING TO STANDARD SHEET D-2 ADDED.
2. REMOVED CUT-OFF WALL NOTE 2/21/73
3. REVISED PRODUCT NOTES 1-30-74 E.K.R.
4. REVISED END BLOCK NOTES 1-30-74 E.K.R.

APPROVED _____ 6-27-78
DIRECTOR OF OPERATIONS DATE

_____ 1/21/70
DEPUTY DIRECTOR-CHIEF ENGINEER DATE

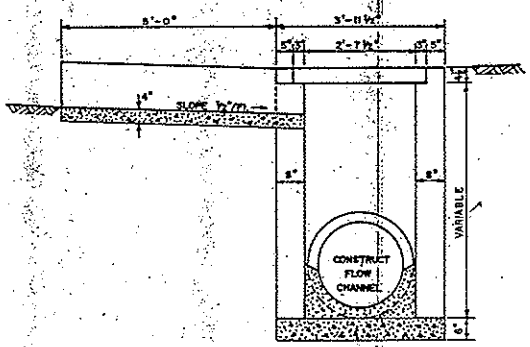


PLAN

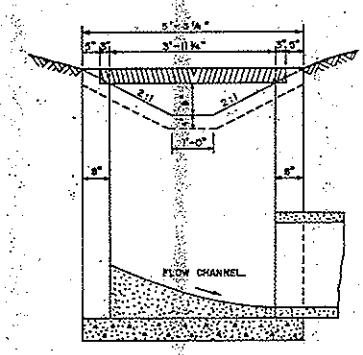


GENERAL NOTES:

1. TOP 12" OF THE CATCH BASIN TO BE OF P.C.C. MASONRY.
2. COST OF P.C.C. GUTTER AND P.W.-B.D.-2 GRATING TO BE INCLUDED IN THE UNIT PRICE BID FOR CATCH BASIN.
3. P.W.-B.D.-2 MODIFIED CATCH BASINS 1 & 2 TO BE USED ONLY 30' OR MORE FROM EDGE OF NEAREST RUNNING LANE.
4. STEPS ARE TO BE PLACED IN ALL CATCH BASINS AND MANHOLES OVER 4' DEEP. SEE STANDARD SHEET D-1. COST STEP TO BE INCLUDED IN COST OF CATCH BASIN.
5. FARGET BRICK OR BLOCK MASONRY WITH 1/2" OF PORTLAND CEMENT MORTAR.
6. CATCH BASINS MAY BE PRECAST. CONTRACTOR SHALL SUBMIT DETAILED PLANS SHOWING SECTIONS, JOINTS, REINFORCEMENT, AND OTHER PERTINENT INFORMATION FOR APPROVAL.

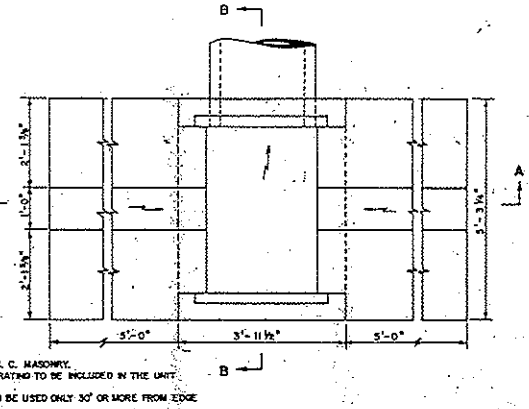


SECTION A-A

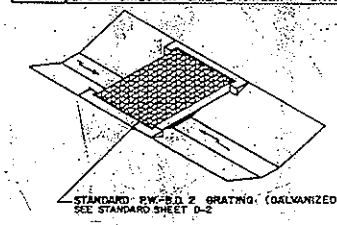


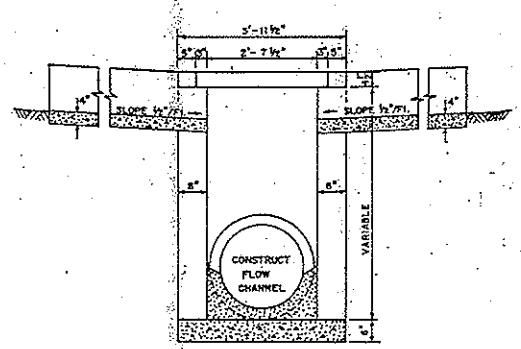
SECTION B-B

P.W.-B.D.-2 MODIFIED #1 CATCH BASIN

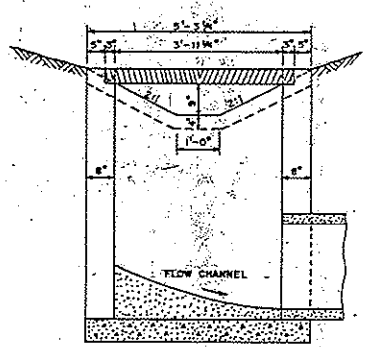


PLAN





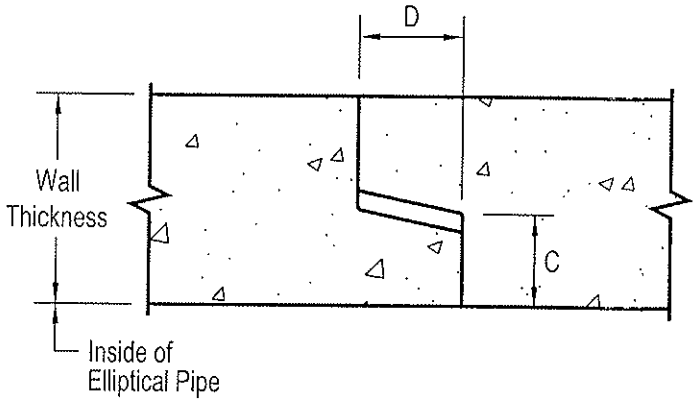
SECTION A-A



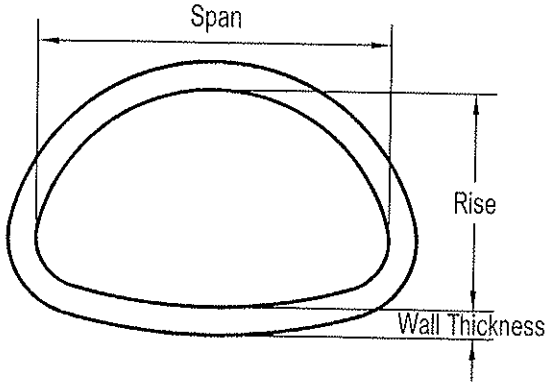
SECTION B-B

P.W.-B.D.-2 MODIFIED #2 CATCH BASIN

Concrete Arch Pipe
15" - 72" Equivalent Diameter



Section Thru Joint



Section Thru Barrel

Table Of Dimensions And Weights							
Round Equivalent (inches)	Inside Dimension (inches)		Wall Thickness (inches)	C (inches)	D (inches)	Full Flow Water Area (Sq. Ft.)	Approx. Weight (lbs / ft.)
	Rise	Span					
15	11	18	3	1 1/4	2 1/4	1.1	130
18	13 1/2	22	3 1/8	1 7/16	2 1/4	1.65	190
24	18	28 1/2	3 1/2	1 1/2	2 3/4	2.8	350
30	22 1/2	36 1/4	3 1/2	1 5/8	3	4.4	468
36	26 5/8	43 3/4	4	1 3/4	3 1/2	6.4	638
42	31 5/16	51 1/8	4 1/2	1 15/16	3 1/2	8.8	878
48	36	58 1/2	5	2 1/4	3 1/2	11.4	1,110
54	40	65	5 1/2	2 5/8	5	14.3	1,375
60	45	73	6	2 15/16	5	17.7	1,513
72	54	88	7	3 3/16	6	25.6	2,113

Pipe dimensions may vary depending upon equipment availability.

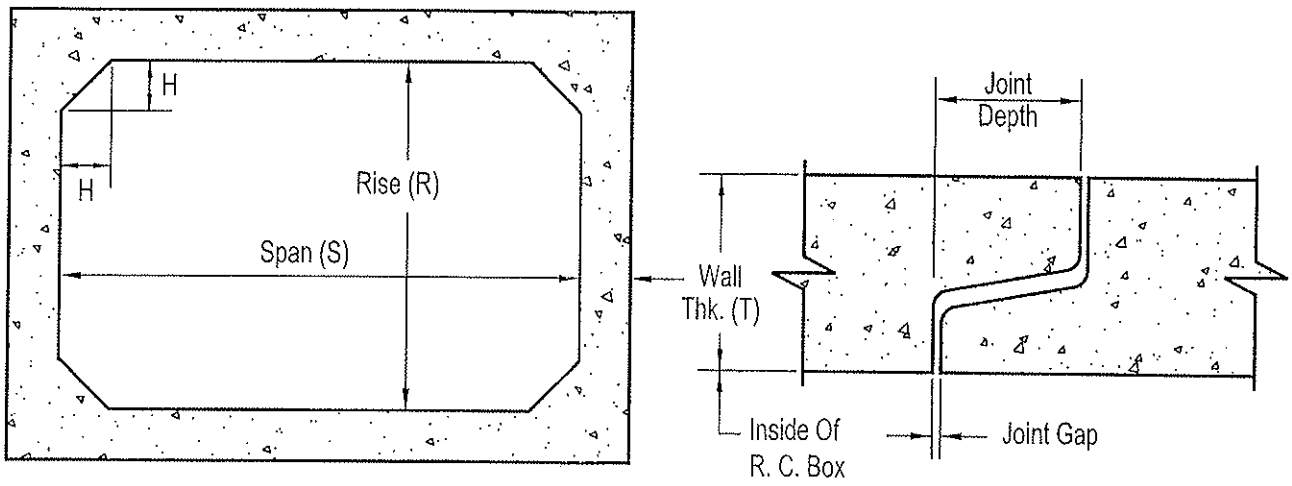
Notes:

1. Produced to meet ASTM Specifications.
2. Contact a Concrete Pipe Division representative for details not listed on this sheet.

Rinker MATERIALS™

Concrete Pipe Division

Reinforced Concrete Box Culvert



Section thru Box Culvert

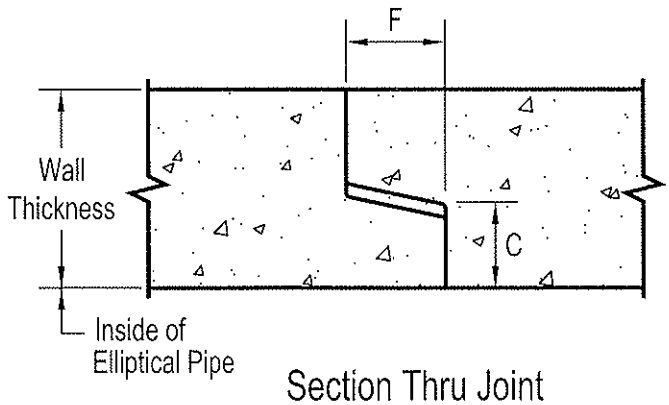
Section thru Box Joint

Span (S) → / Rise (R) ↓	Standard Box Culvert Weights (lbs.) per Foot									
	3	4	5	6	7	8	9	10	11	12
2	605	905								
3	705	1025	1425	1885	2410					
4		1155	1575	2060	2600	2800			4880	5700
5			1725	2235	2800	3000	3655	4375		
6				2410	3000	3200	3885	4625	5430	6300
7					3200	3400	4105	4875		
8						3600	4335	5125	5980	6900
9							4555	5375		
10								5625	6530	7500
11									6810	
12										8100
Wall (T)	4	5	6	7	8	8	9	10	11	12
Haunch (H)	7	7,8	7,8	7,8,12	8,12	8,12	12	12	12	12

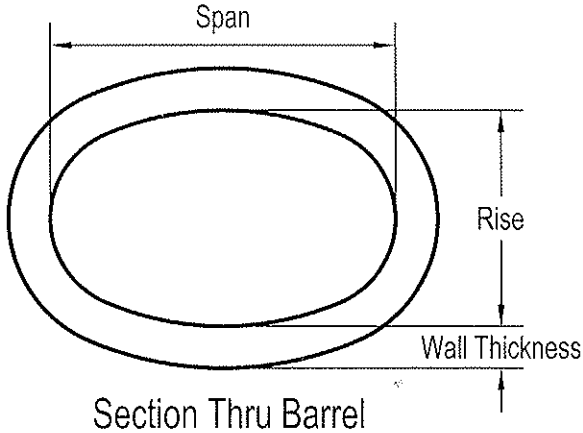
Notes: Box dimensions may vary depending upon equipment availability.

1. Produced to meet ASTM Specifications.
2. Contact a Concrete Pipe Division representative for details not listed on this sheet.
3. Walls, Slabs and Haunches are designed to meet ASTM / AASHTO standards and project specifications.

Concrete Elliptical Pipe
18" - 144" Equivalent Diameter



Section Thru Joint



Section Thru Barrel

Table Of Dimensions And Weights							
Round Equivalent	Inside Dimension (inches)		Wall Thickness	C	F	Full Flow Water Area	Approx. Weight
(inches)	Rise	Span	(inches)	(inches)	(inches)	(Sq. Ft.)	(Lbs / Ft.)
18	14	23	2 3/4	1 1/8	2	1.83	200
24	19	30	3 1/4	1 1/4	2	3.28	310
27	22	34	3 1/2	1 3/8	2 1/4	4.12	380
30	24	38	3 3/4	1 3/8	2 1/2	5.10	450
33	27	42	3 3/4	1 3/8	3	6.33	495
36	29	45	4 1/2	1 3/4	3	7.36	650
39	32	49	4 3/4	1 13/16	3 1/4	8.78	750
42	34	53	5	1 7/8	3 1/2	10.2	850
48	38	60	5 1/2	2 3/16	3 3/4	12.9	1,040
54	43	68	6	2 3/8	4	16.7	1,285
60	48	76	6 1/2	2 5/8	4	20.5	1,535
66	53	83	7	2 3/4	5	24.8	1,815
72	58	91	7 1/2	2 7/8	5 1/2	29.4	2,120
78	63	98	8	3	6	34.6	2,440
84	68	106	8 1/2	3 1/4	6	40.1	2,790
90	72	113	9	3 1/2	6	46.1	3,170
96	77	121	9 1/2	3 3/4	6	52.4	3,560
102	82	128	9 3/4	3 7/8	6	59.1	3,880
108	87	136	10	4	6	66.4	4,200
114	92	143	10 1/2	4 1/4	6	73.9	4,650
120	97	151	11	4 1/2	6	82.1	5,130
132	106	166	12	5	6	99.2	6,150
144	116	180	13	5 1/2	6	118	7,300

Pipe dimensions may vary depending upon equipment availability.

Notes:

1. Produced to meet ASTM Specifications.
2. Contact a Hydro Conduit representative for further details not listed on this sheet.

CMP Sizing	Shape
15"	Round
18"	Round
21"	Round
24"	Round
27"	Round
30"	Round
36"	Round
42"	Round
48"	Round
54"	Round
15" flared end section	Round
18" flared end section	Round
21" flared end section	Round
24" flared end section	Round
27" flared end section	Round
30" flared end section	Round
36" flared end section	Round
42" flared end section	Round
48" flared end section	Round
54" flared end section	Round
14" x 9" (12")	Arc
17" x 13" (15")	Arc
21" x 15" (18")	Arc
24" x 18" (21")	Arc
28" x 20" (24")	Arc
35" x 24" (30")	Arc
42" x 29" (36")	Arc
49" x 33" (42")	Arc
57" x 38" (48")	Arc
64" x 43" (54")	Arc
71" x 47" (60")	Arc
77" x 52" (66")	Arc
83" x 57" (72")	Arc
17" x 13" (15") flared end section	Arc
21" x 15" (18") flared end section	Arc
24" x 18" (21") flared end section	Arc
28" x 20" (24") flared end section	Arc
35" x 24" (30") flared end section	Arc
42" x 29" (36") flared end section	Arc
49" x 33" (42") flared end section	Arc
57" x 38" (48") flared end section	Arc
64" x 43" (54") flared end section	Arc

DELDOT AGR. 2056

KCI PROJECT NO. 00008105_00001

FIELD DATA COLLECTION APPLICATION

STANDARD OPERATING PROCEDURES

APPENDIX C

MAINTENANCE WORK ORDERS

WORK ORDER FUNCTION CODES

Problem Code	Description	Priority	Automatically Select Function Code	Automatically Select Category	Automatically Select Action
RPLFRME	Replace Frame	5	2240.1	Catch Basin, Manhole, French Drain, Dry Well	Maintenance Repair
RPLGRT	Replace grate	3	2240.1	Catch Basin, Manhole, French Drain, Dry Well	Maintenance Repair
RPLGRT	Grate Broken in Half	3	2240.1	Catch Basin, Manhole, French Drain, Dry Well	Maintenance Repair
BURPIPE	Pipe Buried	5	2199.0	Open Drainage Maintenance	All Other
ACCESS	Clear Vegetation	3	2199.0	Open Drainage Maintenance	All Other
REPCURBO	Repair Curb Opening	3	2240.5	Catch Basin, Manhole, French Drain, Dry Well	Hood replacement w/Grate
VACBAS	Remove Accumulated Sediment Debris throughout the structure	3	2250.0	Catch Basin, Manhole, French Drain, Dry Well	Cleaning
CLGPIPE	Remove Accumulated Sediment from Pipe	3	2230.0	Drainage Conduit	Cleaning
OPSTWATE	Open Drainage Standing Water	3	2130.1	Ditch Cleaning and Reshaping	Gradall
OPFLOOD	Open Drainage Flooding	3	2130.1	Ditch Cleaning and Reshaping	Gradall
CLSINK	Closed Drainage Sinkhole	3	2220.1	Drainage Conduit	Maintenance/Repair (Cave in & Joint Repair)
CLFLOOD *	Closed Drainage Flooding	5	2230.0	Drainage Conduit	Cleaning
PIPEREP	Pipe Replace/Repair	5	2220.1	Drainage Conduit	Maintenance/Repair (Cave in & Joint Repair)
RPRJOINT	Repair Pipe Joint	3	2220.1	Drainage Conduit	Maintenance/Repair (Cave in & Joint Repair)
RPRJOINT	Repair Pipe Seal	3	2220.1	Drainage Conduit	Maintenance/Repair (Cave in & Joint Repair)
CURBREP	Curb Repair	3	2240.5	Catch Basin, Manhole, French Drain, Dry Well	Hood replacement w/Grate
CTCHBAS	Catch Basin Repair	5	2240.1	Catch Basin, Manhole, French Drain, Dry Well	Maintenance Repair
EROSION	Repair Erosion Around Structure	3	2120.0	Erosion Repair	Re-grade, Re-shape, Replace Fill/Topsoil
RPRBAS	Repair Loose/Missing Brick or Block	3	2240.1	Catch Basin, Manhole, French Drain, Dry Well	Maintenance Repair
RPRBAS	Tree Roots Breaking Wall	3	2299.0	Closed Drainage Maintenance	All Other

Remove immediate action work orders

* Check Outfall: Under water = no work order; Dry day and basins / pipe flooded but outfall is clear = environmental work order for pipe/basin cleaning.

Statewide Stormwater BMP
&
Stormdrain Infrastructure Inventory and Inspection Maintenance Work Orders

March 27, 2023

Edited March 29, 2023

1. Clear Vegetation (ACCESS)

Issues related to vegetation around structures/conveyances

Priority 3

Vegetation impeding flow in and around structure.

2. Replace / Broken Grate (RPLGRT)

Issues related to grate/cover

Priority 3 = Broken grate/cover; grate missing bar (s) – R/W

Priority 5 = Broken grate/cover; grate missing bar (s) – Out of R/W

Broken:

Priority 2 = Missing grate/ severely damaged – R/W.

Priority 4 = Missing grate/ severely damaged – Out of R/W.

Missing / Severely Damaged:

→ Missing grates outside the R/W will trigger an immediate action workorder even though Priority 4 if a public safety concern.

3. Replace Frame (RPLFRME)

Issues related to frame

Priority 3 = Broken frame / severely damaged –R/W

Priority 5 = Broken frame / severely damaged – Out of R/W

Priority 5 = Moderately broken / damaged frame – R/W

4. Remove Accumulated Sediment/Debris throughout Structure (VACBAS)

Issues related to accumulated sediment/debris in structure

Priority 2 = ≥50% full; flow is severely restricted causing flooding.

Priority 3 = ≥50% full; flow is severely restricted not causing flooding.

Priority 5 = 25 to 50% full; flow is minimally restricted

5. Remove Accumulated Sediment from Pipe (CLGPIPE)

Issues related to accumulated sediment/debris in closed drainage pipe

Priority 2 = ≥50% full; flow is severely restricted causing flooding.

Priority 3 = ≥50% full; flow is severely restricted not causing flooding.

Priority 5 = 25 to 50% full; flow is minimally restricted.

* Note, the highest % of debris in a pipe will be recorded (previously the average)

6. Pipe Buried (BURPIPE)

Issues related to accumulated sediment/debris in open drainage pipe

Priority 2 = ≥50% full; flow is severely restricted causing flooding.

Priority 3 = ≥50% full; flow is severely restricted not causing flooding.

Priority 5 = 25 to 50% full; flow is minimally restricted.

7. Pipe Replace/Repair (PIPEREP)

Issues related to damaged pipe

Priority 2 = **<u>Severe</u>** pipe damage – R/W.

Priority 3 = **<u>Severe</u>** pipe damage – Out of R/W.

Priority 3 = Significant Pipe damage – R/W

Priority 4 = Pipe damage with sinkhole – Out of R/W*

<u>*Unless Severe, Not a Work Order if No Sinkhole is Present and Out of R/W.</u>

7. Pipe Replace/Repair (PIPEREP)- Con't

Issues related to damaged pipe

Priority 2 = **<u>Severe</u>** pipe damage – R/W.

Priority 3 = **<u>Severe</u>** pipe damage – Out of R/W.

Priority 3 = Significant Pipe damage – R/W

Priority 4 = Pipe damage with sinkhole – Out of R/W*

<u>* Unless Severe, Not a Work Order if No Sinkhole is Present and Out of R/W.</u>

7. Pipe Replace/Repair (PIPEREP)- Con't

Issues related to damaged pipe

Priority 2 = **<u>Severe</u>** pipe damage – R/W.

Priority 3 = **<u>Severe</u>** pipe damage – Out of R/W.

Priority 3 = Significant Pipe damage – R/W

Priority 4 = Pipe damage with sinkhole – Out of R/W*

<u>* Unless Severe, Not a Work Order if No Sinkhole is Present and Out of R/W.</u>

7. Pipe Replace/Repair (PIPEREP)- Con't

Issues related to damaged pipe

Priority 2 = **<u>Severe</u>** pipe damage – R/W.

Priority 3 = **<u>Severe</u>** pipe damage – Out of R/W.

Priority 3 = Significant Pipe damage – R/W

Priority 4 = Pipe damage with sinkhole – Out of R/W*

<u>* Unless Severe, Not a Work Order if No Sinkhole is Present and Out of R/W.</u>

7. Pipe Replace/Repair (PIPEREP)- Con't

Issues related to damaged pipe

Priority 2 = **<u>Severe</u>** pipe damage – R/W.

Priority 3 = **<u>Severe</u>** pipe damage – Out of R/W.

Priority 3 = Significant Pipe damage – R/W

Priority 4 = Pipe damage with sinkhole – Out of R/W*

<u>* Unless Severe, Not a Work Order if No Sinkhole is Present and Out of R/W.</u>

7. Pipe Replace/Repair (PIPEREP)- Con't

Issues related to damaged pipe

Priority 2 = **<u>Severe</u>** pipe damage – R/W.

Priority 3 = **<u>Severe</u>** pipe damage – Out of R/W.

Priority 3 = Significant Pipe damage – R/W

Priority 4 = Pipe damage with sinkhole – Out of R/W*

<u>* Unless Severe, Not a Work Order if No Sinkhole is Present and Out of R/W.</u>

8. Repair Pipe Joint (RPRJOINT)

Issues related to pipe joint

Priority 2 = Pipe joint **severely** damaged with sinkhole – R/W.

Priority 3 = Pipe joint **severely** damaged no sinkhole – Out of R/W.

Priority 3 = Pipe joint damage no sinkhole – R/W

Priority 4 = Pipe joint damage with sinkhole – Out of ROW

*Unless Severe, Not a Work Order if No Sinkhole is Present and Out of R/W.

8. Repair Pipe Joint (RPRJOINT) – Con't

Issues related to pipe joint

Priority 2 = Pipe joint **severely** damaged with sinkhole – R/W.

Priority 3 = Pipe joint **severely** damaged no sinkhole – Out of R/W.

Priority 3 = Pipe joint damage no sinkhole – R/W

Priority 4 = Pipe joint damage with sinkhole – Out of ROW

*Unless Severe, Not a Work Order if No Sinkhole is Present and Out of R/W.

8. Repair Pipe Joint (RPRJOINT) – Con't

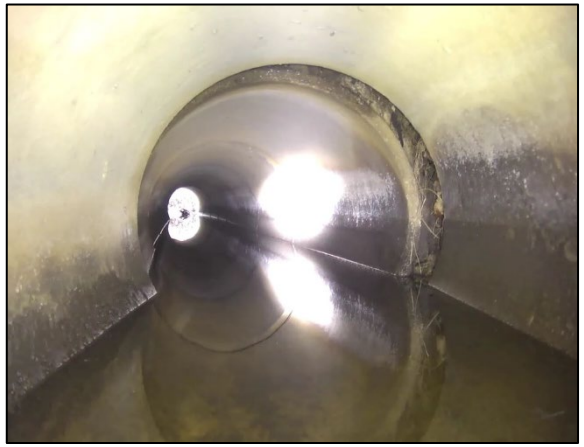
Issues related to pipe joint

Priority 2 = Pipe joint **severely** damaged with sinkhole – R/W.

Priority 3 = Pipe joint **severely** damaged no sinkhole – Out of R/W.

Priority 3 = Pipe joint damage no sinkhole – R/W

Priority 4 = Pipe joint damage with sinkhole – Out of ROW



*Unless Severe, Not a Work Order if No Sinkhole is Present and Out of R/W.

8. Repair Pipe Joint (RPRJOINT) – Con't

Issues related to pipe joint

Priority 2 = Pipe joint **severely** damaged with sinkhole – R/W.

Priority 3 = Pipe joint **severely** damaged no sinkhole – Out of R/W.

Priority 3 = Pipe joint damage no sinkhole – R/W

Priority 4 = Pipe joint damage with sinkhole – Out of ROW

*Unless Severe, Not a Work Order if No Sinkhole is Present and Out of R/W.

8. Repair Pipe Joint (RPRJOINT) – Con't

Issues related to pipe joint

Priority 2 = Pipe joint **severely** damaged with sinkhole – R/W.

Priority 3 = Pipe joint **severely** damaged no sinkhole – Out of R/W.

Priority 3 = Pipe joint damage no sinkhole – R/W

Priority 4 = Pipe joint damage with sinkhole – Out of ROW

*Unless Severe, Not a Work Order if No Sinkhole is Present and Out of R/W.

9. Repair Curb Opening (REPCURBO)

Issues related to curb opening of structure

Priority 2 = Curb opening severely damaged – Adjacent to sidewalk.

Priority 3 = Curb opening damage – No sidewalk.

*Cosmetic concerns will not trigger a work order.

10. Repair Curb (CURBREP)

Issues related to solid curb behind structure

Priority 2 = Curb severely damaged – Adjacent to sidewalk.

Priority 3 = Moderate curb damaged – No sidewalk.

*Cosmetic concerns will not trigger a work order.

11. Closed Drainage Sinkhole (CLSINK)

Issues related to sinkhole near structure/conveyance

Priority 2 = Large sinkhole adjacent to structure.

Priority 3 = Smaller sinkhole adjacent to structure.

12. Erosion Around Structure (EROSION)

Issues related to erosion around structure/conveyance

Priority 2 = Severe erosion in ROW within 10’ of roadway.

Priority 3 = Severe erosion not within 10’ of roadway but in R/W.

Priority 3 = Moderate erosion within 10’ of roadway and in R/W.

*Severe erosion out of R/W will still be noted as poor condition but with no work order generated.

13. Catch Basin Repair (CTCHBAS)

Issues related to a compromised wall of structure

Priority 2 = Catch Basin Collapsing

Priority 3 = Catch Basin damaged / frame / grate moderately unstable

*Cosmetic concerns will not trigger a work order.

13. Catch Basin Repair (CTCHBAS) – Cont'd

Issues related to a compromised wall of structure

Formerly: Repair Loose/Missing Brick or Block; Tree Roots Breaking Wall of Structure (RPRBAS)

Priority 2 = Catch basin wall severely damaged / collapsing

Priority 3 = Catch basin wall has structural damage

*Cosmetic concerns will not trigger a work order

15. Open Drainage Standing Water (OPSTWATE)

Issues related to standing water in swale
(must be present 72hrs after last rainfall)

Priority 3

>75% full of water

16. Open Drainage Flooding (OPFLOOD)

Issues related to water encroaching roadway - open drainage system

Priority 1 – KCI CALL TO DISTRICT

Significant amount of water present in travel lanes and poses immediate safety concern

Priority 3

Water pooling on roadway around open drainage structure

17. Closed Drainage Flooding (CLFLOOD)

Issues related to water encroaching roadway - closed drainage system

Priority 1 – KCI CALL TO DISTRICT

Significant amount of water present in travel lanes and poses immediate safety concern

Priority 2

Water pooling on roadway around closed drainage structure

DELDOT AGR. 2056

KCI PROJECT NO. 00008105_00001

FIELD DATA COLLECTION APPLICATION

STANDARD OPERATING PROCEDURES

APPENDIX D

SPECIAL CASE DRAINAGE SCENARIOS

MS4 INVENTORY AND INSPECTION PROGRAM
APPENDIX D – SPECIAL CASE DRAINAGE SCENARIOS

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APPENDIX D – SPECIAL CASE DRAINAGE SCENARIOS

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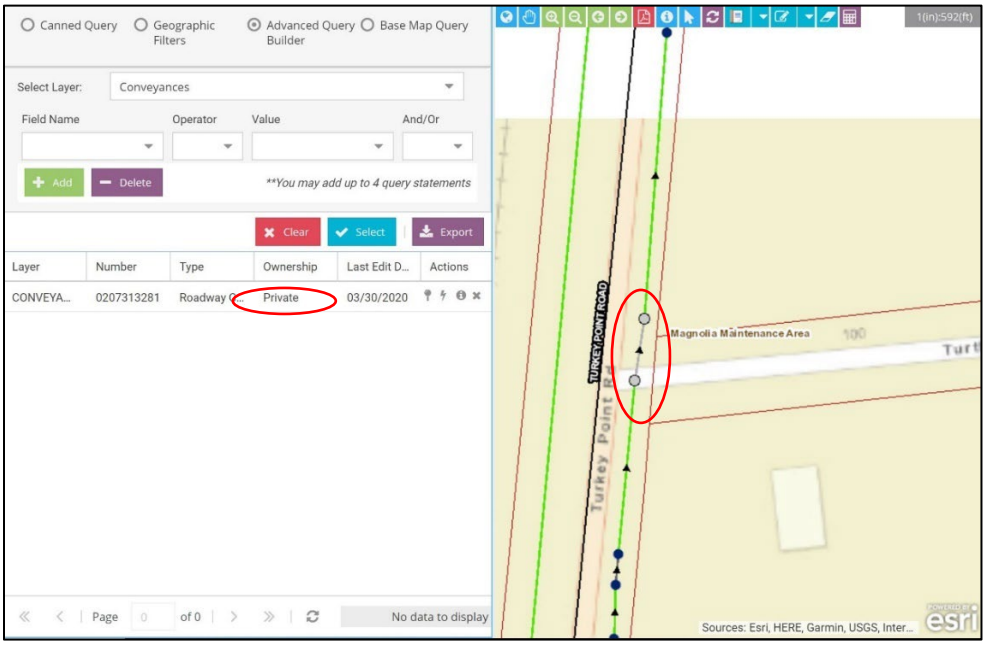
Appendix D – Special Case Scenarios

A. Inventory Guidelines for Common Scenarios

Driveway Culverts, Roadway Culverts, and Access Culverts – (sourced to CS email on 3/15/17 labeled 'Inventory Updates')

- Culvert Points should be used at the ends of both Roadway Culvert Conveyances and Driveway Culvert Conveyances.
    - Guardrail Culvert Conveyances should start with an Inlet pipe and end with a Pipe End.
- Driveway culvert Inspections (Source to Internal MS4 Meeting #44)
    - Fully inspect driveway culverts on highways and major roads. This includes landscape and structure photos of each culvert point, plus upstream and downstream photos.
    - Subdivision driveway culverts do not need a landscape, structure, upstream, or downstream photo. However, the culverts should still be rated on a Good/Fair/Poor rating system and debris percentage should still be noted. A work order should not be added to the structure or conveyance unless there is a safety or flooding issue.
- Roadway Culverts where the drainage continues along the road (i.e. there is a swale coming off the end of the crossroad pipe and continues along the roadway/right of way) should have the swales directly attached to the culvert points.
    - If the drainage flows away from the roadway, then swale points with Connection Type = End should be placed at the end of the swale before they enter the roadway culvert.
        - This also applies for situations where the tax ditch, stream, etc. is only on one side of the road. You should place swale end points on the upstream and downstream ends of the culvert.
    - Roadway culverts along a DelDOT owned road that cross over a non-DelDOT road with a centerline would be collected as a Roadway Culvert with an ownership of Private (sourced to Internal MS4 Meeting #33 and 55).

FIGURE 1
INVENTORY OF A PRIVATE CULVERT



- Driveway Culverts where the drainage leaves the right-of-way should have a swale point with Connection Type = End placed at the end of the swale before it enters the driveway culvert/access culvert. A hydraulic connection should be drawn between the swale end and the starting point of the driveway culvert (culvert point) if the driveway culvert goes under an actual driveway.
- Driveway Culverts where the upstream end was altered by a homeowner (i.e. converted to a catch basin, a grate added on top) the point would have an ownership of Private. If the pipe was also altered, the pipe's ownership should also be Private. (Source to email from Amanda Stevens on 10/8/2021).

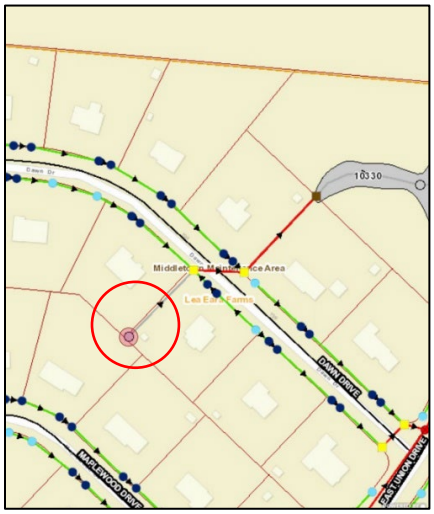
Private Structures Entering DelDOT MS4 – [Sourced to MO email on 2/19/18 labeled 'Private Structures coming into DelDOT's MS4' – This was slightly modified after receiving an email from Emily Seldomridge (DelDOT) on 3/25/2019]

- In the past we have collected private structures as a dummy point (one structure back from DelDOT's ROW) to show connectivity coming into DelDOT's MS4. Now that we have the new database and multiple clients will be using the viewer we have decided to slightly modify this methodology. Please see below:

    - All backyard closed drainage should have a full inventory-inspection conducted with all applicable photos, regardless of ownership. See Section B for ownership guidelines.
    - Structures such as this will be counted in the first and third number of the daily point count.

- Note: Structures within a private parking lot do not follow this rule unless warranted by the specific scenario.

FIGURE 2
INVENTORY OF A BACKYARD PRIVATE STRUCTURE



In-Line Underground Pipes – (Sourced to Internal MS4 Meeting #24)

- This should be represented by a dummy point connected to a pipe connection via pipe conveyance. If there is a change in ownership, the structure classification will go on the pipe connection as outlined in the methodology in Section B.
- Fill out all information you can on the pipe punching in. This includes shape, size, and material. If shape or material can't be determined, the field should be Unknown. If the size can't be measured (which it likely won't), leave the size as 0. (Source to Internal MS4 Meeting #55)

Underdrains – (Sourced to email from Bruce Thompson on 1/20/2021)

- We are only collecting underdrains on major roadways, where underdrains have definitive outfalls. You may need to refer to construction plans when you are deciding where and when to collect to look for underdrain outfalls.

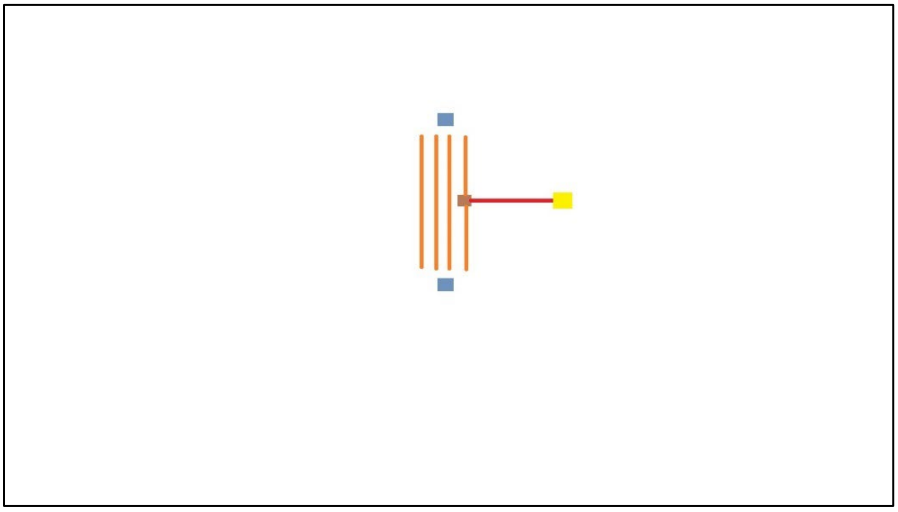
Utilities Going Through Structures/Pipes –

- Leave comment "UTILITIES PRESENT" in the location tab (Source to Internal MS4 Meeting #30). This comment should go before any other comment and comments should be separated by a period. (Source to Internal MS4 Meeting #32)
- A Utilities Present memo should then be created upon returning to the office (Source to Internal Meeting #35).

Barrel Conveyance

- When to use a Barrel Conveyance – (Sourced to MO email on 6/8/17 labeled 'Barrel Conveyance Clarification')
    - If you have a Pipe Connection that notes a change in pipe size/material between two pipe segments, a barrel conveyance SHOULD be created. **Note, as of 12/17/2021, this type of barrel conveyance has temporarily been put on hold**.
    - If you have multiple barrels, a barrel conveyance SHOULD be created.
        - This includes crossroad pipes that contain multiple pipes, which is the most common scenario.
        - This also includes multiple barrels that start and end in the same location but have structures along them. The most common case of this is when two parallel pipes convey a stream across the road but only one of those pipes has catch basins on top of it.
        - This scenario does not get a barrel inspection, as often the barrel inspection is the same as the segment inspection.
- If there is a barrel conveyance with multiple barrels and closed drainage is entering only some or one of the barrels, all the barrels should be inventoried as roadway culverts.
    - Example: four-barreled barrel conveyance with structures connected to only one of the barrels.
        - The pipe segments of the barrel with structures attached are still inventoried as roadway culverts and are snapped directly to the structure they are connected to.
        - In the end there should still only be two total culvert points and 4 total barrels making up one-barrel conveyance.

FIGURE 3
INVENTORY OF A MULTI-BARRELED BARREL CONVEYANCE



Streams Within the Right-of-Way – (Sourced to MO email labeled 'DelDOT MS4 within ROW that is in line with a Blue Line Stream')

Open Drainage

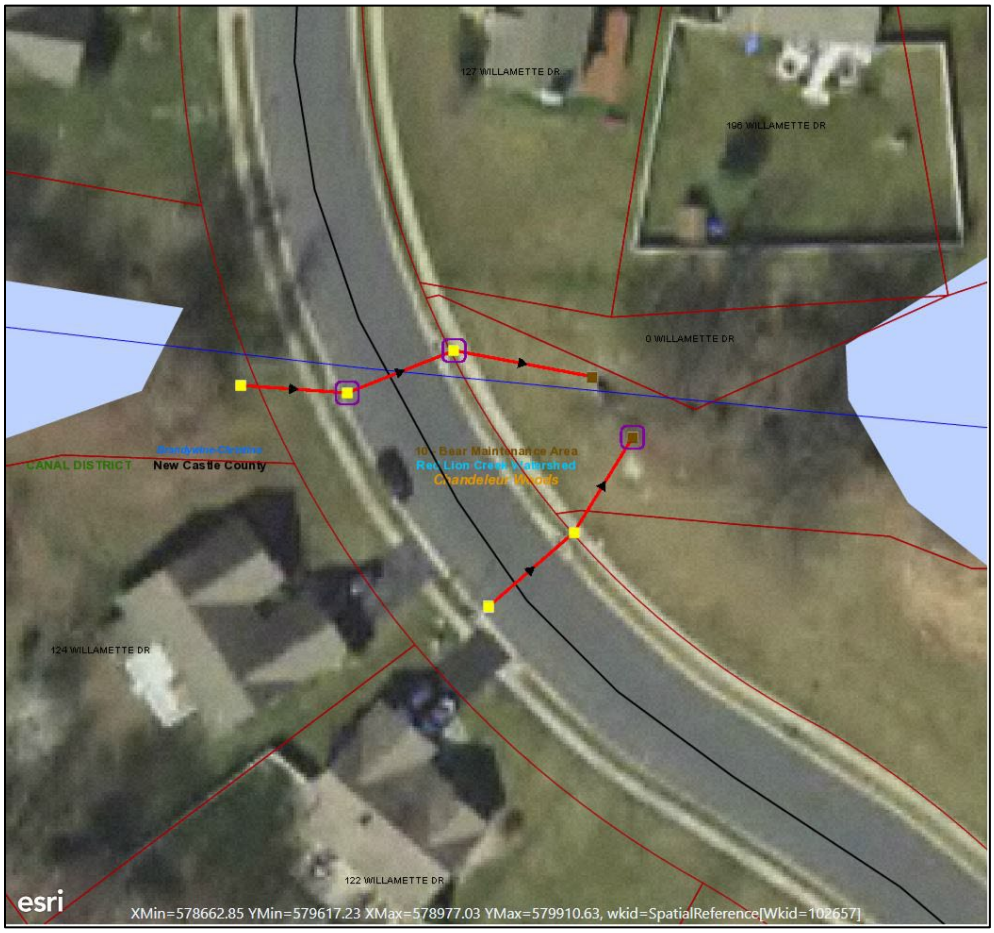
- In the case where a blue line stream is running in line with open drainage, all MS4 drainage should be inventoried.
- If the drainage entering the stream is open drainage, a swale end should be placed before the stream enters the ROW.
- All open drainage should be connected with hydraulic connections instead of swales, and if the stream flows toward a roadway culvert, a hydraulic connection can be tied directly into the roadway culvert because a swale end will be further upstream before the stream enters the ROW. (Source to Internal MS4 Meeting #29)

FIGURE 4
INVENTORY OF A STREAM CONVEYED BY OPEN DRAINAGE

Closed Drainage

- When a stream enters closed drainage MS4, all structures that take in water from the road while also conveying the stream should be marked as Outfalls (see Section B). (Source to Internal MS4 Meeting #56)
    - The idea is that the ideal sample location would be before the roadway drainage enters the stream water, otherwise the drainage will be diluted.

FIGURE 5
INVENTORY OF A STREAM CONVEYED BY CLOSED DRAINAGE



Arch Pipes in the Field Tool (Source to Internal MS4 Meeting #33)

- Verify whether the dimensions properly saved. Sometimes the viewer won't save dimensions, but the field tool will and vice versa depending on the situation. This is an issue with migrated pipes. Changed arch pipe dimensions carry over from one pipe to another, but the dimensions don't save.
- Either change the pipe shape to another shape and change back to arch or change the dimensions to a different preset set of dimensions and change it back to the correct one. Use below arch pipe dimensions as a reference.

TABLE 1
ARCH PIPE DIMENSIONS

Cross_Sectional_Area_SqFt	Width	Height
1.1	17	13
1.6	21	15
1.7	20	16
2.3	23	19
2.2	24	18
3	27	21
2.9	28	20
4.7	33	26
4.5	35	24
6.7	40	31
6.5	42	29
9.2	46	36
8.9	49	33
11.7	53	41
11.6	57	38
15.6	60	46
14.7	64	43
19.3	66	51
18.1	71	47
23.2	73	55
21.9	77	52
27.4	81	59
26	83	57
32.1	87	63
37	95	67
42.4	103	71
48	112	75
54.2	117	79
60.5	128	83
67.4	137	87
74.5	142	91
81	150	96
89	157	101
98	164	105
107	171	110

DelDOT Special Investigations –

- Add the comment "SPECIAL INVESTIGATION" in every inspection, not the location tab. (Source to Internal MS4 Meeting #34)
- If there is a second comment needed, add a period after the comment "SPECIAL INVESTIGATION" and then add the second comment. (Source to Internal MS4 Meeting #35)

Curb Cuts – Attach both a landscape and structure picture to the inspection. (Source to Internal MS4 Meeting #34)

Structures Not Inspected – When a structure is not inspected, be sure to fill in as much information as possible in the Inventory tab. (Source to Internal MS4 Meeting #35)

(Source to Internal MS4 Meeting #52) If you know the condition of the structure or component (can see it), fill out Inspected drop down as Yes and rate all components you can see. Leave the rest of the components Not Inspected.

- If a structure is filled w debris, you can still rate frame, grate, curb…etc. Inspected = Yes, even if it cannot be opened bc of the debris, overall rating will be Poor and work order will be created for debris -DelDOT wants to be able to see accurate numbers of poor ratings.
- This does not apply to a driveway culvert filled with sediment/buried-only buried/filled with sediment structures/pipes needing work orders.
- Always inspect what you can, if getting a work order it needs a poor inspection.
- Note if the sediment is causing water to back into the system.
- For a large work order area (multiple structures/conveyances) create ONE work order and mention the other structures/conveyances in the work order comment.

Trench Drains – (Source to Internal MS4 Meeting #69)

- Example – Conveyance 0110336462
- https://www.arconcrete.com/products/trench-drains/
- The inlet should be placed at the most upstream end of the trench drain and receive wall measurements. Two comments should be placed on the inlet:
  - "TRENCH DRAIN."
  - There should also be a comment referring to the number of grates. Ex: "STRUCTURE HAS 71 GRATES."
- The conveyance drawn should represent the length of the trench drain and should have a comment of "TRENCH DRAIN."

Slotted Drains – (Source to Internal MS4 Meeting #69)

- https://ncspa.org/steel-product/pipes/slotted-drain-pipe/
- Conveyance receives a comment of "SLOTTED DRAIN."

Deleting Structures with Water Quality Inspections – (Source to Internal MS4 Meeting #33)

- Confirm there are no Water Quality Inspections present.
- If possible, please move the existing pipe/swale end point to preserve data.
- If you need to delete, see 2070 staff, and do not delete.

Pipe Material that is not in the Field Tool – Choose "other" as the material and add a comment. (Source to Internal MS4 Meeting #36)

Concrete Swales Within the Right of Way – Concrete swales within the right-of-way that cross from one side of the road to the other should be inventoried. (Source to email from SE on 7/1/2021)

- Two swale points with the type "Midpoint" should be placed on either end of the concrete swale. A concrete swale should be drawn from the upstream end to the downstream end.
- If private drainage enters a roadway concrete swale in the right of way then leaves the right of way and the private swales have not been inventoried, collect private swales to give context (don't need to "chase").

Structures Filled with Water/Debris – Any structure that can be opened is considered inspected. This is so the debris percentage can accurately be filled out.

Inspecting Pipes Punching into Structures – Underdrains and sump pumps should be inventoried but not inspected. Roof drains should not be inventoried. If roof drains are already inventoried DO NOT delete but instead add a comment explaining what it is. Because sump pumps have a structure classification of Non MS4 Connection (see section below), they do not need a comment.

Structures on Interstates and/or Expressways – The address should be the name of the Interstate (I-495, I-95, I-295, SR-1). NB or SB should be placed in the Location comments before any other comment. **Note**: If a road has buildings on it with addresses, the road name should be spelled out (DuPont Highway, Coastal Highway, Pulaski Highway, etc.). (Source to Internal MS4 Meeting 67)

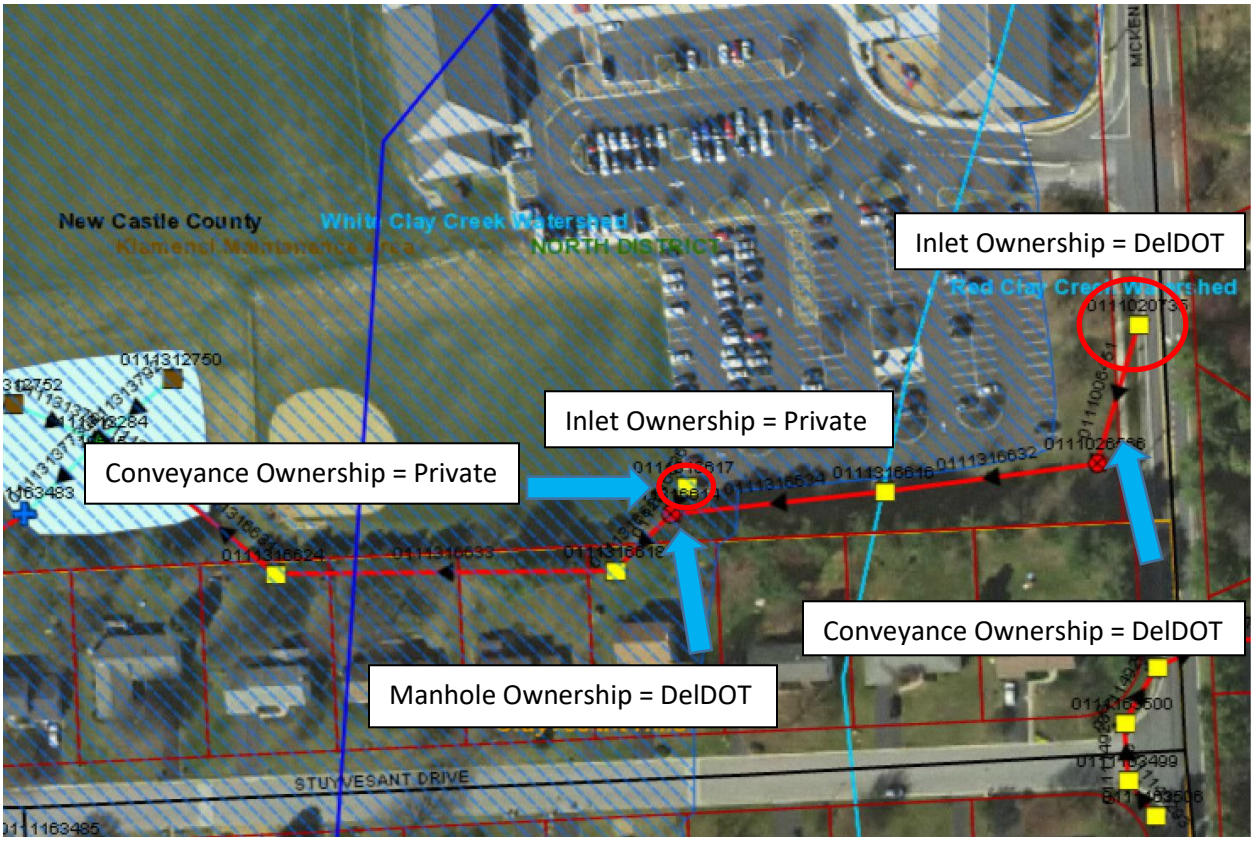
Address Line – See above for Interstate/Expressway guidelines. Cardinal directions go at the front of the address (EAST SAVANNAH DRIVE). Pipe Connections do not need a house number. Any structure or conveyance with a work order should get a house number. Add a house number to swale ends with possible. (Source to Internal MS4 Meeting 67)

B. Guide to Ownership, Structure Classification, Role, Outfall vs Outlet, Roadway vs Subdivision, and Point Count

Ownership – (Sourced from Internal MS4 Meeting #29)

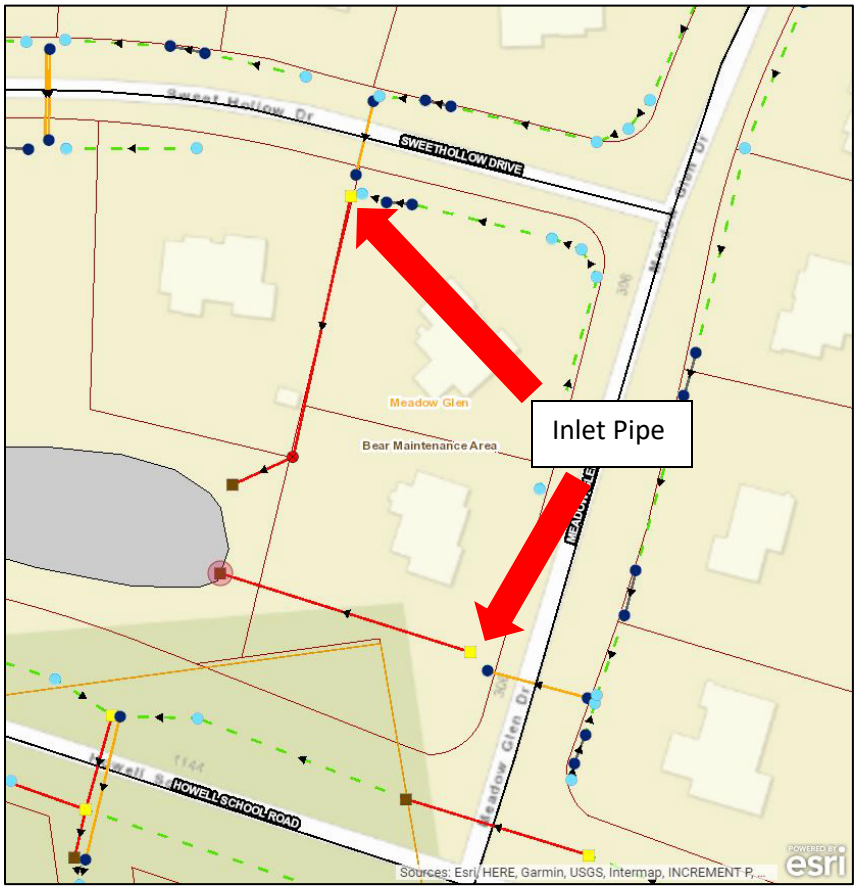
- Structures within the DelDOT right-of-way will have an ownership of DelDOT.
- Structures outside the DelDOT right-of-way will NOT have an ownership of DelDOT (unless conveying DelDOT drainage outside of a parking lot).
- Structures on a DelDOT road will have an ownership of DelDOT.
    - An exception to this rule is inlet pipes. Even if the inlet pipe is not in the right-of-way, the ownership of that inlet pipe will be the same as its associated conveyance because the inlet pipe is not a true structure, just the end of a pipe.
    - Structure 0111163519: Culvert conveys natural stream from one side to the other, therefore DelDOT owns it. (Source to Internal MS4 Meeting #44)
- Conveyances between two DelDOT structures will have an ownership of DelDOT.
- Conveyances that leave a DelDOT structure and go into a structure with a different ownership will have an ownership of DelDOT.
- Conveyances that enter a DelDOT system from a structure not owned by DelDOT will NOT have a DelDOT ownership.
- All field crews should NOT collect any backyard open drainage. When you come across backyard open drainage the lead scientist will advise on whether it should be collected or not. Be sure to check the subdivision construction plans for an easement. (Sourced from MO email on 10/6/2017 labeled “Backyard Open Drainage”)
- Collect all backyard closed drainage. Backyard drainage that accepts roadway runoff should have an ownership of DelDOT. All other backyard drainage should be collected and marked as private. All drainage should have full inspections and photos regardless of ownership. (Source to Internal MS4 Meeting #32)
- If DelDOT requests an ownership that goes against one of these guidelines, add a comment so it does not get changed during a cleanup task (Source from MO email on 9/7/2021 labeled “Ownership Question – Meadowdale Drive”)

FIGURE 6
BACKYARD CLOSED DRAINAGE OWNERSHIP EXAMPLE



- Conveyances take the ownership of the structure upstream.
- Open Drainage Pipes/Driveway Culverts leaving DelDOT right-of-way (Structure 0110201290).
    - If there are plans that show an easement, collect as a DelDOT inlet/outfall.
    - If there are no plans that show an easement, collect as an Unknown driveway culvert.
    - If the pipe is outside the right-of-way (greater than 50 feet from the centerline) then use discretion on if it should be collected at all.
        - If you are doubtful, do not collect it.
        - If the existing swales behind backyards are coming into DelDOT's right-of-way, mark as private. (Source to Internal MS4 Meeting #33)
    - Structure 0111160575: Structure and everything downstream is DelDOT owned because there is an easement. If there was no easement, the downstream inlet and all downstream drainage would be Private until the drainage entered DelDOT right-of-way again. (Source to Internal MS4 Meeting #44)
    - Structure 0110326364: Structure and everything downstream is Private owned because the structure is not conveying a stream and there is not an easement. (Source to Internal MS4 Meeting #44)

FIGURE 7
BACKYARD DRIVEWAY CULVERT EXAMPLE



- Open Drainage Pipes/Driveway Culverts coming into DelDOT right-of-way:
  - Collect as "Private" if it is already inventoried.
  - Reminder: Do not collect backyard open drainage.
- NCC-Private BMPs – Drainage flowing from a New Castle County-Private BMP should be classified as New Castle County-Private until it ties back into DelDOT's system. (Source to email from Matt Ortynsky on 10/12/2021)
- Manholes in the roadway that are surrounded by asphalt:
  - If the manhole is on the plans, the ownership is DelDOT.
  - If the manhole is not on the plans, follow up with CS/MO (Sourced from Internal MS4 Meeting #43)
- 6 ways to determine ownership:
  - Whether the MS4 conveys DelDOT runoff (Source to Internal MS4 Meeting #43)
  - NCC Parcel Search
  - Atlas
  - Acceptance Letter
    - Structure 0111319400. Manhole is in the right-of-way but technically does not convey roadway runoff. The acceptance letter indicates that DelDOT, "assumes no responsibility for closed drainage systems, including inlets and pipes, outside the right of way, that do not convey

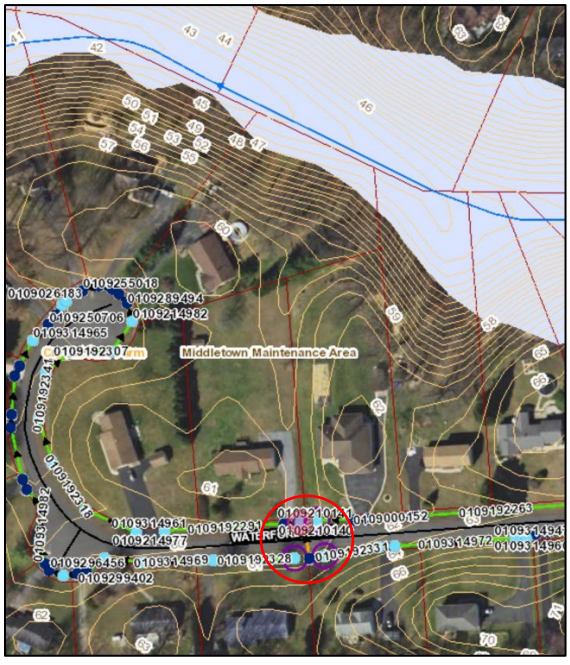
roadway runoff." KCI is following up with DelDOT to confirm ownership of this structure and other such manholes in the neighborhood. (Source to Internal MS4 Meeting #44)

- Construction plans
  - Example: Structure 0111163528. Structure is on the original plans for the neighborhood and within the right-of-way. Even though the structure is behind a curbed road, it collects roadway runoff from an uncurbed area upstream, so DelDOT owns it. (Source to Internal MS4 Meeting #44)
- Whether the structure conveys a stream (natural or blue line).
  - Example: Structure 0111124273. Conveys a natural channel, and the pipe was put in to prevent the road from overtopping. (Source to Internal MS4 Meeting #44)
- If DelDOT makes a special ownership change comment, use comment "OWNERSHIP DETERMINATION MADE BY DELDOT (MM-DD-YY EMAIL)" (Source to Internal MS4 Meeting #46)

Structure Classification – (Sourced from Internal MS4 Meeting #29)

- Determined based on the ownership of the conveyances entering and leaving.
- Structures with the same ownership on all conveyances entering and leaving will have a structure classification of N/A.
  - Structures entering easements that flow directly to a stream or stream-fed wetland will have a structure classification of N/A.

FIGURE 8
EXAMPLE OF DRAINAGE ENTERING EASEMENT THAT FLOWS DIRECTLY TO WETLAND



- Structures can have a structure classification of MS4 Connection in a variety of circumstances.
    - Structures that have a conveyance attached that has an ownership of a different MS4 (New Castle County, Dover, Elsmere, etc).
    - Structures that flow into a different MS4, most commonly a pipe end/swale end of a system flowing into a BMP with a different MS4 ownership than the pipe end (DelDOT pipe ends in New Castle County flowing into a New Castle County BMP).
        - This does NOT apply to pipe ends/swale ends entering private, HOA owned, NCC-Private, or Private-NCC BMPs.
- Dummy nodes directly connected to a pipe representing a sump pump will have the structure classification of Non-MS4 Connection.
    - Reminder – The sump pump pipe will have an ownership of Private due to the ownership of the dummy point on the upstream end. (see above section on Ownership)
    - If backyard drainage is clearly private drainage (parking lots, etc.) and enters DelDOT drainage, dummy point the first basin and comment approximately how many structures are upstream. These structures should be a Non-MS4 Connection. (Source to Internal MS4 Meeting #32)
- Structures can have a structure classification of Private Connection in a variety of circumstances.
    - Structures that have a private pipe entering (from a backyard structure, from a structure in a private parking lot, etc).
        - This does not apply if the private pipe is a sump pump. (see above)
    - Structures that flow into private drainage. This includes pipe ends/swale ends that enter private or HOA owned BMPs (commonly in Kent/Sussex County) as well as NCC-Private and Private-NCC BMPs.
    - Structures **in all counties** that enter easements not flowing to a stream or stream-fed wetland, but instead flow back into MS4 drainage downstream.

See Structure Classification_Role_Ownership Flow Chart for further information

Role – (Source to Internal MS4 Meeting #29)

- Determined based on the ownership of the structures on the upstream and downstream end of a conveyance.
- If the ownership of the structures on the upstream and downstream end of a conveyance are the same, the role of the conveyance will be N/A.
- If the ownership of the structure on either the upstream or downstream end of a conveyance is private and the structure on the opposite end is DelDOT, the role will be

either “From Private to DelDOT” or “From DelDOT to Private” depending on which end of the conveyance has which ownership.
    - This does not apply to conveyances in which the upstream structure has a structure classification of Non-MS4 Connection (sump pump).
- Conveyances which have an upstream structure that has a structure classification of Non-MS4 Connection will have a role of “From Non-MS4 to DelDOT.”
- If the ownership of the structure on either the upstream or downstream end of a conveyance is New Castle County and the structure on the opposite end is DelDOT, the role will be either “Outflow from NCCo to DelDOT” or “Outflow from DelDOT to NCCO” depending on which end of the conveyance has which ownership.

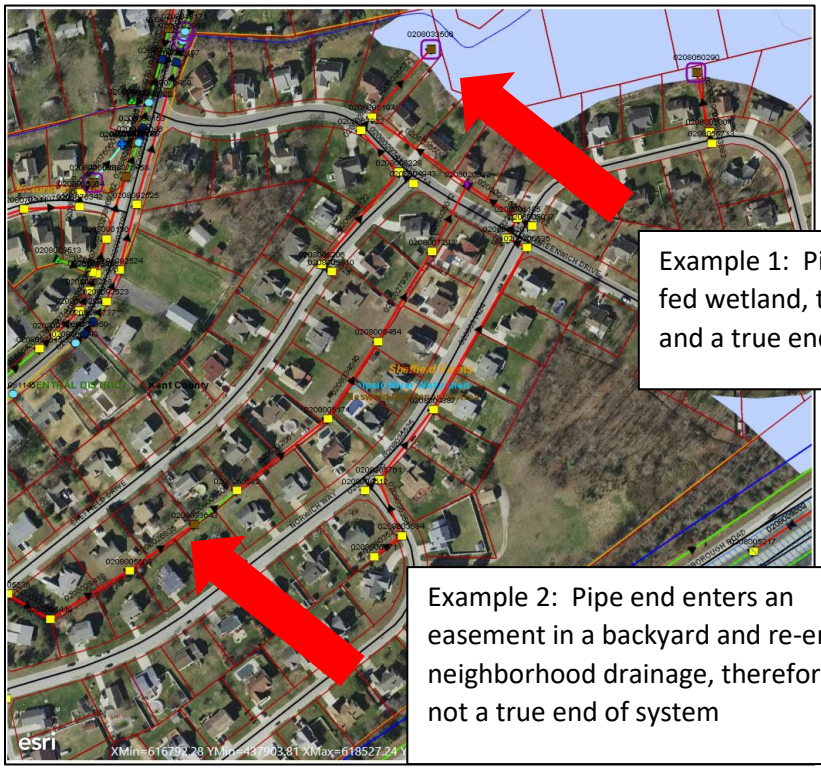
See Structure Classification_Role_Ownership Flow Chart for further information

Outfall vs Outlet – (Sourced from Internal MS4 Meeting #29)

- An outfall is the final discharge point of a system. Drainage will leave an outfall and never return to any MS4 or private drainage.
    - Outfalls will always be counted as an end of system (second number in the point count).
    - Any structure classified as NPDES will be inventoried as an outfall.
    - If the drainage leaves the system and flows directly to a stream deemed “Waters of the US,” it will be inventoried as an outfall.
    - If drainage flows to an easement that conveys the drainage directly to a stream or stream-fed wetland, it will be inventoried as an outfall.
- An outlet is NOT the final discharge point of the system. The drainage will flow into another MS4 or private drainage.
    - Outlets will only be counted as an end of system (second number in the point count) if the drainage downstream of the outlet is a BMP or tax ditch.
    - An end of system that flows to an easement and re-enters an MS4 will be inventoried as an outlet with “Discharge Downstream Type” as “Easement” and “Ownership Downstream” as “Private”. These structures will not be counted in the second number in the point count.
    - An end of system that flows to an easement, which then flows to a BMP, will have “Discharge Downstream Type” as “BMP” if the end of system is in the general area of the BMP and will be counted in the second number of the point count. If the end of system is not in the general area, “Discharge Downstream Type” should be “Easement.” (Source to Internal MS4 Meeting #30)
- Swale ends that do not leave the right-of-way should not be classified as either an outfall or outlet. However, these points should be counted as an end of system in the final point count.

- For open drainage flowing to another state through a field, make the swale end an Outfall and label the outfall as not NPDES. (Source to Internal Meeting #28)

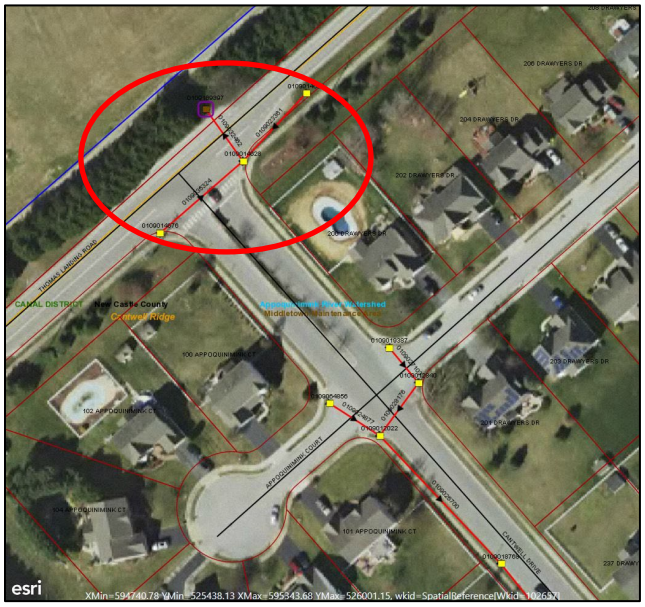
FIGURE 9
EXAMPLES OF AN OUTFALL AND OUTLET



Roadway vs. Subdivision – (Sourced from Internal MS4 Meeting #28)

- Any structures that are located on the main road but considered part of the subdivision's drainage should be labeled as Roadway AND counted as part of the nearest subdivision roadway.
- DelDOT roadway ROW is generally considered to be 50 feet.

FIGURE 10
ENTRANCE DRAINAGE ROADWAY VS SUBDIVISION
EXAMPLE



The system circled in red were on the subdivision's construction plan and were accepting roadway runoff from the subdivision. Since they are located on Thomas Landing Road they were labeled 'Roadway' but also inspected as part of the subdivision and counted with 'Cantwell Ridge Drive'.

Point Count

DelDOT point count consists of three numbers:

- The first number includes DelDOT physical structures and all ends of systems. These include inlets, manholes, pipe ends, junction boxes, control structures, and swale ends.
- The second number includes DelDOT ends of systems. These are typically pipe ends or swale ends where drainage is leaving the right-of-way and not returning. See above sections on Structure Classification and Outfall vs Outlet.
- The third number is the total point count. This includes every type of structure including those listed above, dummy points, pipe connections, culvert points, and all types of swale points. This does NOT include temporary dummy points.

C. Work Orders

- **Determining if a Structure or Conveyance is a Work Order**:
  - Pictures and examples shown below.
  - Source to Internal MS4 Meeting #36 and 51.

Structures

1. Structure 0112039375 – No (integrity of the wall is still there)

2. Structure 0112056622 – Yes (concrete block at the top is beginning to fall inward)

3. Structure 0208127058 – No (integrity of the wall is still there)

4. Structure 0111114854 – No (integrity of the wall is still there)

5. Structure 0112005672 – Yes (safety issue)

6. Structure 0112042251 – No (sinkhole does not break the wall of the structure)

Conveyances

7. Conveyance 0207034250 – No unless there is a sinkhole forming above the pipe

8. Conveyance 0208003249 – Depends on last rain date (Valid = Yes, Invalid = No)

9. Conveyance 0208200253 – No (also depends on last rain date)

- **Choosing a Supervisor** (Source to Internal MS4 Meeting #38)

TABLE 2
MAINTENANCE WORK ORDER ASSIGNMENT SUMMARY

County Code	District	District Superintendent	Area	Maintenance Area Work	Maintenance Area Work Employee ID	Area Supervisor (Not in Database)	Area Supervisor Employee ID	Area Supervisor Assigned Work Orders - BMP	Area Supervisor Assigned Work Orders - Stormdrain Infrastructure
1	South	Jeff Revel	1	Wendy Marker	029395	Wendy Marker	029395	All	Non-crossroad pipes
1	South	Jeff Revel	2	Dexter Massey	112034	Dexter Massey	112034	All	Non-crossroad pipes
1	South	Jeff Revel	3	Frank Zimmerman	112286	Frank Zimmerman	112286	All	Non-crossroad pipes
1	South	Jeff Revel	4	Duane Rust	139371	Duane Rust	139371	All	Non-crossroad pipes
1	South	Jeff Revel	5	John Marvel	55771	John Marvel	55771	All	Non-crossroad pipes
1	South	Jeff Revel	20	Glenn Phillips	74388	Glenn Phillips	74388	None	Crossroad pipes for all South District
2	Central	Duwayne Shaffer	6	BJ Lewis	046387	BJ Lewis	046387	Vegetation/Trash Only, Minor Erosion	All Roadway Work Orders

2	Central	Duwayne Shaffer	7	Wayne Mast	151921	Wayne Mast	151921	Vegetation/Trash Only, Minor Erosion	All Roadway Work Orders
2	Central	Duwayne Shaffer	8	Brian Parton	151203	Brian Parton	151203	Vegetation/Trash Only, Minor Erosion	All Roadway Work Orders
2	Central	Duwayne Shaffer	21	Billy Keen	150812	Billy Keen	150812	Non-Vegetation/Trash Work Orders, Major Erosion for all Central District	All Subdivision Work Orders
3	Canal	Troy Foraker	9	Steve Loper	093921	Steve Loper	093921	All excluding SR-1/US-301 and SR-1/US-301 Ramps	None
3	Canal	Troy Foraker	10	Joseph Baker	105809	Joseph Baker	105809	All excluding SR-1 and SR-1 Ramps	None
3	Canal	Troy Foraker	22	Jeff Trent	109768	Jeff Trent	109768	None	All
3	Canal	Troy Foraker	26	Gene Kerpen	118092	Gene Kerpen	118092	All for SR-1 and SR-1 Ramps / US-301	None
3	North	Stewart Douglass	11	Josh Kavelak	167961	John Davis	116406	All (Excluding I-95)	None

3	North	Stewart Douglass	12	Josh Kavelak	167961	Brian Kohr	142529	All (Excluding I-95)	None
3	North	Stewart Douglass	13	Josh Kavelak	167961	Josh Kavelak	167961	None	All (Sent to Josh)
3	North	Stewart Douglass	14	Josh Kavelak	167961	Joe O'Neal	122538	All I-95 (Including all I-95 in Canal)	None

Updates Made Per Email Comments

- **Writing a Work Order** –
  - Rating a structure/conveyance as "Poor"
    - If the condition of the pipe is Poor but does not require a work order under new methodology, add a comment to the inspection detailing the defect. (Source to Internal MS4 Meeting #51).
    - For defects unrelated to the structure condition, instead of rating the Overall Condition as Poor, nothing will be rated as Poor. Instead, a comment will be left on the work order. For example, for sinkholes, the comment will be "REPAIR SINKHOLE ADJACENT TO STRUCTURE XXXX. NO DEFICIENCIES IDENTIFIED WITHIN STRUCTURE OR CONNECTING CONVEYANCE(S)." (Source to Internal Meeting #51). See the MS4 Standardized Comments SOP.
    - Be sure to walk the entire length of a pipe when possible, to ensure no ground level sinkholes are missed. (Source to Internal Meeting #50)
  - Populate the house number for all structures and conveyances with a work order. On major roadways, use a mile post marker in place of a house number. If on a minor road with no houses nearby, reference how many feet the work order is from the nearest intersection. (Source to Internal MS4 Meeting #44)
  - If there are multiple problems with a structure or conveyance, each problem gets their own comment separated by a period. (Source to Internal MS4 Meeting #32).
  - Use the % symbol; do not write out "Percent". (Source to Internal MS4 Meeting #37)
    - When filling out debris percentage, always go with the highest percentage within the pipe. If the pipe is 100% blocked at one end and 0% at the other, debris should be filled out as 100%. (Source to Internal Meeting #50)
  - Every problem code used should be referenced in the WO comments. Make sure your problem codes specifically align with the structure/conveyance it is associated with. (Source to Internal MS4 Meeting #37)
  - If you must delete a problem code from an existing work order, use the viewer to make sure it saved properly. (Source to Internal MS4 Meeting #37)
  - Include action and ID number in the work order comments (Ex: repair, remove, replace) (Sourced from Internal MS4 Meeting #43)
  - Standard Work Order Comments can be found in the MS4 Standardized Comments SOP.
    - Note: A structure is not submerged if you can open it and look in; that would be considered full of water. A structure is not buried if you can open it and look in, that would be considered full of sediment. (Source to Internal MS4 Meeting #38)
    - Note: Make sure you distinguish between rust and corrosion when assessing pipes. Corrosion should be used when the pipe is deteriorating. Rust refers to when it is "discolored." (Source to email from CS on 2/3/2022)

- CREATE DATE matters. If a work order must be back dated to a date in a different quarter, email CS and ask her to fix the date. (Sourced to Internal MS4 Meeting #43)
- When two pipes are failing in a multi-barrel conveyance, a work order needs to be generated for both failing conveyances. In each work order comment, reference that the pipe is part of a barrel and mention the other failing pipe. The work order goes on the conveyance, not the barrel. (Sourced to Internal MS4 Meeting #45)
- Grate in the bottom of a structure (Source to Internal MS4 Meeting #46)
    - Create a Work Order.
    - If there are no defects, do not rate anything as Poor.
    - Use "Removed accumulated sediment/debris" as the problem code.
    - If it can be removed safely without entering the structure, remove and take it to nearest maintenance yard.
- 2056 Watch List
    - Cancelled work orders will be revisited in 2 years by DelDOT. (Source to Internal MS4 Meeting #51)
- Pipe Buried vs Clogged Pipe (Source to Internal MS4 Meeting #51)
    - Pipe Buried – An open pipe that isn't exposed.
    - Clogged pipe – between two catch basins.
    - Work orders should not be generated for pipe ends if they are not accessed and there are no issues (flooding, sediment upstream, etc.) If there is an issue, create a work order on the issue upstream and mention "Unable to locate downstream structure. Potentially buried." (Source to Internal Meeting #52).
    - Do not create a work order for poor downstream channels unless there is a flooding issue. These issues should be sent to the field manager. If there is a flooding issue due to downstream erosion, create work order on pipe end – "Remove accumulated sediment within and downstream of Structure XXXX". (Source to Internal MS4 Meeting #52)
- If a frame sinks below the concrete on the road, it should be labeled as Immediate Action. (Source to Internal MS4 Meeting #57)
- If a pipe seal is damaged, rate it Poor. No need to mention this in the work order (gets covered with the wall) unless there is something else odd. (Source to Internal MS4 Meeting #57)
- If a pipe end has erosion and is detached, the pipe end is rated Poor and the pipe is rated Fair. (Source to Internal MS4 Meeting #58)
- Mark inlets with silt bags as a defect. (Source to Internal MS4 Meeting #62)
    - Use Remove Accumulated Sediment Problem Code.
    - Send to Matt like you would an Immediate Action Work Order.
    - "REMOVE SILT BAG FROM STRUCTURE #. NO ACTIVE CONSTRUCTION IN AREA."

- **Selecting a Work Order Problem Code**
  - Refer to 2023 Maintenance Work Order SOP. (Source to Internal Meeting #51)

- **Initial Inventory Work Orders**
  - Initial inventory means the structures/conveyances being worked on have never been inventoried or inspected before and are being added into the field tool for the very first time.
  - A common occurrence is when DelDOT accepts the maintenance of a new subdivision, when this occurs the subdivision needs to be inspected within a 3 Year Warranty period.
  - Work orders created during an initial inventory within the 3 Year Warranty period are more stringent and should be created even if there is a small defect with the drainage system. (The lead scientist should be contacted if you are unsure of a potential defect)
  - There are only minor differences when creating initial inventory work orders and the workflow for a normal work order should be followed (see above for reference).
    - First, a comment must be left on the 1st page of the work order tab in the Comments section stating "3 Year Warranty" followed by a description of the problem, as is the case with regular work orders. (Source to Internal MS4 Meeting #35)
    - Second, any work order created during an initial inventory should be labeled as 'Immediate Action' because it is within the 3 Year Warranty period. (All other fields on Page 1 should be treated as a normal work order) (Source to Internal MS4 Meeting #35)
    - Page 2 and Page 3 should be treated the same as a normal work order.
    - Page 4 will be completed by the field manager and can be skipped by the field crew but make sure the field manager is notified the work order was found so the correct information can be updated.
    - Page 5 should be treated as a normal work order.
  - The day after the work order was originally created, make sure the work area the drainage system is in is synced first thing in the morning. (By doing this the field tool generates a unique ID for the structure/conveyance the work order is on that will be used for future reference.) (Source to Internal MS4 Meeting #35)
  - The field manager will use these unique ID's in the Initial Inventory Memo to fill out page 4.
  - "Fair" ratings can be used when applicable for three year warranty initial inspections. (Source to Internal Meeting #51)
  - Reminder, if BMP looks to have defect, try to figure out why, such as look at downstream outfall, which is probably good idea even if no defect, since we are there. That's where the "environmental" concerns are bound to happen. (Source to email from Bruce Thompson on 1/15/2024)

D. Guidelines

Bridge Guidelines – (Sourced to CS email on 2/12/2021)

BRIDGE

- Must be equal to or greater than 48" tall AND over 20 square feet
- If pipe is over 48" tall but under 20 square feet it is NOT A BRIDGE
- Examples:
    - Double Barrel 48" Round (12.5sqft x 2 = 25sqft)
    - Single Barrel 48" x 76" Elliptical (20.5sqft)
    - Single Barrel 66" Round (24sqft)

NOT A BRIDGE

- Height is equal to or greater than 48" tall but total square feet is less than 20
- Height is under 48" tall
    - Single Barrel 48" – 60" Round (12.5sqft – 19.5sqft)
    - Double Barrel 43" x 68" Elliptical (under 48" tall)
    - Triple Barrel 42" Round (under 48" tall)
    - 47" x 96" Box Culvert (under 48" tall)

Acceptance Dates – (Sourced from Internal MS4 Meeting #18 on 3/8/18)

- If you are reinspecting a subdivision with multiple acceptance dates, use the oldest acceptance date.
- If you are reinspecting a subdivision with multiple acceptance dates, more than one defined phase, and have a greater than 5-10 years difference between the two dates, use the corresponding dates for each phase.
- If a subdivision was split up into separate phases or sections in the re-inspection schedule or only one phase of a subdivision is called out in the re-inspection schedule, only re-inspect the section called out in the schedule with the associated acceptance date.
    - See Mallard Pointe/Mallard Pointe Phase III in Army Creek.
    - This is different than one subdivision name with multiple acceptance dates for street names.
- If a subdivision is split into two phases or sections in the re-inspection schedule and not the field tool, use the subdivision names and acceptance dates for each phase or section separately.
    - See Commodore Estates I/Commodore Estates II in Appoquinimink.

Street Names – (Source to Internal MS4 Meeting #34)

- Use parcels as a potential guide, which takes priority over street signs.
- Call the office if you have questions.

- For roads that are numbered, use the roadway name based on the parcel layer in the viewer/field tool, do not use the numbered road (ex. “Dupont Highway” not “US-13).
    - The exception is interstates and SR-1.
    - If a roadway has buildings with addresses on it, the road name should be spelled out. For expressways with no buildings, the numbered road can be used.

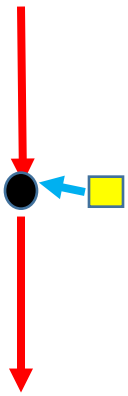
E. Miscellaneous Scenarios

Inlets with Solid Cover (No grate) – (Sourced to MO email on 12/22/17 labeled ‘Inlet with a solid Cover and No Grate’)

- If you have an Inlet with a cover instead of a grate, make sure you note the following:
    - Grate Present = No
    - Cover Present = Yes
    - Modified = Yes
    - Write a comment stating a solid cover is present
- Inlets with intentional solid covers are inventoried as a modified manhole with a comment “Inlet with Solid Cover.” (Source to Internal MS4 Meeting #44)
- Inaccessible or asphalted over inlets will be inventoried as a junction box. (Source to Internal MS4 Meeting #44)

Vertical Pipes

Example 1: Structure directly next to and punched into the side of a pipe



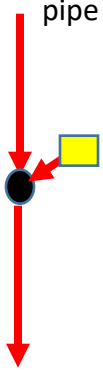
- Inventory basin as is with a hydraulic connection connecting the basin to a pipe connection at the point where the hole is punched into the pipe. Slightly offset pipe connection.

Example 2: Structure directly overtop and punched into pipe

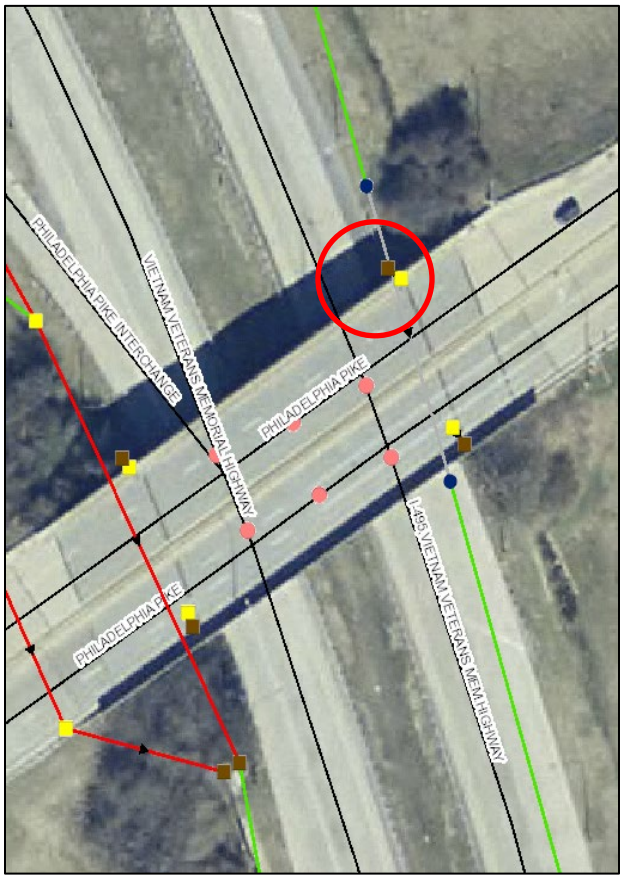
- If entire top half of pipe is removed (essentially bottom of pipe is the low flow channel of the basin) inventory as normal with upstream and downstream photos on pipes with no hydraulic connections or pipe connections. This is also true for basins where the bottom of the basin is cut directly into the top of a pipe AND the hole is big enough to take PMC pictures. If the hole is too small treat like example 1 with a basin connected to a pipe connection via hydraulic connection. Slightly offset pipe connection.

Example 3: True vertical pipe

- Inventory as a modified basin connected to a pipe connection by an actual pipe. Treat like example 1 but replace the hydraulic connection with the vertical pipe, slightly offset pipe connection.



Example 4: Bridge Scuppers

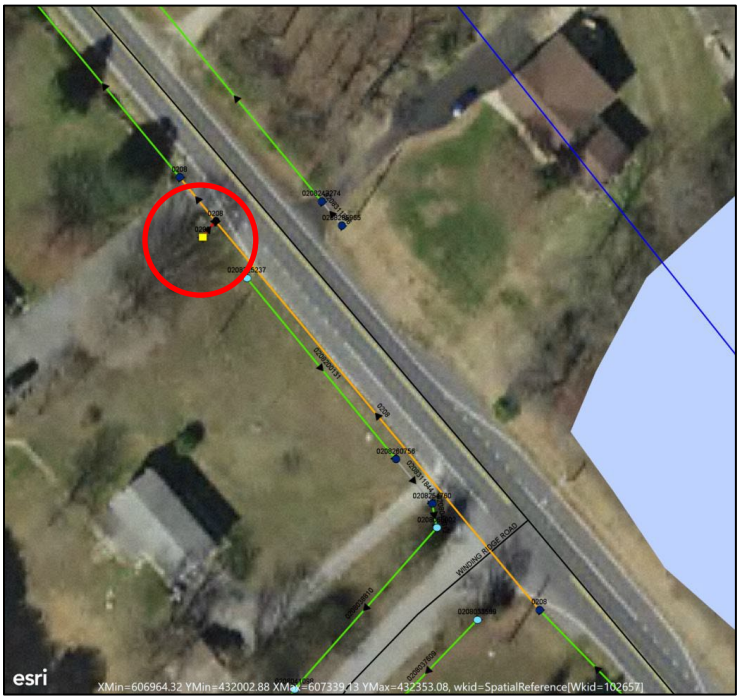


- This would be inventoried as an inlet connected with a pipe to an outfall that is slightly off set
- Note: Add a comment to the Location Tab that says "BRIDGE SCUPPER."

Pipe Punching into the Side of a Roadway Culvert – Source to Internal MS4 Meeting #30

- If a pipe punches into the side of a roadway culvert with an inlet upstream, inventory as an inlet with a pipe leaving going to a pipe connection in the middle of the roadway culvert.

FIGURE 11
PIPE PUNCHING INTO A ROADWAY CULVERT



Catch Basin Intentionally Converted to a Junction Box – (Source to Internal MS4 Meeting #30)

- Leave a comment "PREVIOUSLY INVENTORIED AS STRUCTURE 1234567890".
- Change the inlet to a junction box in the field.
- Recreate old inspections using the viewer (see Miscellaneous Scenario below).

Structure Type Change – (Source to Internal MS4 Meeting #63)

- Change structure type in the field tool.
- At the end of the day in the office, recreate all inspections in the field tool.
    - When a structure type changes, it deletes old inspections, therefore back dated inspections must be recreated to ensure all information is present on the new structure type.
    - Note: This must be completed **BEFORE** a viewer push. If recreating the inspections can't be done right away, notify the Field Manager to ensure a viewer push is not done until after the inspections are recreated.

Round, CMP wall – (Source to email from Amanda Mitsdarfer 10/5/2021) Inventory with the wall measurement only reflecting the portion from the bottom of the frame to where the wall meets the top of the CMP pipe.

FIGURE 12
ROUND, CMP WALL

Backyard COG/COS Basins – These are COG/COS basins in a swale/backyard that are raised and take in water. The Inlet Type should be COG/COS depending on the location of the cleanout. It should be classified as Modified. No curb opening measurement is needed. (Source to Internal MS4 Meeting #41)

FIGURE 13
BACKYARD COG/COS BASIN

Storm Drain Plaques – Place a storm drain plaque where there is a sidewalk. A sidewalk typically means there are houses and/or businesses along the roadway. (Sourced from Internal MS4 Meeting #43)

HPPP Pipes – Or high-performance polypropylene, is another type of plastic like HDPE. (Source to email from CS on 10/11/22)

Pipes that Cannot be Measured – (Source to Internal MS4 Meeting #52) Leave height (or width) blank/0 if you cannot measure/determine the entire height (or width) of the pipe-don't guess.

- If in between sizes on misshapen CMP/Asphalt coated pipes, use best judgement to choose.
- Leave helpful comments about unique inventory situations – ask if you aren't sure if comment is needed.

Parked on Catch Basins – (Source to Internal MS4 Meeting #52) Circle back to structures with cars parked on them. If parked on in AM-check back after lunch/next day -once the subdivision is completed, no need to keep checking (Service vehicles often move- pay special attention).

APPENDIX B

B-3: SUMP PUMP DISCHARGE LETTER

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

NICOLE MAJESKI
SECRETARY

March XX, 202X

Maria Smith
4517 Pickwick Drive
Wilmington, DE 19808

Subject: Discharge connection, *4517 Pickwick Drive, Wilmington, DE 19808, parcel 0804410224*

Dear Mrs. Smith

The Delaware Department of Transportation has no objection to connection of the sump pump drainage pipe at subject location to the enclosed drainage system within right-of-way on Pickwick Drive. You have requested this connection to alleviate a drainage issue on your property. This letter Agreement is issued with the following stipulations:

1. Installation and its associated costs are the responsibility of the homeowner.
2. Installation and maintenance of the connection shall be completed to the satisfaction of DelDOT
3. DelDOT accepts no maintenance responsibility for the drain line connection.
4. All holes made for the connections, whether into a catch basin or drainage pipe, must be core drilled. The holes shall not be jack hammered.
5. After connection of the drainage pipe, the hole must be sealed with non-shrink grout to prevent leakage.
6. When connecting to a drainage pipe, the tie-in must be made in the upper half of the pipe only and all tie-ins must be at least 12" from any pipe joints.
7. Illicit discharges (liquid or substance containing pollutants and/or pathogens) are **not** permitted. Examples of illicit discharges are sewer wastes, oils, laundry wastewater, and household chemicals, among others.
8. Prior to construction, the homeowner must contact Miss Utility at 1-800-282-8555 at least 72 hours in advance. The DelDOT inspector must be notified at least 24 hours in prior to work.
9. The homeowner(s) shall indemnify and save harmless the Department of Transportation of and from all suits and damages from or on account of the drain line connections to the drainage system within right-of-way.

I/We, the undersigned, hereby agree to all terms and conditions of this form and will perform all related work in accordance with State regulations.

Property Owner's Signature:_____

Print Name(s):_____

Date:_____

DelDOT

APPENDIX B

B-4: AGREEMENT 2070 REQUEST FOR PROPOSAL

Delaware Department of Transportation

REQUEST FOR PROPOSALS
PROFESSIONAL SERVICES

RFP Number: **2070S**

ENVIRONMENTAL AND WATER QUALITY MONITORING SERVICES

Submission Due Date/Time: **Thursday, June 1, 2023, no later than 2:00 P.M. Local Time**

Three (3) year term with two (2) possible one-year extensions

Agreement Type: On-Call

One (1) agreement may be awarded from this solicitation

Funding: State

The anticipated method of payment is cost plus fixed fee

29 Del.C. §6981, 2 CFR part 200

PROJECT INFORMATION

This Request for Proposal (RFP) issued by the Delaware Department of Transportation is for the purpose of acquiring Proposals from interested firms to provide water quality monitoring in support of DelDOT's NPDES Permit Program.

PROJECT DESCRIPTION

The services required in this agreement include stormwater quality and best management practices (BMPs) performance monitoring for the DelDOT NPDES program. The need for stormwater monitoring services arises from compliance with the statewide stormwater NPDES program, which includes: (1) a Phase I MS4 Permit for New Castle County; (2) a Phase II MS4 Permit for portions of Kent and Sussex Counties: and (3) maintenance facilities covered by Delaware's General Permit for Industrial Stormwater Runoff.

Services may include wet weather monitoring of designated stormwater outfalls, conveyances and BMPs, illicit discharge detection and elimination, as well as monitoring of streams or other water bodies that are impacted by stormwater discharges. Additional monitoring may include sediment sampling as well as biological assessments that include physical habitat assessment, biosurvey of aquatic benthic macroinvertebrates, and fish assessment. Additional work may include employee training, maintenance facility Pollution Prevention Plan and Spill Prevention, Control and Countermeasure Plan inspections, assisting with various data collection and management plan development such as street sweeping, vehicle washing, and Water Quality Improvement Plans.

Monitoring

- Implementation of a statistically-based wet weather monitoring program for the MS4 to provide data necessary for:
  - Assessing the effectiveness and adequacy of BMP implementation toward meeting TMDLs.

  - Estimating annual cumulative pollutant loadings from the MS4.
  - Estimating event mean concentrations and seasonal pollutants in discharges from major outfalls.
  - Calculating outfall and BMP drainage areas.
  - Identifying and prioritizing portions of the MS4 requiring additional controls.
- Wet weather monitoring will include:
  - Precipitation monitoring to predict representative storms.
  - Sampling and monitoring at sites for MS4 permit compliance or as determined by DelDOT, with number and timing of events sampled to be determined in consultation with DelDOT. All permitted maintenance yards must be sampled at minimum two times a year following the requirements of Delaware's General Permit for Industrial Stormwater Runoff.
  - Installation and monitoring, as required, of rainfall and flow measurement devices.
  - Sample events may consist of "first flush" samples and/or flow-weighted composite samples. Both manual and automated sampling methodologies may be required.
  - Coordination with a certified laboratory regarding bottle requirements, sample pick-ups, and data deliverables.
  - Submission of data to the International BMP Database, as requested.
  - Based on the results of the storm events monitoring, consultant should be prepared to estimate and report annual cumulative pollutant loadings and event mean concentrations of discharges.
  - Consultant may be asked to assist with experimental design, site selection, statistical analyses of data, and reporting.
- Collection and analysis of water quality samples from sites upstream and downstream of stormwater BMPs, from areas impacted by BMPs, or other specialized samples as needed for stormwater/BMP monitoring, watershed assessments or improvement plans, or TMDL compliance.
- Watershed studies and assessments, including water quality modeling. Watershed studies may include geomorphic, physical, chemical and biological assessments of rivers, streams and/or tributaries.
- Assistance, as needed, in development of Department stormwater management plans, monitoring plans and watershed improvement plans that incorporate strategies to meet Total Maximum Daily Load (TMDL) pollutant reduction goals.
- Dry weather screening and detection of illicit discharges or improper disposal to the DelDOT-owned stormwater conveyance system. The scope includes follow-up investigation of suspected or reported illicit discharges or dumping into the DelDOT stormwater conveyance system and coordination with other agencies as required. The scope also includes maintenance of a public

hotline for reporting illicit discharges.

- Study sites may be located throughout Delaware, so the consultant must be able to perform monitoring activities in any part of the state.
- There may be situations where gaining access to sampling locations requires construction and trimming/cutting of vegetation as well as installation of diversions, weirs, and monitoring brackets for flow metering equipment. Design of any special access structures (e.g., wood stairs), all necessary permitting, the cost, and the construction shall be within the scope of this Agreement.
- Samples will be analyzed in conformance with 40 CFR Part 136 and the protocols described in the 2002 edition of the ASCE/EPA guidance manual for Urban Stormwater BMP Performance Monitoring for some or all of the following parameters. Analytical work may be subcontracted to an approved analytical laboratory. The particular subset of parameters for each sample will be determined in consultation with DelDOT NPDES staff and may include (but not be limited to) the following:
  - pH
  - Hardness
  - Chloride
  - Conductivity
  - Dissolved Oxygen
  - Total Suspended Solids (TSS)
  - Settleable Suspended Solids (SSC)
  - Turbidity
  - Volatile Suspended Solids (VSS)
  - 5-Day Biological Oxygen Demand (BOD_5)
  - Chemical Oxygen Demand (COD)
  - Total Kjeldahl Nitrogen (TKN)
  - Total Ammonia Nitrogen
  - Total Nitrate + Nitrite
  - Total phosphorus
  - Dissolved phosphorus
  - Orthophosphorus
  - Oil and Grease
  - Total Petroleum Hydrocarbon (TPH)
  - Diesel- and Gas-Range Organics (DRO, GRO)
  - Polycyclic Aromatic Hydrocarbon (PAH)
  - BTEX
  - Phenolics
  - Heavy metals, total and dissolved, including lead, zinc, copper, nickel, chromium and cadmium
  - PCBs
  - Fecal coliform counts
  - Enterococcus counts

- Consultant must submit a QA/QC Plan and Standard Operating Procedures to be followed during monitoring to ensure compliance with federal and state regulations.

- Deliverables:
  - Written memo reports on all activities will be submitted to the DelDOT NPDES Program after each sampling event. The reports should be comprehensive and include procedures, observations, photos, data and analyses.
  - An annual report of all monitoring activities and data to be incorporated in to DelDOT's annual reports to DNREC and EPA. This report will include a calculation of TMDL pollutant loads for each watershed, and the reductions achieved each year. The annual report should be submitted in both hardcopy and electronic format.
  - Summary reports of monitoring activities as required by DelDOT staff for use in other reports and presentations.

Maintenance Facilities

- Besides the wet weather monitoring listed above, conduct Stormwater Pollution Prevention Plan (SWPPP) maintenance facility inspections per Delaware's General Permit for Industrial Stormwater Runoff. Permitted facilities shall be a minimum of two times a year, and non-permitted facilities a minimum of one time a year.
- Assist in Spill Prevention Control and Countermeasure (SPCC) compliance at maintenance facilities. At minimum all Above-Ground Storage Tanks (AST) shall be inspected at minimum once a year.
- Prepare reports and photographic assay regarding permit compliance.
- Maintain SWPPP and SPCC maps of the maintenance facilities.

Management Plan Development

- Provide data necessary in the development Water Quality Improvement Plans as determined by DelDOT.
- Assist DelDOT in the preparation of management plans including, but not limited to, sweeping, WQIP, and SWPP&MP.

Training

- Assist DelDOT with employee training including, but not limited to, BMP and Pollution Prevention Plan General Permit requirements.

The successful Lead/Prime consultant will need to demonstrate the following qualifications:

- Expertise in environmental sampling methods, with specific experience in stormwater wet weather monitoring methodologies.
- Knowledge of, and expertise in, dry weather screening methods and illicit discharge detection.
- Knowledge of, and experience in, stream assessment, in-stream monitoring methods, watershed assessment, and biomonitoring protocols.
- Expertise in watershed studies, water quality modeling, and TMDL compliance.

- Sufficient qualified local staff or subcontractors to capture wet weather events from multiple sites throughout Delaware on short notice.
- Possession of and skill in operating automated stormwater sampling and flow measurement equipment.
- Expertise in ASTs including STI SP001 Certified AST inspector(s) and TMS certified technician(s) for leading manufacturers including Veeder Root and OMTEC.
- Knowledge of NPDES MS4 and Industrial (General Permit Program) permits.
- Record of performance or demonstrated ability to handle similar projects. Demonstrated ability to apply creative solutions to challenging sampling situations.

QUESTIONS

Questions must be submitted before the due date identified in the Procurement Schedule for this RFP. All inquiries must be submitted in the Q/A section of the project listing in the Bonfire Procurement Portal.

The Department's response to questions will be posted, according to the procurement schedule, under the project listing in Bonfire and to the State of Delaware Bid Solicitation Directory Website: http://www.bids.delaware.gov/.

PROCUREMENT SCHEDULE

Action Item	Date	Time
Deadline for Questions to ensure response:	Ten (10) business days prior to the proposal due date	2:00 P.M. Local Time
Final Response to Questions posted by:	Five (5) business days prior to the proposal due date	2:00 P.M. Local Time
Proposals Due no later than:*	**Thursday, June 1, 2023**	2:00 P.M. Local Time

NOTE: Only asterisk (*) marked date changes will be communicated (via posted Addendums).

PROPOSAL REQUIREMENTS

Interested firms must submit the material required herein or they may not be considered for the project:

1. Proposals must be received before the Proposal Due Date and Time, as identified in the Procurement Schedule for this RFP. Responses submitted by hard copy, mail, facsimile, or e-mail will not be accepted. Responses received after the Proposal Due Date and Time will not be considered.
2. **Upload your submission at**: https://deldot.bonfirehub.com/portal/

   Important Notes:
   - Logging in and/or uploading the file(s) does not mean the response is submitted. Users must successfully upload all the file(s) and MUST click the submit button before the proposal due date and time.
   - Users will receive an email confirmation receipt with a unique confirmation number once the submission has been finalized. This will confirm that the proposal has been submitted

successfully.

- Each submitted item of Requested Information will only become visible to DelDOT after the proposal due date and time.
- If the file is mandatory, you will not be able to complete your submission until the requirement is met.
- Uploading large documents may take significant time depending on the size of the file(s) and your Internet connection speed. The maximum upload file size is 1000 MB.
- Minimum system requirements: Internet Explorer 11, Microsoft Edge, Google Chrome, or Mozilla Firefox. Java Script must be enabled.

Need Help? Please contact Bonfire directly at Support@GoBonfire.com for technical questions related to your submission. You can also visit their help forum at https://bonfirehub.zendesk.com/hc.

3. **The Prime Consultant must be Registered,** or submit application for registration, with DelDOT at or before the time of submission in order to be considered. For registration information, click here.

4. **Submit one (1) Original and one (1) Redacted copy** of the Proposal. The original must be a .pdf file of the original signed proposal and should be clearly marked "Original" on the first page of the document. The redacted copy must be a .pdf file of the original signed proposal with any proprietary or confidential information redacted, and this copy should be clearly marked as "Redacted" on the first page of the document. The redacted copy is required even if the submission contains no proprietary or confidential information.

   To determine what information may be considered proprietary or confidential and may be redacted from their Proposal, firms should review Delaware's Freedom of Information Regulations here; http://regulations.delaware.gov/AdminCode/title8/1400.shtml#TopOfPage. Under Delaware FOIA law, 29 Del. C, §10002(l)(2), "Trade secrets and commercial or financial information…which is of a privileged or confidential nature" are "records that shall not be deemed public" and are therefore exempt from disclosure under FOIA.

5. **Architect-Engineer Qualifications**; **GSA SF330:**

http://www.gsa.gov/portal/forms/download/116486

Follow instructions for the SF330, and add the following Individual Agency Instructions:

A. Part I Section C 11, Proposed Team;
   Indicate if the firm is a DBE and provide the approximate percentage of the contract cost they will perform.

B. Part I Section E, Resumes of Key Personnel Proposed for this Contract;
   Resume information is limited to eight (8) individuals regardless of affiliation.

C. Part I Section F, Example Projects;
   Example Projects provided are limited to ten (10).

D. Part I Section H 30, Additional Information;
   (The Department recommends formatting this section using Times New Roman, 12 pt. font)
   1) The Prime consultant must indicate the current workload with the Department by listing the following in a table format:
      Agreement No.; Agreement Title; Consultant PM; Prime or Sub; Total Dollars paid to date; current number of Tasks issued; and date of contract expiration.

2) List any DelDOT agreement number your firm has been selected for and not included above.
3) Firms may include a "Rating Criteria Support Information" Section, limited to four pages, within Section H, that covers any information that directly relates to the firm's ability to meet the specific rating criteria listed in this RFP.

Note: Letters of Interest should not be included.

6. **Joint venture** submissions will not be considered.
7. DelDOT reserves the right to reject any and all submissions. Submissions become property of the Department and shall be retained electronically for a minimum period of three (3) years from the date of receipt. DelDOT reserves the right to any and all ideas included in this response without incurring any obligations to the responding firms or committing to procurement of the proposed services.
8. **Required Certification Forms.** All firms responding to the RFP must complete and return the submission forms located in 'Appendix A' of this document.

No promotional materials or brochures are to be included as part of the submission.

RATING CRITERIA

#	**Criteria Description**:	**Weight**
1	Firm's experience pertaining to environmental sampling methods, with specific experience in stormwater wet weather monitoring methodologies, ambient water quality monitoring, biological monitoring, dry weather outfall screening methods, and illicit discharge detection and elimination (IDDE) methods.	30 %
2	Firm's experience pertaining to industrial stormwater compliance, including Above-Ground Storage Tank (AST) compliance.	20 %
3	Firm's ability to provide to provide research studies in stormwater related topics, including but not limited to street sweeping, vehicle washing, stream restorations, etc.	20 %
4	Project understanding and approach for the services required	15 %
5	Staff capabilities and workload capacity to accomplish proposed work on schedule, and on call as needed.	15 %
	TOTAL :	**100%**

OVERVIEW OF SELECTION PROCESS

- This is an On-Call agreement utilized for the performance of services for a number of projects under task orders issued on an as-needed basis.
- This is a single-phase solicitation process with the availability for discussions with up to three (3) of the most highly qualified firms. Based upon the listed criteria and evaluation of each firm's submitted proposal, the Selection Committee may decide if a small sample task and/or discussions will be held with the most highly qualified consultants. If discussions are held, they will serve to clarify the technical approach, qualifications, and capabilities provided in response to the RFP, after which the committee will determine the ranking of the candidate firms.

- Selection Committee members will individually score each firm's submitted proposal which determines individual ranking. The Department's ranking is the combined ranking of all Committee members. Firms, in order of ranking, will have the opportunity to negotiate an agreement with the Department. If the Department cannot reach agreement with the highest ranked firm(s), the Department terminates negotiations and begins negotiations with the next highest ranked firm, and so on until an agreement is reached. The Department notifies via email the awarded firm(s) of the opportunity to enter into an agreement with the Department. This notification also includes information on the next steps for the agreement process.
- After the ranking process has been completed, applicable price information will be requested from the successful candidate firm(s), such as; salary rates for various classifications of personnel; and an indirect cost derivation for the most current accounting period.
- Payroll burden and overhead will be computed on direct salary costs only (not including overtime) at the consultant's audited rate, as per Federal Acquisition Regulations Part 31, and Department policies. Computer and CADD costs are not allowable as a direct cost to this project. Rate determination and applicability is subject to audit by the Department. Additionally, candidates should be prepared for the Department to work with your current accounting firm to provide information and backup documentation. Full and immediate cooperation is required to avoid delays in execution of an agreement. Failure to cooperate may result in breaking off of negotiations and moving to the next ranked firm.
- Selection Committee membership appointments are confidential. The Department's Professional Services Procurement Manual may be viewed here.

INSURANCE REQUIREMENTS

The selected firm(s) must obtain at its own cost and expense and keep in force and effect during the term of the agreement, including all extensions, the minimum coverage limits specified below with a carrier satisfactory to the State.

a. Worker's Compensation and Employer's Liability Insurance in accordance with applicable law.

b. Commercial General Liability - $1,000,000 per occurrence/$3,000,000 per aggregate.

c. Miscellaneous Errors and Omissions - $1,000,000 per occurrence/$3,000,000 per aggregate.

d. Automotive Liability Insurance covering all automotive units used in the work (including all units leased from and/or provided by the State to Vendor pursuant to this Agreement as well as all units used by Vendor, regardless of the identity of the registered owner, used by Vendor for completing the Work required by this Agreement to include but not limited to transporting Delaware clients or staff), providing coverage on a primary non-contributory basis with limits of not less than:

   1. $1,000,000 combined single limit each accident, for bodily injury;
   2. $250,000 for property damage to others;
   3. $25,000 per person per accident Uninsured/Underinsured Motorists coverage;
   4. $25,000 per person, $300,000 per accident PIP benefits if carrying any of our clients or employees; and

5. Comprehensive coverage for all vehicles leased from the State of Delaware Fleet Services which shall cover the replacement cost of the vehicle in the event of collision, damage or other loss.

Certificate of Insurance and/or copies of the insurance policies will be requested at time of award.

In no event shall the State of Delaware be named as an additional insured on any policy required under this agreement.

MISCELLANEOUS

The Department is not liable for any cost incurred by the consultant in the preparation or presentation of the Proposal.

Any individual, business, organization, corporation, consortium, partnership, joint venture, or any other entity including subconsultants currently debarred or suspended is ineligible to participate as a candidate for this process. Any entity ineligible to conduct business in the State of Delaware for any reason is ineligible to respond to the RFP.

The Department of Transportation will affirmatively insure individuals and businesses will not be discriminated against on the grounds of race, creed, color, sex, or national origin in consideration for an award. Minority business enterprises will be afforded full opportunity to submit bids/proposals in response to this invitation.

Department of Transportation
State of Delaware
By: Nicole Majeski
Secretary
Dover, DE

Appendix A - REQUIRED FORMS

The following completed forms are required to be returned with each proposal:

- Certification of Eligibility
- Certificate of Non-Collusion

CERTIFICATION OF ELIGIBILITY

Delaware Department of Transportation

Request for Proposal 2070S – Environmental and Water Quality Monitoring Services

We have read Request for Proposal number 2070 and fully understand the intent of the RFP as stated, certify that we have adequate personnel and knowledge to fulfill the requirements thereof, and agree to furnish such services in accordance with the contract documents as indicated should we be awarded the contract.

_____ hereby certifies that it is not included on the United States Comptroller General's Consolidated List of Persons or Firms Currently Debarred for Violations of Various Public Contracts Incorporating Labor Standard Provisions.

_____Signature of the Bidder or Offeror's Authorized Official

_____Name and Title of the Bidder or Offeror's Authorized Official

_____Date

Sworn and subscribed before me this _____ day of _____, 20___

_____ My commission expires: _____ / _____ / 20___

Notary Public Month Day Year

CERTIFICATE OF NON-COLLUSION

By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid, each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:

1) The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement for the purpose of restricting to such prices, with any other bidder or with any competitor;

2) Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the Bidder and will not knowingly be disclosed by the Bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and

3) No attempt has been made or will be made by the Bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

_____Signature of the Bidder or Offeror's Authorized Official

_____Name and Title of the Bidder or Offeror's Authorized Official

_____Date

Sworn and subscribed before me this _____ day of _____, 20___

_____ My commission expires: _____ / _____ / 20___

Notary Public Month Day Year

APPENDIX B

B-5: IDDE PROGRAM STANDARD OPERATING PROCEDURES

National Pollutant Discharge Elimination System
Phase II MS4 Permit
NPDES Permit No. DE 0051217 / State Permit No. WPCC 3033/17

ILLICIT DISCHARGE DETECTION & ELIMINATION PROGRAM STANDARD OPERATING PROCEDURES

Prepared For:

Delaware Department of Transportation
National Pollutant Discharge Elimination System Program

Prepared By:

KCI Technologies, Inc.
Delaware Water Resources Practice

JANUARY 2025

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

Phase II MS4 Permit

ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM STANDARD OPERATING PROCEDURES

KCI TECHNOLOGIES

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NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
Phase II MS4 Permit

ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

STANDARD OPERATING PROCEDURES

Illicit Discharge Detection and Elimination (IDDE) Program activities are conducted in accordance with the requirements of the National Pollutant Discharge Elimination System (NPDES) Phase II Municipal Separate Storm Sewer System (MS4) Permit.

NPDES Permit No. DE 0051217 / State Permit No. WPCC 3033/17

KCI Technologies, Inc. (KCI) is providing IDDE Program services for the Delaware Department of Transportation (DelDOT). As such, KCI developed this document to serve as a standardized plan for DelDOT to use to fulfill a Phase II MS4 Permit requirement.

INTRODUCTION

IDDE Program responsibilities include Dry Weather Field Screening and Potential Illicit Discharge (PID) Investigations. The Phase II MS4 Permit IDDE Program consists of five major components:

A. Dry Weather Field Screening

- Inspect storm drain system for the purpose of identifying the source of any illicit discharges
- Requirement to screen 20% of the storm drain system per year
- Follow up on reports of illicit discharges received through miscellaneous sources

B. Record Keeping and Quality Assurance/Quality Control

- Electronic Filing
- Photos
- Tracking Form
- Location Map
- Laboratory Data
- Memorandum
- Door Hangers
- Notice of Potential Illegal Discharge
- QA/QC Form

C. Tracking and Elimination of Verified Illicit Discharges

- Elimination and Enforcement Action
- Door Hanger Distribution

D. Annual Report

- IDDE Outfall Evaluation
- Dry Weather Field Screening
- Tracking and Elimination of Verified Illicit Discharges

E. Public Interaction Guidelines

- NPDES Field Work Authorization Letter
- Immediate Action Work Order

This IDDE Standard Operating Procedure (SOP) generally follows the approach recommended in the IDDE Program Manual written for the Environmental Protection Agency (EPA) by the Center for Watershed Protection (CWP): *Illicit Discharge Detection and Elimination, A Guidance Manual for Program Development and Technical Assessments* (E. Brown et al., 2004). An overview of the IDDE Process is depicted in the IDDE Screening Process Flow Chart (see attached **SOP Form 1**).

BASIC TERMINOLOGY

Dry Weather Period:
24-hours without measurable storm event or snow melt.

Illicit Connection:
Connection of non-stormwater into stormwater system or illegal tap-ins.

Illicit Discharge:
Any discharge to MS4 that is not composed entirely of stormwater. Examples of illicit discharge:

- Dumping oil or antifreeze into catch basin
- Flow from car wash or detailing shop into stormwater system
- Discharge of washing machine effluent

Examples of **non-illicit discharge**:

- Residential vehicle washing
- Runoff from over-watering of lawn
- Clean sump pump discharge
- Clean discharge from industrial site with NPDES Permit
- Uncontaminated groundwater infiltration to MS4

Outfall:
Point where the man-made stormwater system connects into the natural stormwater system (streams, rivers, wetlands, creeks, forests). Examples of outfalls:

- Pipe from storm sewer system into natural area
- Swale (concrete, grass, rock) from storm sewer system into natural area
- Outlet from detention basin into natural area
- Pipes discharging highway drainage into natural area
- Catch basin discharging drainage directly into stream/creek
- Inlet into detention basin

Examples of structures that are **not outfalls**:

- Culverts carrying stream under road or structure (Note that there may be outfalls or outlets located within culverts)
- Pipe end discharging drainage that re-enters MS4

Potential Illicit Discharge (PID):
All potential non-stormwater discharges that are investigated through the IDDE Program are considered PIDs, regardless of whether they are verified to be illicit.

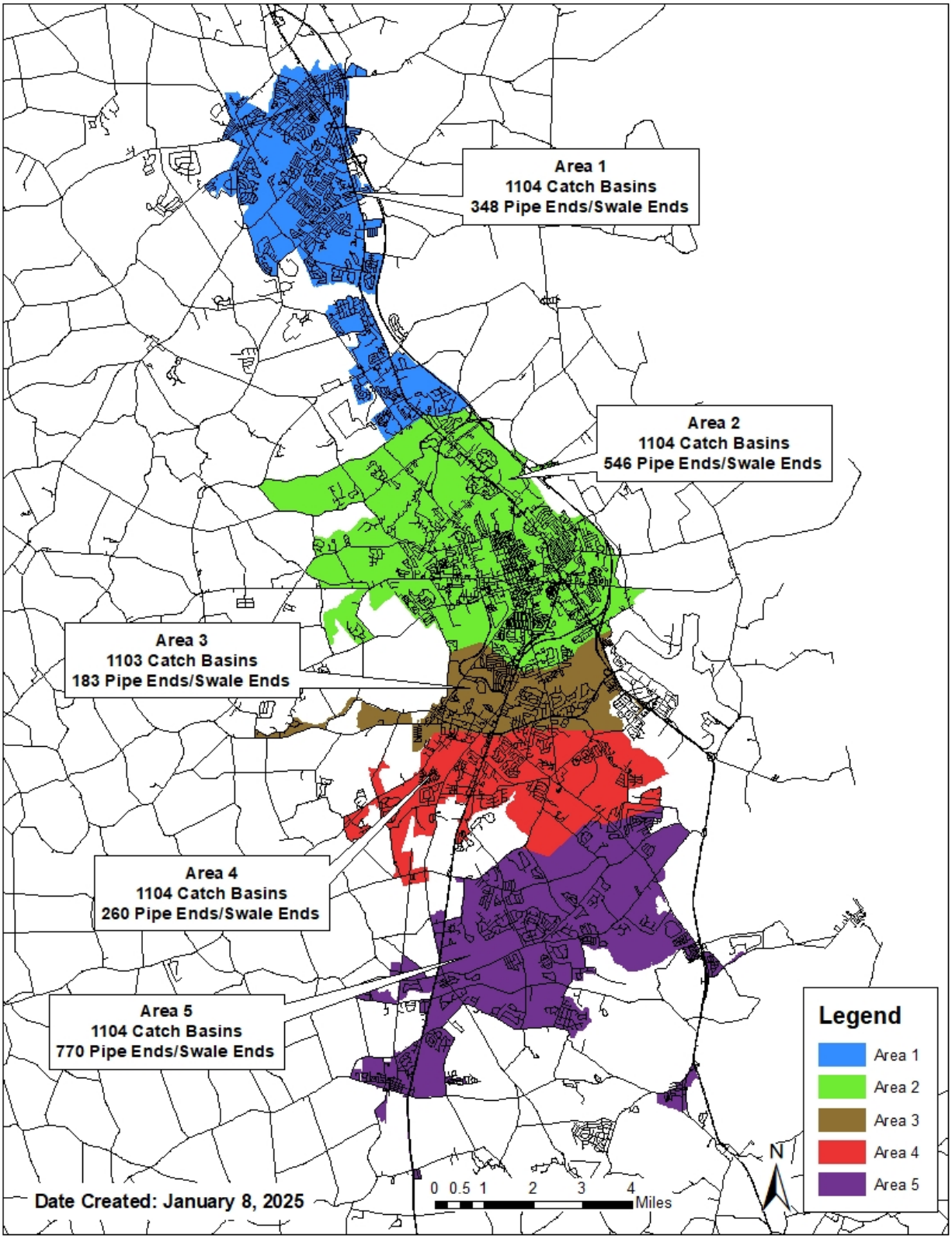
A. DRY WEATHER FIELD SCREENING

All KCI field trucks are equipped with KCI's Health and Safety Plan, which describes team member responsibilities, potential hazards, personal protective equipment (PPE), communication procedures, and emergency procedures. The Health and Safety Plan is located in KCI's Project Files, and is available for review upon request.

The Phase II MS4 Permit issued to DelDOT requires screening of 20% of the storm drain system each year of the permit. To meet this requirement, KCI will screen 20% of DelDOT's mapped catch basins each year, as well as the outfall at the end of each system. KCI identified five areas (each containing approximately 20% of DelDOT's catch basins) to be screened annually for the next five years, as shown on **Figure 1.**

Dry weather field screening is conducted at each outfall and through staff and public reports of potential issues. KCI IDDE staff respond to these reports the same day or next business day after notification to conduct field screening and to identify potential illicit discharges (PIDs). The dry weather screening verifies whether potential illicit discharges are illicit. If a discharge is determined to be illicit, field staff investigate and track the source of the discharge. All KCI field screening is performed by a team of two people, allowing for the safe and efficient completion of the work.

FIGURE 1
PHASE II AREA 5-YEAR SUMMARY



1. MS4 Inventory and Inspection

When a KCI MS4 Inventory and Inspection crew observes flow during routine MS4 field work, it is reported to the KCI IDDE Program Manager. During a valid dry weather period, a KCI IDDE field crew screens the flow for PIDs. KCI MS4 inspectors are also trained to recognize other signs of PIDs (oil sheens, unusual odors, toilet paper), which are immediately reported to the KCI IDDE Program Manager for follow-up dry weather screening and investigation.

2. Miscellaneous Reports and Complaints

Illicit discharge reports may also be received from NPDES staff, the public, or other municipalities and agencies. These reports may include evidence of illegal spills or dumping to the MS4, such as:

- Improperly disposed laundry wastewater, septic system effluent, oil, or any household chemical into the storm drain system
- Odors or stains near a storm drain
- Dead fish in streams or ponds

a. 302STOPPIT Hotline

KCI receives reports from the 302STOPPIT Hotline, which was created by DelDOT and New Castle County for residents to report instances of stormwater pollution. In 2025, DelDOT expanded coverage to include reports from the Phase II Area in Kent County, as well as any non-MS4 areas. A blank copy of the 302STOPPIT Hotline Summary table is attached as **SOP Form 2.**

3. Outfall Screening Field Work

All field personnel must complete the following prior to going to the field:

a. STEP 1: Prior to Field Work

(1) Agency Guidance

Dry weather field screening is conducted in accordance with the recommendations provided in the documents listed below. All staff should become familiar with these documents:

- 40 CFR 122.26 (d)(1)(iv)(D)
- *Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assistance* (CWP, 2004)

(2) Field Equipment List

The Field Equipment List is attached as **SOP Form 3.**

Rugged Laptop

Trimble GPS Unit

Envirosight Pole-Mounted Camera

(3) NPDES Field Work Authorization Letter

The NPDES Field Work Authorization Letter is attached as **SOP Form 4**. KCI field staff should have at least ten letters in the field.

(4) Public Interaction Guidelines

The KCI Public Interaction Guidelines are located in **Section E** of this document. All KCI field staff are required to read and follow these guidelines.

b. STEP 2: Field Work

All KCI field personnel must complete the following in the field:

(5) Water Quality Investigation

A Water Quality Investigation (WQI) is created in the NPDES Database for each outfall determined to be the end of system (i.e., where water is discharged from the MS4 into a natural area). The WQI documents the presence or absence of dry weather flow and is filled out for each end of system MS4 outfall (or structure) visited in the field. A copy of the WQI Field Sheet and an explanation of each line item are attached as **SOP Forms 5-6.**

Complete the following items on the WQI upon arrival:

- Investigation Reason.
  - Report Type, as applicable
  - Reported By, as applicable
  - External Report Type, as applicable

- Firm
- Inspection Type
- Determination
  - Type Discharge, as applicable
- Door Hanger Info (Y/N)
- Field Sheet (Y/N)
- Personnel
- Air Temperature
- Flow Observed
- Last Rain Date/Time
  - Monitor climatologic conditions to confirm dry weather conditions; Conduct screening only after period of at least 24 hours without significant rain (>0.10 in). Screening may be conducted prior to 24 hours without rain provided only structures with No Flow are field-screened. Outfalls visited during this time with Flow will be re-visited during valid conditions.
- Sample Collected (Y/N)
- Precipitation in 24 hours (Y/N)

(2) Cannot Access/Cannot Locate (CA/CL)

If an outfall cannot be located or accessed, select Cannot Access/Cannot Locate in the determination field. Note information about area investigated, and any information that would help find the outfall in the future on Pages 1 and 2 of the WQI. If possible, investigate next upstream storm drain manhole/catch basin/inlet for pipe size and dry weather flow.

(3) Outfall Determined to be Non-DelDOT

If an outfall is determined not to be DelDOT's responsibility, mark the ownership accordingly on the outfall screening map and proceed to next outfall location. No WQI is required; however, any signs of illicit discharge should be reported to DelDOT so they can forward to the appropriate entity for further investigations.

(4) Outfall with NO FLOW:

If an outfall does not have flow at the time of the IDDE investigation, investigate for indication of intermittent discharge/flows and complete the following in the WQI.

- Setting and Land Use
- Structural and Vegetative Conditions
- Odor
- Algae Growth
- Deposits/Stains
- Erosion

Investigate the following for indication of Intermittent Discharge/Flow.

- **Stains/Deposits:** Deposits and stains (residues) are any type of coating that remains after a non-storm water discharge has ceased. Deposits or stains usually are of a dark color and typically cover the area surrounding the storm water discharge. They often contain fragments of floatable substances, and, at times, take the form of a crystalline or amorphous powder.

- **Odors:** Discharge odors can vary widely. Some may indicate the source of contamination. Industrial discharges may smell like a particular spoiled product, oil, gasoline, a specific chemical, or a solvent. For example, the decomposition of organic wastes in a discharge will release sulfide compounds, creating an intense smell of rotten eggs. Significant sanitary wastewater contributions will also cause pronounced and distinctive odors.

- **Unusual Stream-Side Vegetation Conditions:** In order to accurately judge if the vegetation surrounding a discharge is normal, the observer must take into account recent weather conditions and the time of year. Increased or inhibited plant growth near storm water discharges is often a sign of pollution. It is important to distinguish whether plant damage is caused by contamination or by the physical effects of increased flows (scour).

- **Outfall Structural Damage:** Structural damage can be a sign of industrial discharge contamination. Cracked or deteriorated concrete or peeling surface paint at an outfall usually indicates the presence of severely contaminated discharges. Contaminants causing this type of damage are usually very acidic or basic and are usually of industrial origin. For instance, discharges from primary metal industries may cause structural damage because their batch dumps are highly acidic.

(5) Outfall WITH FLOW:

If an outfall has flow during dry weather, in addition to conducting the procedures described above (odor, color, floatables, vegetative condition), a sample of the flow is collected. Additional procedures include the following:

- **Photo:**
  - Take a photo of the outfall and a landscape photo of the general area.
  - Make sure a good landmark is in the photo to help identify the location.
  - Upload photos to Page 6 of the WQI.
- **Collect a Sample:**
  - Using nitrile gloves, collect a sample of the flow coming from the outfall in accordance with the recommendations provided in 40 CFR 122.26 (d)(1)(iv)(D) and *Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assistance* (CWP, 2004).
  - Use a Nasco Swing Sampler to collect the sample from outfalls that are out of arm's reach.

- **Observations** (see **SOP Form 6** for explanation of each)**:**
  - Setting
  - Land Use
  - Structural Condition
  - Vegetative Condition
  - Odor
  - Deposits/Stains
  - Erosion
  - Algae Growth
  - Color
  - Floatables

- **Field Tests** (use nitrile gloves):
  - Flow Rate (see **SOP Form 6**)
  - Water temperature (use pH meter)
  - pH (use pH meter)
  - Turbidity (use turbidity meter)

- Ammonia***** (use Hach kit): See **SOP Form 7** and **NOTE** below.
- Detergents * (Surfactants) (use Hach kit): See **SOP Form 8** and **NOTE** below.
- As indicated on the Ammonia and Detergents SOP Forms, pour all sample collection water used for testing into the chemical waste bottle at the truck. Record the chemicals used on the Waste Container Chemical Composition List **(SOP Form 9)**. Back at the office, pour the contents of the waste bottle from the truck into the container supplied by Safety-Kleen. Contact Richard.Eicher@safety-kleen.com when the chemical container is full.

***NOTE:**

* If field testing results indicate an elevated level of ammonia or detergents, or visual reconnaissance suggests an illicit discharge, a second sample is immediately collected and brought to the Laboratory to confirm field test results for surfactants and ammonia, and to be analyzed for potassium.

* Laboratory tests for oil and grease, total petroleum hydrocarbons, fecal bacteria, and/or potassium are added if evidence of contamination from oils, sewage, or industrial discharges exist.

* If an illicit discharge is suspected, trace the source of flow.

- **Flow Rate:**
  - Calculate using one of two methods, as described on **SOP Form 6.**
  - Document the Flow Rate in the WQI Field Tool.

- **Incident ID No.:**
  - Assigned to structures or outfalls with flow
  - Determined by the year in which the outfall is field-screened, dash, numeric number and dash (i.e., first structure with flow screened in 2024 would have an incident ID # of 2024-1)

c. STEP 3: Post Field Work

(9) Discharge Characterization

The Residential or Light Commercial Flow Chart **(SOP Form 10)** is used to categorize a discharge as:

- No Evidence of Illicit Discharge
- Likely Sanitary Wastewater Source
- Likely Graywater/Washwater Source
- Confirmed Sewage Source
- Dumping

If field testing was performed, and there were no signs of ammonia or detergents (ammonia < 1.0 mg/L; detergents < 0.25 mg/L), the outfall investigation is characterized as "no evidence of illicit discharge" as per the Residential or Light Commercial Flow Chart **(SOP Form 10**). If there was no flow at the time of investigation and no other signs of illicit discharge, the outfall investigation is categorized as "no evidence of illicit discharge."

If field testing results indicated the presence of ammonia or detergents or if laboratory testing was conducted, upon receipt of the laboratory results, use the Residential or Light Commercial Flow Chart to identify contaminating sources based on parameter levels and land use.

(2) Documentation

Documentation is required to be created for each IDDE investigation. The specific documents required depends on the final determination based on the IDDE investigation (No Flow, Flow, Dumping) and are described in more detail below.

(3) Watch List

When a PID is reported/investigated and does not have any signs of illicit discharge upon the initial field visit, it is placed onto a Watch List and re-inspected quarterly for one year (the initial visit and three subsequent visits.) The Watch List is used for intermittent flows or discharges that might not be present continually. If there is evidence of illicit discharge during any of the inspections, the standard procedures for documenting and eliminating the PID are conducted. If all four investigations determine there is no evidence of illicit discharge, the incident is closed and removed from the Watch List.

B. RECORD KEEPING AND QUALITY ASSURANCE/QUALITY CONTROL

An update on outfalls investigated is provided in the Monthly Task Status submitted to DelDOT each month. The status of immediate action IDDE Investigations are provided to DelDOT as soon as they are discovered.

Information collected during each IDDE investigation is entered into the NPDES Database Field Tool WQI, as previously described. Documentation for each PID and outfall screened is stored in the NPDES Database. The documentation is available to be viewed or downloaded by users of the NPDES Database Map Viewer. It is also stored on KCI's Network.

1. General Documentation Procedures

a. Field Sheet

The Field Sheet **(SOP Form 5)** is generated from information input to the Field Tool WQI and summarizes the field observations during the outfall screening process. An explanation of each line item in the Field Sheet is attached as **SOP Form 6**.

b. Tracking Form

The Tracking Form **(SOP Form 11)** is generated from the Field Tool WQI, and is organized by Incident ID number. It serves as a concise one-page summary of the IDDE evaluation and field screening process. An explanation of each line item in the Tracking Form is attached as **SOP Form 12**.

c. Outfall Location Map

The Outfall Location Map identifies the exact location of the outfall with discharge and is created in the Field Tool WQI. Outfall Location Map creation procedures and a map example are provided in the attached **SOP Form 13**.

d. Laboratory Data

The Laboratory Data is filed on the KCI Network and is also entered into Page 5 of the Field Tool WQI and includes the following:

- Date Sent
- Date Received
- Laboratory Data: As Applicable - Surfactants, Ammonia, Oil and Grease, pH, Potassium, Diesel Range Organics, Gasoline Range Organics, Other

The Laboratory Data is compared to the Residential and Light Commercial Flow Chart **(SOP Form 10).** The Monthly Task Status IDDE Worksheet, Field Investigation Summary Table, Project Memorandum and Tracking Form are all updated with the Flow Chart Method Determination.

e. PID Memorandum

The PID Memorandum **(SOP Form 14)** information is entered on Page 7 of the Field Tool WQI. The following information is entered into the Field Tool WQI:

- Memorandum From
- Memorandum To
- Date & Memorandum Comment (for each update to the investigation)

The PID Memorandum is continually updated throughout the entire investigation with the most recent coordination, information, laboratory data, and flow chart method determinations. When the PID investigation has been completed, the PID Memorandum is exported and saved on the KCI Network.

f. Door Hanger Information

As applicable, fill out the Door Hanger **(SOP Form 15)** and create a Door Hanger Distribution Map **(SOP Form 16)**. The Door Hanger and Door Hanger Distribution Map are scanned and saved on the KCI Network.

g. Notice of Potential Illicit Discharge

As applicable, fill out a DelDOT Notice of Potential Illicit Discharge **(SOP Form 17)** and save on KCI Network.

h. QA/QC

After all documentation has been organized and completed, check it versus the QA/QC Form **(SOP Form 18).**

2. Required Documentation

The following documentation is required for IDDE Investigations **WITHOUT FLOW**.

- Field Sheet

The following documentation is required for IDDE Investigations **WITH FLOW**.

- Field Sheet
- Tracking Form
- Location Map

The following documentation is required for IDDE Investigations **WITH EVIDENCE OF ILLICIT DISCHARGE**.

- Field Sheet
- Tracking Form
- Location Map
- Memorandum
- Laboratory Results, as applicable
- Notice of Potential Illicit Discharge, as applicable

The following documentation is required for IDDE Investigations **WITH SIGNS OF DUMPING**.

- Tracking Form
- Memorandum
- Door Hanger Information

C. TRACKING AND ELIMINATION OF VERIFIED ILLICIT DISCHARGES

Determining the necessary steps for illicit discharge elimination are based on the results of the outfall field screening and inspections. The category of illicit discharge (wastewater, dumping) determines the additional steps taken to locate and identify the responsible party and to eliminate the illicit discharge.

As described above, when an illicit discharge is detected, a KCI field crew creates a Memorandum in the field tool, which includes information regarding how the discharge was reported, field screening observations, and laboratory results. KCI maintains a record of all correspondence and field visits for each PID in the Monthly Task Status Report. All Memorandums, Tracking Forms, and the Monthly Task Status Report are updated when new information is received, thereby detailing every activity related to the illicit discharge until it is eliminated or removed.

1. Elimination and Enforcement Actions

Administrative action is the first step used to eliminate an illicit discharge. The party or parties responsible for an illicit discharge are notified in person, if possible, and in writing (certified mail) of the suspected or identified illicit discharge by way of a Notice of Potential Illicit Discharge **(SOP Form 17)**. Permission is sought from the property owner to conduct further inspections, including dye testing or video pipe inspection, if appropriate, in order to confirm the source.

Once a discharge and its source are confirmed, the responsible party is requested to voluntarily eliminate the illicit discharge, or to develop and submit a written time-appropriate plan to do so. If the voluntary compliance is insufficient or the approved plan is not executed as agreed upon, or if there is no response or appropriate action taken by the responsible party(s), after notice and within a specified period, the case will be referred to DNREC to take actions to eliminate the illicit connection and subsequently recover costs from the owner. After illicit discharge elimination, a KCI field crew conducts a follow-up field screening to confirm the discharge has been eliminated at the structure/outfall.

The following types of reports/discharges are immediately referred to DNREC for follow-up: onsite wastewater treatment systems (OWTS), major spills, fish kills, or immediate environmental hazards.

2. Door Hanger Distribution

In residential neighborhoods where illicit discharge or dumping of materials into the MS4 is suspected or reported, KCI investigates the area and transmits all associated documentation to DelDOT. Upon approval, KCI distributes Stormwater Pollution Awareness Door Hangers **(SOP Form 15).** Door hangers are a public education tool to raise awareness that materials such as grass clippings, leaves, motor oil, pet waste, etc., need to be kept out of storm drains. Door hangers are distributed to a select number of houses surrounding the affected outfall or structure. The following information is presented:

- Type of illicit discharge that was found in the storm sewer system
- Location of affected structure
- Potentially affected water body
- Importance of stormwater management
- Guidelines for reducing stormwater runoff pollution
- Contact information for illegal discharge information

A Door Hanger Distribution Map, including the location of the affected structure, accompanies the documents for the illicit discharge. An example map is attached as **SOP Form 16**.

D. ANNUAL REPORT

An Annual Report is prepared to include a summary of IDDE Investigations conducted in the calendar year, field and laboratory data sheets, and descriptions of dry weather flows detected and possible sources for the dry weather flows. The following topics are summarized:

1. Dry Weather Field Screening

- Storm drain system inspection for purpose of identifying source of any illicit discharges
- Targeted screening/inspection of structures draining to outfalls
- Permit requirement to screen 20% of outfalls per year

2. Tracking and Elimination of Verified Illicit Discharges

- Elimination and enforcement actions
- Door hanger distribution

Throughout the year, KCI maintains a record of all correspondence and field visits for each PID in the Monthly Task Status Report. At the end of the year, for the Annual Report, each PID incident is compiled into a PID Summary Table. The PID Summary Table is attached as **SOP Form 19**.

E. PUBLIC INTERACTION GUIDELINES

During field investigations, it is not uncommon for the public to interact with KCI field crews. The intent of these guidelines is to provide the field crews with a consistent approach to providing information to the public, while minimizing the chances of the public misinterpreting the authority or function of the field crews.

At all times, each field crew member should recognize the importance of providing polite and accurate information to the public with regard to the purpose of the NPDES field work. Field staff are required to wear KCI safety vests (Refer to the KCI Health & Safety Plan).

1. Necessary Documentation for Public Interaction

The NPDES Field Work Authorization Letter **(SOP Form 4)** verifies that field staff have the authority by DelDOT to conduct NPDES field work. Ten copies of the NPDES Field Work Authorization Letter should be carried with each field crew at all times.

2. Sample Public Interactions

The following are common situations or concerns that field crews may experience during interaction with the public. The proper field staff response is provided below.

a. Public Inquires about What You are Doing

The field staff should respond that DelDOT is required to conduct environmental and water quality monitoring and to inventory and inspect the MS4 storm drain system. The field staff should hand them the NPDES Field Work Authorization Letter and explain the purpose of the field work.

b. Public Presents You with a Drainage / Maintenance Concern

(1) Concern Needs Immediate Attention/Action

The field crew should report the issue to the appropriate DelDOT staff. Examples of immediate action concerns include missing or damaged grates or other situations that could pose an immediate dangerous situation.

(2) Concern Does Not Need Immediate Attention/Action

The field crew should listen to the public's concern and respond that DelDOT is required to conduct environmental and water quality monitoring and to inventory and inspect the MS4 storm drain system. State that you do not have the authority to investigate this concern at this time. **UNDER NO CIRCUMSTANCES** offer a possible solution to the concern.

c. Public Presents You with an Illicit Discharge Concern

(1) Illicit Discharge Not of Their Doing

The field crew should obtain the location of the discharge and inform the person that KCI will follow up on the concern.

(2) Previous Illicit Discharge Notification Concerning Their Property

The field crew should recommend they contact the DelDOT Project Manager as per written on the notification.

d. Public Does Not Want You on Their Property

Respond that you are working for DelDOT to conduct environmental and water quality monitoring and to inventory and inspect the storm drain system, and that you have the right to be there.

Provide them with the NPDES Field Work Authorization Letter **(SOP Form 4)** and explain the purpose of the field work. If they still do not want you there, attempt to obtain their name, address, and phone number so that the KCI Project Manager can contact them. If they become aggressive, leave the premises.

DO NOT ARGUE WITH ANYONE UNDER ANY CIRCUMSTANCES!

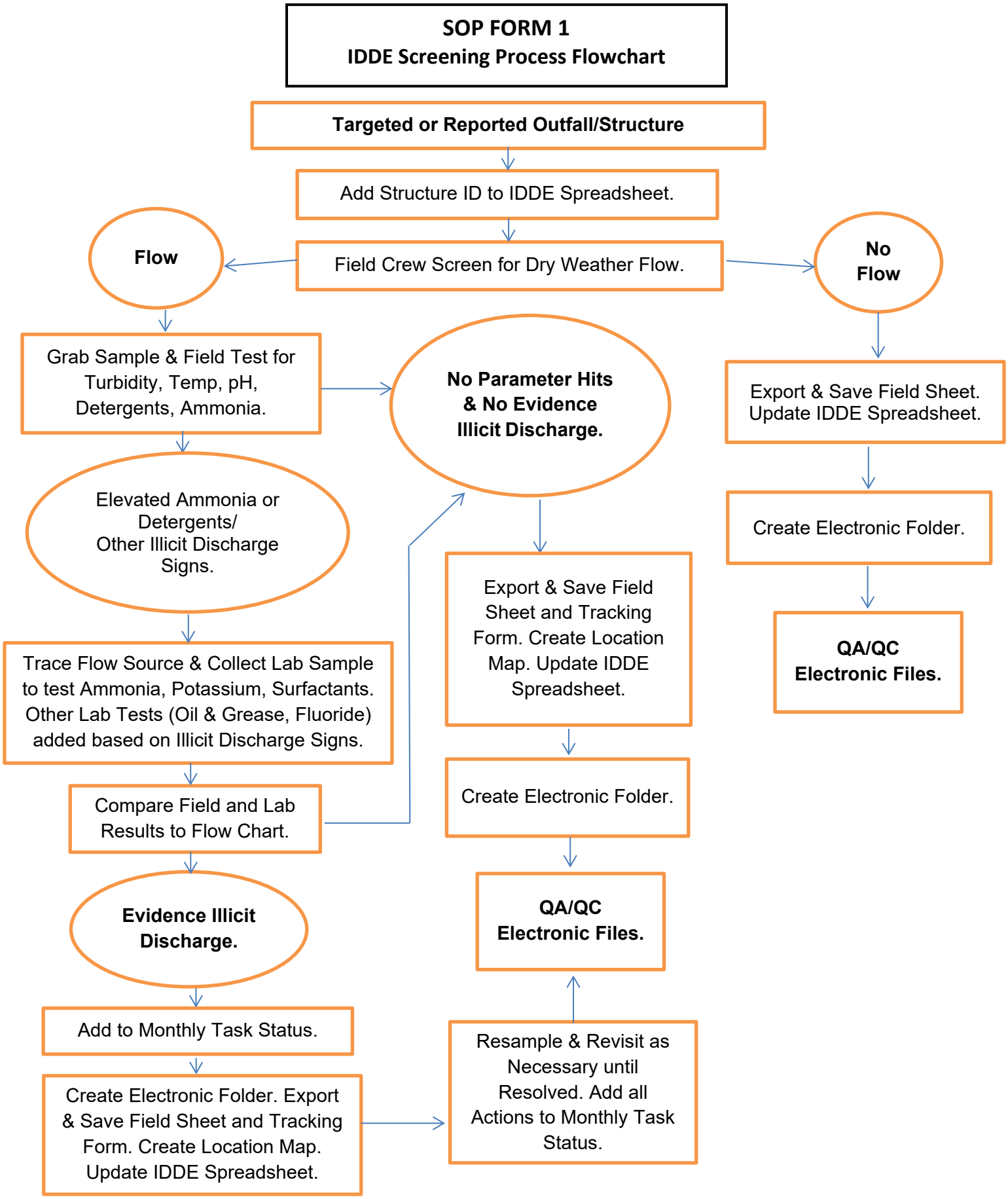
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
Phase II MS4 Permit

ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

STANDARD OPERATING PROCEDURES

SOP FORMS

SOP FORM 1
IDDE Screening Process Flowchart



2025 302STOPPIT FIELD INVESTIGATIONS

Date Reported	Field Visit Date	Address/Location	Issue	Reported Through	Responsibility	Incident ID No.	Homeowner Information	Homeowner Contacted?	Investigation Results	Action Taken

SOP FORM 3
Field Equipment List

GENERAL EQUIPMENT
- Intent to Enter Legal Letters (SOP Form 3)
- Field Data Sheets (SOP Forms 4-5)
- Rugged Laptop
- GPS Unit
- Pole-Mounted Camera & Associated Equipment
- Digital Camera
  - Extra Batteries
- Aerial Maps, ADC Map Book
- Clipboard & Pencils
- IDDE SOP

SAFETY EQUIPMENT
- First Aid Kit
- Sunscreen
- Bug Spray
- Nitrile Gloves
- Safety Googles
- Work Gloves
- Traffic Safety Vests
- Traffic Cones
- Emergency Telephone Numbers
- Cell Phone

SAMPLE COLLECTION EQUIPMENT
- Sample Pole and Accessories
- Shallow Sample Collection Scoop
- Manhole Cover Remover
- Sample Bottles
- Liquid / Chemical Waste Bottle
- Sharpie Markers for Sample Labeling
- 6’ Measuring Tape
- Cooler and Ice (for Laboratory Transport)
- MSDS for all Chemicals / Reagents
- Machete
- Waders / Hip Boots

ANALYTICAL EQUIPMENT
- Ammonia Test Kit and Manual
- Detergents Test Kit and Manual
- Turbidity Meters (2) and Manual
- pH Probes (2) and Manual
- Distilled Water (to rinse analytical equipment)
- Wash Bottle
- Sample Temperature Gage
- Paper Towels

FLOW ESTIMATION EQUIPMENT
- Tape Measure
- Stop Watch
- Calculator
- Floating Object to Measure Flow Rate
  - Ping Pong Ball or Cork

SOP FORM 4
Field Work Authorization Letter

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

NICOLE MAJESKI
SECRETARY

TO WHOM IT MAY CONCERN:

This letter verifies that the Delaware Department of Transportation (DelDOT) has hired KCI Technologies, Inc. to conduct engineering surveys and inspections for our Statewide Environmental and Water Quality Monitoring and Municipal Separate Storm Sewer/Best Management Practices Inventory and Inspection Programs.

To assist the Department in obtaining such surveys and inspections, the laws of the State of Delaware include the following:

TITLE 17, Chapter 1, Subchapter III, Section 132(c)(13) DELAWARE CODE

The Department may:

(13) Enter upon the lands or waters of any person for the purpose of surveys, repairs, reconstruction and operation of publicly financed improvements but subject at all times to responsibility for all and any damages which shall be done to the property of any such person or persons. Water levels to be maintained back of publicly financed sluices, water control structures, dams and similar structures shall be at a level that will not cause damage to adjoining property, such as seepage of water into basements and wells, and that no lands shall be flooded without the owners' full consent.

Your cooperation in this matter will be appreciated. For further information, you may contact:

Mr. Brian Urbanek, PE
Assistant Director, Statewide Support Services
Delaware Department of Transportation
P.O. Box 778
Dover, Delaware, 19903.
(302) 760-2536

DelDOT

SOP FORM 5
Field Sheet

ILLICIT DISCHARGE DETECTION & ELIMINATION FIELD SHEET

Structure Number:

Incident ID #:

County:

Subdivision:

Address/Location:

Personnel		
Date		
Time		
Air Temperature (F)		
Photograph		
Date Last Rain		
Outfall Dimensions (inches)		
Outfall Shape		
Outfall Type		
Flow Observed		
Land Use		
Structural Condition		
Erosion (Outfall Area)		
Algae Growth		
Vegetative Condition (Outfall Area)		
Flow Rate (cfs)		
Water Temperature (F)		
pH (units)		
Turbidity (ntu)		
Surfactants (mg/L)	**Field Tested:**	
	Lab Tested:	
	Follow Up Lab Tested:	
Ammonia (mg/L)	**Field Tested:**	
	Lab Tested:	
	Follow Up Lab Tested:	
Potassium (mg/L)	**Lab Tested:**	
	Follow Up Lab Tested:	
Other Lab Result (units)		
Odor		
Deposits/Stains		
Color		
Floatables		
DETERMINATION (FROM IDDE FLOWCHART)		

SOP FORM 6
Field Sheet Explanation

IMPORTANT:

- Fields marked with an asterisk (*****) below are recorded only for structures with ***FLOW***.
- All other fields are recorded for ALL structures.

Structure Number. Structure ID number from DelDOT's NPDES Map Viewer database for the structure being field screened.

*** Incident ID #**. ID numbers are given to structures or outfalls with flow. It is determined by the year in which the outfall is field screened, dash, numeric number. (i.e., The first structure with flow screened in 2025 would have an incident ID # of 2025-1). Structures with no flow are not given an Incident ID.

County. The county in which the structure is located.

Subdivision. The name of the neighborhood where the structure is located. If the structure is not located in a neighborhood, "N/A" will be recorded on this line.

Address/Location. The closest known address to the structure. If there are no known addresses surrounding the structure, this field will be blank.

Personnel. The initials of all persons performing field screening tasks. Initials are separated by a comma (i.e., DG, JL).

Date. The date when the structure was screened.

Time. The time when the field screening crew arrived at structure.

Air Temperature. The temperature when the field crew arrived at the structure. Temperature is recorded in degrees Fahrenheit.

Photograph. Records whether a landscape/structure photograph was taken. If the structure has dry weather flow, photographs must be taken and "Y" is recorded. If the structure does not have flow, "N" is recorded and no photographs are taken.

Date Last Rain. The date of the last precipitation that accumulated to 0.10" or more within a 24-hour time period. This date is determined by the latest weather report e-mail or by the Delaware Environmental Observing System (DEOS) website. This information is used to determine if field screening was performed during valid conditions (72-hour antecedent dry period).

Outfall Dimensions. The dimensions of the structure that was field screened. Measurements must be taken using a tape measure in the field.

Outfall Shape. The shape of the structure being field screened. If the structure being screened is not an outfall, "N/A" is recorded in this field.

SOP FORM 6
Field Sheet Explanation

Outfall Type. The material of the structure being field screened.

Flow Observed. Records whether dry weather flow was observed at the time of field screening.

Land Use. How the land surrounding the structure is being used. Categories are residential "R", commercial "C", industrial "I", or other "O". If "O" is chosen, specify the type of land use.

Structural Condition. Any deficiencies with the structure being screened.

Erosion. Any erosion that may be occurring around the structure.

Algae Growth. The presence of algae in the structure or in the flow from the structure.

Vegetative Condition. The condition of the area around the structure. Notes any growth that is impeding field screening or sample collection.

*** Flow Rate**. The flow rate of the discharge leaving the structure. Flow rate is measured using one of two methods – Flow Volume Method and Velocity and Cross-Sectional Area Method.

*** Water Temperature**. The water temperature of the sample collected from the structure. Temperature is in degrees Fahrenheit.

*** pH**. The pH of the sample collected from the structure recorded using a pH meter.

*** Turbidity**. The turbidity as measured in the field of the sample collected from the structure. Turbidity is recorded in NTUs.

*** Surfactants Field Tested**. The concentration of detergents found in the sample after conducting field testing according to Hach Storm Water Test Kit Instruction Booklet.

*** Surfactants Lab Tested**. The detergent laboratory results from the second sample as reported by the Lab. This information is only recorded if an initial detergent level was detected in the field and a second sample was collected for Lab analysis.

*** Surfactants Follow Up Lab Tested**. The detergent laboratory results from the third sample as reported by the Lab. This information is only recorded if field crews returned to the structure for a follow-up sample collection.

*** Ammonia Field Tested**. The concentration of ammonia found in the sample after conducting field testing according to Hach Fish Farmer's Water Quality Test Kit Instruction Booklet.

*** Ammonia Lab Tested**. The ammonia laboratory results from the second sample as reported by the Lab. This information is only recorded if an initial ammonia level was detected in the field and a second sample was collected for Lab analysis.

SOP FORM 6
Field Sheet Explanation

*** Ammonia Follow Up Lab Tested**. The ammonia laboratory results from the third sample as reported by the Lab. This information is only recorded if field crews returned to the structure for a follow-up sample collection.

*** Potassium**. The potassium laboratory results from the second sample as reported by the Lab. This information is only recorded if a second sample was collected for Lab analysis.

*** Potassium Follow Up Lab Tested**. The potassium laboratory results from the third sample as reported by the Lab. This information is only recorded if field crews returned to the structure for a follow-up sample collection.

*** Other Lab Result**. The laboratory results from the second sample as reported by the Lab for any additional parameters.

*** Odor**. Any noticeable discharge odor from a structure or from the sample collected.

*** Deposits/Stains**. Any deposits or staining (oil, iron flocculent, etc.) on the structure or sample bottle.

*** Color**. The color of the sample collected.

*** Floatables**. Any noticeable floatables in collected sample or in flow coming from structure.

*** Determination**. The final determination of the discharge based on the IDDE Residential or Light Commercial Flowchart **(SOP FORM 11)**. This is to be determined after all test results have been returned from the laboratory and evaluated.

SOP FORM 6
Field Sheet Explanation

Flow Volume Method

1. Determine if there is Flow or No Flow.

2. If No = Record in WQI in Field Tool.

3. If Yes = Determine if flow is sufficient to use a 1 Liter (L) or a 32 ounce (oz) sample collection bottle, or if flow is minimal and need to use a cut out plastic container.

3. Record the amount of time for flow to fill the entirety of the established volume.

4. Record required fields:

   - Record the **Container Size** (oz).
   - Record the **Seconds to Fill**.

6. Use following calculations to calculate flow rate in cubic feet/second (cfs):

   - If using a 1 Liter Sample Bottle:
     1 L/s = 0.0353147 cfs
     FLOW RATE (cfs) = 0.0353147 cfs / ____ seconds to fill up bottle

   - If using a 32 oz Sample Bottle:
     (32 / ____ sec to fill) x 0.469 = _____ GPM
     FLOW RATE (cfs) = _____ GPM / 448.8

   - If using an irregular Sample Bottle:
     _____ oz / _____ sec to fill x 60 sec/1 minute x 1 gal/128 oz = _____ GPM
     FLOW RATE (cfs) =_____ GPM / 448.8

7. Add the Flow Rate to WQI in Field Tool.

SOP FORM 6
Field Sheet Explanation

Velocity and Cross-Sectional Area Method

1. Determine if there is Flow or No Flow.

2. If No = Record WQI in Field Tool.

3. If Yes = Conduct the following procedures:

4. Measure a **Fixed Length** (ft) along the flow path (e.g., measuring tape on ground).

5. Drop a light object (e.g., ping pong ball) in the flow at the beginning of the measured length and record the time it takes for the object to go from the beginning to the end of the measured length [**Time of Travel** (sec)].

6. Record fields:

   - **Fixed Length** (ft)
   - **Time of Travel** (sec)
   - **Flow Depth** (ft)
   - **Flow Width** (ft)

7. Use following calculations to determine flow rate in cubic feet/second (cfs):

   - Flow Velocity (ft/sec) = _____ Fixed Length (ft) / _____ Time of Travel (sec).

   - Flow Area (sq ft) = _____ Flow Depth (ft) x _____ Flow Width (ft).

   - FLOW RATE (cfs) = _____ Flow Velocity (ft/sec) x _____ Flow Area (sq ft).

8. Add the Flow Rate to WQI in Field Tool.

SOP FORM 7
Field Ammonia Test

The AMMONIA test kit should include:

- 2 20 mL Plastic Viewing Tubes
- Rochelle Salt Solution
- Nessler Reagent
- Color Comparator
- Ammonia Color Disk

INSTRUCTIONS:

1. Fill one viewing tube to the 5-mL mark with distilled water. This reagent will be the blank.
2. Fill the second viewing tube to the 5-mL mark with sample. This will be the prepared sample.
3. Add 1 drop of Rochelle Salt Solution to each viewing tube and swirl to mix.
4. Add 3 drops of Nessler Reagent to each viewing tube and swirl to mix. Stopper both tubes.
5. Allow 10 minutes for color development.
6. Insert the prepared sample into the right-hand opening of the Color Comparator.
7. Insert the reagent blank into the left-hand opening.
8. Hold the Comparator up to the light source.
9. Rotate the disc until the colors in the left and right windows match.
10. Read the concentration of ammonia nitrogen in mg/L (N) through the scale window.

NOTES:

- Pour all waste into the chemical drum.
- Record the chemicals used on the Waste Container Chemical Composition List **(SOP Form 9)**.
- Contact Richard.Eicher@safety-kleen.com when the waste container at the office is full.

SOP FORM 8
Field Detergents Test

The DETERGENTS test kit should include:

- 2 20 mL Glass Viewing Tubes
- Detergents Reagent
- Chloroform
- Test Tube Stoppers
- Draw-off Pipet
- Wash Water Buffer Solution
- Color Comparator
- Detergents Color Disk

INSTRUCTIONS:

1. Fill one 20-mL glass viewing tubes to the upper mark (20-mL) with sample water. This reagent will be the prepared sample.
2. Add 12 drops of Detergent Test Solution and shake to mix.
3. Add Chloroform to the lowest mark (5-mL) on the glass viewing tube. (Chloroform is heavier than water and will sink.) Stopper, shake vigorously for 30 seconds and let stand for one minute to allow the chloroform to separate.
4. Using the draw-off pipet, remove the sample water from the tube and discard.
5. Refill the glass viewing tube to the upper mark with the Wash Water Buffer and, using the draw-off pipet, remove the Wash Water Buffer and discard. This step washes away the remaining sample water.
6. Refill the glass viewing tube to the upper mark with the Wash Water Buffer, stopper and shake vigorously for 30 seconds. See the "Storm Water Test Kit Manual" for turbid samples. Let stand for one minute to allow the chloroform to separate.
7. Insert the prepared sample in the right opening of the Color Comparator.
8. Fill the second 20-mL glass viewing tube with distilled water and place it in the left opening of the Color Comparator.
9. Hold the Comparator up to a light source and rotate the disc until the colors in the left and right windows match.
10. Read the concentration of detergents in ppm. Refer to the "Storm Water Test Kit Manual" if the color is darker than the highest reading on the color disc.

NOTES:

- Pour all waste into the chemical drum.
- Record the chemicals used on the Waste Container Chemical Composition List **(SOP Form 9)**.
- Contact Richard.Eicher@safety-kleen.com when the waste container at the office is full.

SOP FORM 9
Waste Container Chemical Composition

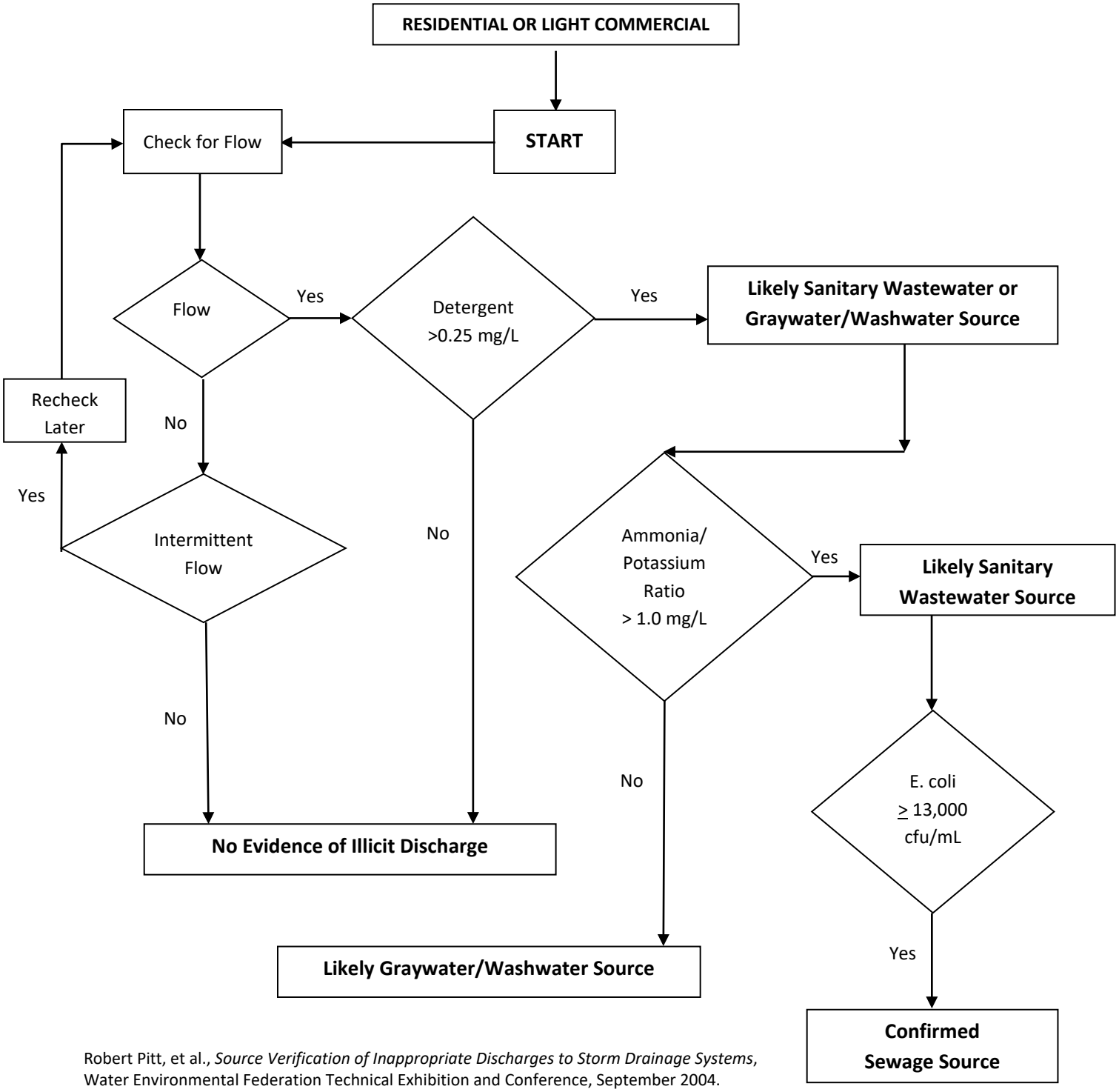
WASTE CONTAINER CHEMICAL COMPOSITION LIST				
DATE	**AMMONIA (no)**	**DETERGENTS (no)**	**DISTILLED WATER RINSE (ml)**	**NOTES**

Contact Richard.Eicher@safety-kleen.com when the waste container supplied by Safety-Kleen is full.

SOP FORM 10
Residential or Light Commercial Flowchart

ILLICIT DISCHARGE DETECTION & ELIMINATION

RESIDENTIAL OR LIGHT COMMERCIAL FLOWCHART



Robert Pitt, et al., *Source Verification of Inappropriate Discharges to Storm Drainage Systems*, Water Environmental Federation Technical Exhibition and Conference, September 2004.

SOP FORM 11
Tracking Form

TRACKING FORM

Incident ID No. **Date:**

Structure No.

EVIDENCE OF ILLICIT DISCHARGE: ☐ YES ☐ NO ☐ TBD

LOCATION:

County: **Subdivision:**
Address: **Watershed:**
City: **Stream:**
Zip Code:

SETTING:

☐	Storm Drain	☐	Outfall	☐	Roadway:
☐	In Stream	☐	Along Bank	☐	Manhole
☐	Stormwater Pond	☐	Other		

VISUAL:

☐	Flow	☐	Soap	☐	Cloudy
☐	Staining	☐	Floatables (toilet paper, etc)	☐	Algae
☐	Oil / Oil Sheen	☐	Precip w/in 72 hrs	☐	Yard Waste
☐	Other				

ODOR:

☐	None	☐	Sulfide (“rotten egg”)	☐	Gas/Oil
☐	Sewage	☐	Other: _____		

IDDE INVESTIGATION SUMMARY:

Referred By:

Issue/Field Investigation:

Determination:

Landscape Photo

DOCUMENTATION:

- ☐ Location Map
- ☐ Summary Memorandum with Photographs
- ☐ Field Data Sheet
- ☐ Laboratory Data
- ☐ Door Hanger / Distribution Map
- ☐ Notice of Potential Illicit Discharge
- ☐ Other: _____

Structure Photo

SOP FORM 12
Tracking Form - Explanation

IMPORTANT:

- Tracking forms are created only for structures with ***FLOW*** or ***POTENTIAL ILLICIT DISCHARGES***.
- Structures with no flow/no evidence of illicit discharge do not receive a tracking form.

Incident ID No. The ID number given to structures or outfalls with flow. It is determined by the year in which the outfall is field screened, dash, numeric number (e.g. The first structure with flow screened in 2018 would have an Incident ID # of 2018-1). The Incident ID No. can be found on the field data sheet.

Date. The date when the structure was screened. For PIDs, the date that the incident is closed is also recorded.

Structure Number. The structure ID number for the structure that was screened.

Evidence of Illicit Discharge. Determination based on field screening and laboratory results. If lab results have not been returned, or investigation is still occurring, "TBD" will be selected. If field screening test results did not indicate any elevated levels of detergent or ammonia, and no visuals of illicit discharge were detected, "No" will be selected. If lab results were returned and flow chart determines illicit discharge, "Yes" will be selected.

County. The county in which the structure is located.

Address. The closest known street address to the structure.

City. The city in which the structure is located.

Zip Code. The zip code in which the structure is located.

Subdivision. Record the name of the neighborhood where the structure is located. If the structure is not located in a neighborhood, record "N/A" on this line.

Watershed. The watershed in which the structure is located. The watershed can be found using http://www.dnrec.delaware.gov/swc/wa/Pages/WatershedAssessment.aspx.

Stream. The stream name closest to the structure that was field screened. The stream name can be found using Google Maps.

Setting. Description of where the sample was collected.

Visual. Any observations that were noticed when the sample was collected. Most tracking forms will check "Flow", unless field screening is a result of dumping, or if there was no flow at the time of screening.

SOP FORM 12
Tracking Form - Explanation

Odor. Any odor at the structure or from the sample.

Referred By. Who reported the structure to the field screening crew. Structures may be referred by Client staff or the public.

Issue / Field Investigation. Record the reason for field screening. If the structure is a potential illicit discharge, record the suspected reason (ex. Pet waste being dumped into MS4).

Determination. The final determination of the discharge based on the IDDE Residential or Light Commercial Flowchart.

Landscape Photo. Landscape photograph that was taken when the structure was screened.

Structure Photo. Structure photograph that was taken when the structure was screened.

Documentation. Boxes will be selected for any additional documentation related to field screening that can be found in the structure folder.

- **Location Map** – Included with ALL structures.
- **Summary Memorandum with Photographs** – Included for structures that are considered potential illicit discharges or with multiple field visits.
- **Field Data Sheet** – Included for all structures field screened with the exception of PIDs that are not flow related (i.e., dumping.)
- **Laboratory Data** – Included for any structures where sample was taken to Laboratory.
- **Door Hanger** – Photocopy/scan pdf of door hanger that was distributed.
- **Door Hanger Distribution Map** – Map identifying the specific houses that received a door hanger.
- **Notice of Potential Illicit Discharge** – Included for any structure for which a Notice of Potential Illicit Discharge was sent to a property owner.
- **Other** – Should be included if the structure required any additional documentation such as any e-mail correspondence, property parcel information, etc.

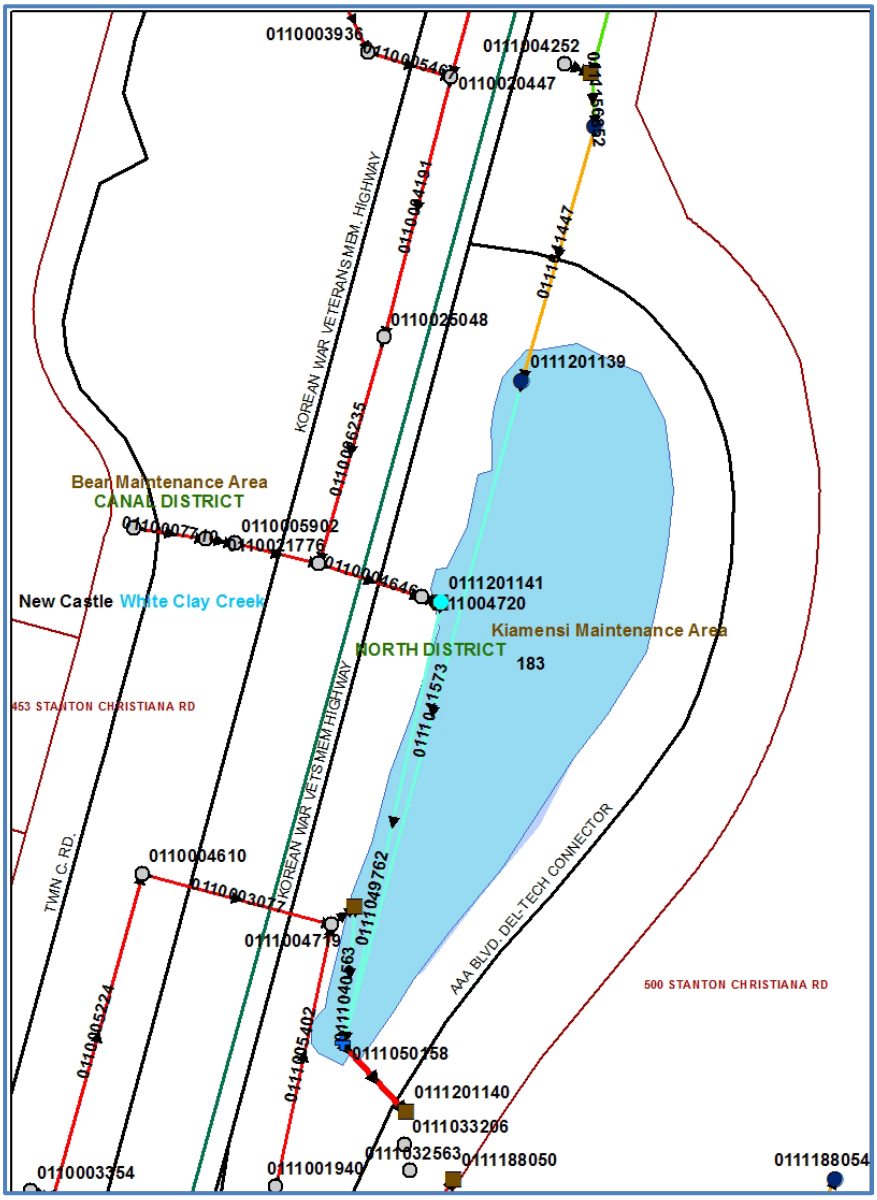
SOP FORM 13
Outfall Location Map Directions & Example Map
(Only Outfalls With Flow)

DIRECTIONS

1. Create Location Map from NPDES Database for Outfalls with Flow:
2. Save Map in applicable Project Folder

EXAMPLE

STRUCTURE 0111004720



SOP FORM 14
PID Memorandum

The PID Memorandum information is entered on Page 7 of the Field Tool WQI.

The following information is entered into the Field Tool WQI:

- PID Memorandum From.
- PID Memorandum To.
- Date & PID Memorandum Comment (for each update to the investigation).

The PID Memorandum is continually updated with the most recent coordination, information, and Laboratory Data/Flow Chart Method throughout the investigation.

When the PID investigation has been completed, the Memorandum is exported and saved in the applicable KCI network electronic folder.

A PID Memorandum Template is located on the next page.

SOP FORM 14
PID Memorandum

PID MEMORANDUM

TO: DelDOT NPDES Group

FROM: KCI Staff

DATE: Start Date – End Date

SUBJECT: **Potential Illicit Discharge Investigation**
Incident ID No./Structure No.
Street Address / Subdivision or Business Name
Watershed / County
KCI Project Number

The purpose of this Memo is to summarize the field investigation regarding a Potential Illicit Discharge (PID) at <INSERT ADDRESS AND COUNTY>. Photos are attached on following pages.

DATE

A field crew (KCI Staff) was conducting inventory field checks and came across a potential illicit discharge.

- OBSERVATIONS.
- ADD PHOTOS

DATE

An IDDE field crew (KCI Staff) visited the area to look for signs of illicit discharge.

- ADD OBSERVATIONS.
- ADD PHOTOS

SOP FORM 15
Door Hanger

Illegal Dumping Found in Your Area!

This is not a citation.

Date: _____

This is to inform you that our staff found the following illegal pollutants in the storm sewer system in your neighborhood.

It is illegal to put any of these items in the storm drain, punishable by a minimum $1000 fine:

- ☐ Motor oil/filters
- ☐ Antifreeze/ transmission fluid
- ☐ Paint
- ☐ Solvent/degreaser
- ☐ Cooking grease
- ☐ Detergent
- ☐ Home improvement waste (concrete, mortar)
- ☐ Pet waste
- ☐ Yard waste (leaves, grass, mulch)
- ☐ Excessive dirt and gravel
- ☐ Trash
- ☐ Pesticides and fertilizers
- ☐ Other_____

The pollutants were found:

_____

_____

This storm sewer leads directly to:

_____

Delaware Department of Transportation

If you have any information regarding this or any other illegal dumping of pollutants, please call:

1-800-652-5600

dotpr@state.de.us

To report water pollution call or text

302 STOPPIT

or visit

www.302STOPPIT.org

Stormwater runoff is water from rain or snowmelt that flows over the ground. As it flows, it can pick up litter, leaves, oil, fertilizer, detergent, animal feces and deposit them into a storm sewer system or waterbody.

Anything that enters a storm sewer system empties into the waterbodies we use for swimming, fishing, and drinking water.

Remember:
Only Rain Down the Storm Drain!

To keep the stormwater that leaves your home or workplace clean, follow these simple guidelines:

- Use pesticides and fertilizers sparingly.
- Repair auto leaks.
- Dispose of household hazardous wastes, used auto fluids (antifreeze, oil, etc.), and batteries at designated recycling locations. dswa.com/programs_haz.asp
- Clean up after your pet.
- Use a commercial car wash or wash your car on a lawn or other unpaved surface.
- Avoid sweeping or blowing grass clippings or leaves into the streets or storm drains.
- Clean paint brushes in a sink, not outdoors. Properly dispose of excess paints through a household hazardous waste collection program.
- Sweep up and properly dispose of construction debris such as concrete and mortar.

SOP FORM 16
Door Hanger Distribution Map

SOP FORM 17
Notice of Illicit Discharge

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

NICOLE MAJESKI
SECRETARY

NOTICE OF POTENTIAL ILLEGAL DISCHARGE

The Delaware Department of Transportation (DelDOT) is responsible for maintaining not only roadways, but also the extensive storm drain and pipe networks located within State rights-of-way. The Federal National Pollutant Discharge Elimination System (NPDES) Program, which is a component of the Clean Water Act of 1972, requires DelDOT to control the amount of pollutants entering the drainage system. Part of this charge is the detection and elimination of *illegal discharges* or connections to the system that may contain pollutants or are otherwise not allowed. Left uncorrected, any pollutants entering the system will ultimately impact nearby streams, as storm drainage is not treated at any sort of treatment facility.

DelDOT has contracted with the engineering firm KCI Technologies, Inc. to survey and inspect the drainage system and to check for illegal discharges or connections. Please review the following checked items that pertain to you:

☐ ***You are receiving this notice because a potential illegal discharge or connection from your property was detected during a recent investigation. Please see details below.***

Date: Structure #: Address:

Indicators or Source:

☐ ***This discharge or connection must be ceased or removed within 30 days. A follow up investigation will be conducted after that time to ensure compliance. Failure to comply within 30 days gives DelDOT the right to remove/cease the connection and/or contact Delaware Department of Natural Resources and Environmental Control for enforcement action. Any damage resulting from a plugged connection is the homeowner's responsibility. After 30 days, DelDOT also has the right to bill the responsible party for investigation costs. Please contact Julie Scheu, KCI Technologies, when the connection has been removed or with any questions regarding this matter.***

☐ ***We are requesting access to your property to assist in our determination. Within seven days, please contact KCI Technologies, Inc. as shown below to make the appropriate arrangements.***

Julie Scheu
KCI Technologies, Inc.
1352 Marrows Road, Suite 100
Newark, DE 19711
(302) 318-1081

NPDES program information can be obtained by contacting Sara Esposito, PE, NPDES Program Manager, by calling (302) 760-2346, or by email at Sara.Esposito@delaware.gov.

Thank you for helping us preserve Delaware's environment.

DelDOT

SOP FORM 18
QA/QC Form

TASK	ACTION	COMPLETED
Field Sheet	Scan and file in electronic and hard copy folders	
Photos	Upload and label in electronic folder	
Tracking Form	Complete and update as necessary: lab results, flow chart, NOV, etc.	
Location Map	QA / QC information displayed	
Laboratory Data	Scan and file in electronic and hard copy folders	
	Compare to Flow Chart Method	
	Make determination and update tracking form and memorandum	
	Update summary table	
Memorandum	Create / review / update as necessary	
Door Hanger	Scan and file in electronic and hard copy folders	
Notice of Violation	Scan and file in electronic and hard copy folders	
Final QA / QC	QA / QC all electronic versus hard copy documentation	

SOP FORM 19
PID Summary Table

POTENTIAL ILLICIT DISCHARGE INVESTIGATIONS
2025 SUMMARY TABLE

Date	Reported By	Investigation Results	Determination	Action
Address / Subdivision **Reported Date / Incident ID No.** **Issue Description**				
Address / Subdivision **Reported Date / Incident ID No.** **Issue Description**				
Address / Subdivision **Reported Date / Incident ID No.** **Issue Description**				

APPENDIX B

B-6: SSO ALTERNATIVE COMPLIANCE REQUEST

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

NICOLE MAJESKI
SECRETARY

March 8, 2024

Gordon Woodrow
Program Manager I
Surface Water Discharges Section
Delaware Dept of Natural Resources and Environmental Control
89 Kings Highway
Dover, DE 19901

Dear Mr. Woodrow:

The Delaware Department of Transportation (DelDOT) requests Alternative Compliance per Part IV, Section C of the Phase II, Tier I MS4 General Permit for the Part II, Section D.3.d.7 Sanitary Sewer Overflow (SSO) requirements to "recognize and report any sanitary sewer overflows or leaking onsite sewage disposal systems that discharge into the small MS4". As a state agency whose authority is limited to road rights-of-way, DelDOT has no authority over wastewater treatment plant sanitary overflows or leaking onsite sewage disposal systems, therefore we have no ability to detect concerns within these systems. DelDOT believes this requirement is more relevant to the municipal permittees.

We will include in our annual report any known discharges that enter into our MS4 system, including:

a) a description of the discharge, including an estimate of the amounts discharged, and the cause of discharge;
b) the period of the discharge, including the dates and times of correction and elimination;

We cannot however do the following:

c) actions taken or to be taken to reduce, and mitigate the discharge, and to prevent recurrence of the discharge;

We believe that this last requirement is more relevant to municipal permittees, as we have no jurisdiction over the wastewater treatment facilities and their discharge protocols. However, we do have a system set up that if the public calls us regarding a concern it would be sent from our Traffic Management Center (TMC) to our Hazardous Waste Coordinator, Jeff Leonard, who would report the concern to DNREC. Likewise, if discovered by internal staff it would also go to Jeff who would report to DNREC.

We hope this information is sufficient, however if you have any questions regarding the alternative compliance request, please do not hesitate to contact me at sara.esposito@delaware.gov or 302.760.2346. DelDOT is available to discuss the topic in further detail with DNREC. Thank you.

Sincerely,

Sara Esposito, PE
DelDOT NPDES Program Manager

SE:
cc: Brian Urbanek, DelDOT, M&O Asst Director, Statewide Support Services
Skip Sanders, DelDOT, NPDES Engineer
Alexis Capes, DNREC, Env Scientist
Gavin Ferris, DNREC, Env Scientist

APPENDIX B

B-7: SSO ALTERNATIVE COMPLIANCE REQUEST APPROVAL

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
DIVISION OF WATER
RICHARDSON & ROBBINS BUILDING
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

COMMERCIAL & GOVERNMENT SERVICES: WASTEWATER, STORMWATER, & BIOSOLIDS MANAGEMENT

PHONE
(302) 739-9946

March 14, 2024

Sara Esposito, DelDOT NPDES Program Manager
State of Delaware Department of Transportation
800 Bay Road
P.O. Box 778
Dover, DE 19903

RE: Approval of The Delaware Department of Transportation's Request for Alternative Compliance, NPDES DE 0051195

Dear Ms. Esposito,

This letter serves as confirmation that the Delaware Department of Natural Resources and Environmental Control's Commercial and Government Services Section has received the Delaware Department of Transportation's request for Alternative Compliance per Part IV, Section C of the Phase II, Tier I MS4 General Permit for the Part II, Section D.3.d.7 Sanitary Sewer Overflow (SSO) requirements.

The request has been reviewed and approved as DelDOT has no authority over wastewater treatment plant sanitary overflows or leaking onsite sewage disposal systems. The Department concludes the following information is sufficient to be submitted in the permittee's future annual reports if any discharges enter their MS4.

- A description of the discharge, including an estimate of the amounts discharged, and the cause of discharge;
- The period of the discharge, including dates and times of correction and elimination;

If you have any questions or require further assistance, please contact Alexis Capes at (302) 612-1441 or by email at alexis.capes@delaware.gov.

Sincerely,

Alexis T.Capes
Environmental Scientist
MS4 Program
Division of Water, DNREC

APPENDIX B

B-8: NOTICE TO SANITARY SEWER PROVIDERS

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

NICOLE MAJESKI
SECRETARY

November 14, 2024

NOTICE TO SANITARY SEWER PROVIDERS

The Delaware Department of Transportation (DelDOT) is responsible for maintaining not only roadways, but also the extensive storm drain and pipe networks located within State rights-of-way. The Federal National Pollutant Discharge Elimination System (NPDES) Program, which is a component of the Clean Water Act of 1972, requires DelDOT to control pollutants entering our drainage system, via our Phase I and Phase II Municipal Separate Stormwater Sewer System (MS4) permits. Our latest Phase II MS4 permit in Kent County, permit DE 0051195 issued on January 1, 2024 by the Delaware Department of Natural Resources and Environmental Control (DNREC), requires DelDOT to "recognize and report any sanitary sewer overflows or leaking onsite sewage disposal systems that discharge into the small MS4." We are therefore required to include in our annual report to DNREC any sanitary sewer overflows into our storm drain system, including:

1. A description of the discharge, including an estimate of the amounts discharged, and the cause of discharge;
2. The period of the discharge, including the dates and times of correction and elimination;

In order to comply with this permit requirement, DelDOT is requesting cooperation from <u>any sanitary sewer provider that has a leak or overflow that enters into or originated within DelDOT's right-of-way</u>. We are requiring:

1. When the situation is an emergency or the response will impede traffic, notify DelDOT's Transportation Management Center (TMC) at 302.659.4600.
    a. TMC will notify Maintenance and Operations staff of the leak or overflow so the appropriate roadway response can be provided.
    b. The location, anticipated clean-up plan, anticipated duration and impacts to the roadway network should be provided, as known at the time.

DelDOT

2. In all situations where there is a leak or overflow affecting DelDOT's storm drain system, contact the appropriate DelDOT Public Works Office notifying them of the leak or overflow and the plan for repairs. *In emergency situations, work may commence following verbal notification to Public Works and concurrence from Public Works that the situation is an emergency.* DelDOT Public Works offices can be reached at the below phone numbers. Please note that after hour emergencies should be sent to TMC.
    a. Canal District (New Castle County): 302.326.4679
    b. Central District (Kent County): 302.760.2433
    c. South District (Sussex County): 302.853.1342
3. Within 24-hours of the commencement of the work, a Utility Permit must be submitted to the DelDOT Public Works Utility Permit Application (UPA) portal.
    a. A Utility Permit can be submitted at: https://services.deldot.gov/UPAExternal/default.aspx
    b. Updated information on the overflow shall be provided including the location, start of the occurrence, flow rate and estimated quantity discharged, estimated duration of discharge, clean-up plan, and the reason for the overflow.
4. The Public Works office and TMC shall be notified when the emergency repair work and/or clean-up is completed.
    a. At that time the following shall be updated: the location, duration of the discharge, flow rate and estimated quantity discharged, the remediation provided, and the reason for the overflow.
    b. If follow-up notification is not provided at the completion of the work, DelDOT shall request that information at the end of the calendar year and it shall be provided at that time.

DelDOT appreciates the cooperation from your organization as we assist DNREC in updating their sanitary sewer overflow records, as required by our Phase II MS4 permit. The notification procedures above also mirror the requirements set forth in the DelDOT Utilities Manual, Section 5.6.3 Emergency Situation, as shown below. All aspects of the Emergency Situation shall also be followed:

5.6.3.1 When a utility initiates an emergency, the utility shall promptly notify the District Public Works Office and the Traffic Management Center (TMC) at 302-659-4600 prior to performing work. The utility is responsible for communicating the type of emergency and location of the work to be performed and other pertinent information. Work may commence following verbal notification to public works and concurrence from Public Works that the situation is an emergency. The utility shall submit a utility construction permit to the District Public Works Office via the UPA within 24 hours of the commencement of work. The utility company shall install the required temporary traffic control devices and personnel in accordance with the DE MUTCD to protect the public and the workers performing emergency work and restoring the site.

This notification is being sent via DelDOT's Utility Section, but any questions on the requirements can be addressed to Sara Esposito, DelDOT NPDES Program Manager at sara.esposito@delaware.gov / 302.760.2346, or the Public Works Offices as reported above.

APPENDIX C – CONSTRUCTION SITE STORMWATER RUNOFF CONTROL

APPENDIX C

C-1: DELDOT DELEGATION LETTER

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
RICHARDSON & ROBBINS BUILDING
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

OFFICE OF THE SECRETARY

PHONE
(302) 739-9000

MAR 1 2 2020

Jennifer Cohan, Cabinet Secretary
Delaware Department of Transportation
800 Bay Road
P.O. Box 778
Dover, DE 19903

Dear Secretary Cohan:

The Department of Natural Resources and Environmental Control (Department) is in receipt of the Delaware Department of Transportation's (DelDOT) request for re-delegation of program responsibility for the Delaware Sediment & Stormwater Program.

The Sediment and Stormwater Program has reviewed and evaluated your existing delegated program responsibility. The Program has recommended conditional delegation of program elements be granted to the DelDOT. This would extend the existing program delegation until June 30, 2025. Condition of re-delegation relies on implementing the recommendations outlined in the 2020 Delegation Review Findings and Recommendations. I concur with that recommendation and by means of this letter, approve delegation for another five years. Department staff will be providing you with a copy of the 2020 Delegation Review Findings and Recommendations, and we will be in touch with your program staff to discuss the findings and recommendations within the next several weeks.

I would like to thank you and your staff for your commitment to administer an effective Sediment and Stormwater Program. If you have any questions or comments regarding the review and evaluation, please do not hesitate to have your staff contact Ms. Jamie Rutherford at (302) 739-9921.

Sincerely,

Shawn M. Garvin
Secretary

cc: Nicole Majeski, Deputy Secretary
Shante Hastings, Chief Engineer
Jim Pappas, Deputy Director, Operations & Support
John Caruano, Group Engineer, Environmental Stewardship
Terry Deputy, Director, Division of Watershed Stewardship
Jamie Rutherford, Sediment and Stormwater Program Manager

APPENDIX C

C-2: ES2M REQUEST FOR PROPOSAL

Delaware Department of Transportation

REQUEST FOR PROPOSALS
PROFESSIONAL SERVICES

RFP Number: **2101-2102**

EROSION, SEDIMENT, AND STORMWATER MANAGEMENT (ES2M)

Submission Due Date/Time: **Thursday, September 07, 2023 no later than 2:00 P.M. Local Time**

Three (3) year term with two (2) possible one-year extensions

Agreement Type: On-Call

Up to two (2) agreements may be awarded from this solicitation

Funding: State

The anticipated method of payment is cost plus fixed fee

29 Del.C. §6981, 2 CFR part 200

PROJECT INFORMATION

This Request for Proposal (RFP) issued by the Delaware Department of Transportation is for the purpose of acquiring Proposals from interested firms to provide assistance to DelDOT's Erosion, Sediment, and Stormwater Management program.

PROJECT DESCRIPTION

Proposed work will involve review of plans and reports for stormwater management, drainage, and erosion and sediment control components in accordance with the standards and regulations of the State and Department for projects of varying size, complexity, and locations across the state of Delaware. Additional tasks may include development of guidelines, manuals, and model plans for stormwater and erosion and sediment control; revising and updating specifications, special provisions, and standard construction details; perform regulation, technology, and policy research. Work will be assigned by task on an as-needed basis.

Assignments will involve review of plans and reports for consistency with DelDOT policies and guidance and the Delaware Sediment and Stormwater Regulations (DSSR). Review will include the issuance of plan and report comments and verification that all comments have been addressed prior to recommendation for approval to the DelDOT Stormwater Engineer.

Consultant Requirements:

- Have knowledge of DelDOT plan standards
- Have knowledge of hydrologic and hydraulic principles
- Have significant experience in the review of engineering of transportation projects
- Have significant experience in Stormwater Management Design
- Have significant experience in Erosion and Sediment Control design and construction phasing
- Have field experience interpreting site conditions with regards to design
- Have clear understanding of the DSSR
- Have strong technical writing abilities for guidance and policy document production

- Be able to perform research on associated topics to develop conclusions & recommendations
- Suitable staff availability to meet prescribed, 30 day, review timelines

Specific tasks may include, but are not limited to:

- Stormwater and Erosion and Sediment Control review for DelDOT's Capital Transportation Program
- Stormwater Management report review for DelDOT's Capital Transportation Program
- Engineering review of projects submitted to DelDOT by internal design staff, contractual design staff and external project submissions.
- Drainage calculation and report review
- Updates to ES2M Design Guide & E2SM Wiki
- Research on associated topics, as requested, with conclusions and recommendations for implementation
- Development of DelDOT Example Plans regarding ES2M for various BMPs to be included on the Design Resource Center website
- Assist with DelDOT Specification and Standard Construction Details updates and revisions
- Maintain approved product list for E&S items
- Maintain standardized general Erosion and Sediment Control notes
- Bentley OpenRoads Designer experience, capabilities & assistance
- Assist in education and training DelDOT staff on research, policy changes, and guidance documents

QUESTIONS

Questions must be submitted before the due date identified in the Procurement Schedule for this RFP. All inquiries must be submitted in the Q/A section of the project listing in the Bonfire Procurement Portal.

The Department's response to questions will be posted, according to the procurement schedule, under the project listing in Bonfire and to the State of Delaware Bid Solicitation Directory Website: http://www.bids.delaware.gov/.

PROCUREMENT SCHEDULE

Action Item	Date	Time
Deadline for Questions to ensure response:	Ten (10) business days prior to the proposal due date	2:00 P.M. Local Time
Final Response to Questions posted by:	Five (5) business days prior to the proposal due date	2:00 P.M. Local Time
Proposals Due no later than:*	Thursday, September 07, 2023	2:00 P.M. Local Time

NOTE: Only asterisk (*) marked date changes will be communicated (via posted Addendums).

PROPOSAL REQUIREMENTS

Interested firms must submit the material required herein or they may not be considered for the project:

1. Proposals must be received before the Proposal Due Date and Time, as identified in the Procurement Schedule for this RFP. Responses submitted by hard copy, mail, facsimile, or e-mail will not be accepted. Responses received after the Proposal Due Date and Time will not be considered.

2. **Upload your submission at**: https://deldot.bonfirehub.com/portal/

   Important Notes:
   - Logging in and/or uploading the file(s) does not mean the response is submitted. Users must successfully upload all the file(s) and MUST click the submit button before the proposal due date and time.
   - Users will receive an email confirmation receipt with a unique confirmation number once the submission has been finalized. This will confirm that the proposal has been submitted successfully.
   - Each submitted item of Requested Information will only become visible to DelDOT after the proposal due date and time.
   - If the file is mandatory, you will not be able to complete your submission until the requirement is met.
   - Uploading large documents may take significant time depending on the size of the file(s) and your Internet connection speed. The maximum upload file size is 1000 MB.
   - Minimum system requirements: Internet Explorer 11, Microsoft Edge, Google Chrome, or Mozilla Firefox. Java Script must be enabled.

   Need Help? Please contact Bonfire directly at Support@GoBonfire.com for technical questions related to your submission. You can also visit their help forum at https://bonfirehub.zendesk.com/hc.

3. **The Prime Consultant must be Registered,** or submit application for registration, with DelDOT at or before the time of submission in order to be considered. For registration information, click here.

4. **Submit one (1) Original and one (1) Redacted copy** of the Proposal. The original must be a .pdf file of the original signed proposal and should be clearly marked "Original" on the first page of the document. The redacted copy must be a .pdf file of the original signed proposal with any proprietary or confidential information redacted, and this copy should be clearly marked as "Redacted" on the first page of the document. The redacted copy is required even if the submission contains no proprietary or confidential information.

   To determine what information may be considered proprietary or confidential and may be redacted from their Proposal, firms should review Delaware's Freedom of Information Regulations here; http://regulations.delaware.gov/AdminCode/title8/1400.shtml#TopOfPage. Under Delaware FOIA law, 29 Del. C, §10002(l)(2), "Trade secrets and commercial or financial information…which is of a privileged or confidential nature" are "records that shall not be deemed public" and are therefore exempt from disclosure under FOIA.

5. **Architect-Engineer Qualifications**; **GSA SF330:**

http://www.gsa.gov/portal/forms/download/116486

Follow instructions for the SF330, and add the following Individual Agency Instructions:

A. Part I Section C 11, Proposed Team;
Indicate if the firm is a DBE and provide the approximate percentage of the contract cost they will perform.

B. Part I Section E, Resumes of Key Personnel Proposed for this Contract;
Resume information is limited to eight (8) individuals regardless of affiliation.

C. Part I Section F, Example Projects;
Example Projects provided are limited to ten (10).

D. Part I Section H 30, Additional Information;
(The Department recommends formatting this section using Times New Roman, 12 pt. font)
1) The Prime consultant must indicate the current workload with the Department by listing the following in a table format:
Agreement No.; Agreement Title; Consultant PM; Prime or Sub; Total Dollars paid to date; current number of Tasks issued; and date of contract expiration.
2) List any DelDOT agreement number your firm has been selected for and not included above.
3) Firms may include a "Rating Criteria Support Information" Section, limited to four pages, within Section H, that covers any information that directly relates to the firm's ability to meet the specific rating criteria listed in this RFP.

Note: Letters of Interest should not be included.

6. **Joint venture** submissions will not be considered.
7. DelDOT reserves the right to reject any and all submissions. Submissions become property of the Department and shall be retained electronically for a minimum period of three (3) years from the date of receipt. DelDOT reserves the right to any and all ideas included in this response without incurring any obligations to the responding firms or committing to procurement of the proposed services.
8. **Required Certification Forms.** All firms responding to the RFP must complete and return the submission forms located in 'Appendix A' of this document.

No promotional materials or brochures are to be included as part of the submission.

RATING CRITERIA

#	**Criteria Description**:	**Weight**
1	Firm's experience pertaining to Drainage, SWM, and E&S design as well as reviewing plans and reports while providing comments and guidance	30 %
2	Firm's experience in conducting research, writing technical papers, as well as preparation and leading training sessions	30 %
3	Firm's knowledge pertaining to DelDOT Standard Specifications and Standard Construction Details and the DSSR	25 %
4	Key Staff and Project Team qualifications	15 %
	TOTAL :	**100%**

OVERVIEW OF SELECTION PROCESS

- This is an On-Call agreement utilized for the performance of services for a number of projects under task orders issued on an as-needed basis. (NOTE: cannot be used for federal engineering or design work leading to construction)
- This is a single-phase solicitation process with the availability for discussions with up to four (4) of the most highly qualified firms. Based upon the listed criteria and evaluation of each firm's submitted proposal, the Selection Committee may decide if a small sample task and/or discussions will be held with the most highly qualified consultants. If discussions are held, they will serve to clarify the technical approach, qualifications, and capabilities provided in response to the RFP, after which the committee will determine the ranking of the candidate firms.
- Selection Committee members will individually score each firm's submitted proposal which determines individual ranking. The Department's ranking is the combined ranking of all Committee members. Firms, in order of ranking, will have the opportunity to negotiate an agreement with the Department. If the Department cannot reach agreement with the highest ranked firm(s), the Department terminates negotiations and begins negotiations with the next highest ranked firm, and so on until an agreement is reached. The Department notifies via email the awarded firm(s) of the opportunity to enter into an agreement with the Department. This notification also includes information on the next steps for the agreement process.
- After the ranking process has been completed, applicable price information will be requested from the successful candidate firm(s), such as; salary rates for various classifications of personnel; and an indirect cost derivation for the most current accounting period.
- Payroll burden and overhead will be computed on direct salary costs only (not including overtime) at the consultant's audited rate, as per Federal Acquisition Regulations Part 31, and Department policies. Computer and CADD costs are not allowable as a direct cost to this project. Rate determination and applicability is subject to audit by the Department. Additionally, candidates should be prepared for the Department to work with your current accounting firm to provide information and backup documentation. Full and immediate cooperation is required to avoid delays in execution of an agreement. Failure to cooperate may result in breaking off of negotiations and moving to the next ranked firm.
- Selection Committee membership appointments are confidential. The Department's Professional Services Procurement Manual may be viewed here.

INSURANCE REQUIREMENTS

The selected firm(s) must obtain at its own cost and expense and keep in force and effect during the term of the agreement, including all extensions, the minimum coverage limits specified below with a carrier satisfactory to the State.

a. Worker's Compensation and Employer's Liability Insurance in accordance with applicable law.

b. Commercial General Liability - $1,000,000 per occurrence/$3,000,000 per aggregate.

c. Errors and Omissions - $1,000,000 per occurrence/$3,000,000 per aggregate.

d. Automotive Liability Insurance covering all automotive units used in the work (including all units leased from and/or provided by the State to Vendor pursuant to this Agreement as well as all units used by Vendor, regardless of the identity of the registered owner, used by Vendor for completing the Work required by this Agreement to include but not limited to transporting Delaware clients or staff), providing coverage on a primary non-contributory basis with limits of not less than:

1. $1,000,000 combined single limit each accident, for bodily injury;
2. $250,000 for property damage to others;
3. $25,000 per person per accident Uninsured/Underinsured Motorists coverage;
4. $25,000 per person, $300,000 per accident PIP benefits if carrying any of our clients or employees; and
5. Comprehensive coverage for all vehicles leased from the State of Delaware Fleet Services which shall cover the replacement cost of the vehicle in the event of collision, damage or other loss.

Certificate of Insurance and/or copies of the insurance policies will be requested at time of award.

In no event shall the State of Delaware be named as an additional insured on any policy required under this agreement.

MISCELLANEOUS

The Department is not liable for any cost incurred by the consultant in the preparation or presentation of the Proposal.

Any individual, business, organization, corporation, consortium, partnership, joint venture, or any other entity including subconsultants currently debarred or suspended is ineligible to participate as a candidate for this process. Any entity ineligible to conduct business in the State of Delaware for any reason is ineligible to respond to the RFP.

The Department of Transportation will affirmatively insure individuals and businesses will not be discriminated against on the grounds of race, creed, color, sex, or national origin in consideration for an award. Minority business enterprises will be afforded full opportunity to submit bids/proposals in response to this invitation.

Department of Transportation
State of Delaware
By: Nicole Majeski
Secretary
Dover, DE

Appendix A - REQUIRED FORMS

The following completed forms are required to be returned with each proposal:

- Certification of Eligibility
- Certificate of Non-Collusion

CERTIFICATION OF ELIGIBILITY

Delaware Department of Transportation

Request for Proposal 2101-2102 – Erosion, Sediment, and Stormwater Management (ES2M)

We have read Request for Proposal number 2101-2102 and fully understand the intent of the RFP as stated, certify that we have adequate personnel and knowledge to fulfill the requirements thereof, and agree to furnish such services in accordance with the contract documents as indicated should we be awarded the contract.

_____ hereby certifies that it is not included on the United States Comptroller General's Consolidated List of Persons or Firms Currently Debarred for Violations of Various Public Contracts Incorporating Labor Standard Provisions.

_____Signature of the Bidder or Offeror's Authorized Official

_____Name and Title of the Bidder or Offeror's Authorized Official

_____Date

Sworn and subscribed before me this _____ day of _____, 20___

_____ My commission expires: _____ / _____ / 20___

Notary Public Month Day Year

CERTIFICATE OF NON-COLLUSION

By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid, each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:

1) The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement for the purpose of restricting to such prices, with any other bidder or with any competitor;

2) Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the Bidder and will not knowingly be disclosed by the Bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and

3) No attempt has been made or will be made by the Bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

_____Signature of the Bidder or Offeror's Authorized Official

_____Name and Title of the Bidder or Offeror's Authorized Official

_____Date

Sworn and subscribed before me this _____ day of _____, 20___

_____ My commission expires: _____ / _____ / 20___
Notary Public Month Day Year

APPENDIX C

C-3: EROSION AND SEDIMENT CONTROL REQUEST FOR PROPOSAL

Delaware Department of Transportation

REQUEST FOR PROPOSALS
PROFESSIONAL SERVICES

RFP Number: **1983F-1984F**

EROSION AND SEDIMENT CONTROL COMPLIANCE

Submission Due Date/Time: **Thursday, May 14, 2020 prior to 2:00 P.M. Local Time**

Three (3) year term with two (2) possible one-year extensions

Agreement Type: On-Call

Up to two (2) agreements may be awarded from this solicitation

The resulting agreement may be State & Federal funded

The anticipated method of payment is cost plus fixed fee

29 Del.C. §6981, 2 CFR part 200

PROJECT INFORMATION

This Request for Proposal (RFP) issued by the Delaware Department of Transportation (DelDOT) is for the purpose of acquiring proposals from qualified firms to provide Certified Construction Reviewers (CCR's) for weekly erosion and sediment (E&S) control inspections at active construction sites.

PROFESSIONAL SERVICES REQUIRED

Services include but are not limited to the following: Erosion and Sediment Control Inspections

PROJECT DESCRIPTION

Services may include, but are not limited to, the following:

1. Erosion and sediment control inspections by a State of Delaware CCR employed by the consultant or preapproved subconsultant. The CCR must function under the direction of a registered Delaware Professional Engineer (P.E.). Roles & Responsibilities of the CCR are described in *Appendix B* of this RFP.

2. Weekly CCR inspections and reports for all assigned projects unless otherwise directed. Reports shall be submitted to the Department's E&S Engineer's Office to insure they will be received within 24 hours of the inspection and conform to the department's standard formatting for such reports.

3. Coordinate weekly inspections so a department construction inspector and a representative of the construction company contracted with the department to construct the transportation infrastructure described in the project will accompany the CCR on inspections and sign off on the report at the time of the inspection. Reports will not be accepted without the appropriate signatures.

4. Coordinate and document an E&S pre-construction meeting with the department construction inspector and a representative of the construction company contracted with the department to construct the transportation infrastructure described in the project and conform to the department's standard formatting for such reports.

5. Perform and document vegetative evaluations twice a year as necessary for all assigned projects and conform to the department's standard formatting for such reports.

6. Perform and document facility construction checklists for all assigned projects and conform to the department's standard formatting for such reports. Perform infiltration testing and reporting for the purpose of determining post-construction infiltration rates as part of inspecting and documenting infiltration BMPs (best management practices) when requested by the department. Perform and document surveying and as-builts for permanent BMPs when requested by the department.

7. The hiring and management of subconsultants and subcontractors to install, implement, and maintain erosion and sediment control measures when requested by the department and perform rain event sampling and testing.

8. Other environmental services as needed and requested, including but not limited to:

   - performing plan reviews and offering comments
   - performing erosion and sediment control related inspections/surveillance using new technologies, such as drones
   - monitoring of department maintenance activities for compliance with various surface water quality related requirements
   - environmental studies, specification preparation, report preparation
   - project stakeholder interaction, outreach, and education
   - environmental coordination with other affected parties to support department goals and requirements
   - reviews and recommendations of department operations and activities for environmental compliance and liability
   - general guidance on environmental issues, regulations, and legal interpretations and other environmental support services as requested by the department

QUESTIONS

Questions must be submitted before the due date identified in the Procurement Schedule for this RFP. All inquiries must be submitted in the Q/A section of the project listing in the Bonfire Procurement Portal.

The Department's response to questions will be posted, according to the procurement schedule, under the project listing in Bonfire and to the State of Delaware Bid Solicitation Directory Website: http://www.bids.delaware.gov/.

DISADVANTAGED BUSINESS ENTERPRISE (DBE)

A five percent (5%) DBE goal has been established for the sum total of all federally funded tasks associated with this Agreement. The Department will require ongoing reviews and approval of *good faith efforts* before a Notice to Proceed is issued. Department DBE Program staff will monitor this Agreement to ensure that good faith efforts are being made to meet the DBE goal. DBE firms must be certified through DelDOT's DBE Program in order to qualify toward meeting the goal.

PROCUREMENT SCHEDULE

Action Item	Date	Time
Deadline for Questions to ensure response:	Thursday, April 30, 2020	2:00 P.M. Local Time
Final Response to Questions posted by:	Thursday, May 7, 2020	2:00 P.M. Local Time
Proposals Due prior to:*	Thursday, May 14, 2020	2:00 P.M. Local Time

NOTE: Only asterisk (*) marked date changes will be communicated (via posted Addendums).

PROPOSAL REQUIREMENTS

Interested firms must submit the material required herein or they may not be considered for the project:

1. Proposals must be received before the Proposal Due Date and Time, as identified in the Procurement Schedule for this RFP. Responses submitted by hard copy, mail, facsimile, or e-mail will not be accepted. Responses received after the Proposal Due Date and Time will not be considered.
2. **Upload your submission at**: https://deldot.bonfirehub.com/portal/

   Important Notes:
   - Logging in and/or uploading the file(s) does not mean the response is submitted. Users must successfully upload all the file(s) and MUST click the submit button before the proposal due date and time.
   - Users will receive an email confirmation receipt with a unique confirmation number once the submission has been finalized. This will confirm that the proposal has been submitted successfully.
   - Each submitted item of Requested Information will only become visible to DelDOT after the proposal due date and time.
   - If the file is mandatory, you will not be able to complete your submission until the requirement is met.
   - Uploading large documents may take significant time depending on the size of the file(s) and your Internet connection speed. The maximum upload file size is 1000 MB.
   - Minimum system requirements: Internet Explorer 11, Microsoft Edge, Google Chrome, or Mozilla Firefox. Java Script must be enabled.

Need Help? Please contact Bonfire directly at Support@GoBonfire.com or 1(800)654-8010 ext. 2 for technical questions or issues related to your submission. You can also visit their help forum at https://bonfirehub.zendesk.com/hc.

3. **The Prime Consultant must be Registered,** or submit application for registration, with DelDOT at or before the time of submission in order to be considered. For registration information, click here.

4. **Submit one (1) Original and one (1) Redacted copy** of the Proposal. The original must be a .pdf file of the original signed proposal and should be clearly marked "Original" on the first page of the document. The redacted copy must be a .pdf file of the original signed proposal with any proprietary or confidential information redacted, and this copy should be clearly marked as "Redacted" on the first page of the document. The redacted copy is required even if the submission contains no proprietary or confidential information.

   To determine what information may be considered proprietary or confidential and may be redacted from their Proposal, firms should review Delaware's Freedom of Information Regulations here; http://regulations.delaware.gov/AdminCode/title8/1400.shtml#TopOfPage. Under Delaware FOIA law, 29 Del. C, §10002(l)(2), "Trade secrets and commercial or financial information…which is of a privileged or confidential nature" are "records that shall not be deemed public" and are therefore exempt from disclosure under FOIA.

5. **Architect-Engineer Qualifications**; **GSA SF330:**

http://www.gsa.gov/portal/forms/download/116486

Follow instructions for the SF330, and add the following Individual Agency Instructions:

A. Part I Section C 11, Proposed Team;

   Indicate if the firm is a DBE and provide the approximate percentage of the contract cost they will perform.

B. Part I Section E, Resumes of Key Personnel Proposed for this Contract;

   Resume information is limited to eight (8) individuals regardless of affiliation.

C. Part I Section F, Example Projects;

   Example Projects provided are limited to ten (10).

D. Part I Section H 30, Additional Information;

   (The Department recommends formatting this section using Times New Roman, 12 pt. font)

   1) The Prime consultant must indicate the current workload with the Department by listing the following in a table format:

      Agreement No.; Agreement Title; Consultant PM; Prime or Sub; Total Dollars paid to date; current number of Tasks issued; and date of contract expiration.

   2) List any DelDOT agreement number your firm has been selected for that is not included in the table above.

3) Firms may include a "Rating Criteria Support Information" Section, limited to four (4) pages on two (2) sheets of paper, within Section H, that covers any information that directly relates to the firm's ability to meet the specific rating criteria listed in this RFP.

Note: Letters of Interest should not be included.

6. **Joint venture** submissions will not be considered.
7. DelDOT reserves the right to reject any and all submissions. Submissions become property of the Department and shall be retained electronically for a minimum period of three (3) years from the date of receipt. DelDOT reserves the right to any and all ideas included in this response without incurring any obligations to the responding firms or committing to procurement of the proposed services.
8. **Required Certification Forms.** All firms responding to the RFP must complete and return the submission forms located in 'Appendix A' of this document.

No promotional materials or brochures are to be included as part of the submission.

RATING CRITERIA

#	**Criteria Description**:	**Weight**
1	Firm's experience pertaining to E&S inspections and BMP construction on highway or transportation related projects	40 %
2	Firm's resources and capacity to accomplish proposed work on schedule and electronically	20 %
3	Key Staff and Project Team qualifications	20 %
4	Firm's ability to provide E&S related training/workshop under DSSR	10 %
5	Firm's knowledge and experience interpreting and applying Delaware Laws and Regulations specific to Certified Construction Site Review	10 %
	TOTAL :	**100%**

OVERVIEW OF SELECTION PROCESS

- This is an On-Call agreement utilized for the performance of services for a number of projects under task orders issued on an as-needed basis.
- This is a single-phase solicitation process with the availability for discussions with up to four (4) of the most highly qualified firms. Based upon the listed criteria and evaluation of each firm's submitted proposal, the Selection Committee may decide if a small sample task and/or discussions will be held with the most highly qualified consultants. If discussions are held, they will serve to clarify the technical approach, qualifications, and capabilities provided in response to the RFP, after which the committee will determine the ranking of the candidate firms.
- Selection Committee members will individually score each firm's submitted proposal which determines individual ranking. The Department's ranking is the combined ranking of all Committee members. Firms, in order of ranking, will have the opportunity to negotiate an agreement with the Department. If the Department cannot reach agreement with the highest ranked firm(s), the

Department terminates negotiations and begins negotiations with the next highest ranked firm, and so on until an agreement is reached. The Department notifies via email the awarded firm(s) of the opportunity to enter into an agreement with the Department. This notification also includes information on the next steps for the agreement process.

- After the ranking process has been completed, applicable price information will be requested from the successful candidate firm(s), such as; salary rates for various classifications of personnel; and an indirect cost derivation for the most current accounting period.
- Payroll burden and overhead will be computed on direct salary costs only (not including overtime) at the consultant's audited rate, as per Federal Acquisition Regulations Part 31, and Department policies. Computer and CADD costs are not allowable as a direct cost to this project. Rate determination and applicability is subject to audit by the Department. Additionally, candidates should be prepared for the Department to work with your current accounting firm to provide information and backup documentation. Full and immediate cooperation is required to avoid delays in execution of an agreement. Failure to cooperate may result in breaking off of negotiations and moving to the next ranked firm.
- Selection Committee membership appointments are confidential. The Department's Professional Services Procurement Manual may be viewed here.

MISCELLANEOUS

The Department is not liable for any cost incurred by the consultant in the preparation or presentation of the Proposal.

Any individual, business, organization, corporation, consortium, partnership, joint venture, or any other entity including subconsultants currently debarred or suspended is ineligible to participate as a candidate for this process. Any entity ineligible to conduct business in the State of Delaware for any reason is ineligible to respond to the RFP.

The Department of Transportation will affirmatively insure individuals and businesses will not be discriminated against on the grounds of race, creed, color, sex, or national origin in consideration for an award. Minority business enterprises will be afforded full opportunity to submit bids/proposals in response to this invitation.

Department of Transportation
State of Delaware
By: Jennifer Cohan
Secretary
Dover, DE

FEDERAL CONTRACT PROVISIONS

FTA's Master Agreement contains a current, but not all-inclusive, description of statutory and regulatory requirements that may affect a recipient's procurement (such as Disadvantaged Business Enterprise (DBE) and Clean Air requirements). The Master Agreement states that applicable Federal requirements will apply to project participants to the lowest tier necessary to ensure compliance with those requirements. The recipient will need to include applicable Federal requirements in each sub-agreement, lease, third party contract, or other document as necessary. For specific guidance on cross-cutting requirements administered by other Federal agencies, FTA recommends that the recipient contact those agencies.

The requirements listed herein must be adhered to by any firms selected to perform work required under these agreements.

1. AUDIT AND INSPECTION OF RECORDS

The Contractor agrees to provide the Delaware Department of Transportation (Department), the FTA Administrator, the Comptroller General of the United States or any of their authorized representatives' access to any books, documents, papers and records of the Contractor which are directly pertinent to this contract for the purposes of making audits, examinations, excerpts and transcriptions. Contractor also agrees, pursuant to 49 C. F. R. 633.17 to provide the FTA Administrator or his authorized representatives including any PMO Contractor access to Contractor's records and construction sites pertaining to a major capital project, defined at 49 U.S.C. 5302(a)1, which is receiving federal financial assistance through the programs described at 49 U.S.C. 5307, 5309 or 5311. By definition, a major capital project excludes contracts of less than the simplified acquisition threshold. The Contractor agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.

2. ACCESS REQUIREMENTS FOR INDIVIDUALS WITH DISABILITIES

The Contractor agrees to comply with all applicable requirements of the Americans with Disabilities Act of 1990 (ADA), 42 U.S.C. Section 12101 et seq. And 49 U.S.C. Section 322; Section 504 of the Rehabilitation Act of 1973, as amended, 29 U.S.C. Section 794; Section 16 of the Federal Transit Act, as amended, 49 U.S.C. App. Section 1612; and implementing regulations, as may be amended

3. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, AND OTHER RESPONSIBILITY MATTERS – Lower Tier Covered Transactions (Third Party Contracts over $100,000)

a) By signing and submitting this bid or proposal, the prospective lower tier participant is providing the signed certification set out below.

b) The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the Department may pursue available remedies, including suspension and/or debarment.

c) The prospective lower tier participant shall provide immediate written notice to the Department if at any time the prospective lower tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

d) The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "persons," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549 [49 CFR Part 29]. You may contact the Department for assistance in obtaining a copy of those regulations.

e) The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized in writing by the Department.

f) The prospective lower tier participant further agrees by submitting this proposal that it will include the clause "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transaction", without modification, in all lower tier covered transactions.

g) A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that it is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the No procurement List issued by the U. S. General Service Administration.

h) Nothing contained in the foregoing shall be construed to require establishment of system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i) Except for transactions authorized under Paragraph E of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible or voluntarily excluded from participation in this transaction, in addition to all remedies available to the Federal Government, the Department may pursue available remedies including suspension and/or debarment.

j) The prospective lower tier participant certifies, by submission of this bid or proposal, that neither it nor its "principals" [as defined at 49 CFR §29.105(p)] is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

k) When the prospective lower tier participant is unable to certify to the statements in this certification, such prospective participant shall attach an explanation to this proposal.

4. CLEAN WATER REQUIREMENTS

The Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq. The Contractor agrees to report each violation to the Department and understands and agrees that the Department will, in turn, report each violation as required to assure notification to FTA and the appropriate EPA Regional Office. (2)The Contractor also agrees to include these requirements in each subcontract exceeding $100,000 financed in whole or in part with Federal assistance provided by FTA.

5. FEDERAL CHANGES

Contractor shall at all times comply with all applicable FTA regulations, policies, procedures and directives, including without limitation those listed directly or by reference in the Master Agreement between the Department and FTA, as they may be amended or promulgated from time to time during the term of this contract. Contractor's failure to so comply shall constitute a material breach of this contract.

6. CLEAN AIR

(1) The Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. §§ 7401 et seq . The Contractor agrees to report each violation to the Department and understands and agrees that the Department will, in turn, report each violation as required to assure notification to FTA and the appropriate EPA Regional Office. (2) The Contractor also agrees to include these requirements in each subcontract exceeding $100,000 financed in whole or in part with Federal assistance provided by FTA.

7. ENERGY CONSERVATION

The Contractor shall recognize mandatory standards and policies relating to energy efficiency which are contained in the State Energy Conservation Plan issued in compliance with the Energy Policy and Conservation Act (42 US Section 321 et seq.).

8. CONTRACT TERMINATION

a) Termination for Convenience

The Department may terminate this contract, in whole or in part, at any time by written notice to the Contractor. The Contractor shall be paid its costs, including contract close-out costs, and profit on product delivered up to the time of termination. The Contractor shall promptly submit its termination claim for payment. If the Contractor has any property in its possession belonging to the Department, the Contractor will account for the same and dispose of it in the manner the Department directs.

b) Termination for Default

If the Contractor does not deliver supplies in accordance with the contract delivery schedule, or, if the contract is for services, the Contractor fails to perform in the manner called for in the contract, or if the Contractor fails to comply with any other provisions of the contract, the Department may terminate this contract for default. Termination shall be affected by serving a notice of termination on the Contractor setting forth the manner in which the Contractor is in default. The Contractor will only be paid the contract price for supplies delivered and accepted, or services performed in accordance with the manner of performance set forth in the contract.

If it is later determined that the Contractor had an excusable reason for not performing, such as a strike, flood, events which are not the fault of or are beyond the control of the Contractor, the Department, after setting up a new delivery or performance schedule, may allow the Contractor to continue work, or treat the termination as a termination of convenience.

In the event the Department exercises its right of termination for default, and if an amount for liquidated damages is set forth, the Contractor shall be liable to the Department for excess costs and, in addition, for liquidated damages in the amount set forth, as fixed, agreed, and liquidated damages for each calendar day of delay, until such time as the Department may reasonably obtain delivery or performance of similar supplies or services.

If the contract is so terminated, the Contractor shall continue performance and be liable to the Department for such liquidated damages for each calendar day of delay until the supplies are delivered or services performed.

The Contractor shall not be liable for liquidated damages resulting from delays such as acts of God, strikes, fire or flood, and events which are not the fault of, or are beyond the control of the Contractor.

9. CIVIL RIGHTS

(1) Nondiscrimination - In accordance with Title VI of the Civil Rights Act, as amended, 42 U.S.C. § 2000d, section 303 of the Age Discrimination Act of 1975, as amended, 42 U.S.C. § 6102, section 202 of the Americans with Disabilities Act of 1990, 42 U.S.C. § 12132, and Federal transit law at 49 U.S.C. § 5332, the Contractor agrees that it will not discriminate against any employee or applicant for employment because of race, color, creed, national origin, sex, age, or disability. In addition, the Contractor agrees to comply with applicable Federal implementing regulations and other implementing requirements FTA may issue.

(2) Equal Employment Opportunity - The following equal employment opportunity requirements apply to the underlying contract:

(a) Race, Color, Creed, National Origin, Sex - In accordance with Title VII of the Civil Rights Act, as amended, 42 U.S.C. § 2000e, and Federal transit laws at 49 U.S.C. § 5332, the Contractor agrees to comply with all applicable equal employment opportunity requirements of U.S. Department of Labor (U.S. DOL) regulations, "Office of Federal Contract Compliance

Programs, Equal Employment Opportunity, Department of Labor," 41 C.F.R. Parts 60 et seq ., (which implement Executive Order No. 11246, "Equal Employment Opportunity," as amended by Executive Order No. 11375, "Amending Executive Order 11246 Relating to Equal Employment Opportunity," 42 U.S.C. § 2000e note), and with any applicable Federal statutes, executive orders, regulations, and Federal policies that may in the future affect construction activities undertaken in the course of the Project. The Contractor agrees to take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, creed, national origin, sex, or age. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.

(b) Age - In accordance with section 4 of the Age Discrimination in Employment Act of 1967, as amended, 29 U.S.C. § 623 and Federal transit law at 49 U.S.C. § 5332, the Contractor agrees to refrain from discrimination against present and prospective employees for reason of age. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.

(c) Disabilities - In accordance with section 102 of the Americans with Disabilities Act, as amended, 42 U.S.C. § 12112, the Contractor agrees that it will comply with the requirements of U.S. Equal Employment Opportunity Commission, "Regulations to Implement the Equal Employment Provisions of the Americans with Disabilities Act," 29 C.F.R. Part 1630, pertaining to employment of persons with disabilities. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.

(3) The contractor agrees to comply with all applicable requirements of the Americans with Disabilities Act of 1990 (ADA), 42 U.S.C. Section 12101 et seq. And 49 U.S.C. Section 322; Section 504 of the Rehabilitation Act of 1973, as amended, 29 U.S.C., Section 794; Section 16 of the Federal Transit Act, as amended, 49 U.S.C. App. Section 1612; and implementing regulations, as may be amended.

(4) The Contractor also agrees to include these requirements in each subcontract financed in whole or in part with Federal assistance provided by FTA, modified only if necessary to identify the affected parties.

10. DISADVANTAGED BUSINESS ENTERPRISES

It is the policy of the Department of Transportation that Disadvantaged Business Enterprises as defined in 49 CFR Part 26 shall have the opportunity to participate in the performance of contracts financed in whole or part with Federal funds under this contract. Consequently the DBE Requirements of 49 CFR Part 26 apply to this contract. The recipient or its contractor agrees to ensure that Disadvantaged Business Enterprises as defined in 49 CFR Part 26 have the opportunity to participate in the performance of contracts and subcontracts financed in whole or in part with Federal funds provided under this contract. In this regard all recipients or contractors shall take all necessary and reasonable steps in accordance with 49 CFR Part 26 to ensure that Disadvantaged

Business Enterprises have the opportunity to compete for and perform contracts. The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of FTA assisted subcontracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy, as the Department deems appropriate.

The successful bidder agrees to comply with the following clauses:

Prompt Payment: The prime contractor agrees to pay each subcontractor under this prime contract for satisfactory performance of its contract no later than 30 days from the receipt of each payment the prime contractor receives from the Department. This clause applies to both DBE and Non-DBE subcontractors.

Retainage: The prime contractor agrees to return retainage payments to each subcontractor within 30 days after the subcontractor's work is satisfactorily completed. Any delay or postponement of payment from the above referenced time frame may occur only for good cause following written approval of the Department. This clause applies to both DBE and non-DBE subcontractors. The specific goal for this contract is shown above under Disadvantaged Business Enterprise.

11. ENVIRONMENTAL VIOLATIONS

The Contractor agrees to comply with all applicable standards, orders, or requirements issued under Section 306 of the Clean Air Act (42 USC 1857 (h)), Section 508 of the Clean Water Act (33 USC 1368), Executive Order 11378, and Environmental Protection Agency regulations: (40 CFR, Part 15) which prohibit the use under nonexempt Federal contracts, grants or loans, of facilities included on the EPA List for Violating Facilities. The Contractor shall report violations to the FTA.

12. EQUAL EMPLOYMENT OPPORTUNITY

In connection with the execution of this contract, the Contractor shall not discriminate against any employee or applicant for employment because of race, creed, religion, color, national origin, age, sex or disability. The Contractor shall take affirmative action to insure that applicants are employed, and that employees are tested during their employment without regard to their race, creed, religion, color, national origin, age, sex or disability. Such actions shall include, but not b limited to the following, employment, upgrading, demotion, or transfer, recruitment or recruitment advertising, layoff or termination; rates of pay, or other forms of compensation. The Contractor further agrees to insert a similar provision in all subcontracts, except subcontracts for standard commercial supplies or raw materials.

13. FTA FUNDING REQUIREMENTS

This project may be financed in part by funds from the Federal Transit Administration. Contractor shall at all times comply with all applicable FTA regulations, policies, procedures and directives, including without limitation those listed directly or by reference in the Master Agreement between

the Department and FTA, as they may be amended or promulgated from time to time during the term of this contract. Contractor's failure to so comply shall constitute a material breach of this contract.

14. INCORPORATION OF FEDERAL TRANSIT ADMINISTRATION (FTA) TERMS

The preceding provisions include, in part, certain Standard Terms and Conditions required by DOT, whether or not expressly set forth in the preceding contract provisions. All contractual provisions required by FTA, as set forth in FTA Circular 4220.1F are hereby incorporated by reference. Anything to the contrary herein notwithstanding, all FTA mandated terms shall be deemed to control in the event of a conflict with other provisions contained in this Agreement. The Contractor shall not perform any act, fail to perform any act, or refuse to comply with any Department requests which would cause the Department to be in violation of the FTA terms and conditions.

15. LOBBYING:

The Contractor is required to certify using the Certification of Restrictions on Lobbying Form included that, to the best of his or her knowledge and belief:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for making lobbying contacts to an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form--LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions [as amended by "Government wide Guidance for New Restrictions on Lobbying," 61 Fed. Reg. 1413 (1/19/96). Note: Language in paragraph (2) herein has been modified in accordance with Section 10 of the Lobbying Disclosure Act of 1995 (P.L. 104-65, to be codified at 2 U.S.C. 1601, *et seq* .)]

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly. The certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of the certification is a prerequisite for making or entering into this transaction imposed by 31, U.S.C. § 1352 (as amended by the Lobbying Disclosure Act of 1995). Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such

failure. Pursuant to 31 U.S.C. § 1352(c)(1)-(2)(A), any person who makes a prohibited expenditure or fails to file or amend a required certification or disclosure form shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such expenditure or failure.

16. NO GOVERNMENT OBLIGATION TO THIRD PARTIES

(1) The Department and Contractor acknowledge and agree that, notwithstanding any concurrence by the Federal Government in or approval of the solicitation or award of the underlying contract, absent the express written consent by the Federal Government, the Federal Government is not a party to this contract and shall not be subject to any obligations or liabilities to the Department, Contractor, or any other party (whether or not a party to that contract) pertaining to any matter resulting from the underlying contract.

(2) The Contractor agrees to include the above clause in each subcontract financed in whole or in part with Federal assistance provided by FTA. It is further agreed that the clause shall not be modified, except to identify the subcontractor who will be subject to its provisions.

17. PROGRAM FRAUD AND FALSE OR FRAUDULENT STATEMENTS AND RELATED ACTS

(1) The Contractor acknowledges that the provisions of the Program Fraud Civil Remedies Act of 1986, as amended, 31 U.S.C. § 3801 et seq . and U.S. DOT regulations, "Program Fraud Civil Remedies," 49 C.F.R. Part 31, apply to its actions pertaining to this Project. Upon execution of the underlying contract, the Contractor certifies or affirms the truthfulness and accuracy of any statement it has made, it makes, it may make, or causes to be made, pertaining to the underlying contract or the FTA assisted project for which this contract work is being performed. In addition to other penalties that may be applicable, the Contractor further acknowledges that if it makes, or causes to be made, a false, fictitious, or fraudulent claim, statement, submission, or certification, the Federal Government reserves the right to impose the penalties of the Program Fraud Civil Remedies Act of 1986 on the Contractor to the extent the Federal Government deems appropriate.

(2) The Contractor also acknowledges that if it makes, or causes to be made, a false, fictitious, or fraudulent claim, statement, submission, or certification to the Federal Government under a contract connected with a project that is financed in whole or in part with Federal assistance originally awarded by FTA under the authority of 49 U.S.C. § 5307, the Government reserves the right to impose the penalties of 18 U.S.C. § 1001 and 49 U.S.C. § 5307(n)(1) on the Contractor, to the extent the Federal Government deems appropriate.

(3) The Contractor agrees to include the above two clauses in each subcontract financed in whole or in part with Federal assistance provided by FTA. It is further agreed that the clauses shall not be modified, except to identify the subcontractor who will be subject to the provisions.

18. PROTEST PROCEDURES

Protests based upon the award of the contract shall be made in writing to the Contract Services Administrator no later than ten (10) calendar days following the award of the contract. The protest must clearly specify in writing the grounds and evidence on which the protest is based. The

protest will be reviewed and decided pursuant to; the proposal documents issued by the Department, the Delaware Code, and the Federal Transit Authority's regulations.

19. RECORD RETENTION

The Contractor agrees to maintain all books, records, accounts and reports required under this contract for a period of not less than three years after the date of termination or expiration of this contract, except in the event of litigation or settlement of claims arising from the performance of this contract, in which case Contractor agrees to maintain same until the Department, the FTA Administrator, the Comptroller General, or any of their duly authorized representatives, have disposed of all such litigation, appeals, claims or exceptions related thereto. Reference 49 CFR 18.39(i)(11).

20. SEISMIC SAFETY

The contractor agrees that any new building or addition to an existing building will be designed and constructed in accordance with the standards for Seismic Safety required in Department of Transportation Seismic Safety Regulations 49 CFR Part 41 and will certify to compliance to the extent required by the regulation. The contractor also agrees to ensure that all work performed under this contract including work performed by a subcontractor is in compliance with the standards required by the Seismic Safety Regulations and the certification of compliance issued on the project.

21. TITLE VI COMPLIANCE

During the performance of any Contract entered into pursuant to these specifications, the Contractor, for itself, its assignees and successor in interest, agrees that it shall comply with Title VI of the Civil Rights Act of 1964 (42 U.S.C. section 2000d) and the Regulations relative to nondiscrimination in federally assisted programs of the Department of Transportation, Title 49, Code of Federal Regulations Part 21, as they may be amended from time to time which are incorporated by reference and made a part of this contract.

22. INTELLIGENT TRANSPORTATION SYSTEMS

Intelligent transportation system (ITS) property and services must comply with the National ITS Architecture and Standards to the extent required by Section 5307(c) of SAFETEA-LU, FTA Notice, "FTA National ITS Architecture Policy on Transit Projects," 66 FR 1455 et seq., January 8, 2001, and later published policies or implementing directives FTA may issue. Consequently, third party contracts involving ITS are likely to require provisions to ensure compliance with Federal requirements.

Appendix A - REQUIRED FORMS

The following completed forms are required to be returned with each proposal:

- Certification of Eligibility
- Certificate of Non-Collusion
- Certification of Primary Participant Regarding Debarment, Suspension, And Other Responsibility Matters
- Certification of Restrictions On Lobbying

CERTIFICATION OF ELIGIBILITY

Delaware Department of Transportation

Request for Proposal 1983-1984 – Erosion and Sediment Control Compliance

We have read Request for Proposal number 1983-1984 and fully understand the intent of the RFP as stated, certify that we have adequate personnel and knowledge to fulfill the requirements thereof, and agree to furnish such services in accordance with the contract documents as indicated should we be awarded the contract.

_____ hereby certifies that it is not included on the United States Comptroller General's Consolidated List of Persons or Firms Currently Debarred for Violations of Various Public Contracts Incorporating Labor Standard Provisions.

_____Signature of the Bidder or Offeror's Authorized Official

_____Name and Title of the Bidder or Offeror's Authorized Official

_____Date

Sworn and subscribed before me this _____ day of _____, 20___

_____ My commission expires: _____ / _____ / 20___

Notary Public Month Day Year

CERTIFICATE OF NON-COLLUSION

By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid, each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:

1) The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement for the purpose of restricting to such prices, with any other bidder or with any competitor;

2) Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the Bidder and will not knowingly be disclosed by the Bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and

3) No attempt has been made or will be made by the Bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

_____Signature of the Bidder or Offeror's Authorized Official

_____Name and Title of the Bidder or Offeror's Authorized Official

_____Date

Sworn and subscribed before me this _____ day of _____, 20___

_____ My commission expires: _____ / _____ / 20___

Notary Public Month Day Year

CERTIFICATION OF PRIMARY PARTICIPANT REGARDING DEBARMENT, SUSPENSION, AND OTHER RESPONSIBILITY MATTERS

The Primary Participant (applicant for an FTA grant or cooperative agreement, or potential contractor for a major third party contract), _____ certifies to the best of its knowledge and belief, that it and its principals:

1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or Local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or Local) with commission of any of the offenses enumerated in paragraph (2) of this certification; and
4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or Local) terminated for cause or default.

If the primary participant (applicant for an FTA grant or cooperative agreement, or potential third party contractor) is unable to certify to any of the statements in this certification, the participant shall attach an explanation to this certification.

The Primary Participant (applicant for an FTA grant or cooperative agreement, or potential contractor for a major third party contract), _____ certifies or affirms the truthfulness and accuracy of the contents of the statements submitted on or with this certification and understands that the provisions of 31 U.S.C. Sections 3801 et seq, are applicable thereto.

_____Signature of the Bidder or Offeror's Authorized Official

_____Name and Title of the Bidder or Offeror's Authorized Official

_____Date

CERTIFICATION OF RESTRICTIONS ON LOBBYING

The Bidder or Offeror certifies, to the best of its knowledge and belief, that:

1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of a Federal department or agency, a Member of the U.S. Congress, an officer or employee of the U.S. Congress, or an employee of a Member of the U.S. Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification thereof.

2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for making lobbying contacts to an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form--LLL, "Disclosure Form to Report Lobbying", in accordance with its instructions (as amended by "Government wide Guidance for New Restrictions on Lobbying," 61 Fed. Reg. 1413 (1/19/96). Note: Language in paragraph (2) herein has been modified in accordance with Section 10 of the Lobbying Disclosure Act of 1995 (P.L. 104-65, to be codified at 2 U.S.C. 1601, et seq.)).

3) The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including subcontracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31, U.S.C. § 1352 (as amended by the Lobbying Disclosure Act of 1995). Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

THE BIDDER OR OFFEROR, _____, CERTIFIES OR AFFIRMS THE TRUTHFULNESS AND ACCURACY OF EACH STATEMENT OF ITS CERTIFICATION AND DISCLOSURE, IF ANY. IN ADDITION, THE BIDDER OR OFFEROR UNDERSTANDS AND AGREES THAT THE PROVISIONS OF 31 U.S.C. §§ 3801 ET SEQ. APPLY TO THIS CERTIFICATION AND DISCLOSURE, IF ANY.

_____Signature of the Bidder or Offeror's Authorized Official

_____Name and Title of the Bidder or Offeror's Authorized Official

_____Date

APPENDIX B

Roles & Responsibilities of Certified Construction Reviewers under the Erosion & Sediment Control Compliance Agreement for DelDOT Projects

1. General Scope of Services

A. The **DEPARTMENT** will at its discretion require the **CONSULTANT** to assign a Certified Construction Reviewer (CCR) to provide erosion and sediment (E&S) control inspection duties on Department construction projects.

B. The CCR shall observe and report on the compliance of all construction activities with the approved **PLANS**, all environmental permits in effect on the **PROJECT,** the Delaware Sediment & Stormwater Management Regulations, and this **AGREEMENT**.

C. At a minimum, The CCR shall review and report on the installation and maintenance of all erosion and sediment controls called for in the **PLANS;** the construction of permanent stormwater management facilities for conformance with the **PLANS** throughout the duration of the **PROJECT**; and monitor the effectiveness of installed erosion and sediment controls recommending additional measures as needed.

D. The Agreement will be administered through the DelDOT E&S Engineer's Office. All entry onto the **PROJECT** site and inspection work shall be conducted in cooperation with the **DEPARTMENT's** Construction Administration staff and its prime contractor working to build the transportation improvements.

E. In accordance with Section 110.22 D. of the *Delaware Department of Transportation Standard Specifications for Road and Bridge Construction 2001*, the **DEPARTMENT** may direct the **CONSULTANT** to employ the assistance of subconsultants and subcontractors under this **AGREEMENT** to install and/or maintain erosion and sediment control measures in order to address construction site compliance issues at on-going construction projects.

2. Reporting Frequency

A. Reports shall be prepared by the CCR on a **weekly** basis. Given special circumstances, written requests for reduction in inspection and reporting frequency will be considered by the **DEPARTMENT**. The request shall include the most recent ES2M Inspection Rating Report, the requested inspection frequency (i.e. every two weeks, monthly), and justification for the reduced frequency request. If the site becomes non-compliant or the construction activity increases, the frequency of required CCR reviews shall return to the standard weekly review or as otherwise directed by DelDOT.

B. In addition to the weekly reports, the CCR shall file a report at the following project milestones:
   i. Following installation of perimeter controls verifying whether all perimeter controls are functioning prior to beginning any other work on the site.
   ii. Upon completion of construction of stormwater management facilities together with a completed Stormwater Management Facility Construction Checklist(s) for each completed facility requiring a checklist.
   iii. At the time of the semi-final construction inspection.

iv. Upon final vegetative stabilization, to ascertain the timing of removal of perimeter erosion and sediment controls and issuance of the NPDES Notice of Termination (NOT) for the General Permit for Construction Activities.

3. CCR Responsibilities

A. The CCR must be certified by DNREC and possess a current, valid certification.

B. The CCR shall review and become familiar with all elements of the approved sediment and stormwater management plan, the environmental compliance sheets, and the environmental statement associated with the project plans, specifications, and construction documents. Any questions or issues raised during this review should be discussed with the E&S Engineer's Office and DelDOT Construction Administration prior to the **DEPARMENT'S** pre-construction meeting with its prime contractor.

C. The CCR shall prepare a report which accurately reflects the condition of the site and its level of conformity with the approved plans and specifications. The CCR shall coordinate with the construction manager to establish dates by which any deficiencies will be resolved. Those dates shall also be reflected on the report. The weekly report shall then be forwarded within three (3) calendar days of the review to the E&S Engineer's Office, DelDOT Construction Administration, and the prime contractors project resident or site superintendent.

D. The CCR shall provide documentation on all stages of stormwater management facility construction and accurately complete the applicable Stormwater Management Facility Construction Checklist(s). The CCR shall be present on site to observe all checklist items.

E. The CCR may recommend minor changes or deviations (i.e. soil stockpile location, silt fence location, additional sediment controls, modification to the construction entrance) to the approved sediment and stormwater management plan with concurrence from the E&S Engineer's Office and DelDOT Construction Administration. Those changes must be documented in the ES2M Inspection Rating Report.

F. If an erosion or sediment control measure or permanent stormwater management facility has failed requiring hydrologic, hydraulic, or structural analysis, or similar engineering judgment, the CCR shall note the conditions in his/her report and immediately contact the E&S Engineer's Office and the supervising Professional Engineer (P.E.) to facilitate either field modifications or a design revision.

G. Should the CCR encounter any sediment or stormwater practice or procedure that in his/her opinion poses an immediate risk to human health and welfare, or is resulting in significant environmental degradation, the CCR shall immediately contact the E&S Engineer's Office and the DelDOT Construction Administration with his/her recommendation for remedial action.

4. Supervising Professional Engineer Responsibilities

A. The **CONSULTANT'S** supervising Professional Engineer (P.E.) must be registered and licensed in the State of Delaware.

B. The P.E. shall review and understand the design intent of the approved **PLANS** pertaining to erosion and sediment control, stormwater management, environmental compliance sheets,

Environmental Statement, and environmental permits in effect on each **TASK ORDER** assigned under this **AGREEMENT**.

C. The P.E. shall be available to assist the CCR with any questions that may arise during the course of CCR inspections.

D. The P.E. shall oversee and verify the accuracy of the CCR review. The P.E. shall maintain an ES2M Inspection Rating Report file on each **TASK ORDER** assigned under this **AGREEMENT**. The ES2M Inspection Rating Report files shall be made available to the **DEPARTMENT** in the event of EPA or DNREC audit of DelDOT's environmental compliance efforts under State and federal laws.

E. The **CONSULTANT'S** Supervising Engineer (P.E.), and staff working under the direction of the Supervising Engineer (P.E.), shall attend and represent the **DEPARTMENT** during any enforcement or legal action by regulatory agencies at the federal or state levels.

5. Consultant's SubContractor Responsibilities

A. Any **CONSULTANT** subcontractor employed through this **AGREEMENT** to implement erosion and sediment control measures on the **PROJECT** shall perform the work in accordance with the specifications.

B. The subcontractor shall maintain close communication with the **CONSULTANT**, its CCR, and the **DEPARTMENT** to coordinate the timing, site access, and completion of the compliance work ordered under this **AGREEMENT**.

C. The subcontractor shall respond within three (3) calendar days when corrective action is required.

6. DEPARTMENT Responsibilities

A. The **DEPARTMENT** is responsible for assigning **TASK ORDERS** under this **AGREEMENT** in order to employ the use of a CCR on DelDOT construction project sites.

B. The **DEPARTMENT** shall clearly direct all its employees and its contractors to implement and comply with all appropriate plans, specifications, permits, and regulations.

C. The **DEPARTMENT** intends to initiate enforcement action under the terms of its contract with its prime contractor when a site is identified by the CCR as out of compliance.

D. The **DEPARTMENT's** E&S Engineer's Office and the DelDOT Construction Administration will work together regarding any changes to the scope and responsibilities of the CCR on any **PROJECT** or this **AGREEMENT**. Changes in scope shall be documented and approved in writing prior to implementation.

E. The **DEPARTMENT** shall perform periodic performance evaluations of the CCR. If it is determined that the CCR is not conducting inspections as required or filing complete and accurate reports, or is not referring problem situations for enforcement action, the **DEPARTMENT** shall notify the **CONSULTANT** to take corrective action under this **AGREEMENT** and at its discretion may also refer the individual CCR to DNREC recommending suspension or revocation of his/her certification.

F. The **DEPARTMEN**T may remove the **CONSULTANT'S** CCR from any project at any time. If the **CONSULTANT** is not able to provide an acceptable CCR for use by the **DEPARTMENT**, the **DEPARTMENT** may initiate termination of this **AGREEMENT**.

End

APPENDIX C

C-4: BMP CHECKLISTS

Delaware Department of Transportation
Bioretention Facility Construction Checklist

Contract No.: _____ Contract Name: _____

Contractor: _____ DelDOT Project Mgr.: _____

CCR Name: _____ CCR No.: _____

BMP No.: _____ BMP Location (Road/Crossroads): _____

Construction Dates & Time:

DATE	TIME IN	TIME OUT	DATE	TIME IN	TIME OUT

Key

√ Item meets standard

X Items not acceptable

N/A Items not applicable

I. Pre-Construction

_____ A. Notification given.

_____ B. Upstream drainage area stabilized or diverted.
(Note: Very important to keep sediment out of facility.)

II. Excavation

_____ A. Facility excavated to dimensions and at location as per the approved plan.

_____ B. Infiltration Bioretention – NO heavy equipment allowed on facility bottom.
(Note: Infiltration will not have an underdrain)

_____ C. Groundwater not encountered during excavation. *(Note: If groundwater is encountered during the excavation process, contact the Stormwater Engineer as soon as possible.)*

_____ D. Bottom scarified prior to placement of stone or bioretention soil media.

Contract No.: _____ Contract Name: _____

BMP No.: _____ BMP Location: _____

CCR Name: _____ CCR No.: _____

III. Structural Components

_____ A. Discharge pipe installed from outlet structure to discharge point.

Discharge Pipe diameter: _____

Discharge Pipe material: _____

_____ B. Outlet scour protection provided at discharge point.

_____ C. Outlet Structure installed at elevation as per the approved plan.

_____ D. Underdrain pipe material as per the approved plan.

Underdrain Pipe diameter: _____

Underdrain Pipe material: _____

_____ E. Underdrain pipe perforations according to the approved plan.

_____ F. Underdrain pipe lies flat or with positive slope towards outlet.

_____ G. Clean-out and/or observation port provided at the endpoint of underdrain pipes.

_____ H. Infiltration stone as per DelDOT Specifications and the approved plan.

_____ I. 3” minimum infiltration stone cover over the underdrain pipe.

_____ J. Geotextile material as per DelDOT Specifications and placed as per the approved plan.

IV. Grading

_____ A. Grading around the bioretention facility as per the approved plan and stabilized.

V. Bioretention Soil Media

_____ A. Approved soil media provided per the DNREC approved suppliers list.

_____ B. Approved soil media placed at depth specified as per the approved plan.

_____ C. Top-dress final elevation of approved soil media with 3” of triple-shredded aged hardwood mulch as per the approved plan.

Contract No.: _____ Contract Name: _____

BMP No.: _____ BMP Location: _____

CCR Name: _____ CCR No.: _____

VI. Erosion and Sediment Control

_____ A. Perimeter control installed around the edge of the facility and/or geotextile placed on top of the facility as per the approved plan. *(Note: Neither should be removed until full stabilization of drainage area to the facility.)*

Comments (Date & Initial)

Delaware Department of Transportation
Infiltration Trench Construction Checklist

Contract No.: _____ Contract Name: _____

Contractor: _____ DelDOT Project Mgr.: _____

CCR Name: _____ CCR No.: _____

BMP No.: _____ BMP Location (Road/Crossroads): _____

Construction Dates & Time:

DATE	TIME IN	TIME OUT	DATE	TIME IN	TIME OUT

Key

√ Item meets standard

X Items not acceptable

N/A Items not applicable

I. Pre-Construction

_____ A. Notification given.

_____ B. Upstream drainage area stabilized or effectively diverted.
(Note: Very important to keep sediment out of facility when bottom elevation exposed)

II. Excavation

_____ A. Facility excavated to dimensions, invert, and location as per the approved plan.

_____ B. Groundwater not encountered during excavation. *(Note: If groundwater is encountered during the excavation process, contact the Stormwater Engineer as soon as possible.)*

_____ C. Bottom of trench excavation scarified prior to infiltration stone placement.

_____ D. Geotextile fabric placed along the vertical sides of the trench.

Contract No.: _____ Contract Name: _____

BMP No.: _____ BMP Location: _____

CCR Name: _____ CCR No.: _____

III. Structural Components

_____ A. Underground storage pipe material as per the approved plan.

Pipe diameter: _____

Pipe material: _____

_____ B. Underground storage pipe capped at both ends and perforations placed as per the approved plans.

_____ C. Underground storage pipe placed at invert and flat / no slope as per the approved plan.

_____ D. Observation well(s) placed as per the approved plan.

This would include: pipe material, pipe size, perforations, top cap, bottom of pipe at trench bottom, top of pipe no higher than 1' above top of stone, and pipe securement at bottom (most likely rebar).

_____ E. Infiltration stone as per the DelDOT Specifications and the approved plan.

IV. Grading

_____ A. Grading around the infiltration trench as per the approved plan and stabilized.

V. Erosion and Sediment Control

_____ A. Perimeter control installed around the edge of the facility and/or geotextile overlapped (1' minimum) on top of the facility. *(Note: Neither should be removed until full stabilization of the drainage area to the facility.)*

Comments (Date & Initial)

_____

_____

_____

Delaware Department of Transportation
Permeable Pavement Construction Checklist

Contract No.: _____ Contract Name: _____

Contractor: _____ DelDOT Project Mgr.: _____

CCR Name: _____ CCR No.: _____

BMP No.: _____ BMP Location (Road/Crossroads): _____

Construction Dates & Time:

DATE	TIME IN	TIME OUT	DATE	TIME IN	TIME OUT

Key

√ Item meets standard

X Items not acceptable

N/A Items not applicable

I. Pre-Construction

_____ A. Notification given.

_____ B. Upstream drainage area stabilized or diverted. *(Note: Very important to keep sediment out of facility.)*

II. Excavation

_____ A. Facility excavated to dimensions and at location as per the approved plan.

_____ B. NO heavy equipment allowed on facility bottom.

_____ C. Groundwater not encountered during excavation. *(Note: If groundwater is encountered during the excavation process, contact the Stormwater Engineer as soon as possible.)*

_____ D. Bottom scarified prior to placement of infiltration stone.

III. Structural Components

_____ A. Underdrain pipe material as per the approved plan.

Underdrain Pipe diameter: _____

Underdrain Pipe material: _____

_____ B. Underdrain pipe perforations according to the approved plan.

_____ C. Underdrain pipe lies flat or with positive slope towards outlet.

_____ D. Clean-out and/or observation port provided at the endpoint of underdrain pipe.

_____ E. Infiltration stone as per DelDOT Specifications and the approved plan.

_____ F. 3" minimum infiltration stone cover over the underdrain pipe.

_____ G. Geotextile material as per DelDOT Specifications and placed as per the approved plan.

_____ H. Permeable pavement placed as per the approved plan.

IV. Vegetative Establishment

_____ A.

_____ B.

V. Erosion & Sediment Control

_____ A.

_____ B.

Comments (Date & Initial)

_____

_____

_____

Contract No.: _____ Contract Name: _____

BMP No.: _____ BMP Location: _____

CCR Name: _____ CCR No.: _____

Delaware Department of Transportation
Stormwater Basin Construction Checklist

Contract No.: _____ Contract Name: _____

Contractor: _____ DelDOT Project Mgr: _____

CCR Name: _____ CCR No.: _____

BMP No.: _____ BMP Location (Road/Crossroads): _____

Construction Dates & Time:

DATE	TIME IN	TIME OUT	DATE	TIME IN	TIME OUT

Key

√ Item meets standard

X Items not acceptable

N/A Items not applicable

I. Pre-Construction

_____ A. Notification given.

_____ B. Upstream drainage area stabilized or effectively diverted. *(Note: Very important to keep sediment out of infiltration basin when designed bottom elevation exposed.)*

II. Excavation

_____ A. Facility excavated to dimensions and at location as per the approved plan. *(Note: NO heavy equipment allowed within 1' of designed bottom elevation for an infiltration basin.)*

_____ B. Groundwater not encountered during infiltration or dry basin excavation. *(Note: if groundwater is encountered during excavation process, contact the Stormwater Engineer as soon as possible.)*

Contract No.: _____ Contract Name: _____

BMP No.: _____ BMP Location: _____

CCR Name: _____ CCR No.: _____

III. Principal Spillway (main outflow conveyance)

_____ A. Riprap size and placement (i.e. scour protection) as per the approved plan.

_____ B. Concrete cradle (Class A bedding) constructed as per the approved plan.

_____ C. Pipe placed as per the approved plan with water tight connections throughout.

Pipe Diameter: _____

Pipe Material:

_____ D. Anti-seep collars properly spaced and constructed as per the approved plan.

_____ E. Backfill placed over the pipe as per the approved plan.

IV. Weir Wall / Riser Structure

_____ A. Weir Wall

_____ Wall constructed as per the approved plan. This includes footer, rebar placement, etc.

_____ Weirs, orifices, v-notches, etc., constructed at proper inverts, sizes, angles, etc.

_____ B. Riser Structure

_____ Riser constructed or placed as per the approved plan. This includes footer, rebar placement, flow channel constructed in bottom (if on the plan), etc.

_____ Weirs, orifices, v-notches, etc., constructed at proper inverts, sizes, angles, etc.

_____ Trash rack(s) constructed and/or placed as per the approved plan.

_____ Underdrain placed as per the approved plan.

Underdrain Pipe diameter: _____

Underdrain Pipe material: _____

Contract No.: _____ Contract Name: _____

BMP No.: _____ BMP Location: _____

CCR Name: _____ CCR No.: _____

V. Embankment (fill areas above original grade)

_____ A. Embankment height and width constructed as per the approved plan.

_____ B. Cut-off Trench constructed as per the approved plan.

_____ Overall dimensions to include length, height, and width.

_____ Constructed with material(s) as shown in the plans. This could be soil type(s), sheet pile, concrete, etc.

VI. Impoundment Area

_____ A. Inlet pipes and/or swales have scour protection (riprap, blanket, etc.) as per the approved plan.

_____ B. Forebay(s) constructed as per the approved plan.

_____ C. Bench(es) constructed as per the approved plan.

VII. Emergency Spillway

_____ A. Spillway constructed to dimensions as per the approved plan.

_____ B. Spillway channel and outfall scour protection constructed as per the approved plan.

VIII. Vegetative Stabilization

_____ A. Seeding placed as per the approved plan.

_____ B. Mulching placed as per the approved plan.

Contract No.: _____ Contract Name: _____

BMP No.: _____ BMP Location: _____

CCR Name: _____ CCR No.: _____

Comments (Date & Initial)

Delaware Department of Transportation
Vegetative Channel/Bioswale
Construction Checklist

Contract No.: _____ Contract Name: _____

Contractor: _____ DelDOT Project Mgr: _____

CCR Name: _____ CCR No.: _____

BMP No.: _____ BMP Location (Road/Crossroads): _____

Construction Dates & Time:

DATE	TIME IN	TIME OUT	DATE	TIME IN	TIME OUT

Key

√ Item meets standard

X Items not acceptable

N/A Items not applicable

I. Pre-Construction

_____ A. Notification given.

_____ B. Upstream drainage area stabilized. Minimum of ECB in channel.

II. Grading/Construction

_____ A. Facility excavated to dimensions and at location as per the approved plan.

_____ B. Groundwater not encountered during excavation. *(Note: If groundwater is encountered during the excavation process, contact the Stormwater Engineer as soon as possible.)*

_____ C. Channel Underdrain / Stone Trench

1. Pipe & Size *Pipe Type:* _____ *Size:* _____
2. Stone & Depth *Stone Type:* _____ *Depth:* _____

_____ D. Blanket installed as per approved plan.

Contract No.: _____ Contract Name: _____

BMP No.: _____ BMP Location: _____

CCR Name: _____ CCR No.: _____

III. Vegetation

_____ A. Permanent stabilization placed as per the approved plan.

Comments (Date & Initial)

APPENDIX D – POST CONSTRUCTION STORMWATER MANAGEMENT

APPENDIX D

D-1: DELDOT DELEGATION LETTER

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
RICHARDSON & ROBBINS BUILDING
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

OFFICE OF THE SECRETARY

PHONE
(302) 739-9000

MAR 1 2 2020

Jennifer Cohan, Cabinet Secretary
Delaware Department of Transportation
800 Bay Road
P.O. Box 778
Dover, DE 19903

Dear Secretary Cohan:

The Department of Natural Resources and Environmental Control (Department) is in receipt of the Delaware Department of Transportation's (DelDOT) request for re-delegation of program responsibility for the Delaware Sediment & Stormwater Program.

The Sediment and Stormwater Program has reviewed and evaluated your existing delegated program responsibility. The Program has recommended conditional delegation of program elements be granted to the DelDOT. This would extend the existing program delegation until June 30, 2025. Condition of re-delegation relies on implementing the recommendations outlined in the 2020 Delegation Review Findings and Recommendations. I concur with that recommendation and by means of this letter, approve delegation for another five years. Department staff will be providing you with a copy of the 2020 Delegation Review Findings and Recommendations, and we will be in touch with your program staff to discuss the findings and recommendations within the next several weeks.

I would like to thank you and your staff for your commitment to administer an effective Sediment and Stormwater Program. If you have any questions or comments regarding the review and evaluation, please do not hesitate to have your staff contact Ms. Jamie Rutherford at (302) 739-9921.

Sincerely,

Shawn M. Garvin
Secretary

cc: Nicole Majeski, Deputy Secretary
Shante Hastings, Chief Engineer
Jim Pappas, Deputy Director, Operations & Support
John Caruano, Group Engineer, Environmental Stewardship
Terry Deputy, Director, Division of Watershed Stewardship
Jamie Rutherford, Sediment and Stormwater Program Manager

APPENDIX D

D-2: AGREEMENT 2056 REQUEST FOR PROPOSAL

Delaware Department of Transportation

REQUEST FOR PROPOSALS
PROFESSIONAL SERVICES

RFP Number: **2056F**

NPDES INVENTORY AND INSPECTION

Submission Due Date/Time: **Thursday, September 22, 2022, no later than 2:00 P.M. Local Time**

Three (3) year term with Two (2) possible one-year extensions

Agreement Type: Project Specific

One agreement may be awarded from this solicitation

Funding: State & Federal

The anticipated method of payment is cost plus fixed fee

29 Del.C. §6981, 2 CFR part 200

PROJECT INFORMATION

This Request for Proposal (RFP) issued by the Delaware Department of Transportation (DelDOT) is for the purpose of acquiring Proposals from interested firms to assist the National Pollutant Discharge Elimination System (NPDES) Program with inventory and inspection services related to compliance with the NPDES Municipal Separate Storm Sewer System (MS4) Permit Program, and statewide inventory and inspection of DelDOT-owned stormdrain infrastructure and stormwater best management practices (BMPs).

PROJECT DESCRIPTION

Services may include but are not limited to Inspections; Environmental Services; GIS-Systems Analysis and Management.

The awarded firm will assist with the asset management of DelDOT's stormwater system including the inventory and inspection of closed stormdrain infrastructure (inlets, manholes, pipes), open drainage system (outfalls, swales) and stormwater BMPs (ponds, sand filters, bioswales, etc.) statewide, with particular emphasis on Phase I and Phase II MS4 permitted areas.

DelDOT will focus this agreement's efforts on the following tasks:

1. Re-inspect portions of the stormdrain system in the Phase I and II areas, as specified within the Phase I and Phase II MS4 permits.
2. Assist with drainage investigations and re-inspections of the stormdrain system statewide.
3. Inventory, and as needed, inspection of newly accepted stormdrain infrastructure in subdivision and state-owned roads statewide.
4. Annual BMP inspections.
5. Pre-acceptance compliance inspections of BMPs.
6. Maintain and update the inventory/inspection database and map viewer application.
7. Identify, create and submit work orders for portions of the infrastructure requiring maintenance.

8. Stormdrain system inventory and inspection:
    a. Develop and compile an inventory of all parts of the DelDOT-owned stormwater drainage system statewide.
    b. Locate the drainage system using Global Positioning System (GPS) techniques, with sub-meter accuracy.
    c. Inspect all respective parts of DelDOT's conveyance system to verify inventory data, and structural integrity and identify maintenance needs. Work is to include external and internal visual inspections of all drainage inlets, catch basins, manholes, junction boxes, flow diverters, stream channels, ditches, and pipes.
    d. Report illicit discharges or any odors or visual clues that would indicate the presence of non-stormwater discharges (actual investigation not part of scope).
    e. Mark those drainage inlets that are readily visible to the general public (i.e. within a subdivision, close to sidewalks, etc.) upon completion of the inspection work with a Departmentally approved decal. Each such mark shall display a public message related to protecting water quality.
9. Stormwater BMP inventory and inspection:
    a. Inventory any new DelDOT-owned stormwater BMPs statewide to include stormwater ponds, media filters, bio-filtration, sedimentation devices, bio-retention, infiltration basins and trenches, check dams, etc.
    b. Locate each BMP using Global Positioning System (GPS) techniques, with sub-meter accuracy.
    c. Perform inspections of all components of DelDOT-owned BMPs.
    d. Perform initial, primary and pre-acceptance inspections of newly constructed BMPs prior to their acceptance into the state system.
10. Maintenance work orders:
    a. Prepare maintenance work orders for deficient elements of the stormwater conveyance system and stormwater BMPs upon discovery.
    b. Work orders shall be submitted to the appropriate sections of DelDOT in a format compatible with existing maintenance management systems.
11. Database maintenance and GIS support:
    a. Provide routine updates of inventories and inspections to the database; the consultant shall ensure the quality and accuracy of the data prior to submitting
    b. Make modifications to map viewer at the request of the DelDOT project manager
    c. The consultant shall be capable to host the database and have it available to DelDOT through the internet.
    d. Any and all data or source code developed for this project shall become the property of DelDOT for its use and shall be submitted to DelDOT as it is developed or upon the request of DelDOT's project manager. The consultant must submit the information in such format as will enable DelDOT to add information or modify the database independently, as it sees fit, as requirements and needs change.
    e. Assist in determining ownership or maintenance responsibility.
    f. GIS and database analysis.

12. Progress reports and submittals:
    a. Attend regular progress meetings with DelDOT NPDES Program. The frequency of meetings will be determined by the DelDOT Project Manager.
    b. Submit annual summary reports for inclusion in DelDOT's annual report.
    c. Assist with compiling stormdrain infrastructure and BMP statistics as requested.

Deliverables:

1. Monthly invoices including monthly summary reports of inventory and inspection efforts.
2. Annual reports of all consultant activities and data to be incorporated into DelDOT's annual reports to DNREC.
3. DelDOT's Phase I and Phase II Annual Reports to DNREC.
4. GIS maps as required.
5. SOPs as required.
6. Meeting minutes.

QUESTIONS

Questions must be submitted before the due date identified in the Procurement Schedule for this RFP. All inquiries must be submitted in the Q/A section of the project listing in the Bonfire Procurement Portal.

The Department's response to questions will be posted, according to the procurement schedule, under the project listing in Bonfire and to the State of Delaware Bid Solicitation Directory Website: http://www.bids.delaware.gov/.

DISADVANTAGED BUSINESS ENTERPRISE

A DBE goal will be established on a task-by-task basis for the sum total of all federally-funded tasks associated with this Agreement. The Department will require ongoing reviews and approval of *good faith efforts* before a Notice to Proceed is issued. Department DBE Program staff will monitor this Agreement to ensure that good faith efforts are being made to meet the DBE goal. DBE firms must be certified through DelDOT's DBE Program in order to qualify toward meeting the goal.

PROCUREMENT SCHEDULE

Action Item	Date	Time
Deadline for Questions to ensure response:	Ten (10) business days prior to the proposal due date	2:00 P.M. Local Time
Final Response to Questions posted by:	Five (5) business days prior to the proposal due date	2:00 P.M. Local Time
Proposals Due no later than:*	**Thursday, September 22, 2022**	2:00 P.M. Local Time

NOTE: Only asterisk (*) marked date changes will be communicated (via posted Addendums).

PROPOSAL REQUIREMENTS

Interested firms must submit the material required herein or they may not be considered for the project:

1. Proposals must be received before the Proposal Due Date and Time, as identified in the Procurement Schedule for this RFP. Responses submitted by hard copy, mail, facsimile, or e-mail will not be accepted. Responses received after the Proposal Due Date and Time will not be considered.

2. **Upload your submission at**: https://deldot.bonfirehub.com/portal/

   Important Notes:
   - Logging in and/or uploading the file(s) does not mean the response is submitted. Users must successfully upload all the file(s) and MUST click the submit button before the proposal due date and time.
   - Users will receive an email confirmation receipt with a unique confirmation number once the submission has been finalized. This will confirm that the proposal has been submitted successfully.
   - Each submitted item of Requested Information will only become visible to DelDOT after the proposal due date and time.
   - If the file is mandatory, you will not be able to complete your submission until the requirement is met.
   - Uploading large documents may take significant time depending on the size of the file(s) and your Internet connection speed. The maximum upload file size is 1000 MB.
   - Minimum system requirements: Internet Explorer 11, Microsoft Edge, Google Chrome, or Mozilla Firefox. Java Script must be enabled.

   Need Help? Please contact Bonfire directly at Support@GoBonfire.com for technical questions related to your submission. You can also visit their help forum at https://bonfirehub.zendesk.com/hc.

3. **The Prime Consultant must be Registered,** or submit application for registration, with DelDOT at or before the time of submission in order to be considered. For registration information, click here.

4. **Submit one (1) Original and one (1) Redacted copy** of the Proposal. The original must be a .pdf file of the original signed proposal and should be clearly marked "Original" on the first page of the document. The redacted copy must be a .pdf file of the original signed proposal with any proprietary or confidential information redacted, and this copy should be clearly marked as "Redacted" on the first page of the document. The redacted copy is required even if the submission contains no proprietary or confidential information.

   To determine what information may be considered proprietary or confidential and may be redacted from their Proposal, firms should review Delaware's Freedom of Information Regulations here; http://regulations.delaware.gov/AdminCode/title8/1400.shtml#TopOfPage. Under Delaware FOIA law, 29 Del. C, §10002(l)(2), "Trade secrets and commercial or financial information…which is of a privileged or confidential nature" are "records that shall not be deemed public" and are therefore exempt from disclosure under FOIA.

5. **Architect-Engineer Qualifications**; **GSA SF330:**

http://www.gsa.gov/portal/forms/download/116486

Follow instructions for the SF330, and add the following Individual Agency Instructions:

A. Part I Section C 11, Proposed Team;
Indicate if the firm is a DBE and provide the approximate percentage of the contract cost they will perform.

B. Part I Section E, Resumes of Key Personnel Proposed for this Contract;
Resume information is limited to eight (8) individuals regardless of affiliation.

C. Part I Section F, Example Projects;
Example Projects provided are limited to ten (10).

D. Part I Section H 30, Additional Information;
(The Department recommends formatting this section using Times New Roman, 12 pt. font)
1) The Prime consultant must indicate the current workload with the Department by listing the following in a table format:
Agreement No.; Agreement Title; Consultant PM; Prime or Sub; Total Dollars paid to date; current number of Tasks issued; and date of contract expiration.
2) List any DelDOT agreement number your firm has been selected for and not included above.
3) Firms may include a "Rating Criteria Support Information" Section, limited to four pages, within Section H, that covers any information that directly relates to the firm's ability to meet the specific rating criteria listed in this RFP.

Note: Letters of Interest should not be included.

6. **Joint venture** submissions will not be considered.

7. DelDOT reserves the right to reject any and all submissions. Submissions become property of the Department and shall be retained electronically for a minimum period of three (3) years from the date of receipt. DelDOT reserves the right to any and all ideas included in this response without incurring any obligations to the responding firms or committing to procurement of the proposed services.

8. **Required Certification Forms.** All firms responding to the RFP must complete and return the submission forms located in 'Appendix A' of this document.

No promotional materials or brochures are to be included as part of the submission.

RATING CRITERIA

#	**Criteria Description**:	**Weight**
1	Firm's experience pertaining to BMP inventory and inspection, assessing deficiencies that affect performance and water quality, and recommending maintenance and/or retrofit solutions.	25%
2	Firm's experience pertaining to stormwater system inventory, inspections, and condition assessment.	25%
3	Firm's experience providing GIS-based database management and the resources needed to house and maintain such databases.	25%
4	Staff capabilities and workload capacity to accomplish proposed work on schedule and on-call as needed.	25%
	TOTAL :	**100%**

OVERVIEW OF SELECTION PROCESS –PROJECT SPECIFIC

- This is a project-specific agreement where the services as described in this RFP will be provided over the life of the project.
- This is a single-phase solicitation process with the availability for discussions with up to three (3) of the most highly qualified firms. Based upon the listed criteria and evaluation of each firm's submitted proposal, the Selection Committee may decide if a small sample task and/or discussions will be held with the most highly qualified consultants. If discussions are held, they will serve to clarify the technical approach, qualifications, and capabilities provided in response to the RFP, after which the committee will determine the ranking of the candidate firms.
- Selection Committee members will individually score each firm's submitted proposal which determines individual ranking. The Department's ranking is the combined ranking of all Committee members. Firms, in order of ranking, will have the opportunity to negotiate an agreement with the Department. If the Department cannot reach agreement with the highest ranked firm(s), the Department terminates negotiations and begins negotiations with the next highest ranked firm, and so on until an agreement is reached. The Department notifies via email the awarded firm(s) of the opportunity to enter into an agreement with the Department. This notification also includes information on the next steps for the agreement process.
- After the ranking process has been completed, applicable price information will be requested from the successful candidate firm(s), such as; salary rates for various classifications of personnel; and an indirect cost derivation for the most current accounting period.
- Payroll burden and overhead will be computed on direct salary costs only (not including overtime) at the consultant's audited rate, as per Federal Acquisition Regulations Part 31, and Department policies. Computer and CADD costs are not allowable as a direct cost to this project. Rate determination and applicability is subject to audit by the Department. Additionally, candidates should be prepared for the Department to work with your current accounting firm to provide information and backup documentation. Full and immediate cooperation is required to avoid delays in execution of an agreement. Failure to cooperate may result in breaking off of negotiations and moving to the next ranked firm.
- Selection Committee membership appointments are confidential. The Department's Professional Services Procurement Manual may be viewed here.

INSURANCE REQUIREMENTS

The selected firm(s) must obtain at its own cost and expense and keep in force and effect during the term of the agreement, including all extensions, the minimum coverage limits specified below with a carrier satisfactory to the State.

a. Worker's Compensation and Employer's Liability Insurance in accordance with applicable law.

b. Commercial General Liability - $1,000,000 per occurrence/$3,000,000 per aggregate.

c. Miscellaneous Errors and Omissions - $1,000,000 per occurrence/$3,000,000 per aggregate.

d. Automotive Liability Insurance covering all automotive units used in the work (including all units leased from and/or provided by the State to Vendor pursuant to this Agreement as well as all units used by Vendor, regardless of the identity of the registered owner, used by Vendor for completing the Work required by this Agreement to include but not limited to transporting Delaware clients or staff), providing coverage on a primary non-contributory basis with limits of not less than:

1. $1,000,000 combined single limit each accident, for bodily injury;
2. $250,000 for property damage to others;
3. $25,000 per person per accident Uninsured/Underinsured Motorists coverage;
4. $25,000 per person, $300,000 per accident PIP benefits if carrying any of our clients or employees; and
5. Comprehensive coverage for all vehicles leased from the State of Delaware Fleet Services which shall cover the replacement cost of the vehicle in the event of collision, damage or other loss.

Certificate of Insurance and/or copies of the insurance policies will be requested at time of award.

In no event shall the State of Delaware be named as an additional insured on any policy required under this agreement.

MISCELLANEOUS

The Department is not liable for any cost incurred by the consultant in the preparation or presentation of the Proposal.

Any individual, business, organization, corporation, consortium, partnership, joint venture, or any other entity including subconsultants currently debarred or suspended is ineligible to participate as a candidate for this process. Any entity ineligible to conduct business in the State of Delaware for any reason is ineligible to respond to the RFP.

The Department of Transportation will affirmatively insure individuals and businesses will not be discriminated against on the grounds of race, creed, color, sex, or national origin in consideration for an award. Minority business enterprises will be afforded full opportunity to submit bids/proposals in response to this invitation.

Department of Transportation
State of Delaware
By: Nicole Majeski
Secretary
Dover, DE

FEDERAL CONTRACT PROVISIONS

FTA's Master Agreement contains a current, but not all-inclusive, description of statutory and regulatory requirements that may affect a recipient's procurement (such as Disadvantaged Business Enterprise (DBE) and Clean Air requirements). The Master Agreement states that applicable Federal requirements will apply to project participants to the lowest tier necessary to ensure compliance with those requirements. The recipient will need to include applicable Federal requirements in each sub-agreement, lease, third party contract, or other document as necessary. For specific guidance on cross-cutting requirements administered by other Federal agencies, FTA recommends that the recipient contact those agencies. The requirements listed herein must be adhered to by any firms selected to perform work required under these agreements.

1. AUDIT AND INSPECTION OF RECORDS

The Contractor agrees to provide the Delaware Department of Transportation (Department), the FTA Administrator, the Comptroller General of the United States or any of their authorized representatives' access to any books, documents, papers and records of the Contractor which are directly pertinent to this contract for the purposes of making audits, examinations, excerpts and transcriptions. Contractor also agrees, pursuant to 49 C. F. R. 633.17 to provide the FTA Administrator or his authorized representatives including any PMO Contractor access to Contractor's records and construction sites pertaining to a major capital project, defined at 49 U.S.C. 5302(a)1, which is receiving federal financial assistance through the programs described at 49 U.S.C. 5307, 5309 or 5311. By definition, a major capital project excludes contracts of less than the simplified acquisition threshold. The Contractor agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.

2. ACCESS REQUIREMENTS FOR INDIVIDUALS WITH DISABILITIES

The Contractor agrees to comply with all applicable requirements of the Americans with Disabilities Act of 1990 (ADA), 42 U.S.C. Section 12101 *et seq.* And 49 U.S.C. Section 322; Section 504 of the Rehabilitation Act of 1973, as amended, 29 U.S.C. Section 794; Section 16 of the Federal Transit Act, as amended, 49 U.S.C. App. Section 1612; and implementing regulations, as may be amended

3. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, AND OTHER RESPONSIBILITY MATTERS – Lower Tier Covered Transactions (Third Party Contracts over $25,000)

a) By signing and submitting this bid or proposal, the prospective lower tier participant is providing the signed certification set out below.

b) The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the Department may pursue available remedies, including suspension and/or debarment.

c) The prospective lower tier participant shall provide immediate written notice to the Department if at any time the prospective lower tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

d) The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "persons," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549 [49 CFR Part 29]. You may contact the Department for assistance in obtaining a copy of those regulations.

e) The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized in writing by the Department.

f) The prospective lower tier participant further agrees by submitting this proposal that it will include the clause "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transaction", without modification, in all lower tier covered transactions.

g) A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that it is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the No procurement List issued by the U. S. General Service Administration.

h) Nothing contained in the foregoing shall be construed to require establishment of system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i) Except for transactions authorized under Paragraph E of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible or voluntarily excluded from participation in this transaction, in addition to all remedies available to the Federal Government, the Department may pursue available remedies including suspension and/or debarment.

j) The prospective lower tier participant certifies, by submission of this bid or proposal, that neither it nor its "principals" [as defined at 49 CFR §29.105(p)] is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

k) When the prospective lower tier participant is unable to certify to the statements in this certification, such prospective participant shall attach an explanation to this proposal.

4. CLEAN WATER REQUIREMENTS

The Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 *et seq.* The Contractor agrees to report each violation to the Department and understands and agrees that the Department will, in turn, report each violation as required to assure notification to FTA and the appropriate EPA Regional Office. (2)The Contractor also agrees to include these requirements in each subcontract exceeding $100,000 financed in whole or in part with Federal assistance provided by FTA.

5. FEDERAL CHANGES

Contractor shall at all times comply with all applicable FTA regulations, policies, procedures and directives, including without limitation those listed directly or by reference in the Master Agreement between the Department and FTA, as they may be amended or promulgated from time to time during the term of this contract. Contractor's failure to so comply shall constitute a material breach of this contract.

6. CLEAN AIR

The Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. §§ 7401 *et seq*. The Contractor agrees to report each violation to the Department and understands and agrees that the Department will, in turn, report each violation as required to assure notification to FTA and the appropriate EPA Regional Office. (2) The Contractor also agrees to include these requirements in each subcontract exceeding $100,000 financed in whole or in part with Federal assistance provided by FTA.

7. ENERGY CONSERVATION

The Contractor shall recognize mandatory standards and policies relating to energy efficiency which are contained in the State Energy Conservation Plan issued in compliance with the Energy Policy and Conservation Act (42 US Section 321 *et seq.*).

8. CONTRACT TERMINATION

a) Termination for Convenience

The Department may terminate this contract, in whole or in part, at any time by written notice to the Contractor. The Contractor shall be paid its costs, including contract close-out costs, and profit on product delivered up to the time of termination. The Contractor shall promptly submit its termination claim for payment. If the Contractor has any property in its possession belonging to the Department, the Contractor will account for the same and dispose of it in the manner the Department directs.

b) Termination for Default

If the Contractor does not deliver supplies in accordance with the contract delivery schedule, or, if the contract is for services, the Contractor fails to perform in the manner called for in the contract, or if the Contractor fails to comply with any other provisions of the contract, the Department may terminate this contract for default. Termination shall be affected by serving a notice of termination on the Contractor setting forth the manner in which the Contractor is in default. The Contractor will only be paid the contract price for supplies delivered and accepted, or services performed in accordance with the manner of performance set forth in the contract.

If it is later determined that the Contractor had an excusable reason for not performing, such as a strike, flood, events which are not the fault of or are beyond the control of the Contractor, the Department, after setting up a new delivery or performance schedule, may allow the Contractor to continue work, or treat the termination as a termination of convenience.

In the event the Department exercises its right of termination for default, and if an amount for liquidated damages is set forth, the Contractor shall be liable to the Department for excess costs and, in addition, for liquidated damages in the amount set forth, as fixed, agreed, and liquidated damages for each calendar day of delay, until such time as the Department may reasonably obtain delivery or performance of similar supplies or services.

If the contract is so terminated, the Contractor shall continue performance and be liable to the Department for such liquidated damages for each calendar day of delay until the supplies are delivered or services performed.

The Contractor shall not be liable for liquidated damages resulting from delays such as acts of God, strikes, fire or flood, and events which are not the fault of, or are beyond the control of the Contractor.

9. CIVIL RIGHTS

(1) Nondiscrimination - In accordance with Title VI of the Civil Rights Act, as amended, 42 U.S.C. § 2000d, section 303 of the Age Discrimination Act of 1975, as amended, 42 U.S.C. § 6102, section 202 of the Americans with Disabilities Act of 1990, 42 U.S.C. § 12132, and Federal transit law at 49 U.S.C. § 5332, the Contractor agrees that it will not discriminate against any employee or applicant for employment because of race, color, creed, national origin, sex, age, or disability. In addition, the Contractor agrees to comply with applicable Federal implementing regulations and other implementing requirements FTA may issue.

(2) Equal Employment Opportunity - The following equal employment opportunity requirements apply to the underlying contract:

(a) Race, Color, Creed, National Origin, Sex - In accordance with Title VII of the Civil Rights Act, as amended, 42 U.S.C. § 2000e, and Federal transit laws at 49 U.S.C. § 5332, the Contractor agrees to comply with all applicable equal employment opportunity requirements of U.S. Department of Labor (U.S. DOL) regulations, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor," 41 C.F.R. Parts 60 *et seq*., (which implement Executive Order No. 11246, "Equal Employment Opportunity," as amended by Executive Order No. 11375, "Amending Executive Order 11246 Relating to Equal Employment

Opportunity," 42 U.S.C. § 2000e note), and with any applicable Federal statutes, executive orders, regulations, and Federal policies that may in the future affect construction activities undertaken in the course of the Project. The Contractor agrees to take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, creed, national origin, sex, or age. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.

(b) Age - In accordance with section 4 of the Age Discrimination in Employment Act of 1967, as amended, 29 U.S.C. § 623 and Federal transit law at 49 U.S.C. § 5332, the Contractor agrees to refrain from discrimination against present and prospective employees for reason of age. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.

(c) Disabilities - In accordance with section 102 of the Americans with Disabilities Act, as amended, 42 U.S.C. § 12112, the Contractor agrees that it will comply with the requirements of U.S. Equal Employment Opportunity Commission, "Regulations to Implement the Equal Employment Provisions of the Americans with Disabilities Act," 29 C.F.R. Part 1630, pertaining to employment of persons with disabilities. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.

(3) The contractor agrees to comply with all applicable requirements of the Americans with Disabilities Act of 1990 (ADA), 42 U.S.C. Section 12101 *et seq.* And 49 U.S.C. Section 322; Section 504 of the Rehabilitation Act of 1973, as amended, 29 U.S.C., Section 794; Section 16 of the Federal Transit Act, as amended, 49 U.S.C. App. Section 1612; and implementing regulations, as may be amended.

(4) The Contractor also agrees to include these requirements in each subcontract financed in whole or in part with Federal assistance provided by FTA, modified only if necessary to identify the affected parties.

10. DISADVANTAGED BUSINESS ENTERPRISES

It is the policy of the Department of Transportation that Disadvantaged Business Enterprises as defined in 49 CFR Part 26 shall have the opportunity to participate in the performance of contracts financed in whole or part with Federal funds under this contract. Consequently the DBE Requirements of 49 CFR Part 26 apply to this contract. The recipient or its contractor agrees to ensure that Disadvantaged Business Enterprises as defined in 49 CFR Part 26 have the opportunity to participate in the performance of contracts and subcontracts financed in whole or in part with Federal funds provided under this contract. In this regard all recipients or contractors shall take all necessary and reasonable steps in accordance with 49 CFR Part 26 to ensure that Disadvantaged Business Enterprises have the opportunity to compete for and perform contracts. The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of FTA assisted subcontracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy, as the Department deems appropriate.

The successful bidder agrees to comply with the following clauses:

Prompt Payment: The prime contractor agrees to pay each subcontractor under this prime contract for satisfactory performance of its contract no later than 30 days from the receipt of each payment the prime contractor receives from the Department. This clause applies to both DBE and Non-DBE subcontractors.

Retainage: The prime contractor agrees to return retainage payments to each subcontractor within 30 days after the subcontractor's work is satisfactorily completed. Any delay or postponement of payment from the above referenced time frame may occur only for good cause following written approval of the Department. This clause applies to both DBE and non-DBE subcontractors. The specific goal for this contract is shown above under Disadvantaged Business Enterprise.

11. ENVIRONMENTAL VIOLATIONS

The Contractor agrees to comply with all applicable standards, orders, or requirements issued under Section 306 of the Clean Air Act (42 USC 1857 (h)), Section 508 of the Clean Water Act (33 USC 1368), Executive Order 11378, and Environmental Protection Agency regulations: (40 CFR, Part 15) which prohibit the use under nonexempt Federal contracts, grants or loans, of facilities included on the EPA List for Violating Facilities. The Contractor shall report violations to the FTA.

12. EQUAL EMPLOYMENT OPPORTUNITY

In connection with the execution of this contract, the Contractor shall not discriminate against any employee or applicant for employment because of race, creed, religion, color, national origin, age, sex or disability. The Contractor shall take affirmative action to insure that applicants are employed, and that employees are tested during their employment without regard to their race, creed, religion, color, national origin, age, sex or disability. Such actions shall include, but not b limited to the following, employment, upgrading, demotion, or transfer, recruitment or recruitment advertising, layoff or termination; rates of pay, or other forms of compensation. The Contractor further agrees to insert a similar provision in all subcontracts, except subcontracts for standard commercial supplies or raw materials.

13. FTA FUNDING REQUIREMENTS

This project may be financed in part by funds from the Federal Transit Administration. Contractor shall at all times comply with all applicable FTA regulations, policies, procedures and directives, including without limitation those listed directly or by reference in the Master Agreement between the Department and FTA, as they may be amended or promulgated from time to time during the term of this contract. Contractor's failure to so comply shall constitute a material breach of this contract.

14. INCORPORATION OF FEDERAL TRANSIT ADMINISTRATION (FTA) TERMS

The preceding provisions include, in part, certain Standard Terms and Conditions required by DOT, whether or not expressly set forth in the preceding contract provisions. All contractual provisions required by FTA, as set forth in FTA Circular 4220.1F are hereby incorporated by reference. Anything to the contrary herein notwithstanding, all FTA mandated terms shall be deemed to control in the event of a conflict with other provisions contained in this Agreement. The Contractor shall not perform any act, fail to perform any act, or refuse to comply with any Department requests which would cause the Department to be in violation of the FTA terms and conditions.

15. LOBBYING:

The Contractor is required to certify using the Certification of Restrictions on Lobbying Form included that, to the best of his or her knowledge and belief:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for making lobbying contacts to an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form--LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions [as amended by "Government wide Guidance for New Restrictions on Lobbying," 61 Fed. Reg. 1413 (1/19/96). Note: Language in paragraph (2) herein has been modified in accordance with Section 10 of the Lobbying Disclosure Act of 1995 (P.L. 104-65, to be codified at

2 U.S.C. 1601, *et seq*.)]

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly. The certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of the certification is a prerequisite for making or entering into this transaction imposed by 31, U.S.C. § 1352 (as amended by the Lobbying Disclosure Act of 1995). Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure. Pursuant to 31 U.S.C. § 1352(c)(1)-(2)(A), any person who makes a prohibited expenditure or fails to file or amend a required certification or disclosure form shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such expenditure or failure.

16. NO GOVERNMENT OBLIGATION TO THIRD PARTIES

(1) The Department and Contractor acknowledge and agree that, notwithstanding any concurrence by the Federal Government in or approval of the solicitation or award of the underlying contract, absent the express written consent by the Federal Government, the Federal Government is not a party to this contract and shall not be subject to any obligations or liabilities to the Department, Contractor, or any other party (whether or not a party to that contract) pertaining to any matter resulting from the underlying contract.

(2) The Contractor agrees to include the above clause in each subcontract financed in whole or in part with Federal assistance provided by FTA. It is further agreed that the clause shall not be modified, except to identify the subcontractor who will be subject to its provisions.

17. PROGRAM FRAUD AND FALSE OR FRAUDULENT STATEMENTS AND RELATED ACTS

(1) The Contractor acknowledges that the provisions of the Program Fraud Civil Remedies Act of 1986, as amended, 31 U.S.C. § 3801 *et seq*. and U.S. DOT regulations, "Program Fraud Civil Remedies," 49 C.F.R. Part 31, apply to its actions pertaining to this Project. Upon execution of the underlying contract, the Contractor certifies or affirms the truthfulness and accuracy of any statement it has made, it makes, it may make, or causes to be made, pertaining to the underlying contract or the FTA assisted project for which this contract work is being performed. In addition to other penalties that may be applicable, the Contractor further acknowledges that if it makes, or causes to be made, a false, fictitious, or fraudulent claim, statement, submission, or certification, the Federal Government reserves the right to impose the penalties of the Program Fraud Civil Remedies Act of 1986 on the Contractor to the extent the Federal Government deems appropriate.

(2) The Contractor also acknowledges that if it makes, or causes to be made, a false, fictitious, or fraudulent claim, statement, submission, or certification to the Federal Government under a contract connected with a project that is financed in whole or in part with Federal assistance originally awarded by FTA under the authority of 49 U.S.C. § 5307, the Government reserves the right to impose the penalties of 18 U.S.C. § 1001 and 49 U.S.C. § 5307(n)(1) on the Contractor, to the extent the Federal Government deems appropriate.

(3) The Contractor agrees to include the above two clauses in each subcontract financed in whole or in part with Federal assistance provided by FTA. It is further agreed that the clauses shall not be modified, except to identify the subcontractor who will be subject to the provisions.

18. PROTEST PROCEDURES

Protests based upon the award of the contract shall be made in writing to the Contract Services Administrator no later than ten (10) calendar days following the award of the contract. The protest must clearly specify in writing the grounds and evidence on which the protest is based. The protest will be reviewed and decided pursuant to; the proposal documents issued by the Department, the Delaware Code, and the Federal Transit Authority's regulations.

19. RECORD RETENTION

The Contractor agrees to maintain all books, records, accounts and reports required under this contract for a period of not less than three years after the date of termination or expiration of this contract, except in the event of litigation or settlement of claims arising from the performance of this contract, in which case Contractor agrees to maintain same until the Department, the FTA Administrator, the Comptroller General, or any of their duly authorized representatives, have disposed of all such litigation, appeals, claims or exceptions related thereto. Reference 49 CFR 18.39(i)(11).

20. SEISMIC SAFETY

The contractor agrees that any new building or addition to an existing building will be designed and constructed in accordance with the standards for Seismic Safety required in Department of Transportation Seismic Safety Regulations 49 CFR Part 41 and will certify to compliance to the extent required by the regulation. The contractor also agrees to ensure that all work performed under this contract including work performed by a subcontractor is in compliance with the standards required by the Seismic Safety Regulations and the certification of compliance issued on the project.

21. TITLE VI COMPLIANCE

During the performance of any Contract entered into pursuant to these specifications, the Contractor, for itself, its assignees and successor in interest, agrees that it shall comply with Title VI of the Civil Rights Act of 1964 (42 U.S.C. section 2000d) and the Regulations relative to nondiscrimination in federally assisted programs of the Department of Transportation, Title 49, Code of Federal Regulations Part 21, as they may be amended from time to time which are incorporated by reference and made a part of this contract.

22. INTELLIGENT TRANSPORTATION SYSTEMS

Intelligent transportation system (ITS) property and services must comply with the National ITS Architecture and Standards to the extent required by Section 5307(c) of SAFETEA-LU, FTA Notice, "FTA National ITS Architecture Policy on Transit Projects," 66 FR 1455 *et seq.*, January 8, 2001, and later published policies or implementing directives FTA may issue. Consequently, third party contracts involving ITS are likely to require provisions to ensure compliance with Federal requirements.

23. RESOLUTION OF DISPUTES, BREACHES, OR OTHER LITIGATION

(a) FTA Interest. FTA has a vested interest in the settlement of any violation of federal law, regulation, or requirement, or any disagreement involving the Award, the accompanying Underlying Agreement, and any Amendments thereto including, but not limited to, a default, breach, major dispute, or litigation, and FTA reserves the right to concur in any settlement or compromise.

(b) Notification to FTA; Flow Down Requirement. If a current or prospective legal matter that may affect the Federal Government emerges, the Recipient must promptly notify the FTA Chief Counsel and FTA Regional Counsel for the Region in which the Recipient is located. The Recipient must include a similar notification requirement in its Third Party Agreements and must require each Third Party Participant to include an equivalent provision in its subagreements at every tier, for any agreement that is a "covered transaction" according to 2 C.F.R. §§ 180.220 and 1200.220.

Appendix A - REQUIRED FORMS

The following completed forms are required to be returned with each proposal:

- Certification of Eligibility
- Certificate of Non-Collusion
- Certification of Primary Participant Regarding Debarment, Suspension, and Other Responsibility Matters
- Certification of Restrictions on Lobbying

CERTIFICATION OF ELIGIBILITY

Delaware Department of Transportation

Request for Proposal 2056F – NPDES Inventory and Inspection

We have read Request for Proposal number 2056F and fully understand the intent of the RFP as stated, certify that we have adequate personnel and knowledge to fulfill the requirements thereof, and agree to furnish such services in accordance with the contract documents as indicated should we be awarded the contract.

_____ hereby certifies that it is not included on the United States Comptroller General's Consolidated List of Persons or Firms Currently Debarred for Violations of Various Public Contracts Incorporating Labor Standard Provisions.

_____Signature of the Bidder or Offeror's Authorized Official

_____Name and Title of the Bidder or Offeror's Authorized Official

_____Date

Sworn and subscribed before me this _____ day of _____, 20___

_____ My commission expires: _____ / _____ / 20___

Notary Public Month Day Year

CERTIFICATE OF NON-COLLUSION

By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid, each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:

1) The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement for the purpose of restricting to such prices, with any other bidder or with any competitor;

2) Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the Bidder and will not knowingly be disclosed by the Bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and

3) No attempt has been made or will be made by the Bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

_____Signature of the Bidder or Offeror's Authorized Official

_____Name and Title of the Bidder or Offeror's Authorized Official

_____Date

Sworn and subscribed before me this _____ day of _____, 20___

_____ My commission expires: _____ / _____ / 20___

Notary Public Month Day Year

CERTIFICATION OF PRIMARY PARTICIPANT REGARDING DEBARMENT, SUSPENSION, AND OTHER RESPONSIBILITY MATTERS

The Primary Participant (applicant for an FTA grant or cooperative agreement, or potential contractor for a major third party contract), _____ certifies to the best of its knowledge and belief, that it and its principals:

1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or Local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or Local) with commission of any of the offenses enumerated in paragraph (2) of this certification; and
4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or Local) terminated for cause or default.

If the primary participant (applicant for an FTA grant or cooperative agreement, or potential third party contractor) is unable to certify to any of the statements in this certification, the participant shall attach an explanation to this certification.

The Primary Participant (applicant for an FTA grant or cooperative agreement, or potential contractor for a major third party contract), _____ certifies or affirms the truthfulness and accuracy of the contents of the statements submitted on or with this certification and understands that the provisions of 31 U.S.C. Sections 3801 *et seq.*, are applicable thereto.

_____Signature of the Bidder or Offeror's Authorized Official

_____Name and Title of the Bidder or Offeror's Authorized Official

_____Date

CERTIFICATION OF RESTRICTIONS ON LOBBYING

The Bidder or Offeror certifies, to the best of its knowledge and belief, that:

1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of a Federal department or agency, a Member of the U.S. Congress, an officer or employee of the U.S. Congress, or an employee of a Member of the U.S. Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification thereof.

2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for making lobbying contacts to an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form--LLL, "Disclosure Form to Report Lobbying", in accordance with its instructions (as amended by "Government wide Guidance for New Restrictions on Lobbying," 61 Fed. Reg. 1413 (1/19/96). Note: Language in paragraph (2) herein has been modified in accordance with Section 10 of the Lobbying Disclosure Act of 1995 (P.L. 104-65, to be codified at 2 U.S.C. 1601, *et seq.*)).

3) The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including subcontracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31, U.S.C. § 1352 (as amended by the Lobbying Disclosure Act of 1995). Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

THE BIDDER OR OFFEROR, _____, CERTIFIES OR AFFIRMS THE TRUTHFULNESS AND ACCURACY OF EACH STATEMENT OF ITS CERTIFICATION AND DISCLOSURE, IF ANY. IN ADDITION, THE BIDDER OR OFFEROR UNDERSTANDS AND AGREES THAT THE PROVISIONS OF 31 U.S.C. §§ 3801 *ET SEQ.* APPLY TO THIS CERTIFICATION AND DISCLOSURE, IF ANY.

_____Signature of the Bidder or Offeror's Authorized Official

_____Name and Title of the Bidder or Offeror's Authorized Official

_____Date

APPENDIX D

D-3: BMP INVENTORY AND INSPECTION SOP

DELDOT AGREEMENT 2056

STATEWIDE MS4/BMP INVENTORY/INSPECTION

BMP FIELD INVENTORY/INSPECTION
STANDARD OPERATING PROCEDURES

Prepared For

DELAWARE DEPARTMENT OF TRANSPORTATION
National Pollutant Discharge Elimination System
Permit Program

Prepared By

KCI TECHNOLOGIES, INC.
Delaware Water Resources Practice
KCI Project No. 00008105_00001

MARCH 2023

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LIST OF ACRONYMS AND ABBREVIATIONS

BMP	Best Management Practice
CAD	Computer Aided Drafting
cfs	Cubic feet per second
CL	Centerline
CMA	Corrugated Metal Arch
CMP	Corrugated Metal Pipe
CMPA	Corrugated Metal Pipe Arch
CMP/A	Corrugated Metal Pipe with Aluminum Coating
CMP/B	Corrugated Metal Pipe with Bituminous Coating
CMPP	Corrugated Metal Plate Pipe
CMPSR	Corrugated Metal Pipe Spiral Rib
D/S	Downstream
dbf	Electronic database file extension
DGPS	Differential GPS
DI	Ductile Iron
DIA	Diameter
DMI	Distant measuring instrument
DSF	Delaware Sand Filter
GIS	Geographic Information System
GPS	Global Positioning System
HDPE	High Density Polyethylene Pipe
ID	Identification reference
JPEG	Joint Photographic Experts Group
jpg	Electronic photo file extension
MS4	Municipal Separate Storm Sewer System
“n”	Manning’s roughness coefficient
NPDES	National Pollutant Discharge Elimination System
PC	Personal computer
PVC	Polychlorinated vinyl chloride
Q	Discharge, flow rate
QA/QC	Quality Assurance/Quality Control
RCP	Reinforced Concrete Pipe
ROW	Right of Way
SD	Storm drain
SPP	Structural plate pipe
SWM	Stormwater Management
U/S	Upstream

GLOSSARY OF TERMS AND DEFINITIONS

Abrasion - Wearing or grinding away of material by water laden with sand, gravel, or stones.

Aggradation - General and progressive raising of the streambed by deposition of sediment.

Aggregate - Stone or gravel material used to fill in an infiltration BMP, such as a trench or porous pavement.

Anti-seep collar - A square plate larger than the diameter of the barrel made of steel, concrete, or polyethylene that is attached to the barrel running through an embankment of a pond that prevents seepage of water along the pipe.

Backfill - Material consisting of soil or stone given the appropriate application used to re-establish an excavated area.

Backwater - The water upstream from an obstruction in which the free surface is elevated above the normal water surface profile.

Barrel - Pipe that conveys flows from the through an embankment to the pond's outfall.

Baseflow - Stream flow during dry weather that is not due to storm runoff.

Bed load - Sediment that moves by rolling, sliding, or skipping along the bed and is essentially in contact with the streambed.

Berm - An earthen mound used to direct the flow of runoff around or through a BMP.

Best Management Practice (BMP) – General terminology given to structural facilities that temporarily store or treat stormwater runoff to reduce flooding, remove pollutants, and provide other amenities.

Biochemical oxygen demand (BOD) - The quantity of oxygen consumed during the biochemical oxidation of matter over a specified period of time (see also COD).

Bituminous (Coating) - Asphalt or tar material used to coat exposed metal surfaces containing bitumen; as asphalt or tar.

Buckling - Failure by an inelastic change in alignment (usually as a result of compression).

Buoyancy - The power of supporting a floating body, including the tendency to float an empty pipe (by exterior hydraulic pressure).

Capacity - Maximum flow rate that a channel, conduit, or structure is hydraulically capable of carrying. The units are usually CFS or GPM.

Channel erosion - The widening, deepening, and headward cutting of small channels and waterways, due to erosion caused by moderate to large floods.

Check dam - (a) A log or gabion structure placed perpendicular to a stream to enhance aquatic habitat. (b) An earthen or log structure used in grass swales to reduce water velocities, promotes sediment deposition, and enhances infiltration.

Chemical oxygen demand (COD) - A monitoring test that measures all the oxidizable matter found in a runoff sample, a portion of which could deplete dissolved oxygen in receiving waters.

Coating - Any material used to protect the integrity of the structural elements of a pipe from the environment, and add service life to the pipe.

Compaction - The process by which a sufficient amount of energy is applied to soil to achieve a specific density.

Conduit - Usually a pipe, designed to flow according to open channel equations.

Corrosion - Deterioration or dissolution of a material by chemical or electrochemical reaction with its environment.

Cover - The depth of backfill over a structure.

Culvert - A pipe constructed within an embankment that conveys flow from an intermittent or perennial stream.

Debris - Any material including floating woody materials and other trash, suspended sediment, or bed load, moved by a flowing stream.

Degradation - General progressive lowering of the stream channel by erosion.

Detention - The temporary storage of storm runoff in a BMP, which is used to control the peak discharge rates, and which provides gravity settling of pollutants.

Detention time - The amount of time a parcel of water actually is present in a BMP. Theoretical detention time for a runoff event is the average time parcels of water reside in the basin over the period of release from the BMP.

Drawdown - The gradual reduction in water level in a pond BMP.

Drop Inlet - A type of inlet structure, which conveys the water from a higher elevation to a lower outlet elevation smoothly without a free fall at the discharge.

Embankment - A bank of earth, rock or material constructed above the natural ground surface over a pipe.

Emergent plants - A rooted herbaceous plant species that has parts extending at or above the water surface. These wetland plants often have high habitat value for wildlife and waterfowl, and can aid in pollutant uptake.

End Section - A concrete or steel appurtenance attached to the end of a culvert for the purpose of hydraulic efficiency and anchorage.

Exfiltration - The downward movement of runoff through the bottom of an infiltration BMP into the soil layer.

Flexible Pipe - A pipe with relatively little resistance to bending. Material may consist of High Density Polyethylene Pipe (HDPE) or other plastic material. Mainly used to transfer surface water runoff down a steep slope.

Flood frequency - The average time interval in years in which a flow of a given magnitude, taken from an infinite series, will recur.

Foundation - The in-place material beneath a structure.

Forebay - An extra storage area provided near an inlet of a BMP to trap incoming sediments before they accumulate in a pond BMP.

Freeboard - The space from the top of an embankment to the highest water elevation expected for the largest design storm stored. This is required as a safety margin in a pond or basin.

Gauge - A standard or scale of measurement.

Grade - The longitudinal slope of the channel as a ratio of the drop in elevation to the distance.

Gradient - See grade

Groundwater - Water contained in the subsoil that is free to move either vertically or horizontally.

Headloss - The loss of energy reported in feet of head.

Headwall - A concrete structure placed at the inlet and outlet of a culvert to protect the embankment slopes, anchor the culvert, and prevent undercutting.

Headwater - The distance between the flowline elevation at the inlet of a culvert and the water surface at the inlet.

Hydraulics - The mechanics of fluids, primarily water.

Hydrology - The science of water related to its properties and distribution in the atmosphere, on the land surface, and beneath the surface of the land.

Infiltration - The downward movement of water from the surface to the subsoil.

Inlet control - A pipe operates with inlet control when the flow capacity is controlled at the entrance by the depth of headwater and the entrance geometry, including the barrel shape, cross-sectional area and the inlet edge.

Invert - Bottom or lowest point of the internal surface of the transverse cross section of a pipe.

Joint - Connection between two pipe sections, made either with or without additional parts.

Low flow channel - An incised or paved channel from inlet to outlet in a dry basin to carry low runoff flows and/or baseflow, directly to the outlet without detention.

Metal corrosion - An electrical process involving an electrolyte (moisture), an anode (the metallic surface where oxidation occurs), a cathode (the metallic surface that accepts electrons and does not corrode), and a conductor (the metal pipe itself).

Minor head losses – Energy lost through transitions in pipe flow such as contraction, expansion, outlets, obstructions, and bends.

Pilot channel - See Low Flow Channel. A riprap or paved channel that routes runoff through a BMP to prevent erosion of the surface.

Ring gasket- A solid gasket of circular cross section.

Outfall - In hydraulics, the discharge end of pond spillways, storm drains or sewers.

Outlet – a general term that indicates the discharge point from a BMP, may be similar to Outfall.

pH Value - The log of the reciprocal of the hydrogen ion concentration of a solution. A pH value of 7.0 is neutral; values of less than 7.0 are acid; values of more than 7.0 are alkaline.

Pipe diameter - The inside diameter of a pipe.

Piping - A process of subsurface erosion in which surface runoff flows along the outside of a culvert with sufficient hydraulic gradient that erodes and carries away soil around or beneath the pipe. Piping can occur through a vegetative root system through an earth embankment.

Ponding - Water backed up in a channel or ditch as the result of a culvert of inadequate capacity or design to permit the water to flow unrestricted.

Pre-stressed concrete - In pre-tensioned concrete, the steel bars, wires, or cables are held in a stretched condition during placing of the plastic concrete and until the concrete has hardened; then the pull on the reinforcing steel is released.

Reinforced concrete pipe - Concrete pipe designed with reinforcement as a composite structure.

Retention - The holding of runoff in a basin without release except by means of evaporation, infiltration, or emergency bypass.

Retrofit – The modification of an existing BMP facility in order to improve the overall function. Modifications may include but are not limited to microtopography, providing additional storage volume, additional vegetative plantings, and altering the riser structure.

Rip Rap - A combination of large stone, cobbles and boulders used to line channels, stabilize banks, and reduce runoff velocities.

Riser - A vertical structure extending from the bottom of a pond BMP that is used to control the discharge rate from a BMP for a specified design storm. Riser material normally consists of concrete or corrugated metal.

Roughness coefficient (n) - A factor in the Manning's equation, and other flow formulas representing the effect of channel or conduit roughness in energy losses in flowing water.

Runoff - That part of precipitation carried off from the area upon which it falls.

Scour (Outlet) - Degradation of the channel at the pipe outlet as a result of erosive velocities.

Seepage - Escape of water through the soil or water flowing from fairly large area of soil instead of from one spot, as with a spring. The discharge of water at a concentrated area through soil or embankment or an area of soil that is saturated to the surface.

Sheetflow - Runoff that flows over the ground surface as a thin, even layer, not concentrated in a channel.

Skew (skew angle) - The acute angle formed by the intersection of the line normal to the centerline of the road with the centerline of a culvert or other structure.

Slide - Movement of a part of the earth (embankment) under the force of gravity that moves parallel to the slope of the embankment.

Slump - Movement of a part of the earth (embankment) under the force of gravity, in which the bottom of the soil mass protrudes out from the slope and the upper portion of the mass sinks downslope.

Spalling - The separation of surface concrete due to fractures in the concrete parallel or slightly inclined to the surface of the concrete.

Stormflow - The portion of flow, which reaches the stream shortly after a storm event.

Subgrade - A layer of placed stone or soil used as the underlying base for a BMP.

Substrate - The natural soil base underlying a BMP.

Suspended load - Sediment that is supported by the upward components of the turbulent currents in a streambed that stays for an appreciable length of time.

Swale - Natural depression or wide shallow ditch used to temporarily store, route, or filter runoff.

Tailwater depth - The depth of water just downstream from a structure.

Underdrain - Perforated plastic pipes surrounded by stone, installed on the bottom of an infiltration BMP, or sand filter, which are used to collect and remove excess runoff.

Watershed - Region or area contributing stormwater runoff and groundwater discharge to the supply of a stream or water-bodies; drainage area, drainage basin, catchment area.

Water table - The upper surface or top of the saturated portion of the soil layer, indicates the uppermost extent of groundwater.

1.0 INTRODUCTION

This document serves as the Standard Operating Procedures (SOP) for the inventory and inspection of Delaware Department of Transportation (DelDOT)-owned stormwater Best Management Practices (BMPs). The SOP documents the methodologies and protocol to be used by field staff while conducting Best Management Practices (BMP) inventory and inspection.

The standardized procedures outlined herein assist DelDOT with decisions regarding inspection, maintenance, repair, and/or retrofit of their BMP stormwater infrastructure, in compliance with their National Pollutant Discharge Elimination System (NPDES) Phase I and Phase II Permits.

The inventory and inspection data identifies specific features of the BMP facility and evaluates each condition related to site conditions, water quality performance, structural integrity, and overall function.

1.1 Pre-Acceptance BMP Inspections

DelDOT requires three unique inspections to be performed on all newly built BMPs during the construction phase of any DelDOT project. Initial, Primary, and Acceptance (**Appendix A**).

The Initial Inspection is performed before the contractor demobilizes or when the contract is at substantial completion. A punch list of corrective action items is generated and given to the contractor. The contractor is then given an appropriate amount of time to complete repairs related to the punch list.

The Primary Inspection involves a review of all contract work related to the BMPs plus the corrective work completed that was identified in the punch list from the Initial Inspection. The inspector will confirm whether the punch list items have been addressed and will also note any new items that require attention. The Primary Inspection is completed before the agreed upon walk through date designated by the contractor, as any new punch list item must be submitted to the contractor by the date of the agreed upon walk through of the project.

The Acceptance Inspection involves a review of the BMPs prior to final acceptance by DelDOT. The inspector will confirm whether the punch list items from the previous inspections have been corrected. The inspector then gives a recommendation of whether to accept the facilities based on the satisfactory completion of the punch list items by the contractor.

1.2 Annual BMP Inspections

DelDOT is required by their NPDES Phase I and II permits to conduct annual inspections on all post construction stormwater BMPs that lie within the permit areas. All DelDOT BMPs outside of the Phase I or II area are inspected annually until their overall inspection grade falls to a C or lower. Once a non-permitted area BMP falls to an overall grade of C or lower it is then placed on a tri-annual inspection schedule until such time the BMP maintenance issues are corrected, and the BMP is brought back to an overall rating of A or B.

Every BMP is inspected and graded on a 24-point inspection protocol. Each BMP is then assigned an overall grade ranging from A - D based on the scoring of each item on the protocol (see **Sections 3.3 / 3.5**).

Inspection reports, summary tables, and work orders related to the annual BMP inspections are generated on a quarterly basis throughout the year and submitted to DelDOT. A BMP Statewide Overview summary table is generated and submitted to DelDOT annually at the end of each year.

2.0. INVENTORY DATA

The inventory data reflects the physical attributes of a BMP, such as components, materials, and dimensions. This is collected during Source Identification; the primary data is listed below.

2.1 BMP Identification

Every BMP has a unique numeric BMP identification number. DelDOT installs a permanent marker in the field for every BMP.

2.2 BMP Types

The inspection parameters address elements that are common to all BMP types, but also allow for specific ones that focus on a major BMP type, such as dry or wet stormwater management (SWM) pond. Based on current statewide inventory, BMP types fall into the main categories listed in **Table 1** and **Appendix B**.

Table 1 – Summary of BMP Types

BaySaver
Biofiltration Swale
Bioretention
Borrow Pond
Check Dam
Constructed Wetland
Diverter Box
Dry Pond
Filter Strip
Infiltration Basin
Infiltration Trench
Other
Porous Pavement
Sand Filter
Sediment Forebay
Storm Filter
Underground Storage/Infiltration
Wet Pond
Wet Swale

a. Stormwater Management (SWM) Ponds

Common BMP that provides water quality treatment and/or quantity control. A facility with a permanent pool is a wet (retention) pond. A dry (detention) pond is a basin that drains entirely. A variation of pond design is to develop facilities that emulate wetlands. These have relatively shallow pool area(s) and specific vegetation. In most cases a pond will have a forebay as pre-treatment for in-flows and a control structure (riser, weir, headwall, etc.) to manage out-flows.

b. Infiltration Devices

Rely on stormwater to infiltrate native soils over a 2-day period. For very small drainage areas, infiltration trenches are used. For small to medium drainage areas, infiltration basins can be used. These BMPs require the groundwater level to be below the invert of the facility.

c. Filtering Devices

Treat stormwater by filtering through the media in the BMP. At the base of a BMP may be a conveyance system (e.g. underdrain pipe). A sand filter can be installed on the surface or as an underground device. A particular design known as the Delaware Sand Filter (DSF) is an underground device with side by side chambers. The first chamber is a settling tank receiving in-flows, which then discharges over a series of weirs into a chamber with a sand filter and underdrain. Another device is a Bioretention Facility. This is similar to the surface sand filter but includes organic media and specific landscaping specifications. A smaller device is a Filter Strip that can be either a stand-alone BMP or a pre-treatment device linked to other BMPs.

d. Open Channel Systems

Vegetated open conveyances that capture and treat stormwater within cells formed by check-dams or other means. A common BMP is the Biofiltration Swale (a.k.a. Bioswale) that conveys stormwater but also can detain and filter stormwater. An underdrain may be included to prevent standing water.

e. Other BMPs

Less common types that treat areas with site constraints. These can be proprietary devices (e.g. StormFilter, BaySaver). May also include features such as a diversion structure that separates flows for water quality treatment.

2.3 BMP Inventory

Each BMP type is comprised of specific components. The following are those components that should be collected, as a minimum, to adequately characterize a BMP and provide a comprehensive field inspection.

a. For All BMPs:

Fence	Yes or No regarding the presence of a fence.
Pre-Treatment	Yes or No regarding the presence of a forebay or other feature to pre-treat runoff before discharging into a BMP.
Permanent Pool	Condition of the designed water surface elevation and permanent pool.
Site Comments	Overall comments on the BMP facility.

b. For All Ponds:

Spillway Type	Shape, size and material of principal spillway.
Emergency Spillway Type	Shape, size and material of emergency spillway.
Dam Height	Height of pond embankment associated with principal spillway (ft). Estimated value recorded from invert of principle spillway to top of embankment.
Riser Material	Material of the riser structure.
Trashrack	Yes or No regarding presence of trashrack on riser. In some cases there may be one for low-flow as well as one on primary opening.
BMP Vegetation	Condition of vegetation designed for stormwater treatment associated with BMP function.

c. For Infiltration Trenches with Monitoring Wells:

Length	Length of facility (ft).
Width	Width of facility (ft).
Observation Well	Yes or No regarding the presence of an observation well.
Depth of pipe (in.)	Depth (in.) of the observation well pipe of an infiltration trench is measured from the top of the well pipe.

3.0. FIELD INSPECTION

A systematic inspection program requires planning and organization to maintain consistency in the data collection and compatibility in data organization. The major tasks involved to ensure the consistent collection of field data are listed below and described in this section:

3.1 Pre-Field Investigation

The objective of the pre-field investigation is to gather all available information to prepare for the field investigation. The inspector reviews the existing information, such as construction plans, GIS mapping, topography, database records, etc. The Standard Details of each BMP Type are located in **Appendix B.** Prior to the field investigation, field maps should be prepared. Field mapping should include features such as the roadway under study, drainage infrastructure, hydrology, and if available residential and industrial development areas adjacent to DelDOT right-of-way.

For each road under study, the existing BMP and storm drain information should be identified and reviewed on the field maps. If the existing database contains outdated, inconsistent, or erroneous data, the questionable data shall be identified and reported to DelDOT. Upon review, the data will be deleted, corrected, or updated.

Mapping is also inspected for defining the roads and associated ramps/intersections to investigate. In addition to DelDOT roadways, other areas to be investigated are Park & Ride lots and other DelDOT facilities and buildings that are maintained by DelDOT. Roads not to be investigated as part of the BMP database include county, local, or private.

The pre-field review also will identify potential safety issues such as road access, road hazards, and BMP site conditions. Based on potential conditions, the inspection crew can prepare appropriately for the field investigation.

3.2 Field Data Collection

As part of planning for the field inspection, the proper equipment must be identified to ensure comprehensive field inspections are performed. **Table 2** lists the required and optional equipment that may be used during BMP inspections. The equipment list includes both field inspection equipment as well as health and safety equipment.

All KCI field trucks are equipped with KCI's Health and Safety Plan, which describes team member responsibilities, potential hazards, personal protective equipment (PPE), communication procedures, and emergency procedures. The Health and Safety Plan is located in KCI's Project Files, and is available for review upon request.

Table 2 - Field Equipment List

Required	Optional
BMP Field Inspection Manual	Distance measuring wheel
Computer/Field forms	Equipment to clear debris (shovel)
GPS and data collector	Plumb bob
Portable digital camera, back-up batteries	Surveyor stakes
Field attire & safety vest	Hammer, chisel, steel rod
Traffic cones	Survey rod
Amber flashing safety light for vehicle(s)	Cellular phone
Field mapping of investigation area	pH and/or conductivity meter
Measuring Tapes (20' minimum)	Compass (azimuth)
Flashlight, back-up batteries	Surveyor flagging
Manhole puller	

3.3 Inspection Parameters

The inspection evaluates different parameters of a BMP. The following describes the parameter scoring. **Appendix C** contains the Field Inspection Form and **Appendix D** contains the BMP Domains and Standard Actions List.

The inspection of Delaware Sand Filters (DSFs) requires a separate protocol and field sheet. DSFs are graded "A" (DSF performing satisfactorily) or "C" (DSF requires contracted maintenance). One sedimentation chamber and one sand chamber are inspected for each DSF. The DSF field inspection report is similar to those used for all other BMP types, and has been specifically tailored to the DSF Study findings. Once the DSF inspections have been completed, the field inspection report PDFs are uploaded to the DelDOT NPDES Database, where they are available on the DelDOT NPDES Map Viewer**. Appendix E** contains the DSF Inspection Standard Operating Procedures.

a. Parameter Scoring

Each of the inspection parameters are rated on a scale of 1 to 5 **(Table 3)**. The scoring defines the relative condition of each parameter. The objective is to provide a consistent framework for performing the scoring of individual parameters. In general the rating reflects:

Table 3 - Parameter Scoring

Scoring	Definition
0	Not applicable
1	Performing as designed; no issues
2	Performing as designed; minor issues not affecting performance
3	Minor Performance issues; repaired by DelDOT Maintenance District or Invasive Spray Contractor
4	Major Performance Issues; repaired by third party contractor
5	Retrofit; redesign or reconstruct with input from DelDOT NPDES Group

If a BMP component cannot be inspected, the component may be scored based on visual observations of the BMP parts that can be inspected; or the component may be scored as a 0, and the reason the component was unable to be inspected should be provided.

b. Inspection Parameters

Parameters are developed to address issues relating to these key areas:

- ❖ Site Conditions Overview
- ❖ Water Quality Overview
- ❖ Embankment Inspection
- ❖ Outlet Inspection

The following lists the individual parameters for each of these areas, and considers BMP design objectives. The criteria are developed for each score from 1 to 5, and where possible quantifiable values are identified.

SITE CONDITIONS OVERVIEW

Relates to site conditions that are not directly involved in SWM, but impact DelDOT and/or the public in general.

1. **Access** – scores available ingress and egress path from BMP for inspection staff, construction crew, field vehicles, and maintenance equipment. Access should be at least 10 feet wide, on a slope lesser than 3:1 (H:V), and stable to handle heavy equipment. Access should be available to the in-flow points and pre-treatment features (if existing), as well as outlet structures. The scoring also considers vegetation and/or debris that may impede access or navigation within a facility. Due to site conditions and/ or design, access may not be easily identifiable. If an area surrounding the facility meets the above criteria, then the access parameter has been satisfied. When access is physically restricted (e.g. noise walls, buildings, fences), alterative access points should be cited in the comments (e.g. private or other public properties). Another consideration is potential need for Maintenance of Traffic (MOT) during remedial actions. The presence of roadway guardrail should not be taken into consideration because these can be removed and reset after the maintenance operation.

2. **Fence** – scores the functionality of a fence. This parameter primarily evaluates the relative ease of entry to the facility, and secondarily considers the restriction of public accessibility.

3. **Invasive Vegetation** – should be evaluated during the growing season between May to October. This parameter scores the need for vegetation management other than routine mowing. Vegetation management includes trimming, thinning, and removal of invasive vegetation. In general this encompasses the entire site, except for structural embankments since this covered by other parameters (Embankment Cover-Upstream and -Downstream Cover; Riser-Opening, Riser-Low Flow, Emergency Spillway). The priority is to assess Canada Thistle and Cattails – Phragmites.

Invasive Vegetation Types – This field lists observed invasive vegetation noted in **Table 4**. This should only be entered when there is a positive identification of the plant type(s). In particular, the consistent and accurate identification of the Canada Thistle is vital due to its impact to BMPs and difficulty in eradicating it. **Appendix F** contains the Invasive Species Identification Manual.

Table 4 - Summary of Invasive Vegetation Types

Herbaceous Bull Thistle Canada Thistle Garlic Mustard Japanese Knotweed Vines & Groundcovers Mile-a-Minute Vine Devil's Tear Thumb Oriental Bittersweet Porcelain Berry	Wetland-type Plants Phragmites (Common Reed) Cattails Purple Loosestrife Trees Autumn Olive Bradford Pear Multiflora Rose NMA - Norway Maple Tree of Heaven

Invasive Vegetation Area – This field is the estimation of the invasive vegetation in square footage and should be estimated to the nearest 10± ft^2 for each of species listed in **Table 4**.

4. **Public Hazards** – scores the observed access to the site by non-authorized personnel. Inspection should look for evidence of public inhabitance (e.g. graffiti, foot paths, vandalism). This parameter is scrutinized more heavily when there is relative ease for the public to access the site.

WATER QUALITY OVERVIEW

These parameters relate to the stormwater management performance or related issues.

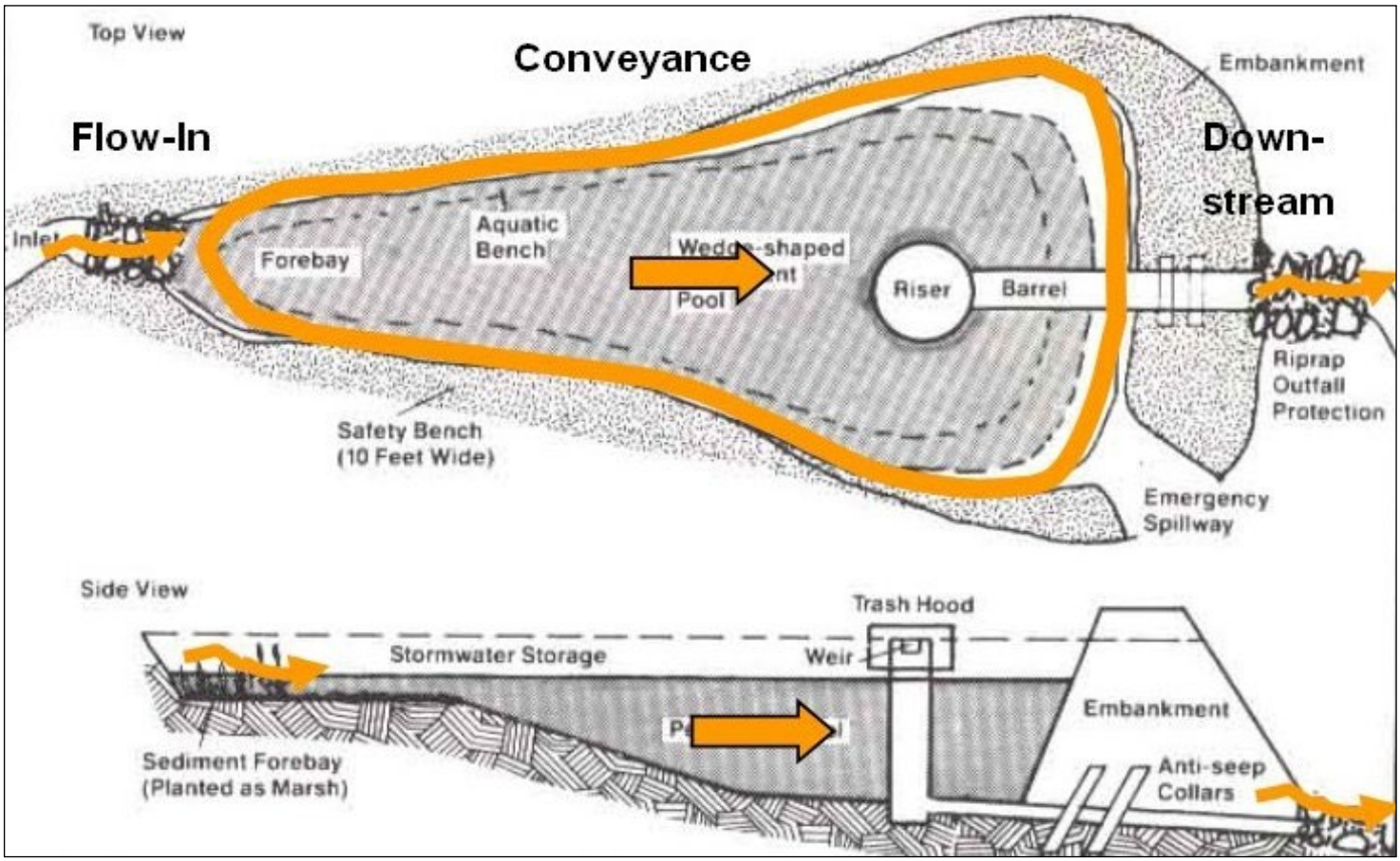
5. **Pre-Treatment** – scores the condition of the pre-treatment devices (e.g. forebay, filter strip, diverter box) and the capacity to trap incoming sediment and debris.

6. **Inflow Condition** – scores the overall condition of the discharge point(s) into a BMP, including sheet flow, conveyance swales, and storm-drain outfalls. This parameter considers their potential adverse effects to the performance or stability of the facility. The score should consider weighing more heavily the in-flows with higher discharges**. Figure 1** shows the general area of this parameter and its relationship with parameters for Conveyance and Downstream Conditions.

7. **Conveyance Condition** – scores the condition of flow path(s) within a BMP where stormwater is conveyed after discharging into a BMP to the outlet of the BMP system. Surface features to consider are pilot channel, berms, check dams, etc. Sub-surface features to consider are underdrains or internal flow splitters/weirs. Consideration should be given to immediate flow paths as well as fringes (e.g. pond shorelines). **Figure 1** shows the general area of this parameter and its relationship with parameters for Inflow Condition and Downstream Conditions.

8. **Downstream Condition** – scores the overall downstream conditions beyond the BMP outlet, and may include area outside the Right-of-Way (ROW). This can reflect open channel conditions or connections to storm-drain system. The downstream should be inspected for signs of instabilities (e.g. erosion) or tailwater impacts (e.g. excessive backwater). **Figure 1** shows the general area of this parameter and its relationship with parameters for Inflow Condition and Conveyance.

Figure 1 - Relationship of Parameters: In-flow, Conveyance, and Downstream Conditions



9. **Ponding** – scores the overall condition of the facility related to unwanted ponding of stormwater that reduces site storage and/or site stability. The evaluation needs to be BMP type-specific (e.g. differentiate between retention and detention ponds). Consideration should be given to the impacts to BMP performance, such as potential for more-frequent discharges from the BMP or potential for structural instability (e.g. dam breaching). Evidence of ponding may include high-water lines with accumulation of debris/garbage, or vegetation along the pond perimeter that appears to be distressed due to extended inundation. Note: An inspector should wait 72 hours after a rain event before performing inspection; this allows time for the BMP to return to design water levels.

   Ponding Depth – is a measurement of the depth of the ponding in the facility above design elevation to the nearest tenth of a foot (where possible).

   Ponds - depth of standing water above the invert for the low-flow control device.

   Filtering Devices – depth of standing water on top of the filter bed.

   Infiltration Devices and BMPs with monitoring wells – depth of standing water within the observation well. Water level is measured from the top of the observation well to the surface of water. Depth of standing water is calculated by subtracting water level in observation well from the observation well depth. Any modification to a well cap or observation well should be reported in the comments for maintenance purposes. For these devices without observation wells, no value is entered and the field is left blank.

   Open Channel System – location of maximum depth of water above the channel invert for BMPs without permanent standing water. For BMPs like Wet Swales, the depth of water is the additional water above the permanent water line.

10. **Water Quality Contamination** – scores the contamination of the water within a BMP. The focus is on the accumulation of unwanted waste; such as organic debris, garbage, illicit contaminates, or sediment. This is evaluated based on observed on-site build-up. The possible contaminants may come from nearby activities or non-point source pollution within the watershed. Examples are visual evidence of oil waste (illegal dumping or roadway runoff), heavy sedimentation (channel erosion or construction runoff), and garbage (floatables, containers, tires, etc.). This evaluation should consider the type and quantity of contamination, potential effects from the decomposition of the waste, and possible effects to downstream resources. This does not include BMPs with forebays since this is covered by the Pre-Treatment parameter, nor excessive vegetation which is covered under Invasive Vegetation parameter

    Contamination Type – logs contamination(s) observed. **Table 5** lists standard values.

Table 5 - Summary of BMP Contaminants

ALG – Algae	OIL - Oil Sheens
FEC - Fecal	DET - Detergents/Foam
SED - Sediment	CHE - Chemical Waste
SSE - Suspended Sediment	ORG - Organic Debris
FLO – Floatables	TRA - Trash
	OTH - Other

11. **Water Quality Treatment** – scores the overall facility condition relating to whether the BMP is performing as designed. **Note: This Parameter is currently not being rated and is a placeholder for potential future permit requirements regarding BMP performance.**

12. **Overall Site Stability** – scores the overall facility condition relating to site stability. The objective is to assess unstable areas that impact BMP sustainability and also the potential impact to BMP functionality. Consideration should be given to the BMP type. For vegetated BMPs, the side slopes along the periphery should be vegetated and stable. Specifically for BMPs with permanent standing water, vegetation should exist along the pool fringe where water depths are <6 inches. For BMPs that are primarily structures (e.g. Underground Sand Filter), this parameter scores the integrity of the structural elements as a whole.

13. **Permanent Pool** – scores the condition of BMPs with permanent standing water that is designed for water quality treatment. The intent of this parameter is to identify loss of permanent pool volume. This may occur by displacement of the volume (e.g. sedimentation or excessive vegetation) or by reduction (e.g. insufficient source of water). The BMP types that may meet this criterion include ponds (e.g. wet pond, wet extended detention pond, pocket pond or detention pond with micro-pools), Stormwater Wetlands, and Wet Swales. Design plans, profiles and details are necessary to properly estimate the design permanent pool elevation.

    The inspection requires the comparison of the maximum observed water depth of the permanent pool(s) against the design depth(s). Observed water depth(s) should be measured at the deepest point of the pool area. In many cases this may be in the middle of the pool area, but safe access may not be feasible due to location, deep water, and/or bottom conditions. With care measurements can possibly be taken at alternative locations (e.g. riser) or by visual approximation. The depth of water should be measured to the nearest tenth of a foot, where possible. Note that depth measurements do not consider features such as forebays or plunge pools.

    Inspection for loss of volume should consider evidence of excessive sedimentation (e.g., filled forebay, delta-like deposits at in-flow points) and/or excessive vegetation within BMP area dedicated to permanent pool. Inspection for irregular water source should consider evidence of fluctuating shoreline, exposure of underwater safety bench that may include vegetation. Inspection for excessive water loss should consider evidence of improper impervious liner or improper low-flow device.

This parameter may be scored in conjunction with BMP Vegetation parameter when aquatic plants are dependent on standing water as part of the design.

14. **BMP Vegetation** – Parameter must be evaluated during the growing season between May 15 to October 30; otherwise the specific vegetation cannot be adequately assessed. This scores the condition of vegetation that is associated with the BMP function. Condition of plants is scored according to effective area of plant cover at the treatment area, the physical condition of the plants and the presence of invasive species. The inspector should rate the vegetation according to the worst parameter. For example, the vegetation may cover 80% of the treatment area, but 60% of the species are invasive. In this case the scoring would be 4 due to the large percentage of invasives present.
    Only the site area providing stormwater treatment is considered, so areas such as the embankment and site vegetation are scored with different parameters. If a BMP does not have specific plants defined for stormwater treatment, this parameter is not scored.

    To inspect these areas, the inspector may need to wade into water depths up to 3 ft and should be prepared for this by using appropriate field equipment. The inspector should have a copy of the original planting/landscape plan, and as-built certification plans (if available) with a planting checklist. The checklist is used to evaluate the vegetation. If no planting/landscape information is available, the vegetation should still be scored but a comment is required in the overall comments (com_overal).

    Certain BMPs require plants to perform the treatment and the planting is integral to the success of the facility. These types of BMPs include:

    - Filtering Devices with Vegetation (e.g. Bioretention)
    - Submerged benches at stormwater ponds
    - Stormwater wetlands
    - Wet swales

    The types of planting areas the inspector is likely to encounter include:

- Marshes with water depths varying from 6 to 18 inches. The types of plants to be expected in these areas are emergents (rooted into the substrate with erect stems and leaves emerging from water surface) and floating aquatics (rooted into the substrate with leaves floating on water surface). These areas may also be planted with or become established with water tolerant woody vegetation (shrubs or trees).

- Micropools or deep water areas with water depths 3 ft or greater. These areas may not be planted but if they are the plants will often be submerged aquatic plants (free floating plants that do not root into the substrate). It is not likely that woody vegetation will be planted into these deeper areas, but with time, some may become established.

- Confined, mulched planting areas with special planting soil underlain with underdrains that daylight or connect to a closed storm drain system. This confined area may be placed in the landscape or be within a concrete or other type of structure. The depth of the special

planting soil over the underdrains may dictate the type of plants that are appropriate. These areas are frequently inundated and have standing water for up to 24 hours or more after a rain event. They will be planted with a mix of native trees, shrubs and herbaceous plant that are ponding tolerant. If the planting depth is less than 2½ ft., large trees should not be present in the facility. The inspector should review the BMP design details to determine the planting depth.

EMBANKMENT INSPECTION

Specific to structural elements (e.g. embankments/berms) relating to impoundments. These parameters are critical to SWM ponds designed under State NRCS 378 regulations. These can also be applied to BMPs that have failed, which may cause significant downstream damage or impact public safety.

15. **Upstream Embankment Cover** – scores the overall vegetative condition of the upstream embankment related to type, size, and percent coverage. There should be no woody vegetation, and the cover should be stable and void of areas without vegetation. This parameter also addresses issues along the dam face with uneven settlement, horizontal or longitudinal cracking, sloughing or rutting. This also considers evidence of rodent infestations, such as muskrat and groundhog.

16. **Downstream Embankment Cover** – scores the overall vegetative condition of the downstream embankment (including the crest) slope similar to the upstream cover above.

17. **Seepage** – scores signs of embankment seepage that may lead to piping through the embankment. Indicators are saturated soil conditions, direct discharge, surficial erosion, sediment build-up at toe, sloughing, and changes in vegetative characteristics (e.g. isolated hydrophytic vegetation). The inspection comments should note for SWM ponds with diaphragms that are intended to capture seepage.

OUTLET INSPECTION

Relates to structural elements specific to impoundments with outlet control structures. These parameters are critical to SWM ponds designed under State regulations. For BMPs without outlet structure (e.g., swales, infiltration basins), score will be 0 for 17-20.

18. **Riser – Opening** – scores the top opening(s) of the riser structure, but not the low flow opening. A riser may be a closed structure, weir, or a headwall that controls flow into a spillway. This parameter evaluates the presence of vegetation, woody debris, sediment, or garbage that impacts the openings. This parameter also includes evaluation of the riser trashrack.

19. **Riser – Low Flow** – scores the opening of the low flow orifice and corresponding trashrack that allows for draining of the pond over a prescribed period. This should be evaluated for

existing conditions and also for future precipitation events that may compromise the function of the opening to drain the facility.

20. **Riser Accumulation** – scores the amount of accumulation located inside the riser structure that could restrict the flow performance of the riser. The accumulation may be sediment, organic debris, garbage, remnant construction concrete forms, riprap etc.

21. **Riser-Structure** – scores the condition of the structural integrity of the riser or outlet structure. This parameter evaluates deficiencies, degradation, and instability of the riser structure. In addition, this parameter considers instabilities around the riser base, such as erosion, sloughing, etc. This also scores the condition of any valves and associated appurtenances of the riser, but the valves should not be tested during the inspection.

22. **Principal Spillway** – scores the overall condition of the principal spillway (e.g. pipe, weir). This evaluates issues such as blockage and structural integrity.

23. **Spillway Outfall** – scores the overall condition at the outfall of the principle spillway. This also considers the immediate transition into downstream hydrologic features.

24. **Emergency Spillway** – scores the stability of the emergency spillway relating to its side slopes and bottom. This feature is located at the intersection of the embankment fill with undisturbed (in-situ) ground, and should be stable with herbaceous vegetation or structural material. It is only intended to pass flows during infrequent high-precipitation events. Fence posts or fences should not be constructed within the weir opening because this is a potential for debris collection.

COMMENTS

Inspection Comments – describe issues observed in the field relating to BMP performance or condition.

Standard Remediation Action Comments - codes that reflect a list of standard actions or comments that are common to BMPs. These are listed in **Appendix D**.

3.4 Field Photos

To document field conditions and support inspection results, photos will be taken at the time of the field investigation. Landscape photos are required for each BMP during each inspection. Individual structures such as inflow, conveyance and outfall structures should be taken at the time of initial inventory. In addition, for each defect requiring maintenance, a defect photo shall be taken during each inspection.

3.5 Inspection Rating

Recommended actions for BMPs are provided in four categories:

- BMPs requiring MAINTENANCE by DelDOT maintenance staff (Maintenance Work Orders),
- BMPs requiring INVASIVE SPECIES to be treated by third party contractor,
- BMPs requiring CONTRACTED WORK by a third party contractor, and
- BMPs requiring RETROFIT evaluations by DelDOT's Stormwater Quality Program staff.

After scoring the parameters, an overall rating is determined by reviewing the individual parameter scoring. This ranges from A to D and reflects the overall condition of a BMP, but also is used to determine remedial action. **Table 6** summarizes the rating system by identifying the scoring range and a brief description.

Table 6 - Overall BMP Rating System

RATING	DESCRIPTION
A	**NO PERFORMANCE ISSUES** BMP with No Issues affecting performance. ≤ 2 Scoring Criteria
B	**MINOR MAINTENANCE** BMP with Minor Maintenance required; repaired by DelDOT Maintenance District or third party invasive spray contractor. ≤ 3 Scoring Criteria
C	**MAJOR MAINTENANCE** BMP with Major Maintenance required; repaired by third party contractor. ≤ 4 Scoring Criteria
D	**RETROFIT** BMP with Retrofit requirements; BMP is failing; needs to be redesigned or re-built with input from DelDOT NPDES Program. ≤ 5 Scoring Criteria

If there are BMP components that are unable to be inspected, the BMP will be rated on whatever components have been inspected, if the inspector determines there is enough information. If the BMP inspector determines that there is not enough information to complete the BMP inspection, the lowest rating will be given to the BMP and comments would be noted.

4.0 RESOURCES

AASHTO Task Force on Hydrology and Hydraulics. Volume IV - Guidelines for the Hydraulic Design of Culverts. 1975.

AISI. Handbook of Steel Drainage & Highway Construction Products. 1983.

Concrete Pipe & Products, Inc. Concrete Pipe Technical Manual. 1990.

CONTECH Construction Products, Inc. Rehabilitating Aging Structures Products Manual.

Delaware Department of Natural Resources & Environmental Control (DNREC). NPDES Permit No. DE 0051071 – Stormwater Discharges from MS4 in New Castle County. April 9, 2001

DNREC. Green Technology: The Delaware Urban Runoff Management Approach. June 2005.

Federal Highway Administration (FHWA). Culvert Inspection Manual - Report No. FHWA-IP-86-2. July 1986.

Maryland Department of the Environment (MDE). Maryland Stormwater Design Manual Volumes I and II. 2000.

Metropolitan Washington Council of Governments (MWCOG). A Current Assessment of Urban Best Management Practices (BMP): Techniques for Reducing Non-Point Source Pollution in the Coastal Zone. March 1992.

Watershed Management Institute, Inc. (WMII). Operation, Maintenance, & Management of Stormwater Management. August, 1997.

DELDOT AGR. 2056

KCI PROJECT NO. 00008105_00001

BMP FIELD INVENTORY AND INSPECTION

STANDARD OPERATING PROCEDURES

APPENDIX A

PRE-ACCEPTANCE INSPECTION FRAMEWORK

Revised Inspection Framework
February 2020

I. Initial Inspection

- To occur before contractor demobilizes or at substantial completion.
- Performed by administering section and contractor to ensure location is ready for Primary Inspection.
    - Appropriate M&O Division District representatives will be invited to attend
- Initial Inspection punch list created by administering section to include any deficiencies from the following: E&S, ADA inspection, safety walk-through and Bridge Management review.
    - Punch list will be generated and sent to the contractor and invitees within seven (7) calendar days of Initial Inspection
    - When a project involves work on a new or existing bridge, schedule the Initial Inspection twenty-one (21) calendar days in advance to notify Bridge Management to create a punch list.
    - The administering section will be responsible to provide each list with dates that remedial activities were resolved that will accompany the date request made to Engineering Support for coordination of the primary inspection.
- When contractor has addressed all Initial Inspection punch list items, then a Primary Inspection is scheduled.

II. Primary Inspection

- To include a review of all contract work plus corrective work completed as identified at Initial Inspection. Date and time of Primary Inspection to be coordinated and confirmed by Engineering Support (ES) prior to scheduling by the Administrating Section.
- Primary Inspection includes the following attending sections:
    - **i.** Administering section
    - **ii.** Contractor
    - **iii.** M&O
    - **iv.** Designer
    - **v.** Engineering Support
    - **vi.** Other support sections as applicable for project
        1. Traffic
        2. ESO
        3. E&S
        4. NPDES
        5. Roadside Environmental
        6. Bridge
        7. Others
- The Primary Inspection will be scheduled within forty-five (45) calendar days of notification to ES of all Initial Inspection punch list items have been addressed for the first six (6) months of implementation. After the sixth month transition period, the Primary Inspection will be scheduled within thirty (30) calendar days of notification to ES of all Initial Inspection punch list items have been addressed.
- Administering section generates draft punch list based upon input from inspection team above.
    i. Others not attending the Primary Inspection will need to have their punch list items submitted prior to the Primary Inspection meeting time

ii. A draft Primary Inspection punch list will be sent for review to inspection team, with the exception of the contractor, within seven (7) calendar days from the date of the Primary Inspection and prior to sending to contractor. Only items discussed at the Primary Inspection or items submitted prior to the Primary Inspection will be added to the list.

- Primary Inspection punch list will be sent to the contractor within fourteen (14) calendar days from the date of the Primary Inspection with a time frame specified to complete listed activities prior to restarting contract time charges.
    i. The Primary Inspection punch list will consist of the following:
        a. A location and description of the required work that needs to be performed.
        b. The entity financially responsible for the corrective work (contractor, DelDOT, utility, or others).
            i. If there is a disagreement as to who is financially responsible for the punch list item(s), the contractor shall follow the Section 100 of the Standard Specifications regarding disputes.
    ii. The contractor will have thirty (30) calendar days to resolve all punch list items. If the Primary Inspection punch list is significant due to the size or complexity of a project, the administering section can negotiate a longer duration with the contractor.
- Inspection Report generated by Engineering Support will be utilized for Departmental documentation, education and best practices.

III. Acceptance Inspection

- Final step before Department acceptance.
- Administering section notifies District Engineer and Maintenance Engineer (or Division equivalent) via email that Primary Inspection punch list items have been addressed.
    i. This notification will include an annotated Primary Inspection punch list based upon follow up review and discussions from the Primary Inspection. The administering section will be responsible to provide the punch list and dates of when remedial activities were resolved that will accompany the request to the district.
    ii. If necessary, the administering section will be responsible to provide dates of when remedial activities were resolved from the ADA Inspection Punch List that will be accompany the request to the district.
    iii. Thirty (30) Calendar Days from notice provided from the administering section, M&O will verify Primary Inspection punch list items have been addressed.
- All release documents be submitted in accordance with Section 100 of the Standard Specifications.
- Project acceptance is date of signature of the Division Director.

DELDOT AGR. 2056

KCI PROJECT NO. 00008105_00001

KCI TECHNOLOGIES

BMP FIELD INVENTORY AND INSPECTION STANDARD OPERATING PROCEDURES

APPENDIX B

BMP TYPES, INSPECTION PARAMETERS, AND STANDARD DETAILS

DELDOT AGR. 2056

KCI PROJECT NO. 00008105_00001

BMP FIELD INVENTORY AND INSPECTION

STANDARD OPERATING PROCEDURES

APPENDIX B-1

BMP TYPES AND INSPECTION PARAMETERS

APPENDIX B
BMP TYPES AND INSPECTION PARAMETERS

Description - Main	Description - Sub-Type	SITE OVERVIEW				WATER QUALITY OVERVIEW										EMBANKMENT INSP.			OUTLET INSPECTION							Overall Rating
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
		Access	Fence	Invasive Vegetation	Public Hazards	Pre-Treatment	Flow-in condition	Conveyance Stability	Downstream Conditions	Ponding	Water Quality Contamination	Overall BMP condition	Permanent Pool	BMP Vegetation	Water Quality Treatment	Cover - Upstream	Cover - Downstream	Seepage	Riser - Opening	Riser - Low Flow	Riser - Accumulation	Riser - Structure	Principal Spillway	Outfall	Emergency Spillway	
Pond	Dry Pond	x	IA	x	x	x	x	x	x	x	x	x	-	IA	-	x	x	x	x	x	x	x	IA	x	IA	x
	Wet Pond	x	IA	x	x	x	x	x	x	x	x	x	IA	IA	-	x	x	x	x	x	x	x	IA	x	IA	x
	Constructed Wetland	x	IA	x	x	x	x	x	x	x	x	x	x	x	-	x	x	x	x	x	x	x	IA	x	IA	x
	Borrow Pond	x	IA	x	x	x	x	x	x	x	x	x	x	x	-	x	x	x	x	x	x	x	IA	x	IA	x
	Sediment Forebay	x	IA	x	x	x	x	x	x	x	x	x	IA	IA	-	x	x	x	x	IA	IA	x	IA	x	IA	x
Infiltration	Infiltration Basin	x	IA	x	x	x	x	x	x	x	x	x	-	-	-	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	x
	Infiltration Trench	x	IA	x	x	x	x	x	x	x	x	x	-	-	-	IA	IA	IA	IA	-	-	-	-	IA	-	x
	Porus Pavement	x	IA	x	x	x	x	x	x	x	x	x	-	-	-	-	-	-	-	-	-	-	-	-	-	x
	Underground Storage	x	-	-	x	x	x	x	x	x	x	x	-	-	-	-	-	-	-	-	-	-	-	IA	-	x
Filtering	Sand Filter (Delaware)	x	IA	IA	x	x	x	x	IA	x	x	x	-	-	-	-	-	-	-	-	-	-	-	-	-	x
	Bioretention	x	IA	x	x	x	x	x	x	x	x	x	-	-	-	-	-	-	-	-	-	-	-	-	-	x
	Filter Strip	x	IA	x	x	x	x	x	x	x	x	x	-	-	-	-	-	-	-	-	-	-	-	-	-	x
Open Channel System	Biofiltration Swale	x	IA	x	x	x	x	x	x	x	x	x	-	-	-	-	-	-	-	-	-	-	-	-	-	x
	Wet Swale	x	IA	x	x	x	x	x	x	x	x	x	x	-	-	-	-	-	-	-	-	-	-	-	-	x
Other	BaySaver	x	IA	IA	x	x	x	x	IA	x	x	x	-	-	-	-	-	-	-	-	-	-	-	IA	-	x
	StormFilter	x	IA	IA	x	x	x	x	IA	x	x	x	-	-	-	-	-	-	-	-	-	-	-	IA	-	x
	Diverter Box	x	IA	IA	x	x	x	x	IA	x	x	x	-	-	-	-	-	-	-	-	-	-	-	IA	-	x
	Check Dam	x	IA	IA	x	-	x	x	x	x	x	x	-	-	-	-	-	-	-	-	-	-	-	IA	-	x

NOTES:
X - Required
IA - If Applicable

DELDOT AGR. 2056

KCI PROJECT NO. 00008105_00001

BMP FIELD INVENTORY AND INSPECTION STANDARD OPERATING PROCEDURES

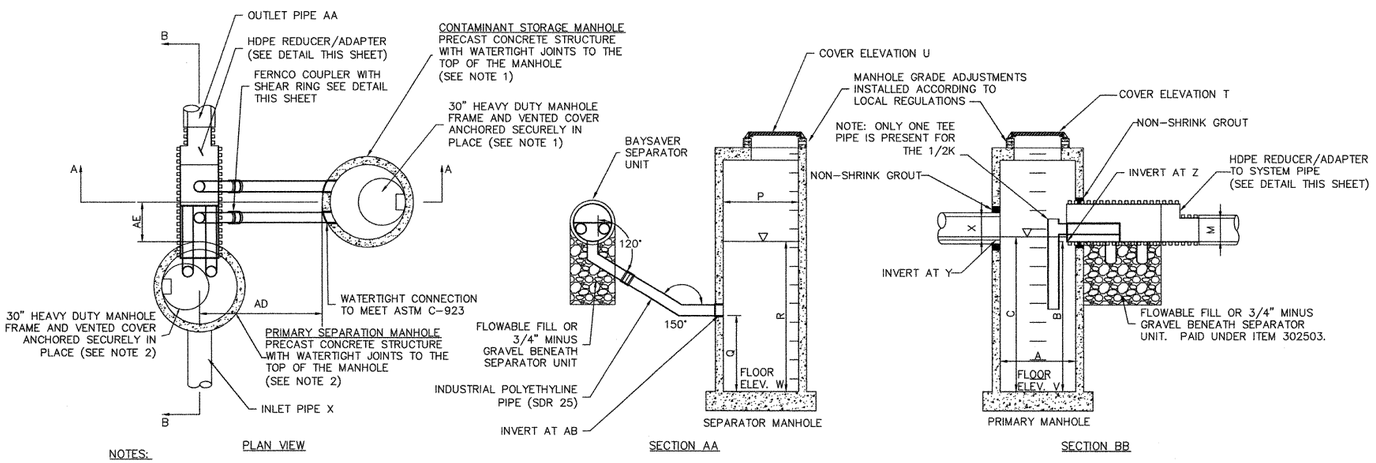
APPENDIX B-2

BAYSAVER STANDARD DETAILS

CONTRACT	COUNTY	F.A.P. NO.	SHEET NO.	TOTAL SHTS.
24-500-06	NEW CASTLE		15	97

TALLEY MAINTENANCE YARD IMPROVEMENTS

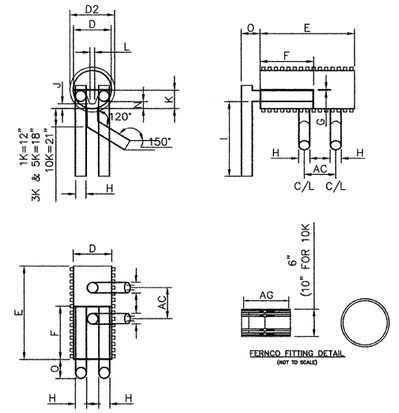
REVISIONS



NOTES:

1. ITEM 708582 – MANHOLE, SPECIAL. THIS MANHOLE ACTS AS THE CONTAMINANT STORAGE MANHOLE FOR THE BAYSAVER SEPARATION SYSTEM. THE MANHOLE IS PAID FOR UNER ITEM 708582.
2. ITEM 708582 – MANHOLE, SPECIAL. THIS MANHOLE ACTS AS THE PRIMARY SEPARATION HANHOLE MANHOLE FOR THE BAYSAVER SEPARATION SYSTEM BUT IS NOT SUPPLIED AS PART OF THE BAYSAVER SEPARATION SYSTEM. THE MANHOLE IS PAID FOR UNDER ITEM 708582.

BAYSAVER SYSTEM
SCALE: NONE



	DISTANCE AG	FERNCO NO.	SHEAR RING
1/2K	7.10"	1055-66	SR-27
1K	7.10"	1055-66	SR-27
3K	10.60"	1056-1010	SR-39
5K	12.73"	1004-1010	SR-44
10K	15.90"	1056-1515	SR-59

NOTES:

1. THE CONTRACTOR SHALL FURNISH AND INSTALL THE BAYSAVER SEPARATION SYSTEM FOR STORMWATER CONDITIONING AT THE LOCATION SHOWN ON THE CONTRACT PLANS AND AS EXPLAINED BY DETAILS, NOTES, AND INSTRUCTIONS FOUND ON THIS SHEET. ALL COSTS ASSOCIATED WITH FURNISHING AND INSTALLING THE BAYSAVER SEPERATION SYSTEM SHALL BE PAID UNDER ITEM 763618 – BAYSAVER INSTALLATION.
2. THE ADDRESS AND CONTACT PHONE NUMBER FOR BAYSAVER IS:

   BAYSAVER, INC.
   1302 RISING RIDGE ROAD
   MONITAIRY, MD 21771

   PHONE: 301-829-6470
   FAX: 301-829-3747
3. THESE STANDARD DETAILS WERE COPIED FROM DETAILS PROVIDED BY BAYSAVER, INC. THE DETAILS AND THE DETAIL GENERATOR CAN BE FOUND ON BAYSAVER'S WEBSITE (www.baysaver.com).

SEQUENCE OF CONSTRUCTION AND INSPECTOR'S CHECK-OFF LIST FOR DUAL MANHOLE SEPARATORS

Stage (X = Approval Required)	Developer's/Engineer Approval		Inspector		Geotechnical Engineer	
	Initials	Date	Initials	Date	Initials	Date
1. Pre-Construction Meeting.	X		X		X	
2. Install Manholes and associated storm drainage: a. Obtain approval of subgrade from Geotechnical Engineer. (Subgrade to have a minimum of 95% compaction)					X	
b. Installation of precast base, lower tank and lower piping.	X		X			
c. Backfill and min. 95% compaction around lower tank and lower piping.					X	
d. Installation of precast middle section(s) with separator unit and remaining piping.	X		X			
e. Installation of precast top slab.	X		X			
f. Installation of adjustment rings and frame and cover.	X		X			
g. Installation of flowable fill or concrete backfill.					X	
3. Backfilling operation and compaction.					X	
4. Site is permanently stabilized. Sediment control measures removed and all sediment and debris removed from dual manhole separators.			X			
5. Final inspection.			X			

Baysaver Separator Unit	Baysaver Manhole Sizes (prim. x stor.)	Maximum Treatment (cfs)	Maximum Treatment (gpm)
1/2K Baysaver Separator	48x48	1.1	494

NOTE:

BAYSAVERS ARE TO BE INSTALLED WITH THE STORM DRAIN SYSTEM AND WILL FUNCTION AS SECONDARY SEDIMENT CONTROL DEVICES.

UPON COMPLETION OF SITE STABILIZATION, EACH BAYSAVER SYSTEM SHALL BE FLUSHED CLEAN & THE MANHOLES CLEANED OUT AND REFILLED WITH CLEAN WATER.

BAYSAVER MAINTENANCE

BAYSAVER SYSTEMS MUST BE INSPECTED AND MAINTAINED PERIODICALLY. INSPECTION IS MADE BY CHECKING THE DEPTH OF SEDIMENT IN EACH MANHOLE WITH A GRADE STICK OR SIMILAR DEVICE. MAINTENANCE IS REQUIRED WHEN THE SEDIMENT DEPTH IN EITHER MANHOLE EXCEEDS 2 FEET. MINIMUM INSPECTION IS RECOMMENDED TWICE A YEAR TO MAINTAIN OPERATION AND FUNCTION OF BAYSAVER.

MAINTENANCE CONSISTS OF THE FOLLOWING:

A. CONTAMINANT STORAGE MANHOLE

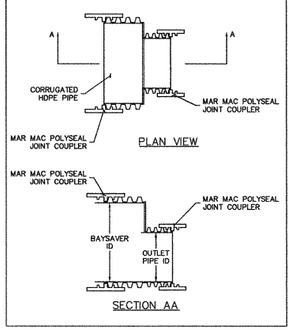
1. REMOVE THE ENTIRE VOLUME OF THE CONTAMINATED WATER BY VACUUM TRUCK.
2. CLEAN THE MANHOLE WALLS AND FLUSH OUT THE MANHOLE USING A HIGH PRESSURE HOSE AND REMOVE FLUSHING WATER BY VACUUM TRUCK. MAKE CERTAIN MANHOLE IS CLEAN.

B. PRIMARY SEPARATION MANHOLE

1. USING A SUBMERSIBLE PUMP, PUMP THE CLEAN WATER FROM THE CENTER OF THE MANHOLE DIRECTLY INTO THE EMPTY STORAGE MANHOLE UNTIL THE WATER LEVEL FALLS TO 1 FOOT ABOVE THE SEDIMENT LAYER.
2. REMOVE THE SETTLED SEDIMENT AND REMAINING WATER BY VACUUM TRUCK.
3. CLEAN THE MANHOLE WALLS AND FLUSH OUT THE MANHOLE USING A HIGH PRESSURE HOSE AND REMOVE FLUSHING WATER BY VACUUM TRUCK. MAKE CERTAIN MANHOLE IS CLEAN.
4. CONTAMINATED MATERIAL REMOVED FROM THE MANHOLES MUST BE DISPOSED OF RESPONSIBLY AND LEGALLY BY THE OPERATOR OF THE VACUUM TRUCK.

HDPE REDUCER/ADAPTER DETAIL

FOR USE WITH ALL CIRCULAR OUTLET PIPES
NOT TO SCALE



BAYSAVER INSTALLATION INSTRUCTIONS

1. EXCAVATION MUST PROVIDE ADEQUATE SPACE TO CONNECT INLET AND OUTLET PIPES TO SEPARATOR MANHOLE AND BAYSAVER UNIT. INSTALL PRECAST DROP STRUCTURES ON SOLID GROUND AS VERIFIED BY A GEOTECHNICAL ENGINEER.
2. VERIFY THE SUBGRADE ELEVATION AGAINST THE MANHOLE DIMENSIONS AND CONNECTING STORM DRAIN INVERTS.
3. MAKING SURE THE BASES ARE LEVEL AND THE STORAGE MANHOLE OPENINGS ARE ALIGNED WITH THE SEPARATOR UNIT, INSTALL PRIMARY AND STORAGE MANHOLES. INSTALL WATERTIGHT GASKETS ON BASE UNITS AND COAT WITH LUBRICATING GREASE (IF REQUIRED). INSTALL ADDITIONAL MANHOLE SECTIONS AS REQUIRED. SEAL LIFT HOLES WITH NON-SHRINK GROUT.
4. BACKFILL BASE SECTIONS OF MANHOLES TO INVERT OF STORAGE MANHOLE CONNECTING PIPES. USING APPROVED BACKFILL MATERIAL, BACKFILL AND COMPACT IN 8 INCH LIFTS. BACKFILL AND COMPACTION SHOULD BE MONITORED BY A GEOTECHNICAL ENGINEER.
5. INSTALL BAYSAVER SEPARATOR UNIT AND CONNECTING PIPES. SEAL ALL CONNECTING JOINTS AND INSTALL SEPARATOR HDPE REDUCER/ADAPTER. CUT EXCESS LENGTH OFF CONNECTING PIPES INSIDE STORAGE MANHOLE.
6. BACKFILL SEPARATOR UNIT AND MANHOLES. AREAS NOT ACCESSIBLE TO COMPACTION EQUIPMENT MUST BE BACKFILLED WITH 3/4" MINUS ANGULAR GRAVEL OR FLOWABLE FILL.
7. INSTALL AND SET MANHOLE COVER GRADE ADJUSTMENT RINGS AS NECESSARY.
8. INSTALL AND SET MANHOLE FRAME AND COVER UNITS.

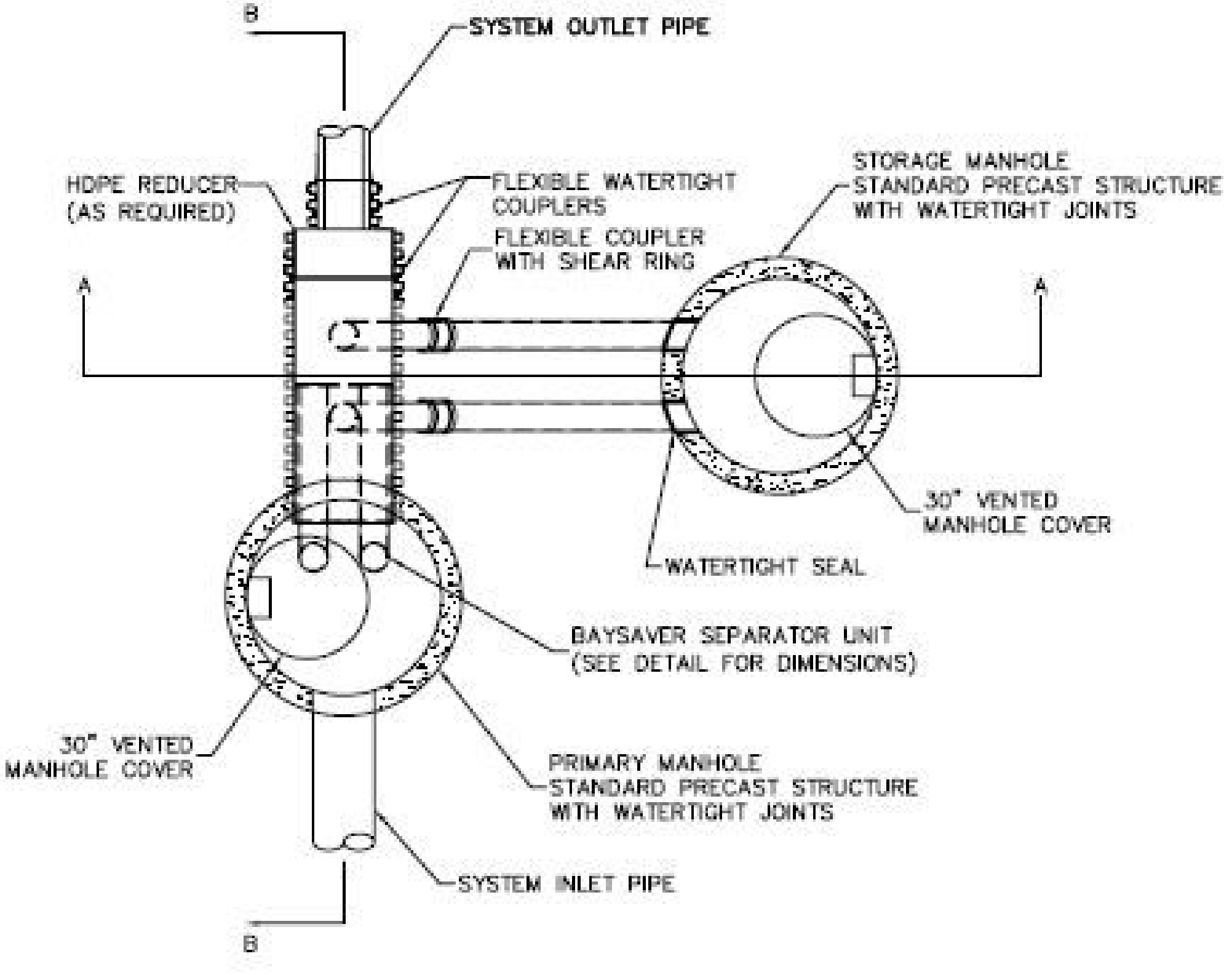
GENERAL CONSTRUCTION NOTES

1. ALL WORK MUST BE DONE WITH REGARD FOR THE SAFETY OF THE CONSTRUCTION CREW.
2. ALL WORK AND MATERIALS MUST COMPLY WITH APPLICABLE STATE AND LOCAL REGULATIONS.
3. KNOW THE LOCATION AND DEPTH OF ANY UNDERGROUND UTILITIES BEFORE EXCAVATION BEGINS.

BAYSAVER SYSTEM DIMENSIONS

	DESCRIPTION	1/2K SYSTEM
	SEPARATOR MANHOLE DIMENSIONS	
A	PRIMARY MANHOLE DIAMETER	48"
B	MANHOLE DEPTH BELOW OUTLET	6' – 0"
C	MINIMUM FLUID DEPTH	6' – 1"
	STANDARD SEPARATOR UNIT DIMENSIONS	
D	SEPARATOR UNIT ID	24"
D2	SEPARATOR UNIT OD	28.5"
E	SEPARATOR UNIT LENGTH	60"
F	BYPASS PLATE LENGTH	34"
G	WEIR/BYPASS PLATE THICKNESS	1/2"
H	ELBOW AND CONNECTING PIPE OD	7.125"
I	ELBOW LENGTH	28"
J	WEIR HEIGHT ABOVE INVERT	1"
K	BYPASS PLATE HEIGHT ABOVE INVERT	12"
L	WIDTH OF WEIR AT BASE	3"
M	OUTLET PIPE DIAMETER	15"
N	ELBOW INVERT HEIGHT ABOVE UNIT INVERT	5"
O	ELBOW PIPE OVERHANG	12"
	STORAGE MANHOLE DIMENSIONS	
P	STORAGE MANHOLE DIAMETER	48"
Q	MANHOLE DEPTH BELOW INLET/OUTLET	36"
R	FLUID DEPTH	6' – 0"
S	TOTAL STORAGE VOLUME	150 CF
	SYSTEM DIMENSIONS AND ELEVATIONS	
T	SEPARATOR MANHOLE COVER ELEVATION	221.55'
U	STORAGE MANHOLE COVER ELEVATION	221.71'
V	SEPARATOR MANHOLE FLOOR ELEVATION	210.77'
W	STORAGE MANHOLE FLOOR ELEVATION	210.77'
X	INLET PIPE ID AND MATERIAL	15" RCP
Y	INLET PIPE INVERT	216.85'
Z	SEPARATOR UNIT INVERT	216.77'
AA	OUTLET PIPE ID AND MATERIAL	15" RCP
AB	CONNECTING PIPE INVERT ELEVATION	213.77'
AC	CONNECTION PIPE SPACING	20"
AD	STORAGE MANHOLE SIDE OFFSET	72 ± 6"
AE	STORAGE MANHOLE DOWNSTREAM OFFSET	24"
AF	BAYSAVER SEPARATOR UNIT ORIENTATION (PLEASE SPECIFY RIGHT OR LEFT)	R
AG	PIPE ANGLE INTO PRIMARY MANHOLE (RELATIVE TO OUTFALL)	0°

DESIGN _____ CHKD _____
PREL. TRACING _____


B
SYSTEM OUTLET PIPE
HDPE REDUCER
(AS REQUIRED)
FLEXIBLE WATERTIGHT
COUPLERS
FLEXIBLE COUPLER
WITH SHEAR RING
STORAGE MANHOLE
STANDARD PRECAST STRUCTURE
WITH WATERTIGHT JOINTS
A
A
30" VENTED
MANHOLE COVER
WATERTIGHT SEAL
BAYSAVER SEPARATOR UNIT
(SEE DETAIL FOR DIMENSIONS)
30" VENTED
MANHOLE COVER
PRIMARY MANHOLE
STANDARD PRECAST STRUCTURE
WITH WATERTIGHT JOINTS
SYSTEM INLET PIPE
B

DELDOT AGR. 2056

KCI PROJECT NO. 00008105_00001

BMP FIELD INVENTORY AND INSPECTION STANDARD OPERATING PROCEDURES

APPENDIX B-3

BIOFILTRATION STANDARD DETAILS

CONTRACT	COUNTY	F.A.P. NO.	SHEET NO.	TOTAL SHTS
90-031-11	N.C.	N/A	16	56

GOV. PRINTZ BLVD. TO PHILA. PIKE CONNECTOR (THROUGH CAUFFIEL ESTATE)

REVISIONS

CONSTRUCTION PLAN

0 5 10 15 METER

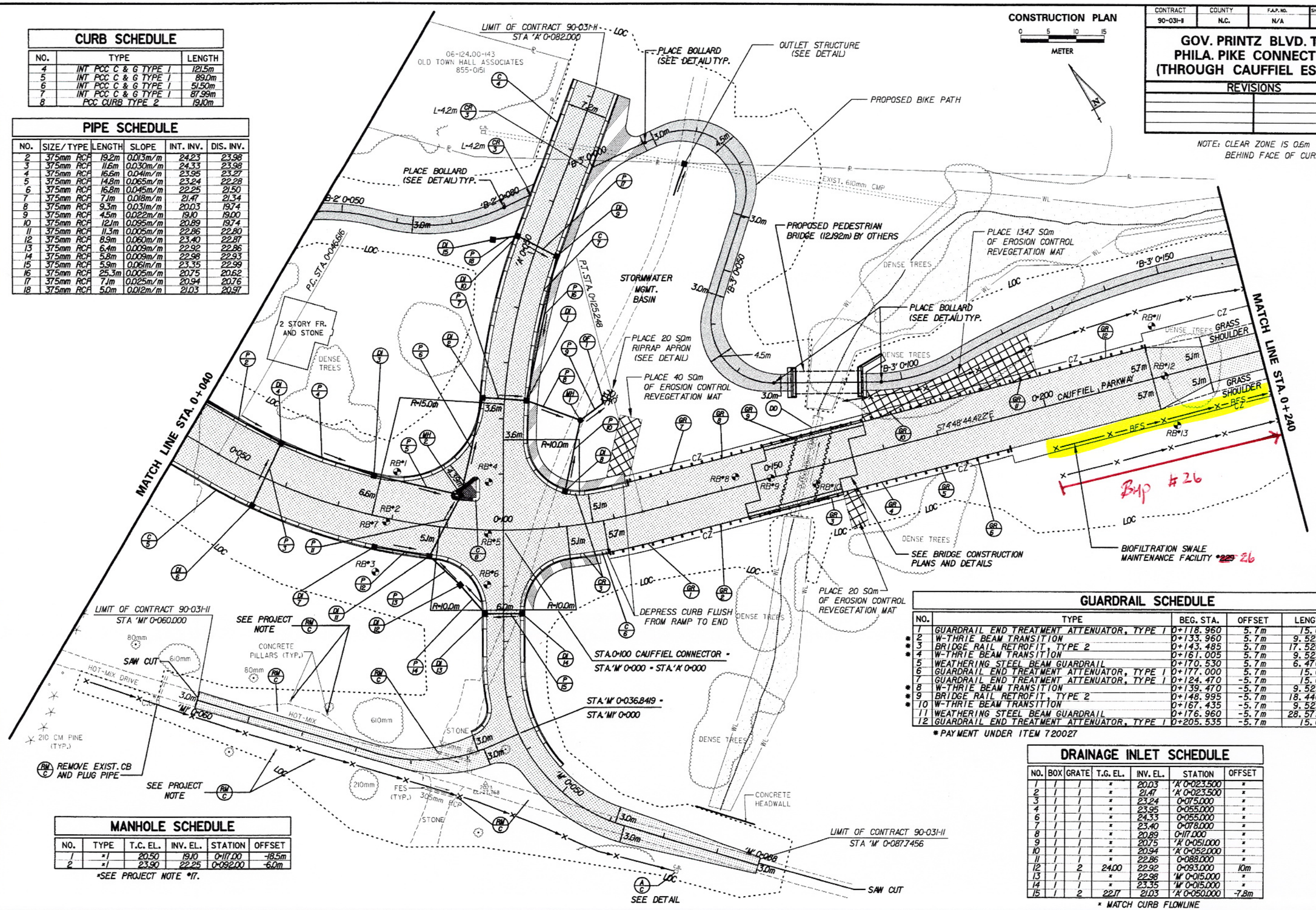
NOTE: CLEAR ZONE IS 0.6m BEHIND FACE OF CURB.

CURB SCHEDULE

NO.	TYPE	LENGTH
4	INT PCC C & G TYPE 1	121.5m
5	INT PCC C & G TYPE 1	89.0m
6	INT PCC C & G TYPE 1	51.50m
7	INT PCC C & G TYPE 1	87.99m
8	PCC CURB TYPE 2	19.10m

PIPE SCHEDULE

NO.	SIZE/TYPE	LENGTH	SLOPE	INT. INV.	DIS. INV.
2	375mm RCP	19.2m	0.013m/m	24.23	23.98
3	375mm RCP	11.6m	0.030m/m	24.33	23.98
4	375mm RCP	16.6m	0.041m/m	23.95	23.27
5	375mm RCP	14.8m	0.065m/m	23.24	22.28
6	375mm RCP	16.8m	0.045m/m	22.25	21.50
7	375mm RCP	7.1m	0.018m/m	21.47	21.34
8	375mm RCP	9.3m	0.031m/m	20.03	19.74
9	375mm RCP	4.5m	0.022m/m	19.10	19.00
10	375mm RCP	12.1m	0.095m/m	20.89	19.74
11	375mm RCP	11.3m	0.005m/m	22.86	22.80
12	375mm RCP	8.9m	0.060m/m	23.40	22.87
13	375mm RCP	6.4m	0.009m/m	22.92	22.86
14	375mm RCP	5.8m	0.009m/m	22.98	22.93
15	375mm RCP	5.9m	0.061m/m	23.35	22.99
16	375mm RCP	25.3m	0.005m/m	20.75	20.62
17	375mm RCP	7.1m	0.025m/m	20.94	20.76
18	375mm RCP	5.0m	0.012m/m	21.03	20.97



GUARDRAIL SCHEDULE

NO.	TYPE	BEG. STA.	OFFSET	LENGTH
1	GUARDRAIL END TREATMENT ATTENUATOR, TYPE 1	0+118.960	5.7m	15.0m
* 2	W-THRIE BEAM TRANSITION	0+133.960	5.7m	9.525m
* 3	BRIDGE RAIL RETROFIT, TYPE 2	0+143.485	5.7m	17.520m
* 4	W-THRIE BEAM TRANSITION	0+161.005	5.7m	9.525m
5	WEATHERING STEEL BEAM GUARDRAIL	0+170.530	5.7m	6.470m
6	GUARDRAIL END TREATMENT ATTENUATOR, TYPE 1	0+177.000	5.7m	15.0m
7	GUARDRAIL END TREATMENT ATTENUATOR, TYPE 1	0+124.470	-5.7m	15.0m
* 8	W-THRIE BEAM TRANSITION	0+139.470	-5.7m	9.525m
* 9	BRIDGE RAIL RETROFIT, TYPE 2	0+148.995	-5.7m	18.440m
* 10	W-THRIE BEAM TRANSITION	0+167.435	-5.7m	9.525m
11	WEATHERING STEEL BEAM GUARDRAIL	0+176.960	-5.7m	28.575m
12	GUARDRAIL END TREATMENT ATTENUATOR, TYPE 1	0+205.535	-5.7m	15.0m

* PAYMENT UNDER ITEM 720027

MANHOLE SCHEDULE

NO.	TYPE	T.C. EL.	INV. EL.	STATION	OFFSET
1	*1	20.50	19.10	0+117.00	-18.5m
2	*1	23.90	22.25	0+092.00	-6.0m

*SEE PROJECT NOTE #17.

DRAINAGE INLET SCHEDULE

NO.	BOX	GRATE	T.G. EL.	INV. EL.	STATION	OFFSET
1	1	1	*	20.03	'A' 0+023.500	*
2	1	1	*	21.47	'A' 0+023.500	*
3	1	1	*	23.24	0+075.000	*
4	1	1	*	23.95	0+055.000	*
6	1	1	*	24.33	0+055.000	*
7	1	1	*	23.40	0+078.000	*
8	1	1	*	20.89	0+117.000	*
9	1	1	*	20.75	'A' 0+051.000	*
10	1	1	*	20.94	'A' 0+052.000	*
11	1	1	*	22.86	0+088.000	*
12	1	2	24.00	22.92	0+093.000	10m
13	1	1	*	22.98	'M' 0+015.000	*
14	1	1	*	23.35	'M' 0+015.000	*
15	1	2	22.17	21.03	'A' 0+050.000	-7.8m

* MATCH CURB FLOWLINE

PRELIM. TRACING ____ DESIGN ____ CHKD. ____

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plotted 6-4-99

CONTRACT	COUNTY	F.A.P. NO.	SHEET NO.	TOTAL SHTS.
90-031-11	N.C.	N/A	17	56

GOV. PRINTZ. BLVD. TO PHILA. PIKE CONNECTOR (THROUGH CAUFFIEL ESTATE)

REVISIONS

CONSTRUCTION PLAN

0 5 10 15

METER

N

LIMIT OF CONSTRUCTION STA 'B-3' 0+352.8600

PLACE 22.5 SQm RIPRAP APRON (SEE DETAIL)

PLACE 23.1 SQm RIPRAP APRON (SEE DETAIL)

PLACE 22.5 SQm RIPRAP APRON (SEE DETAIL)

PLACE BOLLARD (TYP.) (SEE DETAIL)

BRUSH

DENSE TREES

DENSE TREES

WL

WL

LOC

'B-3' 0+200

'B-3' 0+250

'B-3' 0+300

3.0m

3.0m

3.0m

RB#15

RB#16

0+350

3.3m

3.3m

CAUFFIEL PARKWAY

0+400

GRASS SHOULDER

0+450

CZ

GRASS SHOULDER

0+250

RB#14

GRASS SHOULDER

CZ

BFS

Byp # 26

Byp # 27

Byp # 32

Byp # 34

DENSE TREES

3.0m

LOC

LOC

BIOFILTRATION SWALE MAINTENANCE FACILITY #229

MATCH LINE STA 0+240

MATCH LINE STA 0+460

P.C. STA. 0+245.583

EX. GRASS PATH (TYP.)

920mm

920mm

EXISTING SIGN

PIPE SCHEDULE

NO.	SIZE/TYPE	LENGTH	SLOPE	INT. INV.	DIS. INV.
19	375mm RCP	4.2m	0.057m/m	12.67	12.43
20	375mm RCP	15.3m	0.020m/m	12.40	12.10
21	375mm RCP	11.6m	0.006m/m	12.07	12.00
22	450mm RCP	4.2m	0.007m/m	11.36	11.33
23	450mm RCP	15.3m	0.007m/m	11.30	11.19
24	450mm RCP	13.1m	0.007m/m	11.16	11.10
25	375mm RCP	4.2m	0.005m/m	9.98	9.96
26	375mm RCP	15.3m	0.005m/m	9.93	9.85
27	375mm RCP	14.1m	0.005m/m	9.82	9.75

DRAINAGE INLET SCHEDULE

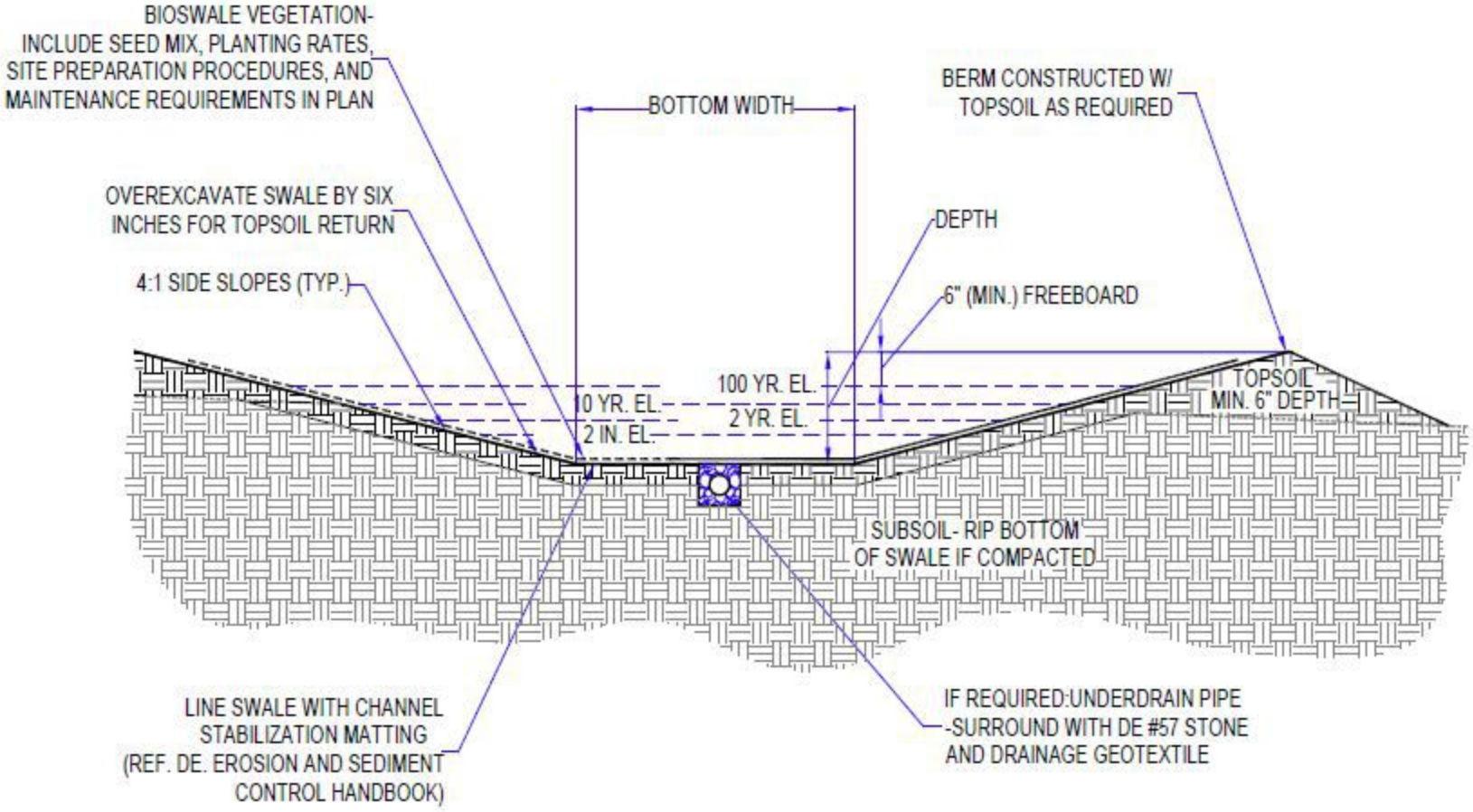
NO.	BOX	GRATE	T.G. EL.	INV. EL.	STATION	OFFSET
17	SPECIAL 2	2	13.86	12.67	0+267.000	13.1m
18	1	2	13.82	12.40	0+267.000	8.0m
19	1	2	13.95	12.07	0+267.000	-8.0m
20	SPECIAL 2	2	11.97	11.36	0+322.000	13.1m
21	1	2	12.35	11.30	0+322.000	8.0m
22	1	2	12.44	11.16	0+322.000	-8.0m
23	SPECIAL 1	2	10.58	9.98	0+375.000	13.1m
24	1	2	10.84	9.93	0+375.000	8.0m
25	1	2	11.03	9.82	0+375.000	-8.0m

OUTFALL SCHEDULE

NO.	TYPE	T.C. EL.	INV. EL.	STATION	OFFSET
2	MITRE	—	12.00	0+267.00	-20.0m
3	MITRE	—	11.10	0+322.00	-21.5m
4	MITRE	—	9.75	0+375.00	-22.5m

PREL. TRACING _____ DESIGN _____ CHKD. _____

orientation/details/courtfield/90031/plans/ep03.dgn
plotted: 6-3-99



GREEN TECHNOLOGY: THE DELAWARE URBAN RUNOFF MANAGEMENT APPROACH

TYPICAL DETAIL
BIOFILTRATION SWALE
(N.T.S.)

DETAIL NUMBER: 2.4.1

DATE: JUNE 2005

DELDOT AGR. 2056

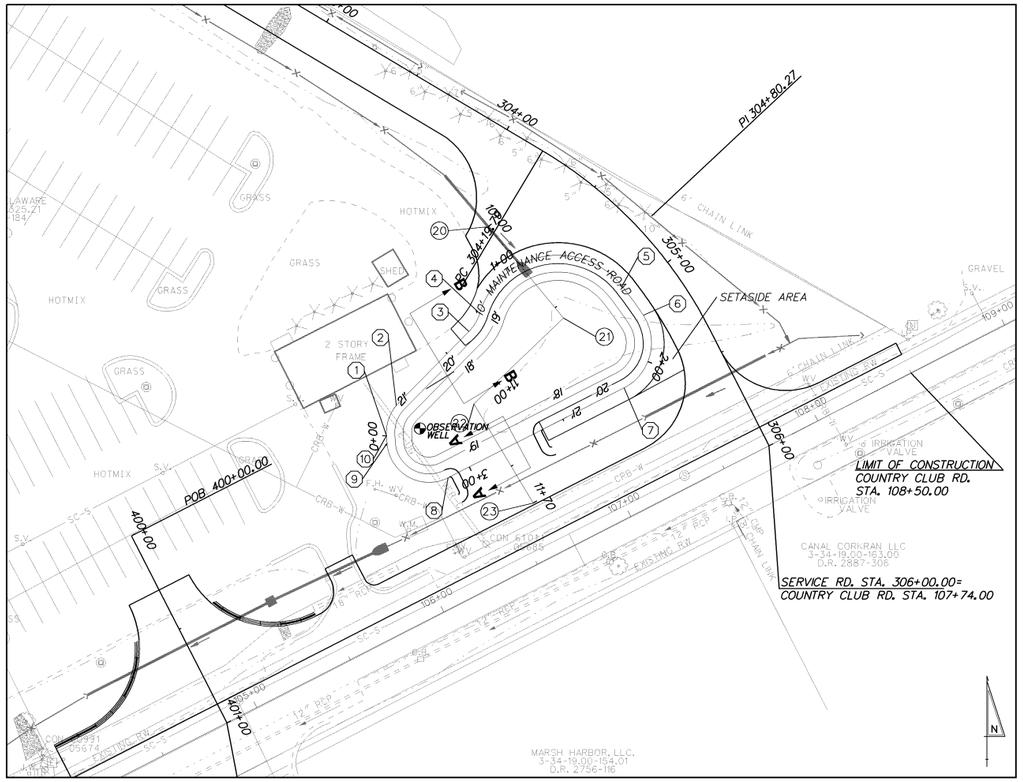
KCI PROJECT NO. 00008105_00001

BMP FIELD INVENTORY AND INSPECTION

STANDARD OPERATING PROCEDURES

APPENDIX B-4

BIORETENTION STANDARD DETAILS



PLAN – DELDOT SWM FACILITY #527
SCALE : NONE

POND DESIGN SUMMARY FOR BMP * 527				
DESIGN STORM	FACILITY INFLOW	FACILITY DISCHARGE	WATER SURFACE ELEVATION	STORAGE VOLUME (AC.FT)
QUALITY STORM (2.0")	1.24	0.00	18.39	0.038
2 - YEAR	2.96	0.00	19.11	0.117
10 - YEAR	5.42	1.32	19.79	0.205
100 - YEAR	10.55	10.45	19.92	0.224

HAZARD CLASSIFICATION: CLASS A AS PER POND CODE 378

DRAINAGE AREA TO FACILITY: 1.45 ACRES

MANAGEMENT PROVIDED BY FACILITY: WATER QUALITY BY INFILTRATION OF FIRST 2.0" OF RUNOFF.
WATER QUANTITY BY INFILTRATION AND EXTENDED DETENTION OF THE 2 AND 10 YEAR STORM EVENTS.

BIORETENTION GENERAL NOTES

1. ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS, AND OTHER OBJECTABLE MATERIAL SHALL BE REMOVED AND DISPOSED OF SO AS NOT TO INTERFERE WITH THE PROPER FUNCTION OF THE BIORETENTIONTION FACILITY.
2. THE BIORETENTION FACILITY SHALL BE EXCAVATED OR SHAPED TO LINES, GRADES, AND CROSS SECTIONS AS REQUIRED TO MEET THE CRITERIA SPECIFIED HEREIN, AND SHALL BE FREE OF BANK PROJECTIONS OR OTHER IRREGULARITIES.
3. ALL EARTH REMOVED AND NOT NEEDED IN CONSTRUCTION SHALL BE STOCKPILED SO THAT IT WILL NOT INTERFERE WITH THE FUNCTIONING OF THE BIORETENTION FACILITY.
4. AT NO TIME WILL ANY CONSTRUCTION EQUIPMENT BE PERMITTED IN THE BIORETENTION FACILITY ONCE THE BIORETENTION MEDIA IS INSTALLED.
5. CONTRACTOR SHALL INSTALL A 6"x12" CONCRETE MARKER AT THE UPSTREAM END OF THE FACILITY. THE MARKER SHALL BE PLACED AT THE TOP OF BANK AND FLUSH WITH THE GROUND. THE APPROVED DELDOT BMP NUMBER SHALL BE STENCILED ONTO THE CONCRETE MARKER WITH 4" TALL LETTERING AND PERMANENT BLACK PAINT. COST SHALL BE INCIDENTAL TO THE BIORETENTION FACILITY CONSTRUCTION.

BIORETENTION CONSTRUCTION SEQUENCE AND NOTES

THE STORMWATER MANAGEMENT FACILITY SHALL NOT BE USED AS A SEDIMENT BASIN DURING ROADWAY CONSTRUCTION IT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE FOLLOWING SECTIONS OF THE STANDARD SPECIFICATIONS AS IS APPLICABLE:

SECTION 271 - STORMWATER MANAGEMENT POND

1. INSTALL STABILIZED CONSTRUCTION ENTRANCE.
2. CLEAR AND GRUB FOR INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS.
3. INSTALL PERIMETER SEDIMENT CONTROLS AS SHOWN. INSTALL ALL EROSION AND SEDIMENT CONTROLS FOR UPSTREAM DRAINAGE AREAS.
4. CLEAR AND GRUB REMAINING AREA FOR FACILITY CONSTRUCTION.
5. EXCAVATE THE FACILITY AND COMPLETE THE EMBANKMENT, SPILLWAY AND BASIN TO LINES, GRADES, AND DETAILS SHOWN IN THE CONSTRUCTION PLANS. EXCAVATE FACILITY BOTTOM TO ELEVATION 15.75 AS SHOWN.
6. PRIOR TO PLACING BIORETENTION SOIL MEDIA, SCARIFY SIDES OF THE EXCAVATED AREA WHERE THE BIORETENTION MEDIA IS TO BE PLACED. INSTALL OBSERVATION WELL. PLACE 2 FEET OF BIORETENTION MEDIA. LANDSCAPE USING PLANTS AS SHOWN ON THE PLAN. TOP DRESS WITH 3 INCHES OF TRIPLE SHREDDED HARDWOOD MULCH.
7. STABILIZE ALL BARE AREAS (EXCEPT BIORETENTION MEDIA) USING PERMANENT DRY SEEDING (6 INCHES TOPSOIL).
8. PLACE BMP IDENTIFICATION MARKER. (SEE GENERAL NOTES)

NOTE: SEE EROSION AND SEDIMENT CONTROL PLANS FOR LOCATION OF EROSION AND SEDIMENT CONTROL MEASURES.

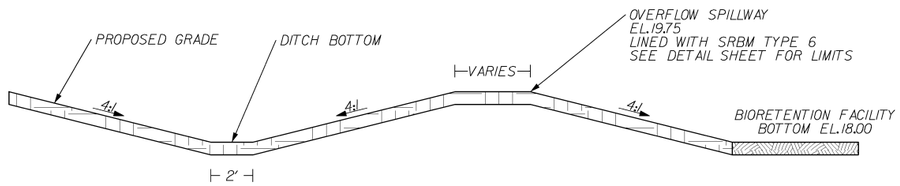
℄ EMBANKMENT

	STATION	NORTHING	EASTING	RADIUS
1	POB STA. 0+00.00	259282.5569	744856.2208	
	PI STA. 0+08.99	259291.5276	744855.6151	20.00'
2	PT STA. 0+16.90	259297.9349	744861.9226	
3	PC STA. 0+64.69	259331.9924	744895.4494	
	PI STA. 0+69.88	259335.6935	744899.0929	21.00'
4	PRC STA. 0+74.87	259340.6661	744900.5912	
	PI STA. 1+49.23	259411.8577	744922.0426	39.00'
5	PCC STA. 1+59.72	259353.7390	744968.4174	
	PI STA. 1+68.32	259347.0140	744973.7835	186.00'
6	PCC STA. 1+76.91	259339.8224	744978.5059	
	PI STA. 2+03.67	259317.4528	744993.1949	24.00'
7	PT STA. 2+17.22	259305.2770	744969.3639	
8	PC STA. 3+11.37	259262.4400	744885.5217	
	PI STA. 3+41.70	259248.6396	744858.5109	20.00'
9	PT STA. 3+50.88	259278.9028	744856.4675	
10	POE STA. 3+54.55	259291.5276	744855.6151	

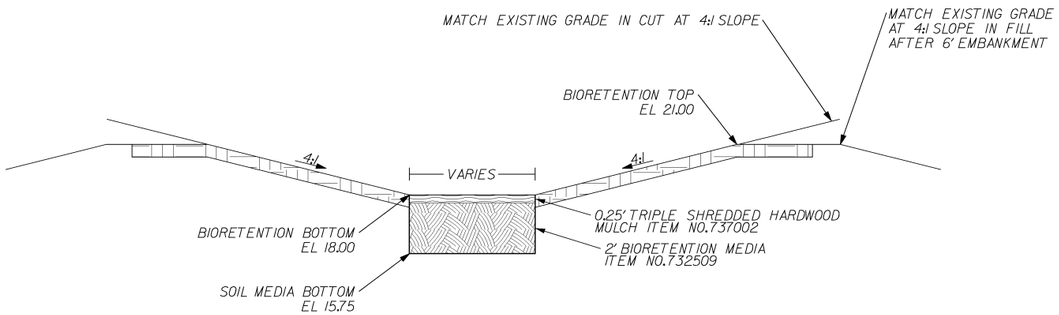
NOTE: ℄ EMBANKMENT IS LOCATED AT TOP OF FACILITY, EL. 21.00'

℄ OVERFLOW

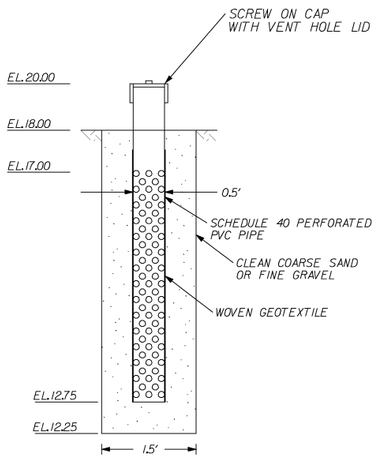
	STATION	NORTHING	EASTING	RADIUS
20	POB STA. 10+00.00	259381.9561	744904.6555	
21	PI STA. 10+56.28	259338.5240	744940.4530	
22	PI STA. 11+15.34	259297.6499	744897.8214	
23	POE STA. 11+70.40	259250.4070	744926.0894	



SECTION A – A
SCALE : NONE



SECTION B – B
SCALE : NONE



OBSERVATION WELL DETAIL
SCALE : NONE

NOTE: OBSERVATION WELL PAID UNDER ITEM NO. 202528.

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS	

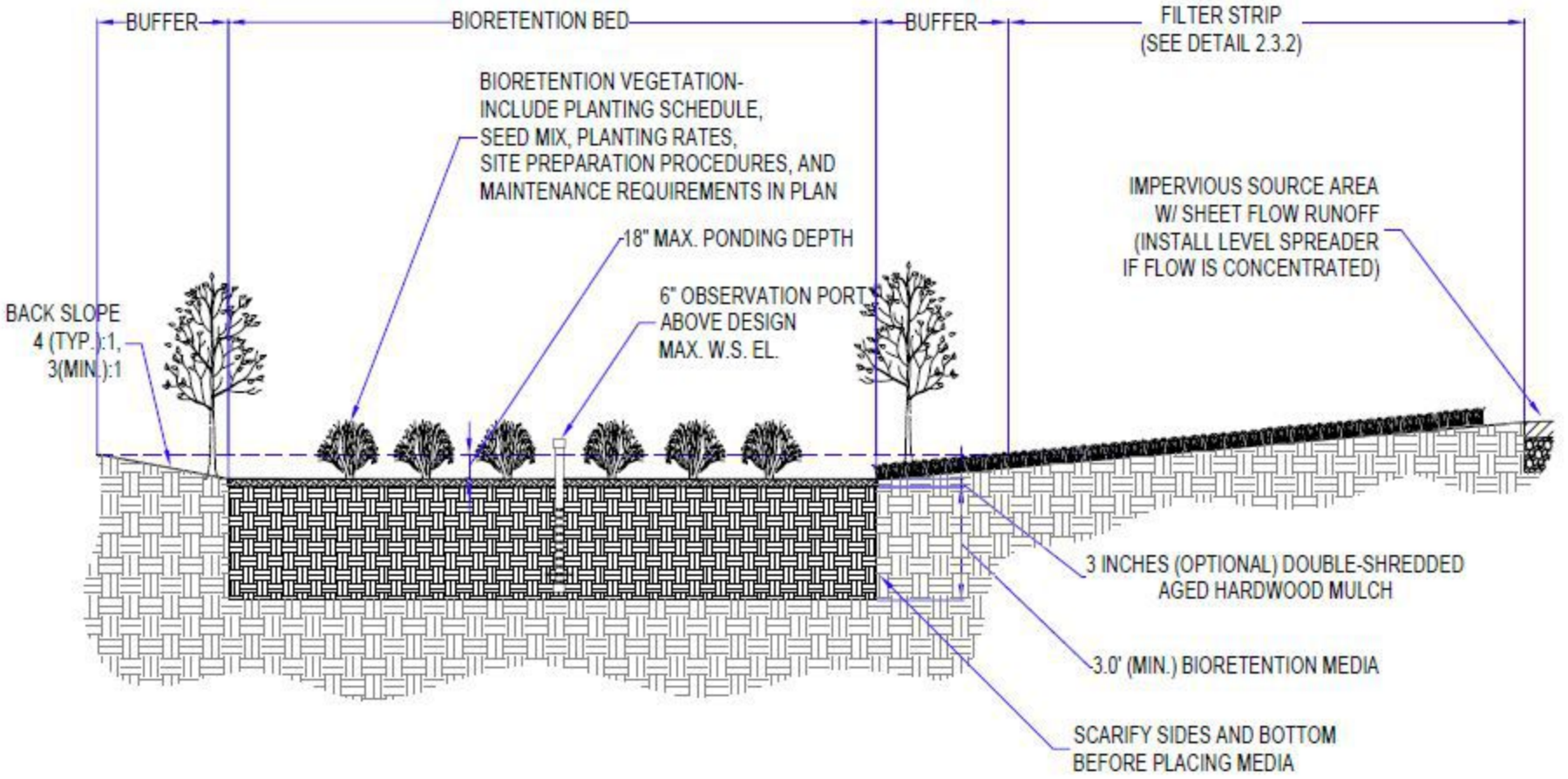
BEACH AREA PARK AND RIDE SYSTEM: PHASE I "DESTINATION STATION"

CONTRACT	BRIDGE NO. –
30-125-01	DESIGNED BY: JFF
COUNTY	CHECKED BY: WFC
SUSSEX	

STORMWATER MANAGEMENT PLANS

SHEET NO.	25
TOTAL SHTS.	40

3/23/2010
G:\PROJECTS\08535.00 (Transportation Enhancement Program)\08535.09 (Task 9, Beach Area Park and Ride - Phase 1)\CADD FILES\swmDetail00.dgn
16:18:45



NOTE: REFER TO GREEN TECHNOLOGY STANDARDS AND SPECIFICATIONS FOR DESIGN STANDARDS AND MATERIAL SPECIFICATIONS

GREEN TECHNOLOGY: THE DELAWARE URBAN RUNOFF MANAGEMENT APPROACH	TYPICAL DETAIL STANDARD BIORETENTION FACILITY (N.T.S.)	DETAIL NUMBER: 2.5.1 DATE: JUNE 2005

DELDOT AGR. 2056

KCI PROJECT NO. 00008105_00001

BMP FIELD INVENTORY AND INSPECTION

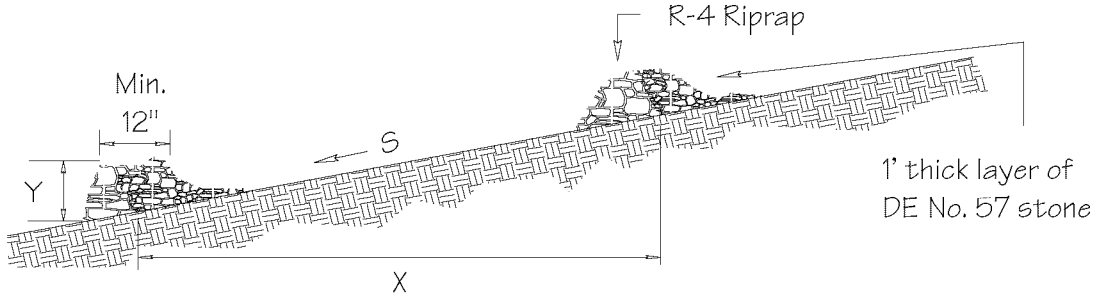
STANDARD OPERATING PROCEDURES

APPENDIX B-5

CHECK DAM STANDARD DETAILS

Standard Detail & Specifications

Stone Check Dam



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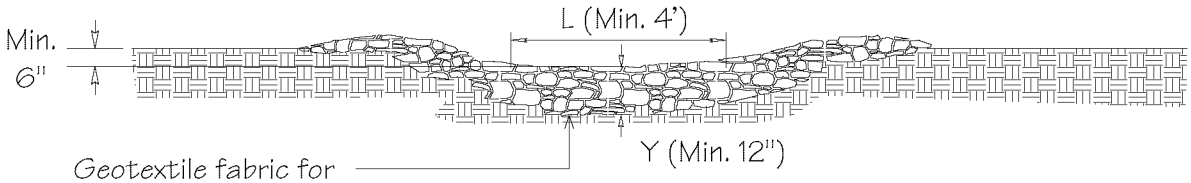
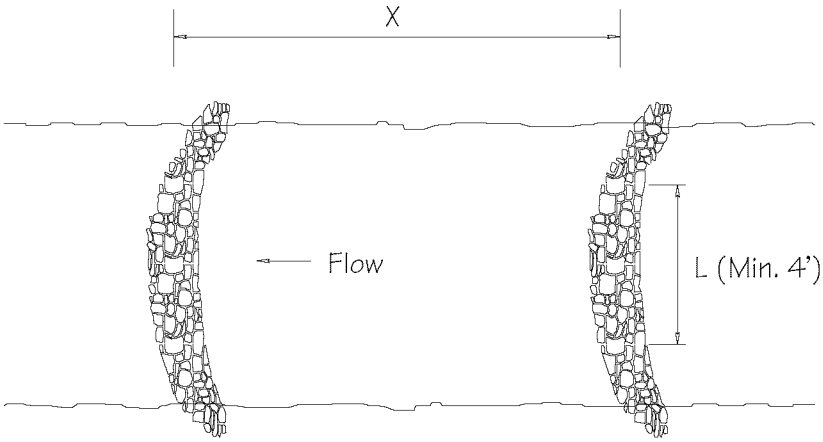


Section



DATA

Slope (S)
Spacing (X)
Length of weir (L)
Height of stone (Y)

NOTE: Angle ends upstream

Plan

Source:	Symbol:	Detail No.
Adapted from MD Stds. & Specs. for ESC	SCD	DE-ESC-3.3.6 Sheet 1 of 2
		Date: 6/05

DELAWARE EROSION & SEDIMENT CONTROL HANDBOOK

Standard Detail & Specifications

Stone Check Dam

Construction Notes:

1. Swales and channels shall be prepared in accordance with the construction specifications described in the **Standards and Specifications for Temporary Berm**, **Temporary Swale**, **Vegetated Channel**, or **Diversions**.

2. The check dam shall be constructed of 4" to 8" riprap. The riprap shall be placed so that it completely covers the width of the channel.

3. The top of the check dam shall be constructed so that the center is approximately 6" lower than the outer edges, forming a weir that the water can flow across. The minimum length of weir shall be 4'.

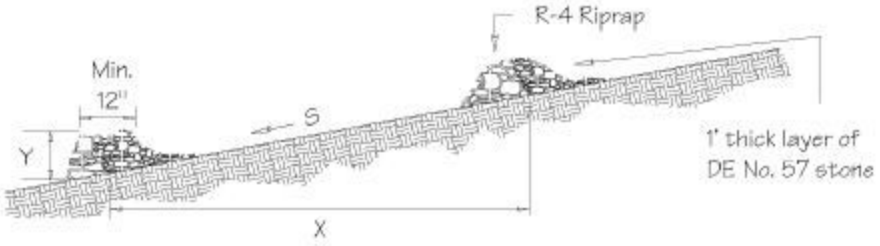
4. The maximum height of the check dam at the center of the weir must not exceed two (2) feet.

5. Maximum spacing between dams should be the distance in the channel where the toe of the upstream dam is at the same elevation as the top of the downstream dam. (See **Standard & Specifications for Check Dams** for design chart.)

Source:	Symbol:	Detail No.
Adapted from MD Stds. & Specs. for ESC	SCD	**DE-ESC-3.3.6** Sheet 2 of 2
		Date: 6/05

Standard Detail & Specifications

Stone Check Dam



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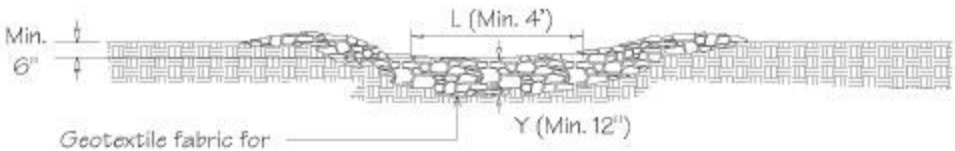

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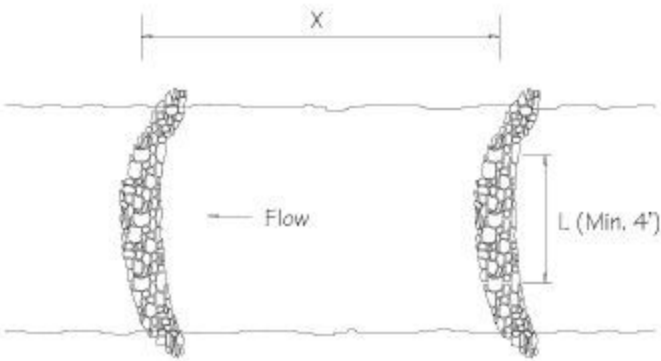


Plan

DATA

Slope (S)
Spacing (X)
Length of weir (L)
Height of stone (Y)

NOTE: Angle ends upstream

Source:	Symbol:	Detail No.
Adapted from MD Stds. & Specs. for ESC	SCD	DE-ESC-3.3.6 Sheet 1 of 2
		Date: 6/05

DELDOT AGR. 2056

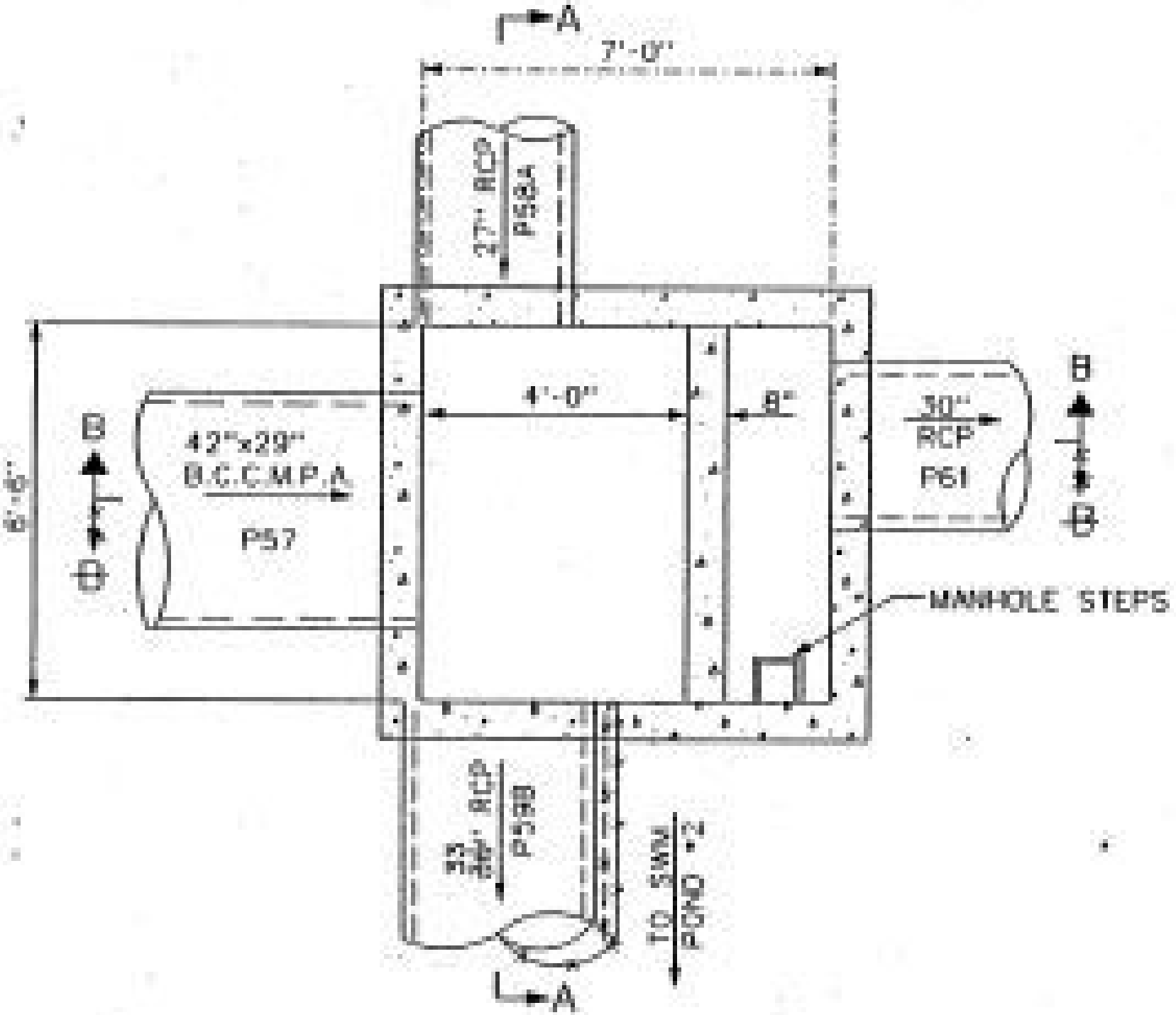
KCI PROJECT NO. 00008105_00001

BMP FIELD INVENTORY AND INSPECTION

STANDARD OPERATING PROCEDURES

APPENDIX B-6

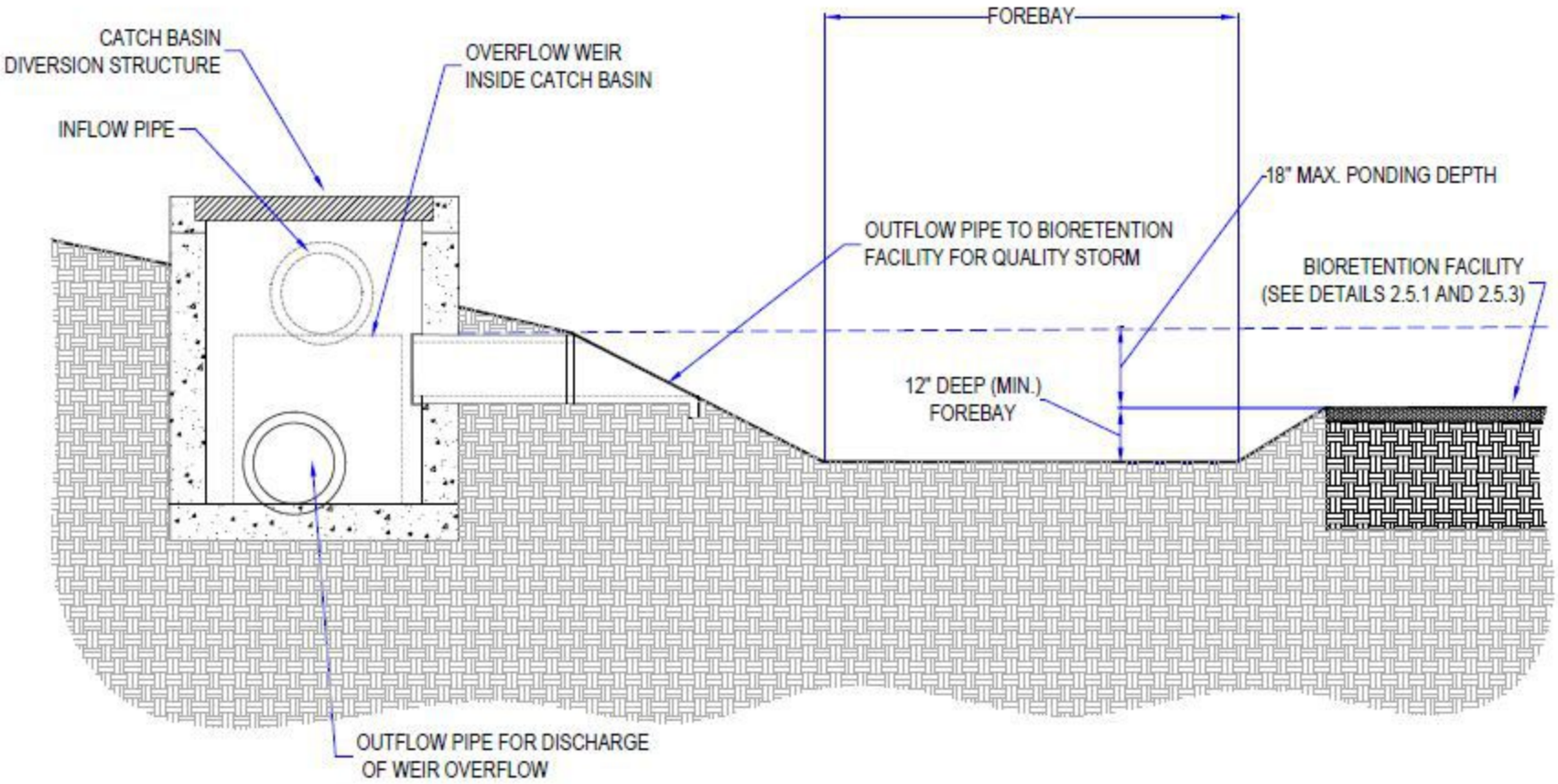
DIVERTER BOX STANDARD DETAILS



PLAN 1

0.8/1 DIVERTER BOX DETAIL

SCALE: ⅜"=1'



PROFILE THROUGH DIVERSION BOX AND FOREBAY (TYP.)
(N.T.S.)

NOTE: REFER TO GREEN TECHNOLOGY STANDARDS AND SPECIFICATIONS FOR DESIGN STANDARDS AND MATERIAL SPECIFICATIONS

GREEN TECHNOLOGY: THE DELAWARE URBAN RUNOFF MANAGEMENT APPROACH	TYPICAL DETAIL DIVERSION STRUCTURE WITH FOREBAY (N.T.S.)	DETAIL NUMBER: 2.5.5 DATE: JUNE 2005

DELDOT AGR. 2056

KCI PROJECT NO. 00008105_00001

BMP FIELD INVENTORY AND INSPECTION

STANDARD OPERATING PROCEDURES

APPENDIX B-7

DRY POND STANDARD DETAILS

SCALE	CONTRACT	COUNTY	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
NONE	91-110-16	NEW CASTLE	F-NH-1003(15)	297	488

SR1,
NORTH OF APPOQUINIMINK
BRIDGE TO S. OF N423

STORMWATER MANAGEMENT POND SPECIFICATIONS

REVISIONS

POND SPECIFICATIONS

Site Preparation

Areas designated for borrow area, embankment and structural works shall be cleared, grubbed, and stripped of topsoil. All trees, vegetation, roots and other objectionable material shall be removed. Channelbanks and sharp breaks shall be sloped to no steeper than 1:1 and deepened and widened as necessary to remove all stone, gravel, sand, stumps, roots, and other objectionable material and to accommodate compaction equipment.

Areas to be covered by the ponds will be cleared of all trees, brush, logs, fences, rubbish and other objectionable materials unless otherwise designated on the plans. Trees, brush and stumps shall be cut approximately level with the ground surface. For dry stormwater management ponds, a minimum of a 50-foot radius around the inlet structure shall be cleared.

All cleared and grubbed material shall be disposed of as designated on the Plans. When specified, a sufficient quantity of topsoil will be stockpiled in a suitable location for use in the embankment and other designated areas.

Earth Fill

Material - The fill material shall be borrow Type 'C' and taken from approved designated borrow areas. It shall be free of all roots, stumps, wood, rubbish, stones greater than 6" frozen or other objectionable materials. Fill material for the center of the embankment, cut off trench and pipe trench backfill shall be borow type 'F' that conforms to AASHTO Soil Classification A-6. Consideration may be given to the use of other materials in the embankment, if disign and other construction are supervised by a geotechnical engineer.

Placement - Areas on which fill is to be placed shall be scarified prior to placement of fill. The surface shall, if necessary, have water added and be compacted so that the first layer of fill material may be compacted and bonded to the foundation. Fill materials shall be placed in maximum 8 inch thick (before compaction) layers which are to be in the downstream portions of the embankment. The principal spillway must be installed concurrently with fill placement and not excavated into the embankment. Foundation areas shall be kept free of standing water when fill is being placed on them. Backfill material shall be placed around structures, pipe conduits, and antiseep collars at approximately the same rate on all sides to prevent damage from unequal loading. Topsoil shall be placed on the top six (6) inches of embankments.

The placing and spreading of fill materials shall be started at the lowest point of the foundation and the fill brought up in horizonal layers of such thickness that the required compaction can be obtained. The fill shall be constructed in continuous horizontal layers except where openings or sectionalized fills are called for. In those cases, the slope of the bonding surfaces between embankment in-place and embankment to be placed will not be steeper than three (3) horizontal to one (1) vertical. The bonding surface is to be treated the same as that specified for the foundation so as to ensure a good bond with the new fill.

Compaction - The movement of the hauling and spreading equipment over the fill shall be controlled so that the entire surface of each lift shall be traversed by not less than one tread track of the equipment. Compaction shall be achieved by a minimum of four complete passes of a sheepsfoot, rubber tired or vibratory roller. Fill material shall contain sufficient moisture such that the required degree of compaction will be obtained with the equipment used. The fill material shall contain sufficient moisture so that if formed into a ball, it will not crumble, yet not be so wet that water can be squeezed out. Material that is too wet shall be dried to meet this requirement. Material that is too dry shall have water added and mixed until the requirement is met.

The construction equipment shall be operated over the areas of each layer of fill in a way that will result in the required compaction. Special equipment shall be used when the required compaction cannot be obtained without it.

Embankments shall be compacted to not less than 95% of minimum dry density with a moisture content within 2% of the optimum. Each layer of fill shall be compacted as necessary to obtain that density, and is to be certified by the Engineer at the time of construction. All compaction is to be determined by AASHTO Method T-99. A minimum of three (3) compaction tests shall be performed at each pond location.

Cut Off Trench - The contractor shall salvage and stockpile sufficient quantities of silt-clay materials classified as A-6 as per AASHTO M-145 to construct cut off trench. The cutoff trench shall be excavated into impervious material along or parallel to the centerline of the embankment as shown on the plans. The bottom width of the trench shall be governed by the equipment used for excavation with the minimum width being four feet. The depth shall be at least four feet below existing grade or as shown on the plans. The side slopes of the trench shall be 1 to 1 or flatter. The backfill shall be compacted with construction equipment, rollers, or hand tamper to assure maximum density and minimum permeability. The cost of the cutoff trench is to be incidental to the cost of the borrow Type 'C' for the pond embankment. The cutoff trench and any other required excavation shall be excavated to the lines and grades shown on the drawings or as staked in the field. To the extent that they are suitable, excavated materials are to be used in the embankment.

Structure Backfill

Backfill adjacent to pipes or structures shall be of the type and quality conforming to that specified for the adjoining fill material. The fill shall be placed in horizontal layers not to exceed four inches in thickness and compacted by hand tampers or other manually directed compaction equipment. The material needs to fill completely all spaces under and adjacent to the pipe. At no time during the backfilling operation shall driven equipment be allowed to operate closer than four feet, measured horizontally, to any part of a structure. Under no circumstances shall equipment be driven over any part of a concrete structure or pipe, unless there is a compacted fill of 24" or greater over the pipe.

Pipe Conduits

All pipes shall be circular in cross section.

A. Corrugated Metal Pipe - All of the following criteria shall apply for corrugated metal pipe.

1. Materials - (Steel Pipe) - This pipe and its appurtenances shall be analyzed and fully bituminous coated and shall conform to the requirements of AASHTO Specification M-190 Type A with watertight coupling bands. Any bituminous coating damaged or otherwise removed shall be replaced with cold applied bituminous coating compound. Steel pipes with polymeric coatings shall have a minimum coating thickness of 0.01 inch (10 mil) on both sides of the pipe. The following coatings or an approved equal may be used: Nexon, Plasti-Cote, Blac-Klad, and Beth-Cu-Loy. Coated corrugated steel pipe shall meet the requirements of AASHTO M-245 and M-246.

2. Coupling bands, antiseep collars, and sections, etc. must be composed of the same materials as the pipe. Metals must be insulated from the dissimilar materials with use of rubber or plastic insulating materials at least 24 mils in thickness.

B. Reinforced Concrete Pipe - All of the following criteria shall apply for reinforced concrete pipe.

1. Materials - Reinforced concrete pipe shall have a rubber gasket joint and shall equal or exceed ASTM Specification C-361.

2. Bedding - Reinforced concrete pipe conduits shall be laid in Class 'A' bedding where indicated as shown in the plans.

3. Laying pipe - Bell and spigot pipe shall be placed with the bell end upstream. Joints shall be made in accordance with recommendations of the manufacturer of the material where concrete bedding is indicated. Bedding shall be placed so that all spaces under the pipe are filled. This shall be done after the joints are sealed for the entire line. Care shall be exercised to prevent any deviation from the original line and grade of the pipe concrete.

Erosion Protection

Vegetation shall be established on all exposed surfaces of the embankment, spillway, and borrow area where soil and climatic conditions permit. Where soil or climatic conditions preclude the use of vegetation, and erosion protection is needed, non-vegetative means such as mulches or gravel may be used. In some cases, temporary vegetation may be used until conditions are right for the establishment of permanent vegetation. The embankment and spillway shall be fenced where necessary to protect the vegetation.

Seedbed preparation, seeding, fertilizing, and mulching shall comply with DelDOT Standards and Specifications.

Principal Spillways

Corrugated metal pipe and its fittings shall conform to the standards set forth in the appropriate American Society of Testing Materials Designation(s) suitable for the intended purpose. These may include, but not be limited to, ASTM A-760, A-762, A-849, A-885, B-745, and B-790. Antiseep collars are to be of materials compatible with the pipe and installed so as to be watertight. The pipe shall be installed in accordance with the manufacturer's instructions. The pipe shall be installed and uniformly bedded throughout its length and shall be installed to line and grade as shown on the drawings.

Concrete

Concrete shall conform to Class A (f'c=4500 psi) in Section 812 of the Standard Specifications. Concrete riser srtuctures may be poured in place or precast. If precast, the Contractor shall be responsible for designing the lifting lugs and hardware, etc. required to transport and install the structures. The top slab shall not be used to lift the riser structures.

Maintenance Access Roads

Maintenance access roads shall be built as stabilized construction entrances during construction of stormwater ponds. Upon final stabilization of pond, six (6) inches of topsoil shall be placed on the stabilized construction entrance and the access road shall be stabilized with seed and mulch items as indicated on stabilization notes, sheet SWM-2. Payment for the maintenance access roads will be made for each item of work previously described which makes up the access road.

Embankment and Excavated Ponds

All completed construction shall conform to the lines, grades, and elevations shown on the drawings or as staked in the field.

Construction operations shall be carried out in such a manner and sequence that erosion and air and water pollution will be minimized and held within legal limits. All work will be conducted in a skillful and professional manner.

The completed job shall present a professional appearance.

Measures and construction methods that enhance fish and wildlife values shall be incorporated as needed and practical.

Fencing and cover to control erosion and pollution shall be established as needed.

Appropriate safety measures, such as warning signs, rescue facilities, fencing, etc., shall be included in the construction drawings and specifications.

An operation and maintenance plan shall be agreed to by the owner and operator.

Sediment set-aside areas indicated on the Plans are for future maintenance use by DelDOT. At the conclusion of the project, the Contractor shall provide DelDOT with permanent stormwater management ponds that are free of all accumulated sediment, and sediment set-aside areas that are free of accumulated sediment.

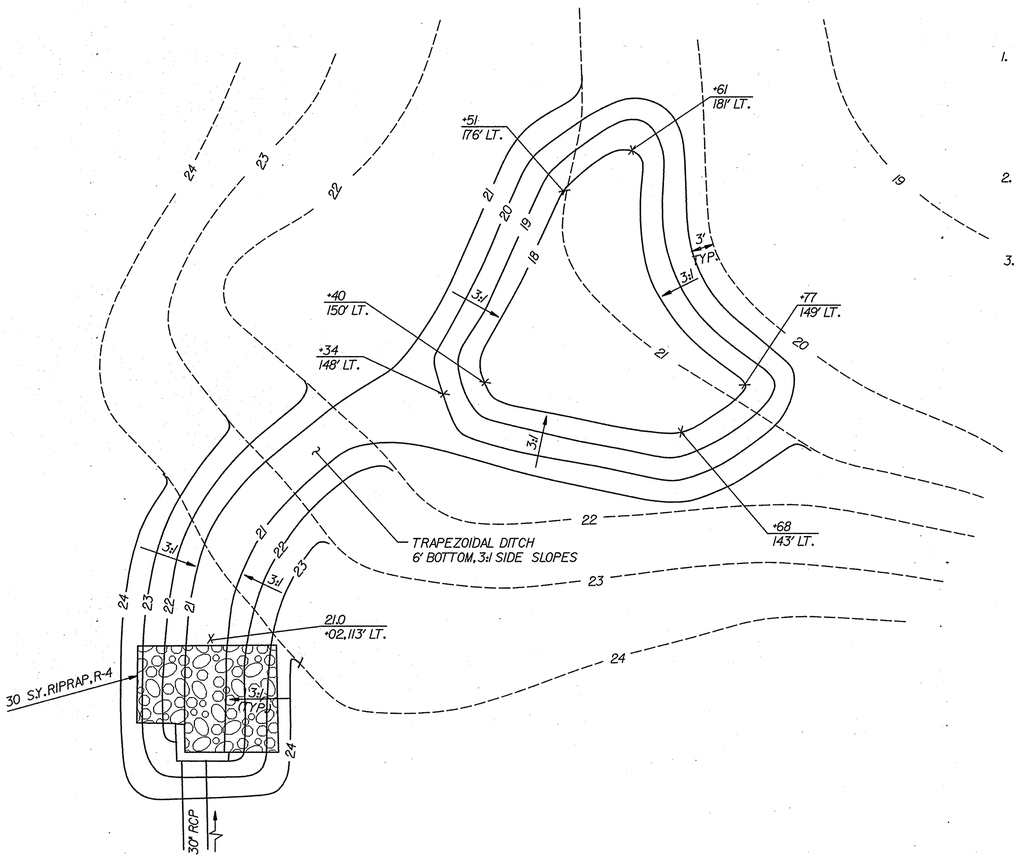
FILE: m:\del-rel\pondspec.dgn
DATE: 2-May-96 12:31

SCALE	CONTRACT	COUNTY	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
AS SHOWN	91-110-16	NEW CASTLE	F-NH-1003(15)	298	488

SR1, NORTH OF APPOQUINIMINK BRIDGE TO S. OF N423

STORMWATER MANAGEMENT PLANS AND DETAILS

REVISIONS



PLUNGE POOL DETAIL

SCALE: 1" = 10'

STABILIZATION NOTES:

1. *DRY GROUND STABILIZATION*

   A. FOR SLOPES LESS THAN 3:1, PROVIDE ITEM 734013 - PERMANENT SEEDING, DRY GROUND AND ITEM 740013 - MULCHING, STRAW

   B. FOR SLOPES 3:1 AND GREATER, PROVIDE ITEM 734014 - PERMANENT CROWN VETCH SEEDING AND ITEM 735521 - BONDED FIBER MATRIX (WOOD FIBER, SPRAYED)

2. *DRY GROUND STABILIZATION FOR CHANNELS*

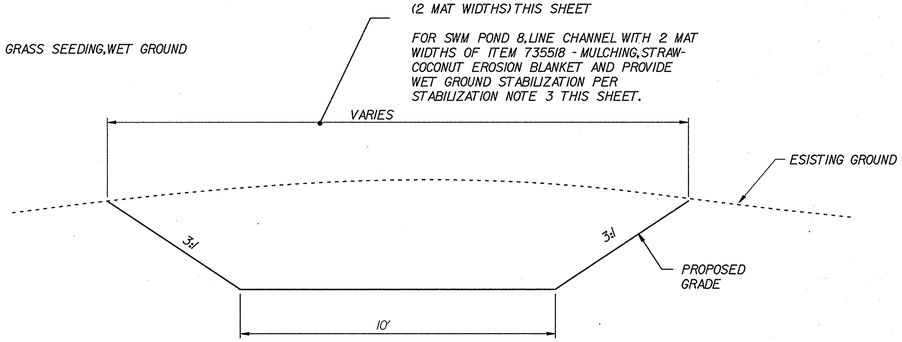
   PROVIDE ITEM 734014 - PERMANENT CROWN VETCH SEEDING AND ITEM 735518 - MULCHING, STRAW-COCONUT EROSION BLANKET (UNLESS SPECIFIED OTHERWISE, USE 1 BLANKET WIDTH)

3. *WET GROUND STABILIZATION*

   A. PROVIDE ITEM 734015 - PERMANENT GRASS SEEDING, WET GROUND

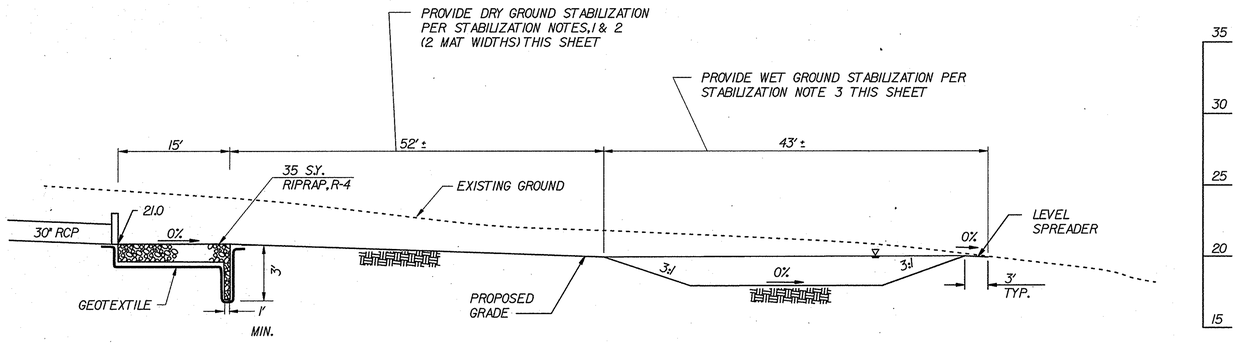
FOR SWM PONDS 2, 6, AND 7, PROVIDE DRY GROUND STABILIZATION PER STABILIZATION NOTES 1 & 2 (2 MAT WIDTHS) THIS SHEET

FOR SWM POND 8, LINE CHANNEL WITH 2 MAT WIDTHS OF ITEM 735518 - MULCHING, STRAW-COCONUT EROSION BLANKET AND PROVIDE WET GROUND STABILIZATION PER STABILIZATION NOTE 3 THIS SHEET.



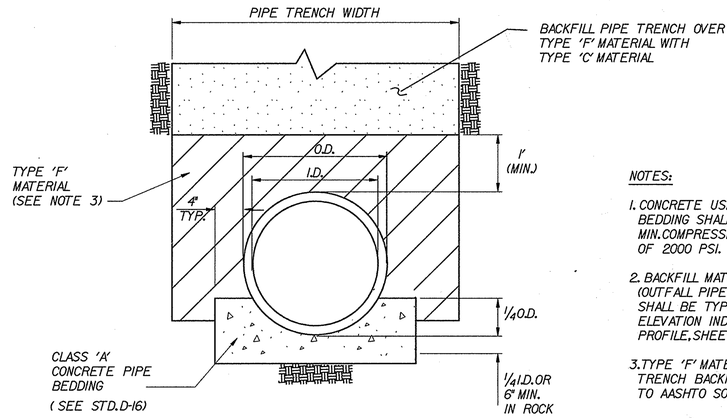
EMERGENCY SPILLWAY TYPICAL SECTION

NOT TO SCALE



PROFILE ALONG ℄ OF CHANNEL AND PLUNGE POOL

SCALE: HORZ. 1" = 10'
VERT. 1" = 5'



NOTES:

1. *CONCRETE USED FOR PIPE BEDDING SHALL HAVE A MIN. COMPRESSION STRENGTH OF 2000 PSI.*
2. *BACKFILL MATERIAL FOR PIPE 15-10 (OUTFALL PIPE FOR SWM POND NO. 8) SHALL BE TYPE 'F' MATERIAL TO ELEVATION INDICATED ON EMBANKMENT PROFILE, SHEET SWM-15.*
3. *TYPE 'F' MATERIAL USED FOR PIPE TRENCH BACKFILL SHALL CONFORM TO AASHTO SOIL CLASSIFICATION A-6.*

CLASS 'A' CONCRETE BEDDING AND PIPE TRENCH BACKFILL

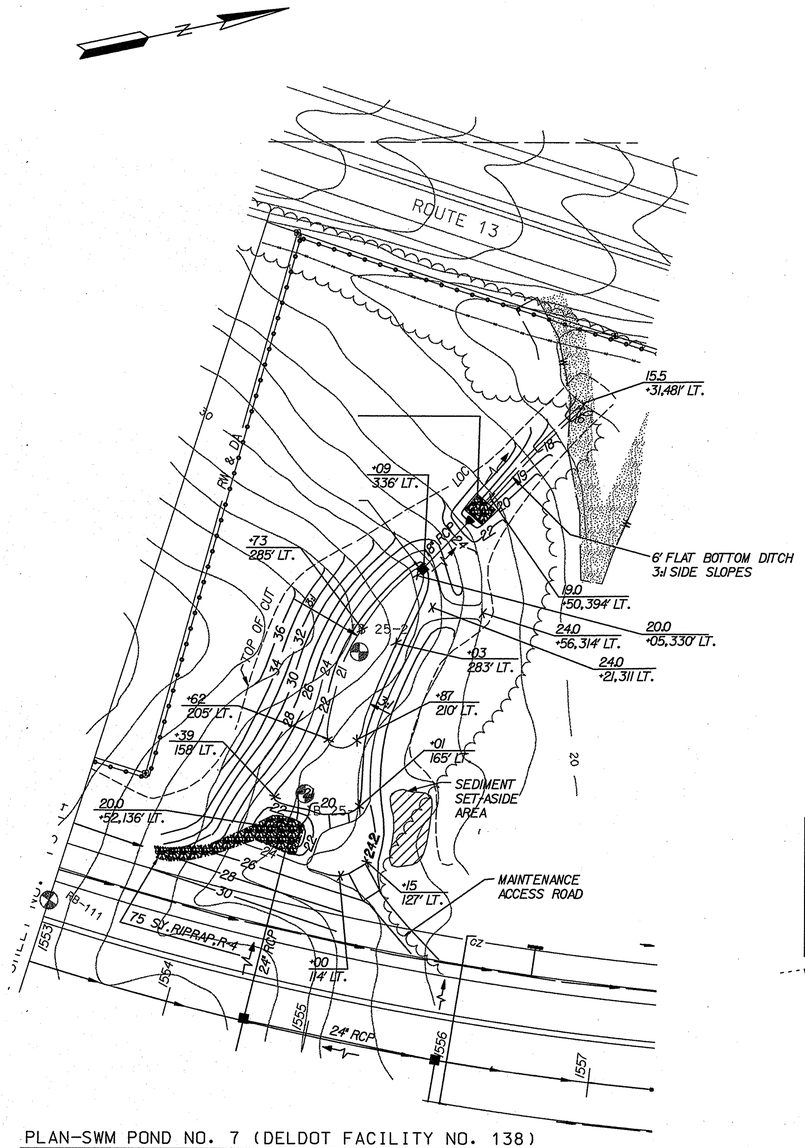
NOT TO SCALE

SWM-13 OF 19	SCALE	CONTRACT	COUNTY	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
	AS SHOWN	91-110-16	NEW CASTLE	F-NH-1003(15)	309	488

SR1, NORTH OF APPOQUINIMINK BRIDGE TO S. OF N423

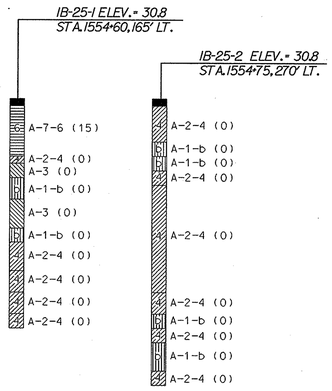
STORMWATER MANAGEMENT PLANS AND DETAILS

REVISIONS



PLAN-SWM POND NO. 7 (DELDOT FACILITY NO. 138)

SCALE: 1"=50'

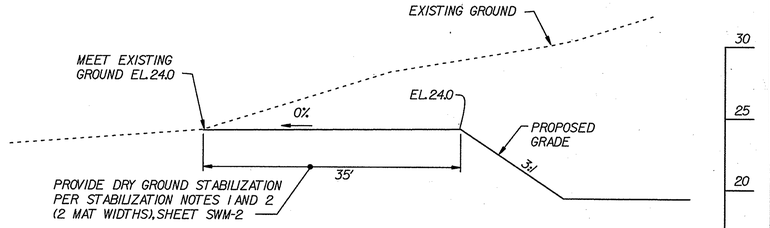


BORING LOGS

SCALE: 1" = 5' VERT.

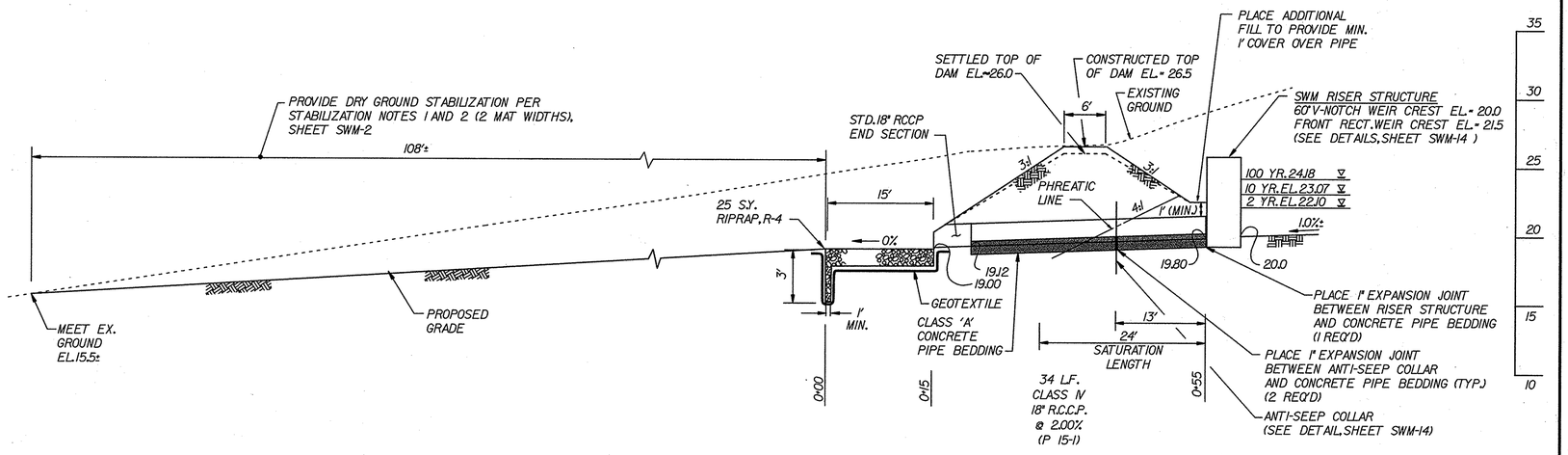
NOTES:

1. RIPRAP OUTFALL IS 15' WIDE.
2. SEE DETAIL FOR ROCK OUTLET PROTECTION II ON SHEET RD-10 FOR CONSTRUCTION SPECIFICATIONS OF RIPRAP OUTFALL.
3. SEE DETAIL FOR "CLASS 'A' BEDDING AND PIPE TRENCH BACKFILL" ON SHEET SWM-2 FOR PIPE BEDDING AND BACKFILL OF OUTFALL PIPE P 15-1.
4. PROVIDE WET GROUND STABILIZATION IN STORMWATER MANAGEMENT POND NO.7 FROM POND BOTTOM TO ELEV. 22.0 PER STABILIATION NOTE 3, SHEET SWM-2. PROVIDE DRY GROUND STABILIZATION ABOVE ELEV. 22.0 PER STABILIZATION NOTE 1, SHEET SWM-2.
5. TYPICAL SECTION OF EMERGENCY SPILLWAY IS LOCATED ON SHEET SWM-2.



PROFILE ALONG ℄ OF EMERGENCY SPILLWAY
SWM POND NO. 7

SCALE H: 1"=10'
V: 1" =5'



PROFILE ALONG ℄ OF PRINCIPAL SPILLWAY
SWM POND NO. 7

SCALE H: 1"=10'
V: 1" =5'

FILE: m:\del-rel\pond7pp.dgn
DATE: 4-Apr-96 16:21

SCALE	CONTRACT	COUNTY	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
AS SHOWN	91-110-16	NEW CASTLE	F-NH-1003(15)	310	488

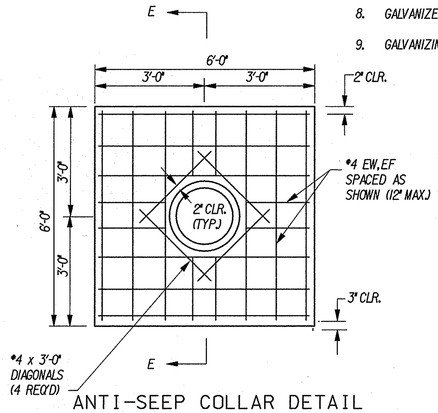
SR1, NORTH OF APPOQUINIMINK BRIDGE TO S. OF N423

STORMWATER MANAGEMENT PLANS AND DETAILS

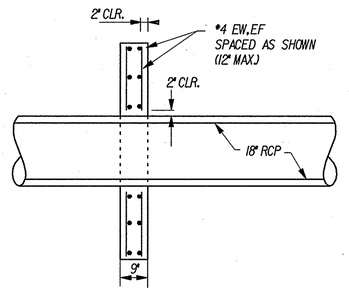
REVISIONS

NOTES:

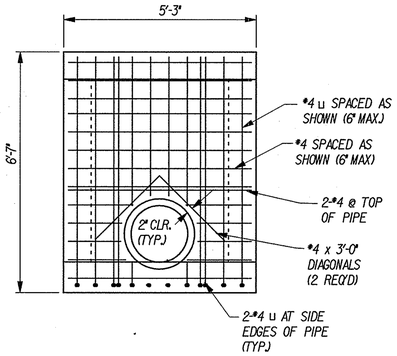
1. PLACE 1' DEPTH DELAWARE NO.57 STONE BENEATH RISER STRUCTURE. STONE SHALL EXTEND A MIN.OF 1' BEYOND OUTSIDE WALLS AND HAVE A 1:1 SLOPE.STONE SHALL BE INCIDENTIAL TO THE COST OF THE RISER STRUCTURE.
2. TRASH RACK SHALL BE INCIDENTAL TO THE COST OF THE RISER STRUCTURE.
3. ANTI-SEEP COLLAR SHALL BE INCIDENTAL TO THE COST OF THE RISER STRUCTURE.
4. RISER STRUCTURE SHALL BE PAID FOR UNDER ITEM 602558,"CONCRETE RISER STRUCTURE"
5. CONCRETE SHALL CONFORM TO CLASS A (f'c = 4500 psi)
6. REINFORCING STEEL SHALL CONFORM TO AASHTO M31,GRADE 60.
7. GALVANIZED BOLTS SHALL CONFORM TO ASTM A307.
8. GALVANIZED STEEL ANGLES SHALL CONFORM TO AASHTO M270,GRADE 36.
9. GALVANIZING SHALL CONFORM TO ASTM A153.



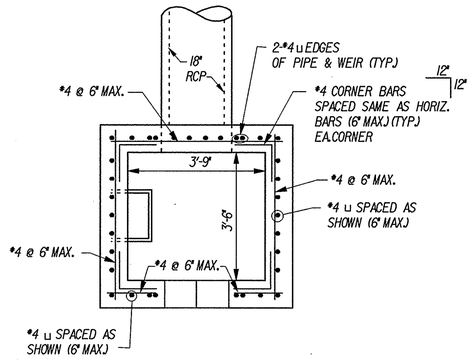
ANTI-SEEP COLLAR DETAIL



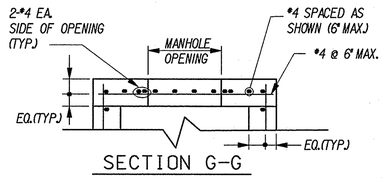
SECTION E-E



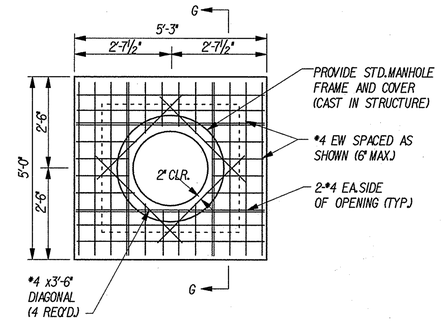
BACK WALL ELEVATION C-C



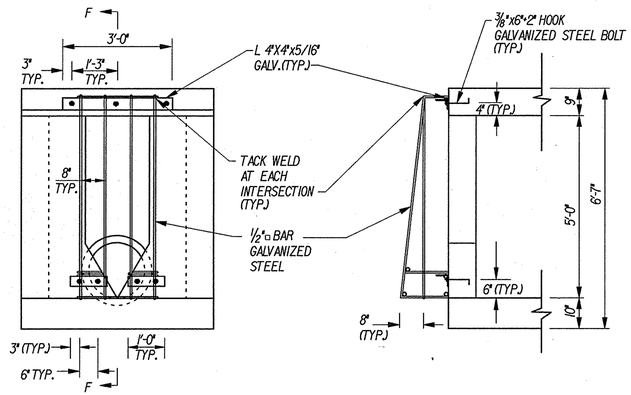
SECTION A-A



SECTION G-G



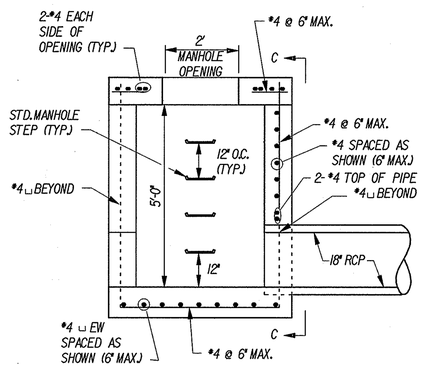
TOP SLAB PLAN VIEW



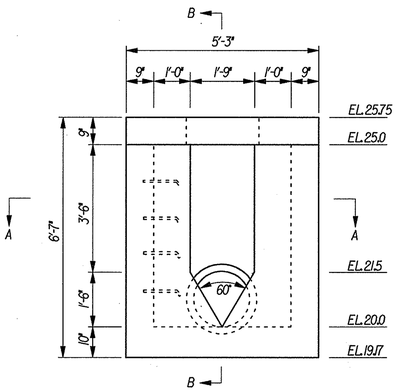
FRONT WEIR TRASH RACK

SECTION F-F

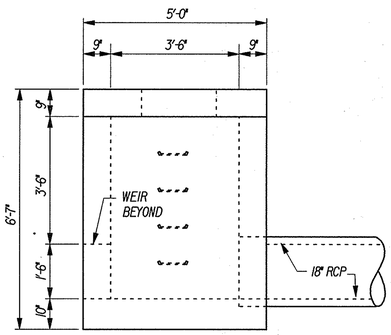
DO NOT USE TOP SLAB TO LIFT RISER STRUCTURE



SECTION B-B



FRONT VIEW



SIDE VIEW

SWM POND NO. 7
RISER STRUCTURE DETAILS

SCALE: ½" = 1'-0"

FILE: m:\del-reh\swm7det.dgn
DATE: 5-Apr-96 09:02

DELDOT AGR. 2056

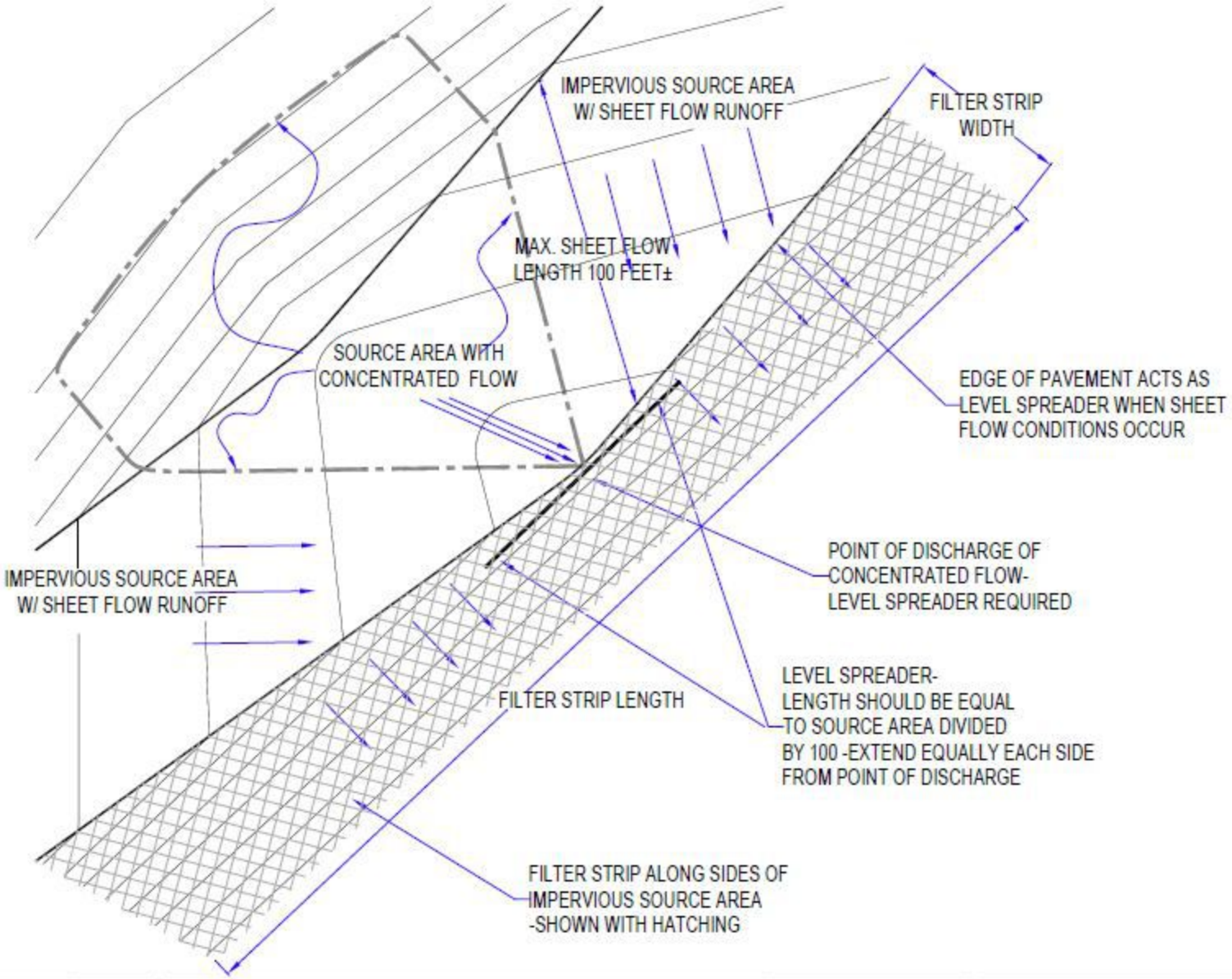
KCI PROJECT NO. 00008105_00001

BMP FIELD INVENTORY AND INSPECTION

STANDARD OPERATING PROCEDURES

APPENDIX B-8

FILTER STRIP STANDARD DETAILS



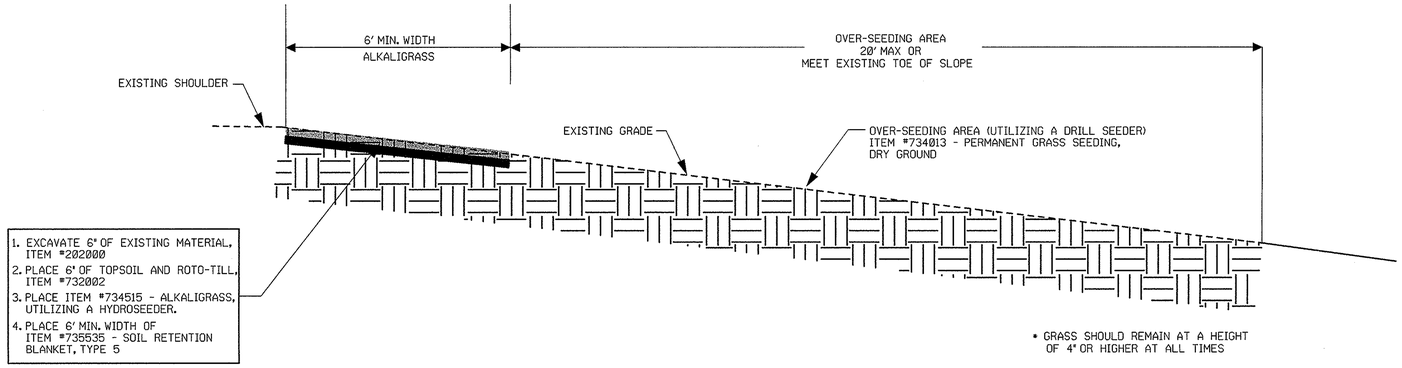
GREEN TECHNOLOGY: THE DELAWARE URBAN RUNOFF MANAGEMENT APPROACH	TYPICAL DETAIL FILTER STRIP DESIGN CRITERIA (N.T.S.)	DETAIL NUMBER: 2.3.1 DATE: JUNE 2005

STORMWATER MANAGEMENT DETAILS

CONTRACT	COUNTY	F.A.P. NO.	SHEET NO.	TOTAL SHTS.
23-110-01	KENT	SEE TITLE SHEET	87	204

DOVER TOLL PLAZA
HIGHWAY SPEED EZ PASS LANES

REVISIONS



FILTER STRIPS

NOT TO SCALE

NOTES:

1. THE CONTRACTOR SHALL PLACE A MIN. 6" TOPSOIL, SEED, AND PLACE SOIL RETENTION BLANKET, TYPE 5 ON ALL LOCATIONS REQUIRING TOPSOIL AS DIRECTED BY THE ENGINEER IN THE FIELD. ALL COSTS INCLUDED UNDER THE APPROPRIATE ITEMS.
2. THE CONTRACTOR SHALL ROTO-TILL ALL LOCATIONS WHERE TOPSOIL IS PLACED. ALL COSTS INCLUDED IN ITEM *734013.
3. THE CONTRACTOR SHALL UTILIZE A DRILL SEEDER TO PLACE ITEM *734013 - PERMANENT GRASS SEEDING, DRY GROUND WITHIN THE OVER-SEEDING LIMITS. THE CONTRACTORS DRILL SEEDING EQUIPMENT MUST BE APPROVED BY THE ENGINEER PRIOR TO THE START OF ANY OVER-SEEDING WORK.

PREL. TRACING _____ DESIGN _____ CHKD. _____

03/21/2003
08:55:09
C:\Projects\Dovertollplaza\Dgnfiles\Final Design\swmdetdls01dtp.dgn
08:55:09 PM

DELDOT AGR. 2056

KCI PROJECT NO. 00008105_00001

BMP FIELD INVENTORY AND INSPECTION

STANDARD OPERATING PROCEDURES

APPENDIX B-9

INFILTRATION BASIN STANDARD DETAILS

STORMWATER MANAGEMENT PLAN

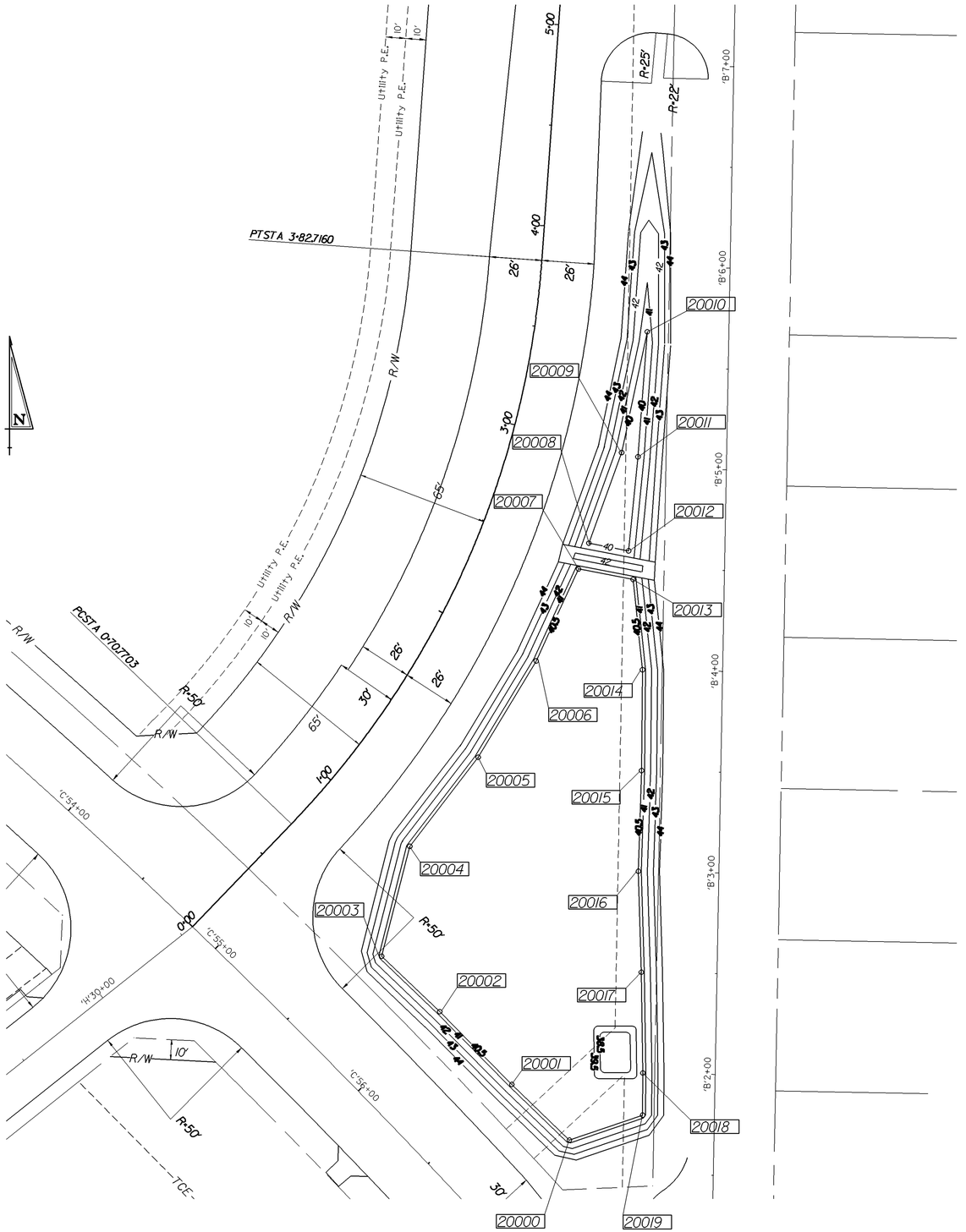
SCALE 0 10 20 30 40 50

CONTRACT	COUNTY	F.A.P. NO.	SHEET NO.	TOTAL SHTS.
21-042-01	KENT	SEE TITLE SHEET	27	53

SR 15, K447 TO K407, MILFORD

REVISIONS	

SWM FACILITY #106



COORDINATE LIST

POINT NO.	NORTH	EAST
20000	337,807.092	644,405.477
20001	337,834.679	644,376.972
20002	337,870.774	644,341.182
20003	337,898.233	644,312.490
20004	337,952.758	644,326.381
20005	337,996.974	644,360.238
20006	338,044.7213	644,389.012
20007	338,090.348	644,410.007
20008	338,103.112	644,415.121
20009	338,148.066	644,431.371
20010	338,207.972	644,444.076
20011	338,145.953	644,439.471
20012	338,099.318	644,434.843
20013	338,085.152	644,437.020
20014	338,040.360	644,441.682
20015	337,990.358	644,441.288
20016	337,940.380	644,439.674
20017	337,890.169	644,441.169
20018	337,840.321	644,441.915
20019	337,819.390	644,441.657

PREL. _____ TRACING _____ DESIGN _____ CHK'D. _____

STORMWATER MANAGEMENT PLAN

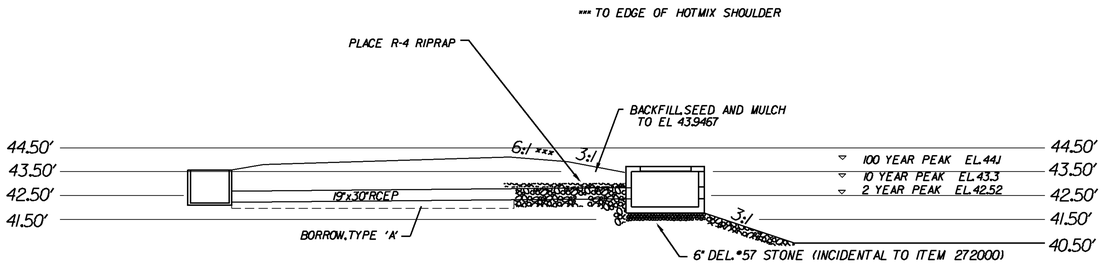
SCALE 0 10 20 30 40 50

CONTRACT	COUNTY	F.A.P. NO.	SHEET NO.	TOTAL SHTS.
21-042-01	KENT	SEE TITLE SHEET	28	53

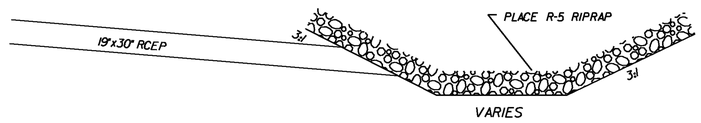
SR 15, K447 TO K407, MILFORD

REVISIONS	

SWM FACILITY #106

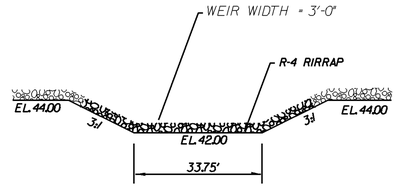


OUTLET STRUCTURE PROFILE
N.T.S.

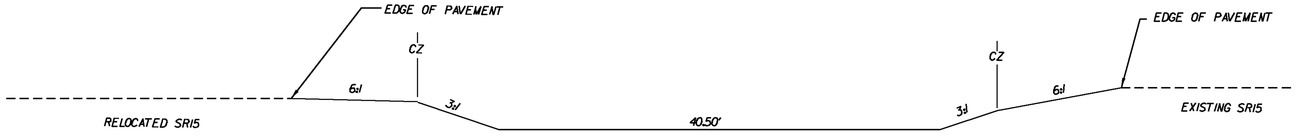


INLET STRUCTURE PROFILE
STATION 4+00 Prop. SR 15

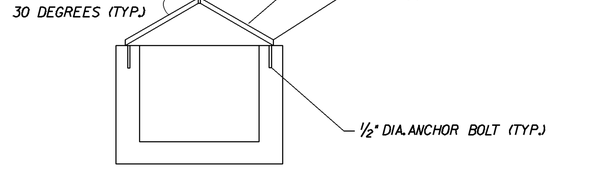
NTS



STONE CHECK DAM
SEDIMENT FOREBAY TO POND
SEE STANDARD SHEET E-5 FOR FURTHER DETAILS
N.T.S.

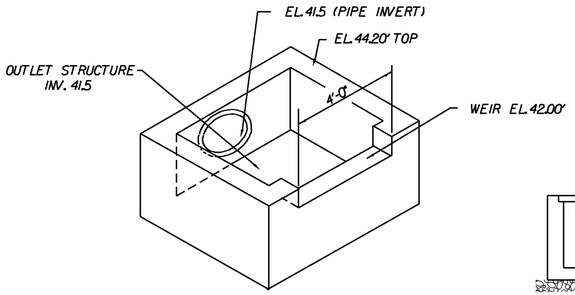


STORMWATER POND CROSS SECTION
N.T.S.

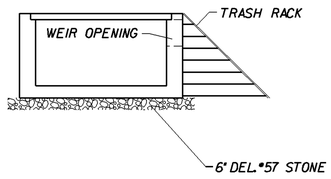


SECTION

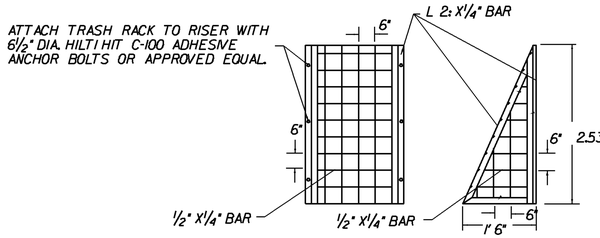
TRASHRACK SHALL BE CONSTRUCTED OF ALUMINUM
TRASH RACK DETAIL (N.T.S.)



OUTLET STRUCTURE DETAIL
MODIFIED 66"X30" DRAINAGE INLET
N.T.S.

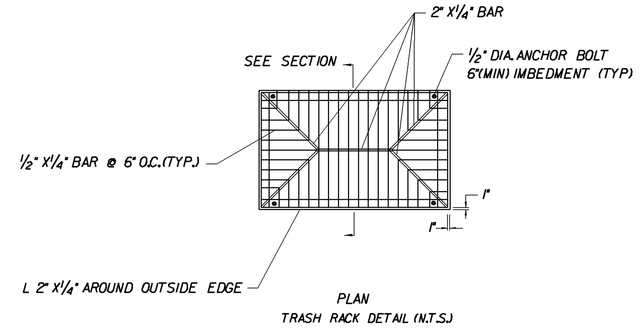


SIDE VIEW
N.T.S.



NOTE: COST FOR MATERIALS AND FABRICATION OF TRASH RACK TO BE INCIDENTAL TO ITEM 272000, POND OUTLET STRUCTURE, CONCRETE, TYPE I

TRASH RACK DETAIL (N.T.S.)



PLAN
TRASH RACK DETAIL (N.T.S.)

OUTLET STRUCTURE DETAILS

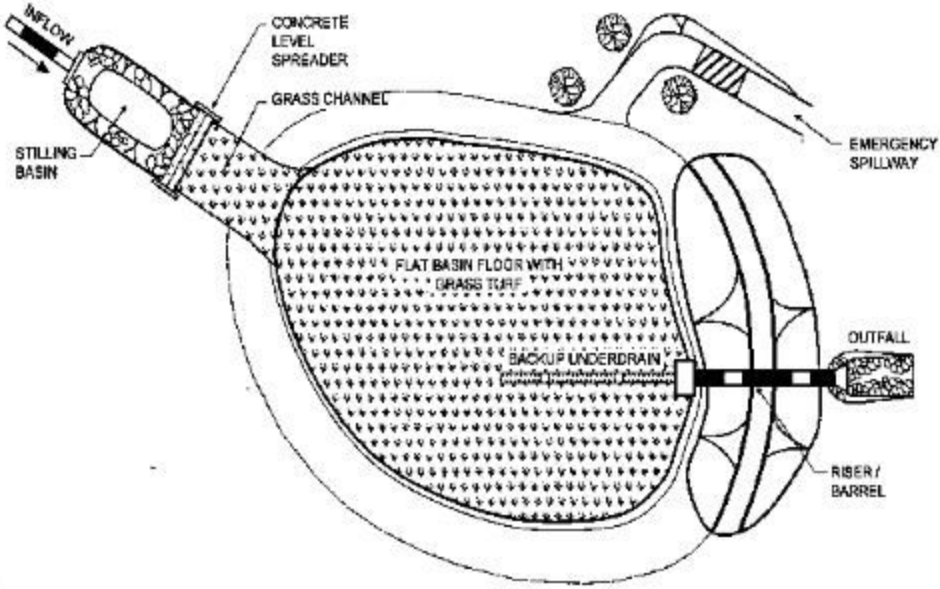
N.T.S.

(ITEM 272000, POND OUTLET STRUCTURE, CONCRETE, TYPE I)

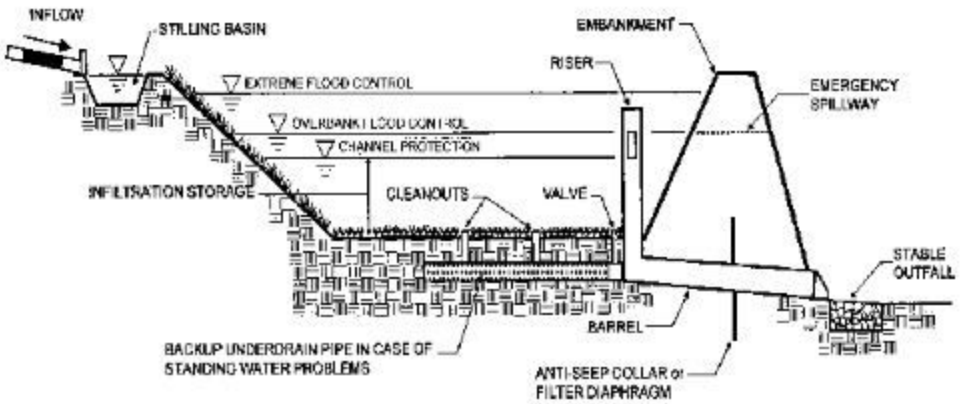
CHK'D.

DESIGN

PREL. TRACING



PLAN VIEW



PROFILE

DELDOT AGR. 2056

KCI PROJECT NO. 00008105_00001

BMP FIELD INVENTORY AND INSPECTION

STANDARD OPERATING PROCEDURES

APPENDIX B-10

INFILTRATION TRENCH STANDARD DETAILS

CONSTRUCTION DETAIL
SCALE AS NOTED

CONTRACT	COUNTY	F.A.P. NO.	SHEET NO.	TOTAL SHTS
25-128-04	NEW CASTLE	SEE TITLE SHEET	96	229

US301 FROM N444, MIDDLE NECK TO N58, PETERSON RD

REVISIONS	

NOTES:

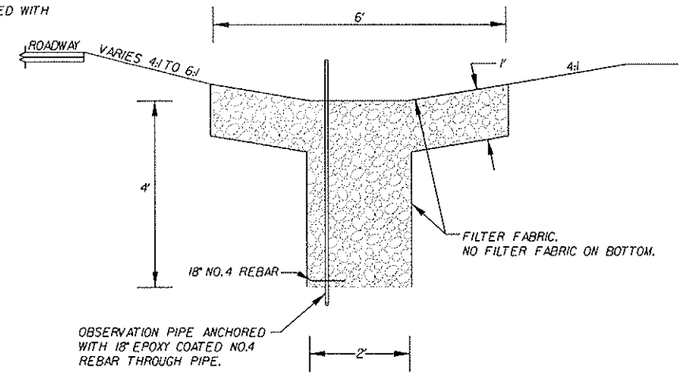
1. IN NON-PAVED AREAS, FOOTPRINT OF PROPOSED INFILTRATION TRENCH PLUS 10 FEET ALL AROUND SHALL BE MARKED WITH CONSTRUCTION TAPE AT THE BEGINNING OF PROJECT CONSTRUCTION. THIS AREA SO MARKED SHALL BE OFF LIMITS TO ALL CONSTRUCTION EQUIPMENT UNTIL CONSTRUCTION OF INFILTRATION TRENCH BEGINS.

2. DURING CONSTRUCTION, CONTRACTOR SHALL EXERCISE CAUTION NOT TO DISTURB AND COMPACT ANY IN SITU SOIL LAYER BELOW THE PROPOSED GRADE AND WITHIN THE 6-FOOT WIDE FOOTPRINT OF THE INFILTRATION TRENCH. ANY GLAZED AND COMPACTED SURFACE CAUSED BY EXCAVATION OPERATION AT THE BOTTOM OF THE TRENCH SHALL BE SCARIFIED BEFORE BACKFILLING.

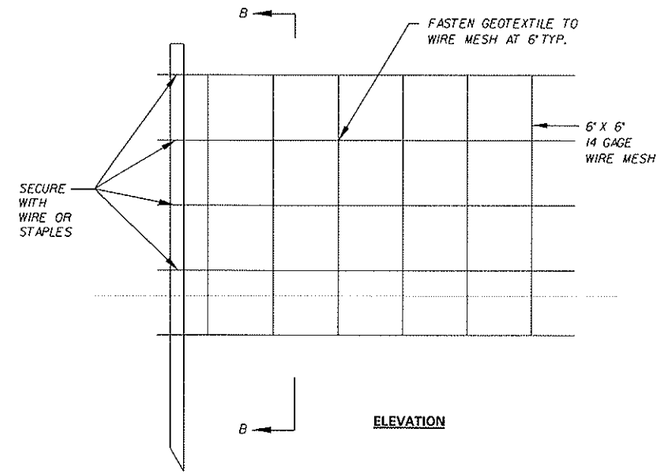
3. FILTER FABRIC SHALL BE MIRAFI 140N, LINQ GTF 1300, AMOCO 4545 OR APPROVED EQUAL IN ACCORDANCE WITH SECTION 827.04 OF THE STANDARD SPECIFICATIONS. WHEN THE ENTIRE DRAINAGE AREA HAS BEEN STABILIZED WITH A GOOD STRAND OF GRASS AT LEAST 6 INCHES TALL AND APPROVED BY THE ENGINEER, THE CONTRACTOR SHALL CUT THE FILTER FABRIC AT GROUND LEVEL AND EXPOSE THE TOP SURFACE OF TRENCH. IMMEDIATELY SEED AND MULCH ALL EXPOSED SOIL WITH SRBM, TYPE 5.

4. STONE BACKFILL FOR INFILTRATION TRENCH SHALL BE DE NO.3 STONE FOR THE LOWER 3-FEET AND DE NO.1 FOR THE UPPER 1-FOOT. STONES SHALL BE CLEAN, DOUBLE WASHED CRUSHED AGGREGATES FREE OF ROCK DUST, FINES OR SOIL PARTICLES. STONES SHALL NOT BE CRUSHED LIMESTONE AGGREGATES. ANY SEDIMENT CONTAMINATED STONE BACKFILL PRIOR TO PROJECT ACCEPTANCE AS DETERMINED BY THE ENGINEER SHALL BE REPLACED AT CONTRACTORS EXPENSE.

5. AN OBSERVATION PERFORATED PIPE SHALL BE INSTALLED AT THE DOWNSTREAM END OF EACH INFILTRATION TRENCH. THE PIPE SHALL BE 5-FEET LONG, 4-INCH PVC SCH.40 WITH A REMOVABLE CAP AT TOP END AND A PERMANENT CAP AT BOTTOM END. TOP OF REMOVABLE CAP SHALL BE 6-INCHES ABOVE STONE BACKFILL. PERFORATIONS SHALL BE 3 ROWS OF 5/8-INCH HOLES AT 6-INCH ON CENTER.

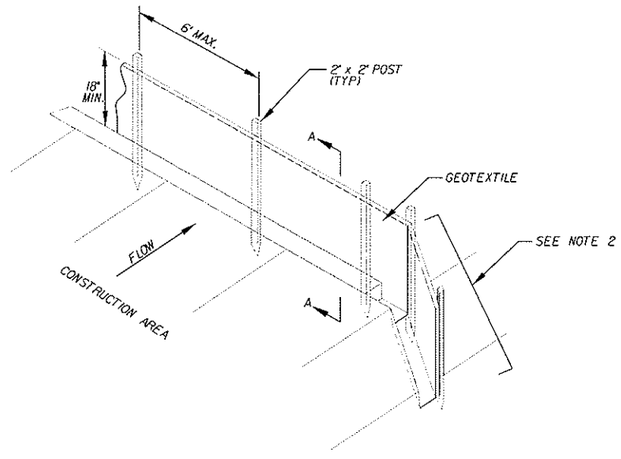


INFILTRATION TRENCH DETAIL (ITEM 718513)
NOT TO SCALE

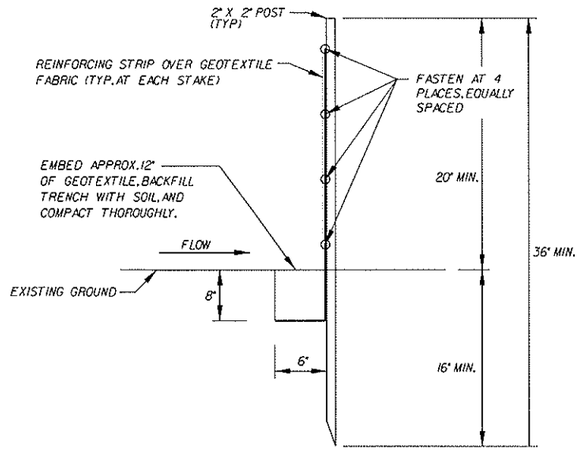


ELEVATION

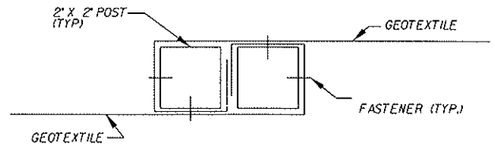
WIRE MESH DETAIL
REINFORCED SILT FENCE ONLY



ISOMETRIC VIEW



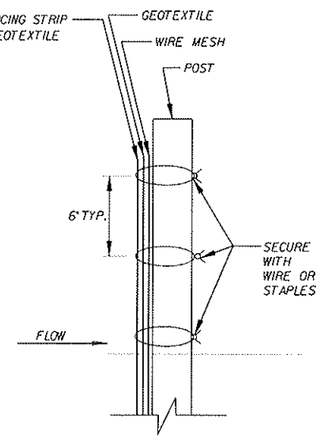
SECTION A-A



CONNECTION DETAIL
FOR USE WITH JOINING TWO ADJACENT SILT FENCE SECTIONS

NOTES:
1. THIS DEVICE IS INTENDED TO CONTROL SHEET FLOW ONLY. IT SHALL NOT BE USED IN AREAS OF CONCENTRATED FLOW.

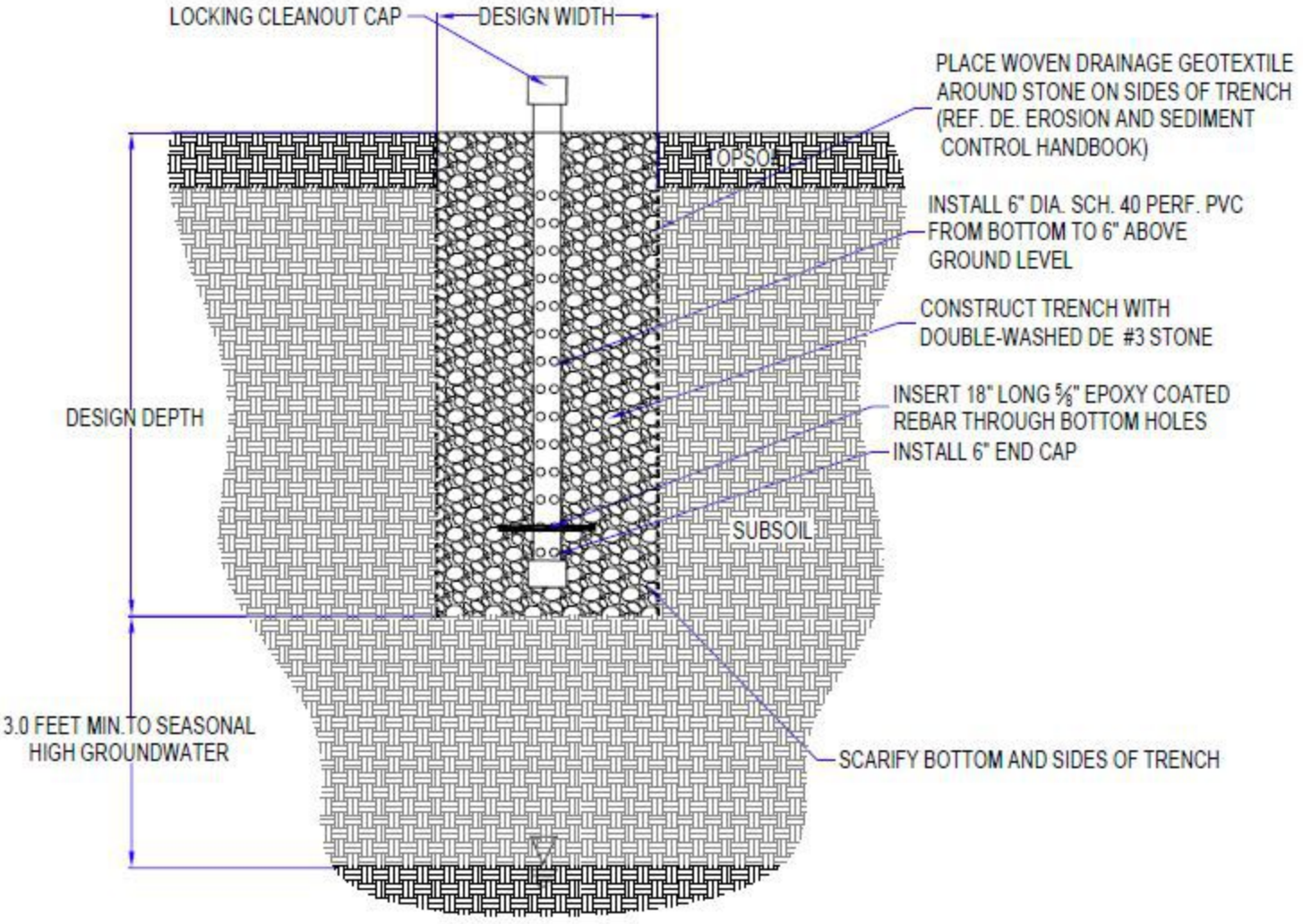
2. SILT FENCE ENDS ARE TO BE PLACED UPSLOPE TO CONTAIN RUNOFF.



SECTION B-B

SILT FENCE DETAIL (ITEM 251501)
NOT TO SCALE

DESIGN W.J.D. CHKD. W.J.D. CHKD. J.M.H.



GREEN TECHNOLOGY: THE DELAWARE URBAN RUNOFF MANAGEMENT APPROACH	TYPICAL DETAIL INFILTRATION TRENCH AND OBSERVATION PORT (N.T.S.)	DETAIL NUMBER: 2.6.1 DATE: JUNE 2005

DELDOT AGR. 2056

KCI PROJECT NO. 00008105_00001

BMP FIELD INVENTORY AND INSPECTION

STANDARD OPERATING PROCEDURES

APPENDIX B-11

PERMEABLE PAVEMENT STANDARD DETAILS

URBAN Waterways

Maintaining Permeable Pavements

INTENDED FUNCTION AND BENEFITS OF MAINTENANCE

Research studies and anecdotal case studies from across the USA and the world have shown that permeable pavements substantially and significantly reduce runoff volumes, limit peak flows, and sequester (trap) many types of pollutants. Many permeable pavements further improve ground water recharge, have high albedo (light reflectivity), reduce runoff temperature, and improve aesthetics. Permeable pavements are able to achieve this by allowing water to pass through the surface layer and temporarily collect in underlying aggregate storage layers. This water then either is released back to the storm drain system through underdrains or infiltrates into the underlying soil, or a combination of both. A small fraction of runoff will evaporate or evapotranspire. To enable permeable pavements to function as intended, however, inspection and consequent maintenance are imperative.

TYPES OF PERMEABLE PAVEMENTS

For the purposes of this bulletin, any pavement that is intended to let water pass through its surface and temporarily collect in an underlying aggregate storage zone is termed permeable pavement. However, among this broad definition of pavement, there are several specific types. Several of these types are pictured in Figure 1 below. For specific details of each pavement type, please see AG-588-14W (Permeable Pavement: Research Update and Design Implications).

Permeable concrete (PC) is a mixture of Portland cement, fly ash, washed gravel, and water. **Permeable asphalt** (PA) consists of fine and course aggregate stone bound by a bituminous-based binder. Water

Figure 1. Types of permeable pavement. Top L-R: Permeable concrete (PC), permeable asphalt (PA), permeable interlocking concrete pavers (PICP). Bottom L-R: concrete grid pavers (CGP), plastic reinforcing grids (PG) filled with gravel, and PG with grass.

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passes through interconnected pores in both PC and PA. **Permeable interlocking concrete pavements** (PICP) are available in many different shapes and sizes. When laid, the blocks form patterns that create openings through which rainfall can infiltrate. **Concrete Grid Pavers** (CGP) are an "older cousin" to PICP and have relatively larger open areas that are filled with gravel, sand, or even a loamy sand top soil. **Plastic reinforcement grid pavers** (PG), also called geocells, consist of flexible plastic interlocking units that allow for infiltration through large gaps filled with gravel or topsoil planted with turfgrass. A sand bedding layer and (more frequently) gravel base course are often added to increase infiltration and storage for many of these paver systems.

All permeable pavement types must be inspected and *maintained*. There are certain elements of maintenance that are common among permeable pavements and other elements that are specific to one or two pavement types.

DESIGNING AND CONSTRUCTING WITH MAINTENANCE IN MIND

Proper design can help avoid future maintenance problems. Typically, the most common permeable pavement performance concern is clogging. Pavements must allow water to pass through their surface to be permeable. Designers can minimize the likelihood of clogging by considering the two most likely clogging sources: vegetative litter and sediment.

Parking lots with overhanging trees provide many benefits: shading to cool pavement temperature and improved aesthetics are obvious reasons to landscape parking lots with trees and shrubs. Designers must be aware, however, of unintended consequences associated with a leaf canopy overhanging a permeable application. Vegetation debris and detritus collect in permeable pavement water pathways, rendering them much less permeable. This has been anecdotally observed at several permeable pavement applications across the U.S. (Figures 2 and 3). After the tree detritus falls on to the permeable pavement, it risks being ground into the pavement by passing vehicle tires. Large parking lots that are fringed by trees have had their perimeters clog, but the middle portions did not clog (Figure 2). While the purpose of this chapter/bulletin is not to dissuade designers from incorporating vegetation in the parking lot, designers do need to be mindful that any pavement underneath a tree canopy is at a much higher risk of clogging than pavement free and clear of vegetation.

Sediment accumulation from disturbed areas surrounding the permeable pavement is the most frequent cause of permeable pavement failure. Designers must take special care to inform contractors to minimize exposure of permeable pavement to sediment during construction. Permeable pavements in residential areas are particularly at risk. As one home is completed, an adjoining property may remain under construction. In these cases, the likelihood of sediment deposition from wind, water, and tires is very high (Figure 3).

LANDSCAPE MAINTENANCE ACTIVITIES: AVOIDING PROBLEMS

Property owners often incorporate landscape maintenance as part their property upkeep. Common activities include re-mulching and lawn mowing with discharge of clippings. An uninformed landscaper may deposit his mulch pile on the pavement immediately adjacent to the landscape bed he is beautifying or may discharge grass clippings onto the pavement. If that pavement is permeable, a clogging source has just been introduced. An easy way to avoid this issue is either to bag clippings or place the mulch pile on a tarp that can be carefully removed to prevent clippings or mulch from falling onto the permeable pavement.

In locations with snowfall, plowing is a necessary maintenance activity that can have an impact on permeable pavement function. When non-spec (unscreened and unwashed) sand (meant for vehicle traction, not permeable pavement infiltration) is

Figure 2. Leaf and tree detritus collects in pathways intended for water in PICP located underneath a tree line outside Chicago, IL.

Figure 3. Residential construction increases the likelihood of sediment accumulation in permeable pavements (left). A pervious asphalt pavement near Philadelphia, PA, is clogged due to runoff from an adjoining area that was not stabilized (right).

placed upon snow and ice and is later plowed to a location that drains to or on top of permeable pavement, a clogging source is introduced to the pavement. Either (1) preventing the stockpiling of snow on permeable pavement or (2) requiring post-event street sweeper maintenance (discussed later) are two options of limiting winter weather induced clogging.

PRIMARY INSPECTION AND MAINTENANCE TASKS

Permeable pavement maintenance is rather straightforward when compared to other stormwater management practices (such as bioretention, wet ponds, and stormwater wetlands). The common inspection and maintenance tasks are: (1) verifying that clogging has not occurred, (2) preventive street sweeping, (3) weeding, and (4) stain removal. Additionally, some pavement type-specific tasks include: (1) restorative street sweeping and (2) mowing.

Each of those inspection and maintenance activities is discussed in more detail.

Inspection

Regular inspection is an essential part of permeable pavement maintenance. During the visit the pavement's surface can be examined for accumulated dust, sediment, and debris (Figure 4). A simple test to verify whether the pavement is infiltrating properly is to empty a bucket or large bottle of water on the pavement and examine how long it takes for water to soak through the pavement and the "water mark" that is left. Pavements that require from several seconds to min-

Figure 4. Visual inspection of a pervious concrete lot in Georgia shows accumulation of both sediment and leaf debris (left). The fact that the lot is clogged is confirmed by emptying approximately 1 gallon of water on the lot, which subsequently runs off rather than infiltrating (right).

utes for the water to stop flowing are clogged to some degree (Figure 4).

During the site visit, the inspector can scout for weed growth and trash deposition. If the permeable pavement is underdrained, the underdrain outlet should be checked to verify it is not blocked. If the visit occurs after a storm, a trickle of water would be expected from the underdrain.

STREET SWEEPING

Street sweeping is the most important maintenance task associated with permeable pavement. Street sweeping can serve one of two purposes: preventive maintenance and restorative maintenance. Preventive street sweeping is preferred. Preventive sweeping is regular, scheduled passes by a street sweeper during a calendar year. While the exact frequency has yet to be determined, it appears two to four visits per year for most permeable pavement applications is sufficient. If the permeable pavement has been neglected for several years, however, preventive maintenance will not be sufficient, so restorative street sweeping will be required to restore a pavement's ability to infiltrate water. The type of equipment needed to achieve either preventative maintenance or restorative maintenance is not the same.

Types of Street Sweepers

There are three main classes of street sweepers: (1) mechanical, (2) regenerative air, and (3) vacuum. Examples of mechanical and vacuum sweepers are shown in Figure 5.

Mechanical street sweepers are the most common street sweeper on the market. By some accounts, approximately 70 percent of street sweepers in the U.S. are mechanical street sweepers (Mark Kinter[1]). Mechanical sweepers employ a multiple brush approach to first move sediment and trash to the middle and then lift the deposits onto a conveyor belt for temporary storage. The brush bristles can penetrate some types of permeable pavements, but not most.

Regenerative air street sweepers are the second most common street sweeper, accounting for roughly 20 percent of street sweepers in use in the U.S. They work by shooting air at an angle to the pavement, which effectively loosens dust and other fine particles at and near the surface of the pavement. Because air is blown across the carriage of the truck, a relatively minor vacuum is created, which then lifts the loosened particles into a hopper. This system removes surface-deposited sediments from all pavement types.

Vacuum street sweepers are the least common and most expensive type of sweepr, and account for 10 percent of street sweepers in the U.S. They function by applying a strong vacuum to a relatively narrow area that lifts particles both at and below the surface of the pavement. Vacuum sweepers have demonstrated their ability to suction 3 to 4 inches of gravel from PICP and have the ability to restore infiltration to some types of pavements that have been grossly neglected.

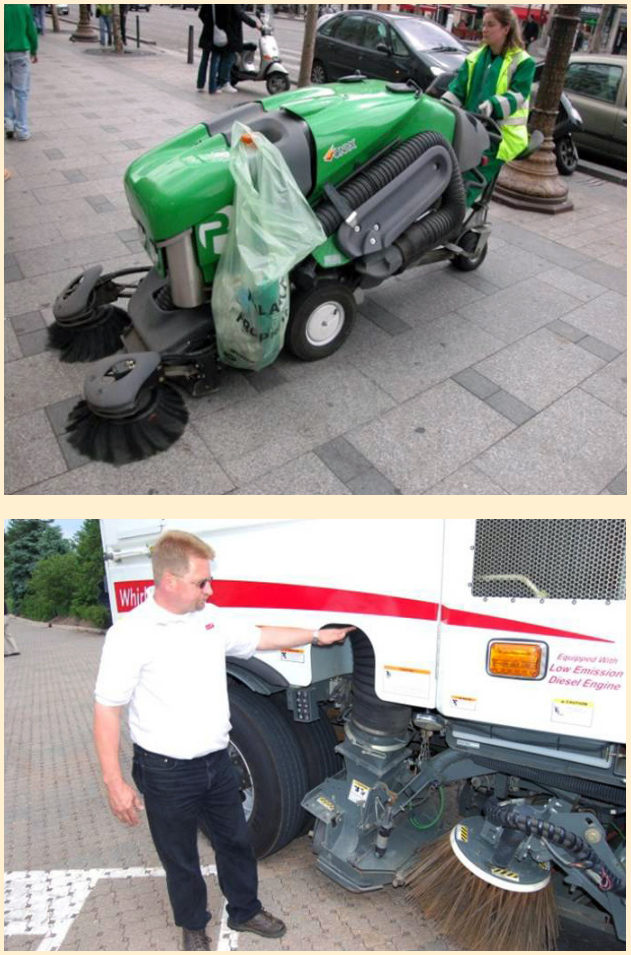

Figure 5. A small mechanical street sweeper (top) and the underpinnings of a vacuum sweeper (bottom).

Where do permeable pavements clog?

Permeable pavement systems clog at different locations in their cross-section. Because of this, not one type of street sweeper is recommended for all types of permeable pavements. Based upon anecdotal observation and research, here are the observed zones or depths of surface clogging.

Concrete grid pavers, because their gaps are filled with sand, act like a sand filter and trap most of the fine

[1]Mr. Kinter is an Elgin Street Sweeper marketing director. Conversation took place in May 2009.

Figure 6. Mechanical sweeper bristle penetration of larger gaps associated with CGP filled with sand (left) is possible, but pavement types with small gaps (such as PICP) is not (right, courtesy of Elgin Street Sweepers).

Figure 7. The clogged zone of PICP is evident toward the top portion of the interlocking paver. The depth of clogging at this location outside Chicago, IL, after 6 years of neglect was 1.5 inches (40mm).

sediment at their surface. The thin clogged zone is named "schmutzdecke" from the German word for dirt cover or ceiling. The thickness of the schmutzdecke for CGP ranges from 0.25 to 0.50 inches (James and Gerrits 2003, Bean et al. 2007). As the gaps associated with CGP are the largest of all permeable pavement types, CGP is the easiest to maintain with a mechanical sweeper. By basic geometry, the ability of bristles to penetrate a large gap to a deeper depth benefits CGP (Figure 6). Research has shown that a standard mechanical street sweeper can sufficiently penetrate the sand-filled gaps of CGP to break apart the schmutzdecke.

Dust and sediment will penetrate PICP filled with gravel to a much deeper level than that of CGP filled with sand. Field observation at a lot outside Chicago found that a 6-year-old PICP lot that had never been maintained had become clogged to a depth of 1.5 to 2.0 inches (Figure 7). Removing a schmutzdecke of this thickness is clearly beyond the ability of a standard mechanical sweeper. In fact, regenerative air street sweepers are considered insufficient for this restorative measure.

Clogging depth of pervious asphalt and pervious concrete depends upon the contributing sediment load. Research has shown that sand collected on a pervious concrete pavement will not penetrate the pavement more than an inch deep. Although pervious asphalt was not tested, it is assumed it would function similarly. However, when a fine fraction of soil (silts or clays) was a part of the clogging sediment, the clogged zone was much deeper, often at or near the bottom of the pervious concrete section (Mata 2008). Restorative maintenance of a PA or PC system clogged by fines has not yet been deemed possible. However, preventative maintenance, by way of a regenerative air street sweeper, has proven to be an adequate measure and keeps PA and PC surfaces infiltrating rainfall and run-on.

Table 1 summarizes the clogging depth of various types of permeable pavements and the appropriate vehicle for prevention or restoration. Obviously, the simplest pavement type to either maintain or restore is concrete grid pavers filled with sand. All pavement types can remain clog-free if preventive sweeper maintenance is reliably provided. If pavements are neglected and allowed to clog to sometimes substantial depths, it is uncertain whether all pavements' necessary surface infiltration rates can be restored. Also important to note, other than for CGP filled with sand, different street sweeper types are used for either preventive or restorative maintenance.

Importance of Underlying Soil Type

Bean et al. (2007) showed that even when maintenance (street sweeping) has been neglected for up to 20 years, permeable pavements can still be permeable, provided the underlying soils are permeable. Several tests of rela-

Table 1. Street sweeper assignment to various permeable pavements

Pavement Type	*Schmutzdecke* Depth	Preventive Sweeper	Restorative Sweeper
Concrete Grid Pavers filled with sand	0.5 inches	Mechanical	Mechanical
PICP filled with aggregate	1.5 to 2.0 inches	Regenerative Air	Vacuum
Pervious concrete	If Sand: < 1 inch	Regenerative Air	If Sand: Vacuum?
	If Silt/Clay: > 3 inches		If Silt/Clay: Not known
Pervious asphalt	If Sand: < 1 inch	Regenerative Air	If Sand: Vacuum?
	If Silt/Clay : > 3 inches		If Silt/Clay: Not known

tively old permeable pavements located along the North Carolina barrier islands and in the NC sandhills, both very sandy soil regions, demonstrated that despite being clogged, infiltration rates usually exceeded 1 in/hr. This is because the pavement was clogged by sand. Designers and regulators should consider whether an infiltration rate of 1 to 2 inches per hour is acceptable. If so, the frequency of required street sweeping in some (albeit limited) parts of the U.S. is reduced. A recent analysis of rainfall intensities in NC demonstrated that less than 2 percent of all rainfall intensities (as measured hourly) exceed 1 in/hr.

PICP related specifics

Street sweepers will remove fill aggregate that could then pose a tripping hazard (Figure 8). So every time PICP is machine swept, aggregate refill is mandatory (Figure 8). Be mindful that not every aggregate may be appropriate for the landowner and application. The aggregate's color or hue and that of the PICP block could be important to the landowner. Refilling gaps is a very easy process and is usually achieved by broom sweeping.

Vacuum sweepers are powerful and, if not carefully operated, can suction too much aggregate from the gaps and beneath the pavers. Care must be taken to verify that the amount of suction provided by the vacuum sweeper is not removing portions of the gravel base layer. This can be quickly checked by sticking a pencil down the vacuumed gap to verify the depth of gravel suctioned is less than the depth of the block.

Figure 8. PICP gaps must be filled with aggregate to prevent a tripping hazard (top). Gravel replacement is simple and done with a push broom (bottom).

OTHER MAINTENANCE ISSUES: REMOVING UNWANTED VEGETATION

Vegetation is often a sign that too much sediment has accumulated, because the excess sediment provides an environment for vegetation to survive. Weeds should be removed using a systemic herbicide such as glyphosate and then returning within the week to pull the weeds. It is imperative to not let unwanted vegetation persist. As weeds mature, it becomes harder to remove the root structure, and its removal can be more destructive to the structure of the pavement.

One cautionary note: some permeable applications are meant to be grassed. Mowing may actually be the appropriate maintenance activity. If a parking lot is to be mowed, please remember to catch the grass clippings before they are deposited on the pavement. Accumulation of grass biomass (clippings) could further limit infiltration.

Figure 9. A stain remover applied to PICP (left) and subsequent pressure washing (right). Ideally, the stain remover is allowed to set overnight.

Table 2. Summary Table of PP Maintenance. Maintenance tasks deemed essential to the hydrologic performance of the device are in bold italics.

Task	Frequency	Notes and Drivers
Inspection	Two-three months	Avoid significant clogging by observation.
Street Sweeping (preventative)	2 to 4 times a year	Using a regenerative air street sweeper for most pavements is appropriate.
Stain Removal	Per client desires	Stains may be tolerated. If stain must be removed, consider a biodegradable detergent.
Weed removal	Do upon inspection	Use glyphosate.
Mowing	In high season 1-2 times per month	Some permeable pavement applications are meant to be mowed.

Do vegetated pavements have higher infiltration than non-vegetated permeable pavements?

There are two ways to answer this question. Permeable applications that are not intended to be vegetated (like PICP filled with gravel, pervious concrete, and pervious asphalt) and that are working as intended will have much higher infiltration rates than purposefully vegetated permeable lots. This is due to the lack of fines collected in the former. However, a lot that without vegetation and with sediment accumulated in pavement gaps probably has a lower infiltration rate than a lot with vegetation, because the grass roots facilitate water flow through the soil media. Were permeable applications to be ranked by permeability the following hierarchy would apply:

- Unclogged PICP with aggregate fill, PC, PA — **Highest**
- Pavement with sediment accumulation with vegetation — **Much Lower**
- Pavement with sediment accumulation without vegetation — **Lowest**

Designers should remember that when a grassed permeable pavement application is specified, the designer is sacrificing infiltration for aesthetics.

OIL AND GREASE STAINS

Can you live with them? Many permeable pavement applications are along parking lot perimeters, and the client may be comfortable with simply allowing the pavements to slowly stain. Clearly, pervious asphalt does not show stains as much as other pavement types. A designer has the option of selecting pavement types that camouflage stains better than others. However, the same pavement types that are good at hiding stains also have low albedo, which conflicts with another driver for the use of permeable pavement. (Designers choose high albedo pavements to comply with LEED™[2] light reflectivity goals.)

Can you remove stains? There are detergents, such as Pour-N-Restore™, that can be used to partially remove stains. They are applied to the stain and allowed to soak. The following day, the soap is pressure washed from the blocks (Figure 9). The majority of stain is removed, but inspection will show a watermark from where the stain had been.

SUMMARY

Designers choose permeable pavements because they reduce runoff volume, mitigate runoff peaks, and sequester many forms of pollution. They may also provide other benefits like groundwater recharge, minor evapotranspiration losses, light reflectivity (albedo), and visual improvement. For permeable pavements to remain permeable, their surface layer must be freely draining, making clogging prevention and street sweeping the most important tasks associated with inspection and maintenance. Although not necessarily inexpensive, permeable pavement maintenance is very straightforward. Other tasks that maintenance professionals should consider include stain removal, weed removal, and in some cases mowing. The exact maintenance tasks will vary by permeable pavement type and intended function.

REFERENCES

Bean, E. Z., W.F. Hunt, and D.A. Bidelspach. (2007). Field survey of permeable pavement surface infiltration rates. *Journal of Irrigation and Drainage Engineering*. 133 (3): 247-255.

James, W. and C. Gerrits. (2003). Ch 21: Maintenance of Infiltration in Modular Interlocking Concrete Pavers with External Drainage Cells. In *Practical Modeling of Urban Water Systems*, Mono, 11. 417-435 W. James, ed. Guelph, Canada: CHI.

Mata, L.A. (2008). Sedimentation of Pervious Concrete Pavement Systems. Ph.D. Dissertation. North Carolina State University. Raleigh, NC.

Related Bulletins in the Urban Waterways (AG-588) Series:

Hunt, W.F. and K.A. Collins. 2008. *Permeable Pavement: Research Update and Design Implications*. North Carolina Cooperative Extension, Raleigh, NC. AG-588-14W.

[2]Leadership in Energy and Environmental Design, an effort of the US Green Building Council.

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Published by

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DELDOT AGR. 2056

KCI PROJECT NO. 00008105_00001

KCI TECHNOLOGIES

BMP FIELD INVENTORY AND INSPECTION

STANDARD OPERATING PROCEDURES

APPENDIX B-12

SAND FILTER STANDARD DETAILS

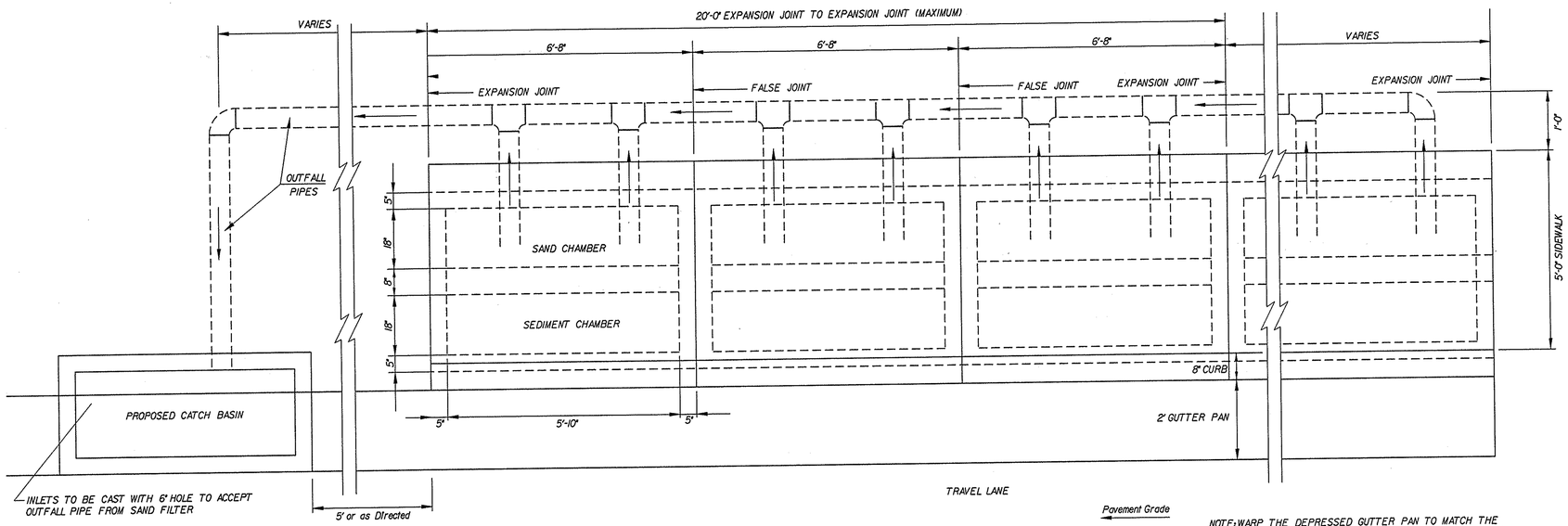
DETAIL SHEET

NOT TO SCALE

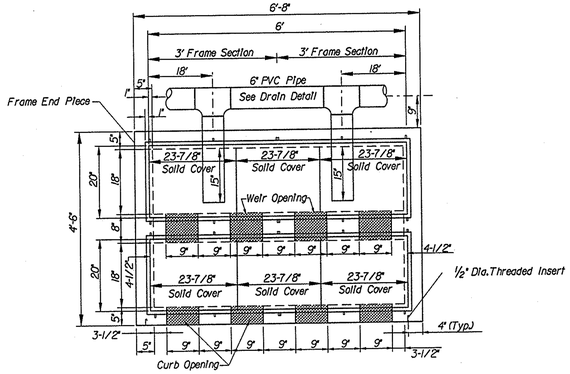
CONTRACT	COUNTY	F.A.P. NO.	SHEET NO.	TOTAL SHTS.
93-062-07	KENT	N/A	20	51

WHITE OAK ROAD
US 13 TO W. OF SR 1

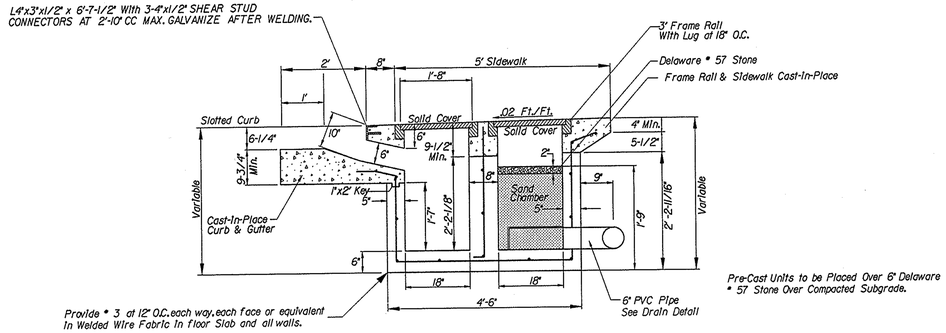
REVISIONS	



TYPICAL LAYOUT



TYPICAL UNIT PLAN VIEW



SIDE VIEW

FILTRATION STRUCTURE

ITEM 708538 (SAND FILTER)

THE BID PRICE FOR SAND FILTERS SHALL BE FOR EACH 6'-8" PRECAST SECTION

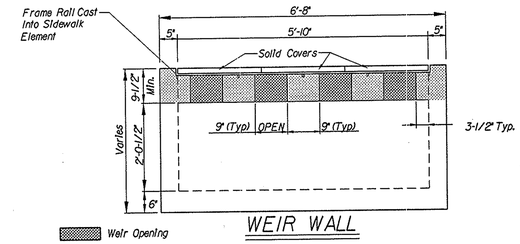
NOTES

1) Portland Cement Concrete shall conform to Section 812 of The DELDOT Standard Specifications. Pre-cast units shall be Class D (4500 PSI) concrete. Cast-In-Place concrete shall be Class B (3000 PSI) concrete.

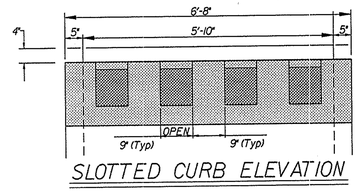
2) Reinforcing shall be either reinforcing bar or welded wire fabric in accordance with Section 603 of the DELDOT Standard Specifications. Reinforcing bars shall conform to AASHTO M 31, Grade 60 (ASTM A 615 GRADE 60). Welded Wire Fabric shall conform to AASHTO M 55 (ASTM A 185). Size and spacing of reinforcing bars are illustrated. Welded Wire Fabric shall provide equivalent or greater cross sectional area per unit width using wires at the spacing shown or less.

3) Structural Steel Components and shear stud connectors shall be galvanized after welding in accordance with ASTM A 123.

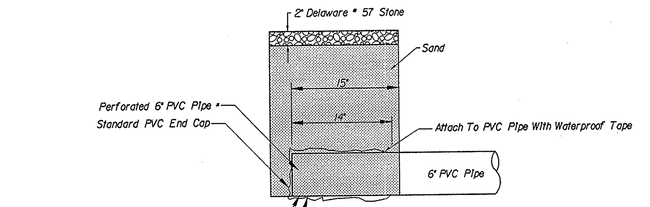
4) The cost of the concrete curbing and sidewalk extension as shown on the drawings related to the construction of the unit shall be incidental to the unit price bid for the unit. Curb & Gutter shall be warped for transition to/from the adjacent integral PCC Curb & Gutter. The sidewalk surfaces shall be finished as per DELDOT Standard Specifications.



WEIR WALL



SLOTTED CURB ELEVATION



DRAIN DETAIL

* The Last 13" of PVC Pipe Shall Be Perforated With 7 Rows of 3/4" Diameter Holes at 1-1/2" on Center From the Capped End. The Holes Shall Be Circumferentially Offset 3/4" From The Adjacent Rows.

PREL. TRACING ____ DESIGN ____ CHKD. ____

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DELDOT AGR. 2056

KCI PROJECT NO. 00008105_00001

BMP FIELD INVENTORY AND INSPECTION

STANDARD OPERATING PROCEDURES

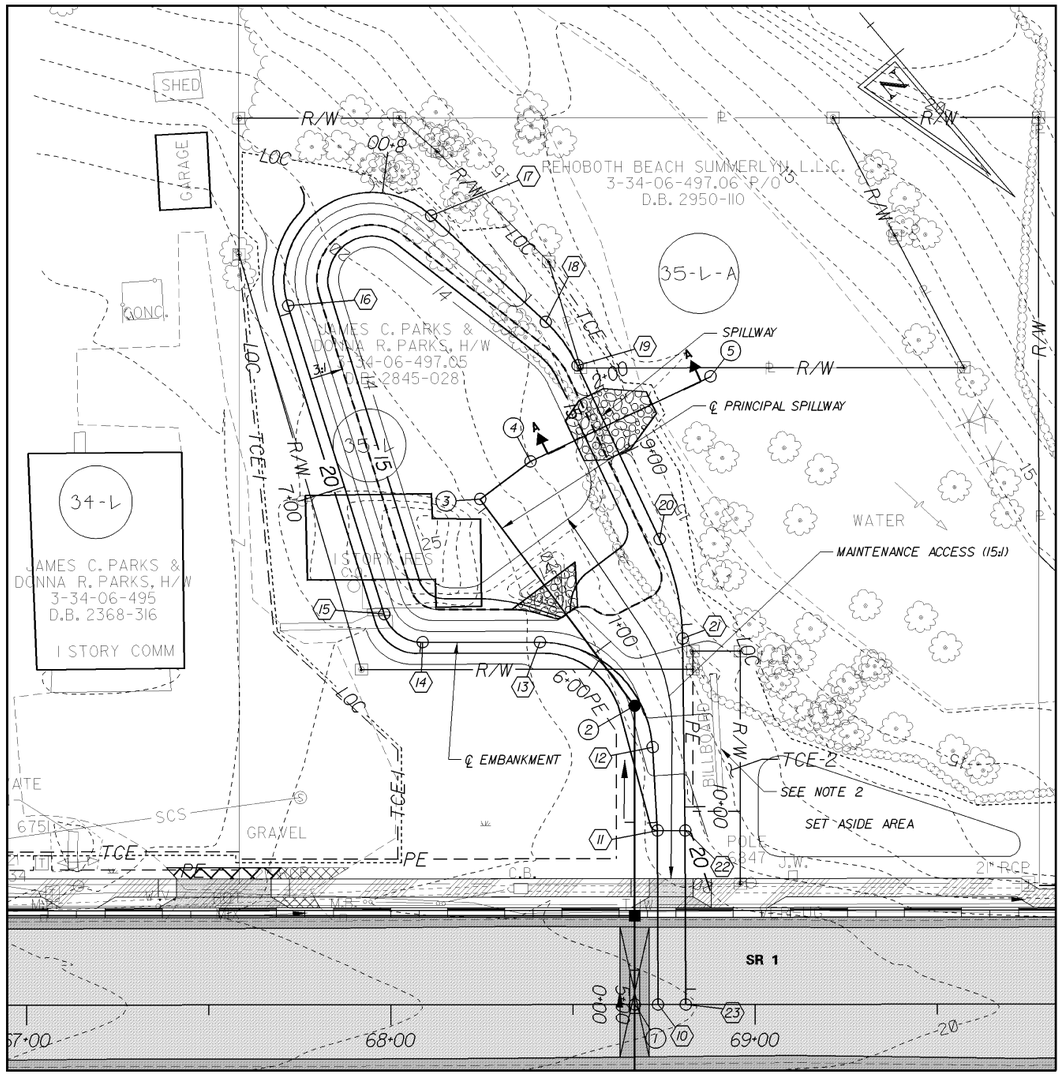
APPENDIX B-13

SEDIMENT FOREBAY STANDARD DETAILS

CONTRACT	COUNTY	F.A.P. NO.	SHEET NO.	TOTAL SHTS.
22-125-01	SUSSEX	SEE TITLE SHEET	74	166

SR 1 – SR 24 TO NORTH OF US 9 (FIVE POINTS) 3RD LANE

REVISIONS	



STORMWATER MANAGEMENT FACILITY – PLAN

STORMWATER MANAGEMENT DETAILS

SCALE
0 20 40 60
FEET

SM FACILITY NO. 295

POND CONSTRUCTION SEQUENCE AND NOTES:

THE STORMWATER MANAGEMENT POND SHALL FUNCTION AS A SEDIMENT BASIN DURING ROADWAY CONSTRUCTION AND SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE FOLLOWING SECTIONS OF THE STANDARD SPECIFICATIONS:

SECTION 271 - STORMWATER MANAGEMENT POND

1. *INSTALL STABILIZED CONSTRUCTION ENTRANCE.*
2. *CLEAR AND GRUB FOR INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS.*
3. *INSTALL PERIMETER SEDIMENT CONTROLS AS SHOWN.*
4. *CLEAR AND GRUB REMAINING AREA FOR POND CONSTRUCTION.*
5. *PLACE THE TEMPORARY EMBANKMENT, AND EXCAVATE THE BASIN TO LINES, GRADES AND DETAILS SHOWN ON THE PLANS. TOP OF TEMPORARY DAM TO BE CONSTRUCTED TO ELEVATION 17.00 AS DEPICTED IN THE STORMWATER MANAGEMENT DETAILS.*
6. *STABILIZE ALL BARE AREAS.*

NOTES:

1. *SEE CONSTRUCTION SEQUENCE PLANS FOR LOCATION OF EROSION AND SEDIMENT CONTROL MEASURES.*
2. *CONTRACTOR SHALL PLACE CONSTRUCTION SAFETY FENCE AROUND PERIMETER OF BILLBOARD AND SUPPORTS DURING CONSTRUCTION. ANY DAMAGE TO BILLBOARD DUE TO CONSTRUCTION OPERATIONS SHALL BE REPAIRED IN KIND.*

MAINTENANCE OF POND AS A SEDIMENT BASIN

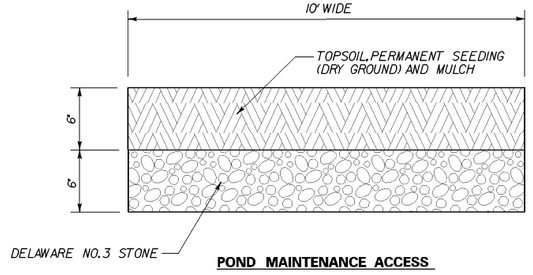
1. *CONTRACTOR SHALL INSPECT THE BASIN IMMEDIATELY AFTER EVERY RAIN AND MAKE REPAIRS AS NEEDED.*
2. *CONTRACTOR SHALL CLEARLY MARK THE CLEANOUT ELEVATION ON A STAKE DRIVEN INTO THE GROUND AT A LOCATION CLEARLY VISIBLE FROM THE EMBANKMENT. SEDIMENT SHALL BE REMOVED WHEN CLEANOUT ELEVATION IS REACHED AND DISPOSED OF AT A LOCATION APPROVED BY THE ENGINEER.*

CONVERSION TO PERMANENT STORMWATER MANAGEMENT POND

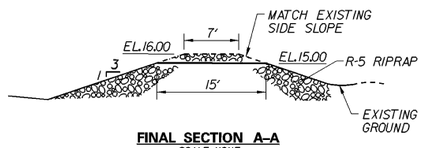
1. *CONVERT THE BASIN INTO THE PERMANENT STORMWATER MANAGEMENT POND AFTER ALL AREAS DRAINING TO THE POND HAVE BEEN PERMANENTLY STABILIZED AND THE ENGINEER HAS APPROVED THE CONVERSION.*
2. *REMOVE TEMPORARY EMBANKMENT AND CONSTRUCT RIPRAP LINED SPILLWAY AT FINAL ELEVATION OF 15.00 AS DEPICTED IN THE STORMWATER MANAGEMENT DETAILS.*
3. *REMOVE EXCESS ACCUMULATED SEDIMENT, IF ANY, TO THE SPECIFIED FINISHED LINES AND GRADES SHOWN IN THE PLAN AND DISPOSE SEDIMENT AT A LOCATION APPROVED BY THE ENGINEER.*
4. *COMPLETE STABILIZATION OF ALL BARE AREAS AND REMOVE EROSION AND SEDIMENT CONTROL MEASURES.*

℄ PRINCIPAL SPILLWAY			
NUMBER	STATION	NORTHING	EASTING
1	POT 0+00.00	270796.5569	731853.1844
2	PI 0+82.00	270733.8173	731800.3884
3	PI 1+52.84	270663.0974	731796.1991
4	PI 1+70.08	270664.1166	731778.9947
5	POT 2+24.74	270678.0990	731726.1468

℄ EMBANKMENT			
NUMBER	STATION	NORTHING	EASTING
10	POT 5+00.00	270800.6683	731848.2986
11	PI 5+47.77	270764.0652	731817.6089
12	PC 5+70.70	270745.6837	731803.8910
13	PT 6+17.23	270703.7103	731808.9855
14	PC 6+49.45	270682.9668	731833.6343
15	PT 6+63.41	270670.2859	731836.6911
16	PC 7+52.08	270588.5491	731802.3133
17	PT 8+14.98	270594.9156	731756.3710
18	PC 8+57.91	270637.5223	731751.1152
19	PT 8+72.78	270652.2722	731752.1192
20	PC 9+25.51	270703.2458	731765.6057
21	PT 9+53.76	270728.2056	731778.2679
22	PI 10+06.45	270768.9591	731811.7749
23	POT 10+54.23	270805.5713	731842.4722



POND MAINTENANCE ACCESS
SCALE: NONE



FINAL SECTION A–A
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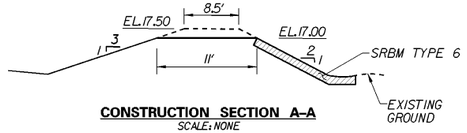
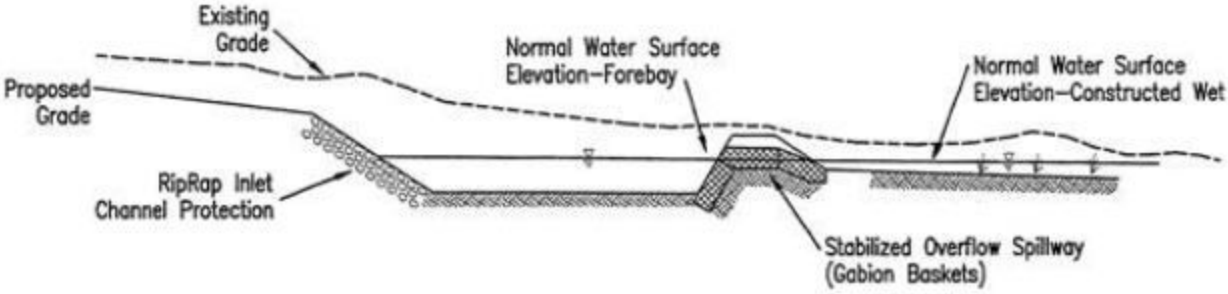
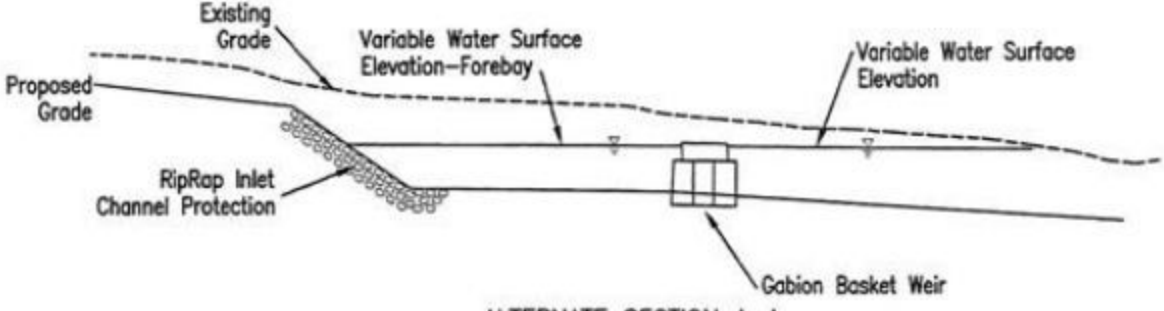


CONSTRUCTION SECTION A–A
SCALE: NONE

CHKD.
DESIGN
PREL. TRACING



ALTERNATE SECTION A–A
No Scale



ALTERNATE SECTION A–A
No Scale

DELDOT AGR. 2056

KCI PROJECT NO. 00008105_00001

BMP FIELD INVENTORY AND INSPECTION

STANDARD OPERATING PROCEDURES

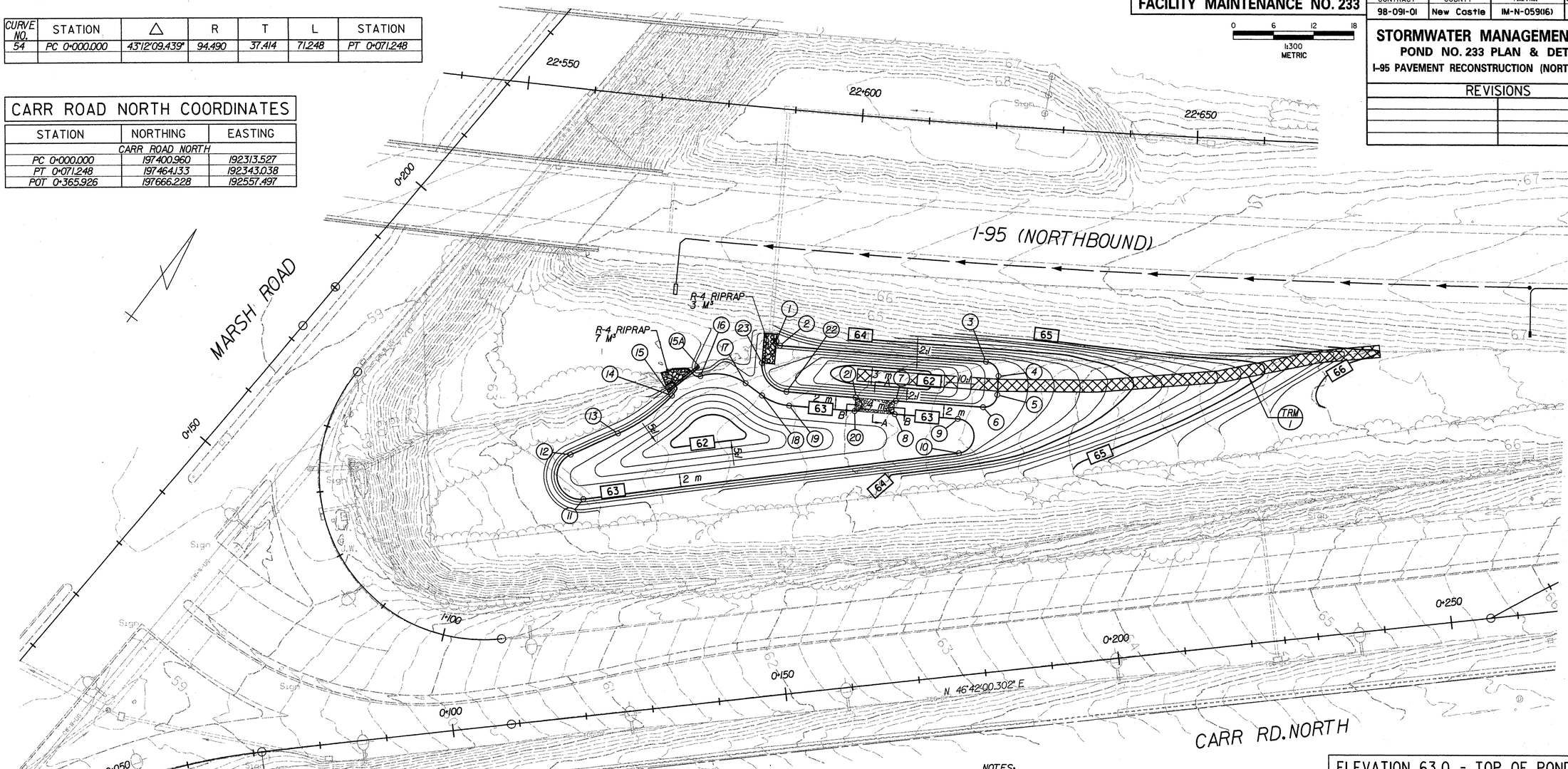
APPENDIX B-14

SHALLOW MARSH STANDARD DETAILS

CURVE NO.	STATION	△	R	T	L	STATION
54	PC 0+000.000	43°12'09.439"	94.490	37.414	71.248	PT 0+071.248

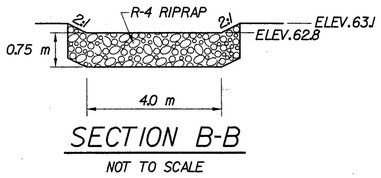
CARR ROAD NORTH COORDINATES

STATION	NORTHING	EASTING
	CARR ROAD NORTH	
PC 0+000.000	197400.960	192313.527
PT 0+071.248	197464.133	192343.038
POT 0+365.926	197666.228	192557.497



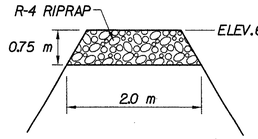
CONCRETE OUTLET STRUCTURE

NO./DESC.	NORTHING	EASTING	
	CONCRETE OUTLET STRUCTURE		
15	197543.868	192359.166	
15A	197549.698	192360.589	



SECTION B-B

NOT TO SCALE



SECTION A-A

NOT TO SCALE

TURF REINFORCEMENT MATTING

NO.	STARTING STA.	ENDING STA.	TYPE	WIDTH (W)	DEPTH (D)	LENGTH (m)	AREA (m²)
TRM-1	0+165, LT.	0+244, LT.		0.60	0.30	78	141.0

NOTES:

1. SEE "PROJECT NOTES FOR STORMWATER MANAGEMENT" ON SHEET NO.113.
2. SEE SHEET NO.117 FOR CONCRETE WEIR DETAIL. ALL COSTS ASSOCIATED WITH THE CONSTRUCTION OF THE WEIRS SHALL BE INCLUDED UNDER ITEM NO.272000, POND OUTLET STRUCTURE.
3. EXCAVATION OF POND NO.1 SHALL BE PAID FOR UNDER ITEM NO.202000, EXCAVATION AND EMBANKMENT.
4. WATER SURFACE ELEVATION FOR POND NO.1 IS 63.0 (SET WEIR AT THIS ELEVATION).

ELEVATION 63.0 - TOP OF POND NO.1

NO./DESC.	NORTHING	EASTING	RADIUS
	POND NO.1		
1 PC	197559.635	192367.591	0.6 m
2 PT	197559.4425	192368.4197	
3 PC	197576.0546	192394.3568	2.0 m
4 PT	197575.4753	192397.1253	
5 PC	197573.1160	192398.6515	2.0 m
6 PT	197570.3558	192398.0668	
7 PC	197563.2615	192387.1227	1.0 m
8 PT	197561.5750	192388.1977	
9 PC	197566.6931	192396.1095	2.6 m
10 PT	197562.6666	192399.3128	
11 PC	197523.3443	192358.7483	3.5 m
12 PT	197527.5529	192353.2503	
13 PC	197534.3398	192357.0086	25.4 m
14 PT	197543.7555	192360.0237	
16 PC	197548.6370	192361.6780	
17 PT	197551.8268	192367.7018	12.0 m
18 PC	197551.8733	192370.7307	
19 PT	197553.1004	192374.8674	8.0 m
20 PC	197558.3408	192383.1440	
21 PT	197560.0274	192560.0274	1.0 m
22 PC	197554.4945	192373.3272	
23 PT	197555.7527	192367.8120	4.0 m

FACILITY MAINTENANCE NO. 233

CONTRACT	COUNTY	F.A.P. NO.	SHEET NO.	TOTAL SHTS.
98-091-01	New Castle	IM-N-059(116)	110	272

0 6 12 18
1:300 METRIC

STORMWATER MANAGEMENT PLAN
POND NO. 233 PLAN & DETAILS
I-95 PAVEMENT RECONSTRUCTION (NORTH SECTION)

REVISIONS	

PREL. TRACING MJC DESIGN HJD CHKD. SK

FILE: P:\1996\9614301\swm01195.dgn
DATE: 04-Aug-99 13:12

CONTRACT	COUNTY	F.A.P. NO.	SHEET NO.	TOTAL SHTS.
98-091-01	New Castle	IM-N-059(116)	112	272

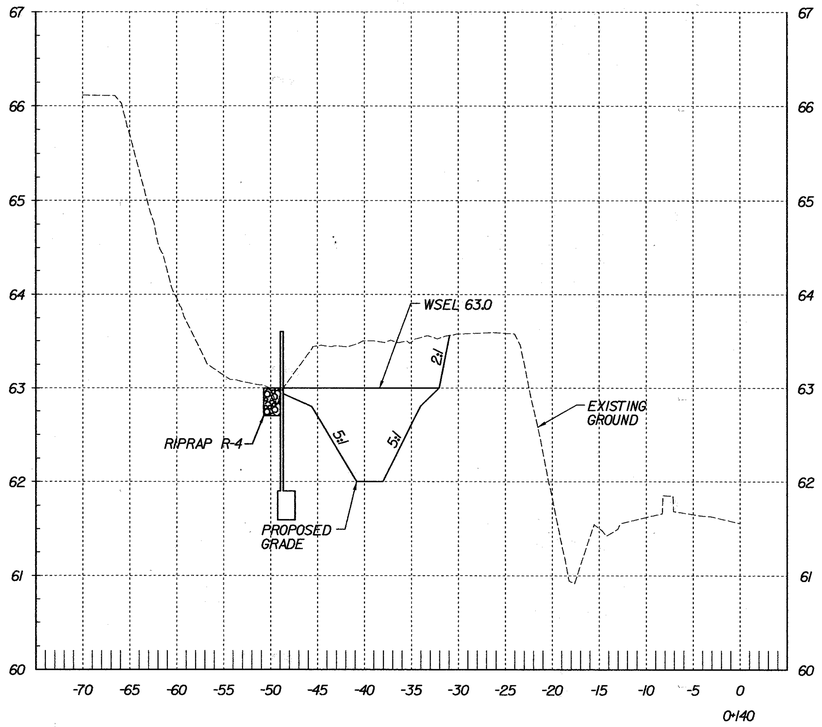
STORMWATER MANAGEMENT POND NO. 1 CROSS SECTIONS

I-95 PAVEMENT RECONSTRUCTION (NORTH SECTION)

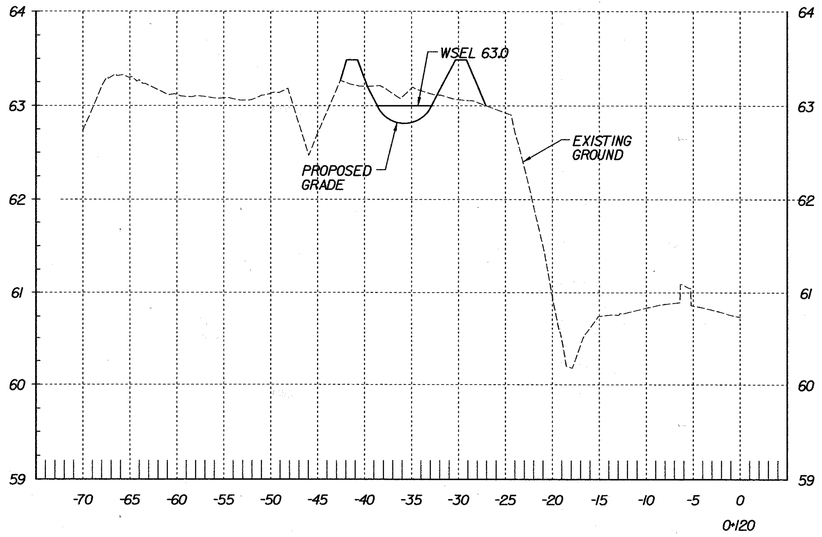
REVISIONS

FACILITY MAINTENANCE NO. 233

SCALE: HORIZ.- 1:300
VERT. - 1:30



STATION 0+140



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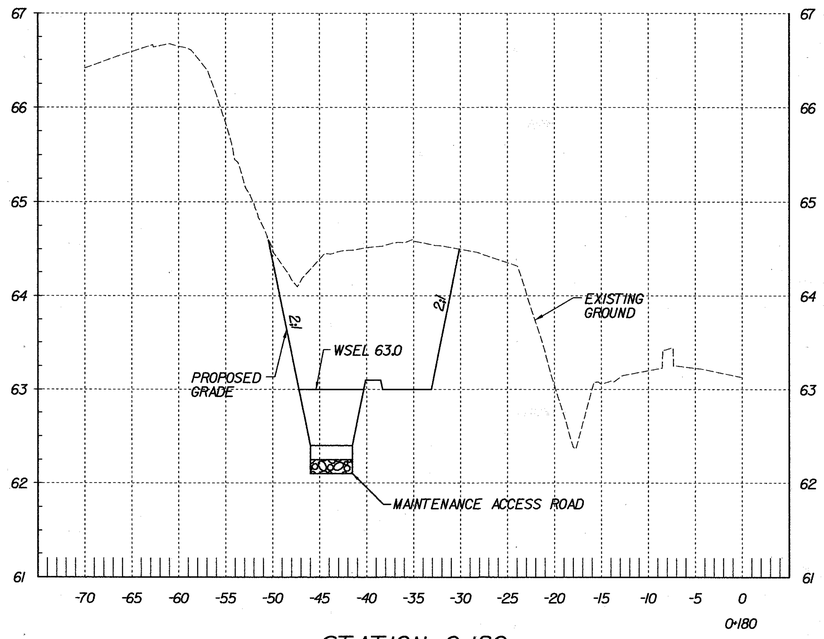

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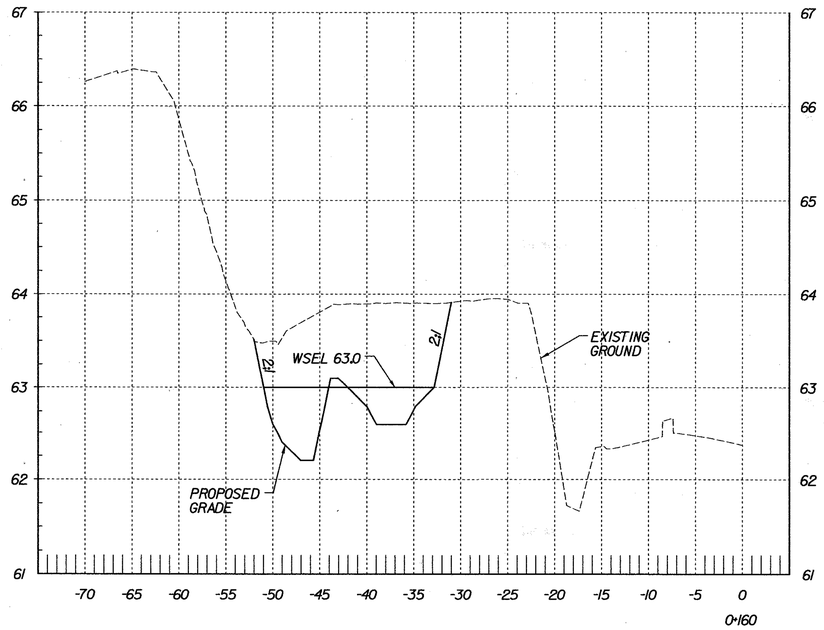

STATION 0+160

PREL. TRACING MJC DESIGN HJD CHKD. SK

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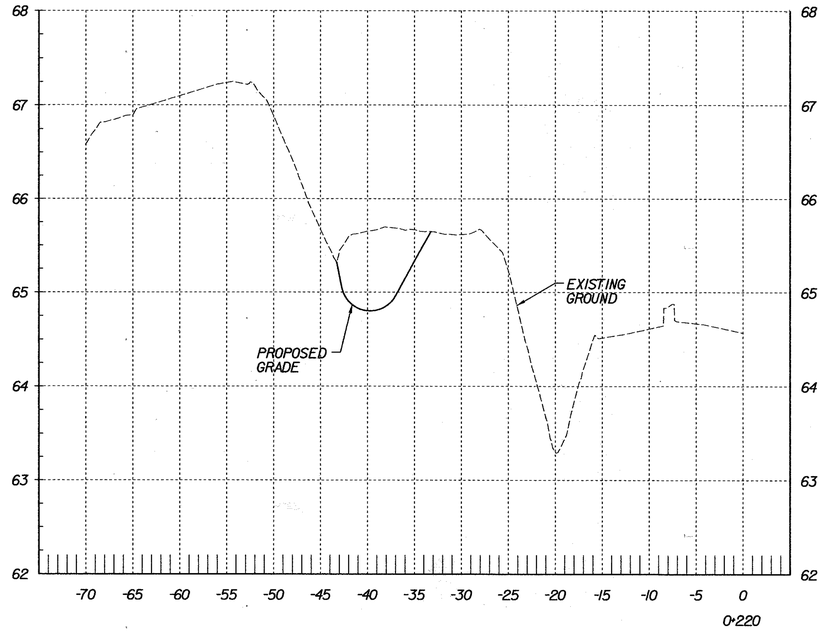


STATION 0+220

SCALE: HORIZ.- 1:300
VERT. - 1:30

CONTRACT	COUNTY	F.A.P. NO.	SHEET NO.	TOTAL SHTS.
98-091-01	New Castle	IM-N-0591(16)	113	272

STORMWATER MANAGEMENT POND NO. 1 CROSS SECTIONS

I-95 PAVEMENT RECONSTRUCTION (NORTH SECTION)

REVISIONS	

FACILITY MAINTENANCE NO. 233

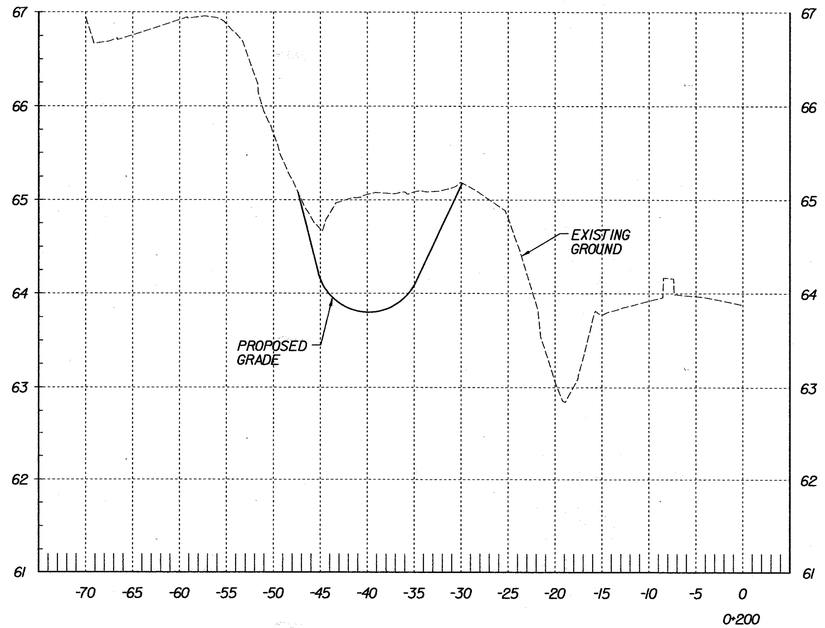
PROJECT NOTES FOR STORMWATER MANAGEMENT

1. AS-BUILT DRAWINGS OF STORMWATER MANAGEMENT FACILITIES. The contractor shall provide "As Built" drawings of all stormwater management facilities, such as ponds, bioflitration swales, bioretention areas, etc. The "As Built" drawings shall show the actual finished ground contours, outlet structure dimensions and elevations, etc. as they exist at the completion of the project. These drawings shall be signed and sealed by a Professional Engineer or Land Surveyor registered in the State Of Delaware. All costs shall be included under Item no.763501, Construction Engineering.

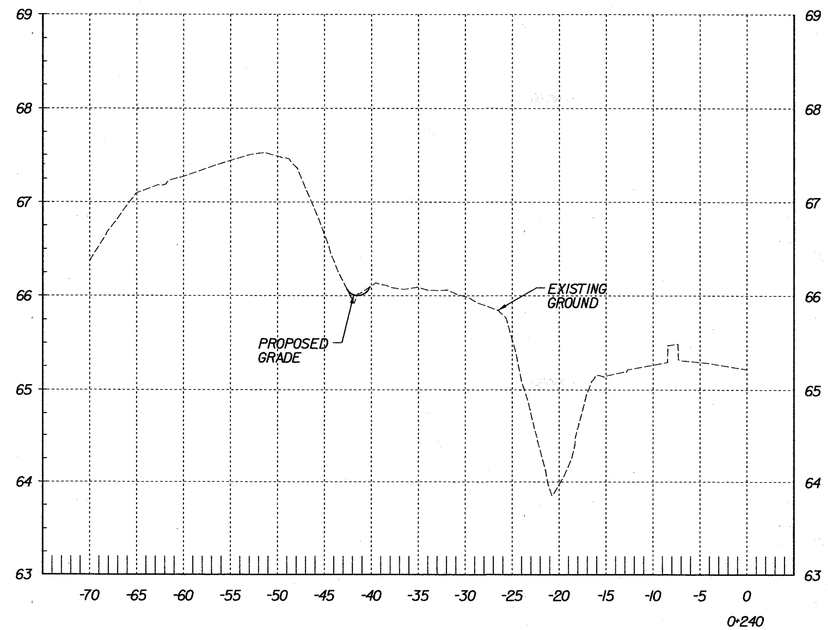
2. MOWING. The Contractor shall maintain all grass established by temporary and permanent seeding to a maximum height of six (6) inches unless otherwise directed by the Engineer. All costs associated with maintaining a six (6) inch maximum height shall be incidental to the various temporary and permanent seeding items. Grass established by Crown Vetch seeding shall be excluded from this requirement.

3. TEMPORARY EROSION CONTROL EXCAVATION AND EMBANKMENT. Item no.740001, Temporary Erosion Control Excavation and Embankment, has been established to include the initial construction and maintenance cleaning of temporary sediment control measures such as sediment traps, dewatering basins sediment control dikes, temporary swales, and diversions. It shall also include the removal of silt in and around silt fence and reinforced silt fence. Removal and backfilling of temporary sediment controls when they are no longer needed shall be incidental to their initial construction.

PREL. TRACING ____ MJC ____ DESIGN ____ HJD ____ CHKD. ____ SK ____



STATION 0+200



STATION 0+240

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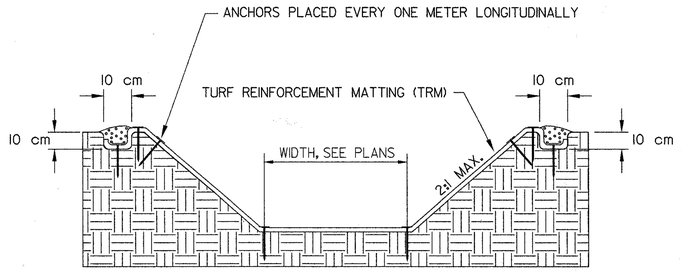
CONTRACT	COUNTY	F.A.P. NO.	SHEET NO.	TOTAL SHTS.
98-091-01	New Castle	IM-N-059(16)	117	272

STORMWATER MANAGEMENT DETAILS

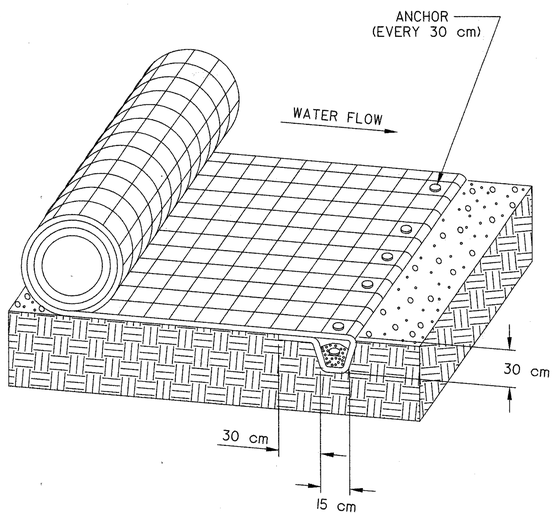
I-95 PAVEMENT RECONSTRUCTION (NORTH SECTION)

REVISIONS

ALL DIMENSIONAL UNITS mm

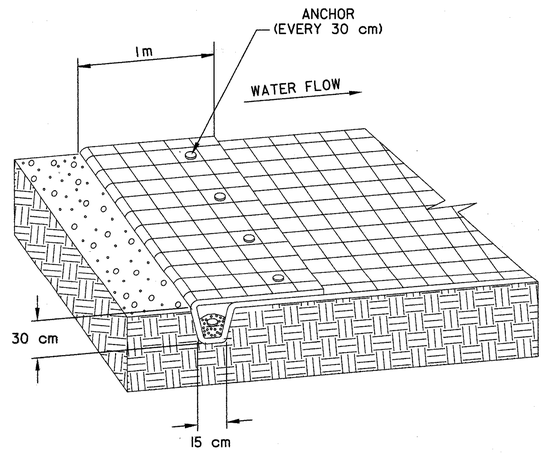


TYPICAL SECTION

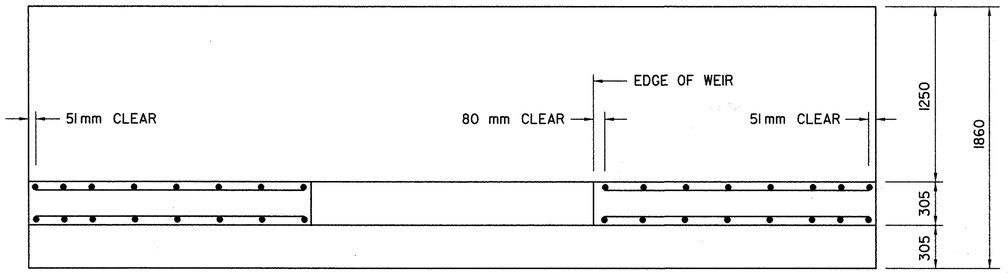


INITIAL CHANNEL ANCHOR TRENCH

(NOTE: TRM WILL INITIALLY BE UPSIDE DOWN IN ANCHOR TRENCH)

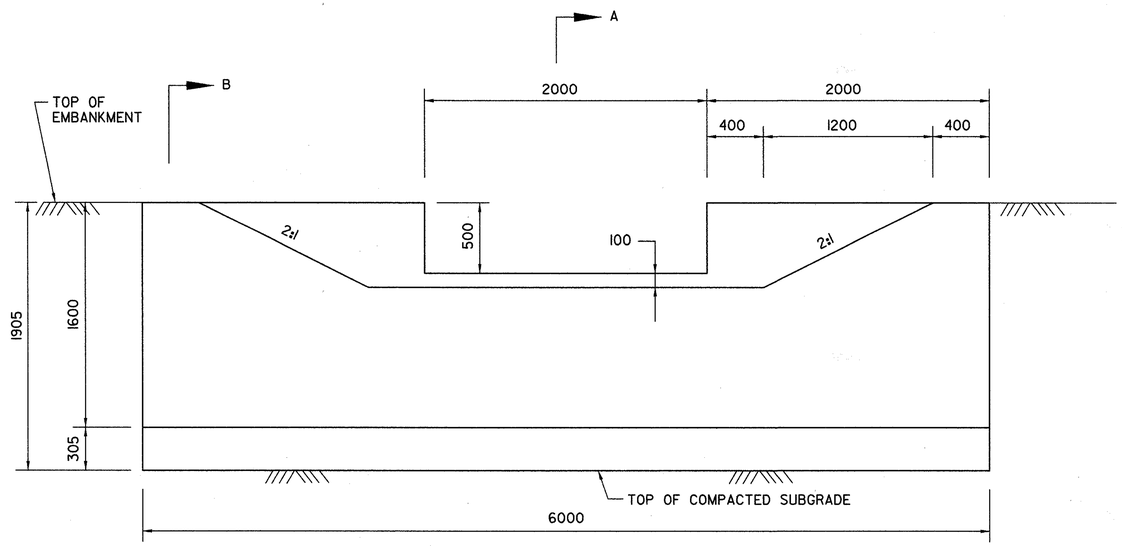


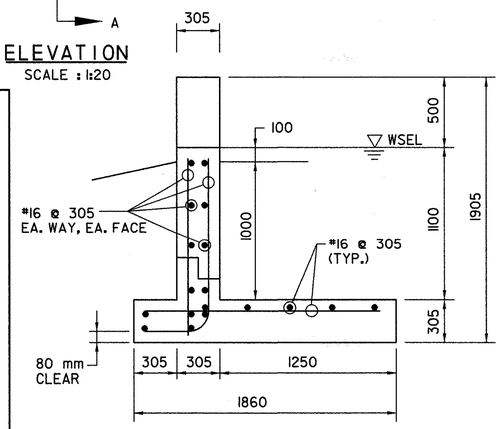
TERMINAL CHANNEL ANCHOR TRENCH



PLAN

SCALE : 1:20



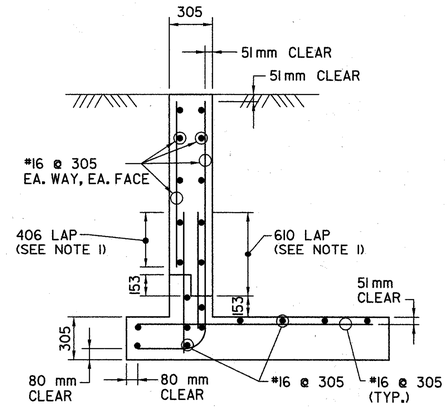


ELEVATION

SCALE : 1:20

SECTION A-A

SCALE : 1:20



NOTE 1- LAP MAY BE ELIMINATED BY EXTENDING DOWEL BARS FULL HEIGHT OF WALL

SECTION B-B

SCALE : 1:20

NOTES:

1.) SEE SPECIAL PROVISIONS FOR MATERIAL SPECIFICATIONS AND METHOD OF MEASUREMENT AND PAYMENT FOR INSTALLATION AND MAINTENCE. TURF REINFORCEMENT MATTING TO BE PAID FOR UNDER ITEM 712520, EROSION CONTROL REVEGETATION MAT.

2.) MULCH IS NOT REQUIRED.

3.) LIME, FERTILIZER, AND SEED SHALL BE APPLIED PRIOR TO BLANKET PLACEMENT. AREAS DISTURBED DURING PLACEMENT OF MATTING (ANCHOR TRENCHS AND SLOTS) WILL NEED TO BE RESEEDED.

4.) PLACE INITIAL ANCHOR TRENCH AT DOWNSTREAM END OF MAT AND TERMINAL TRENCH AT UPSTREAM END.

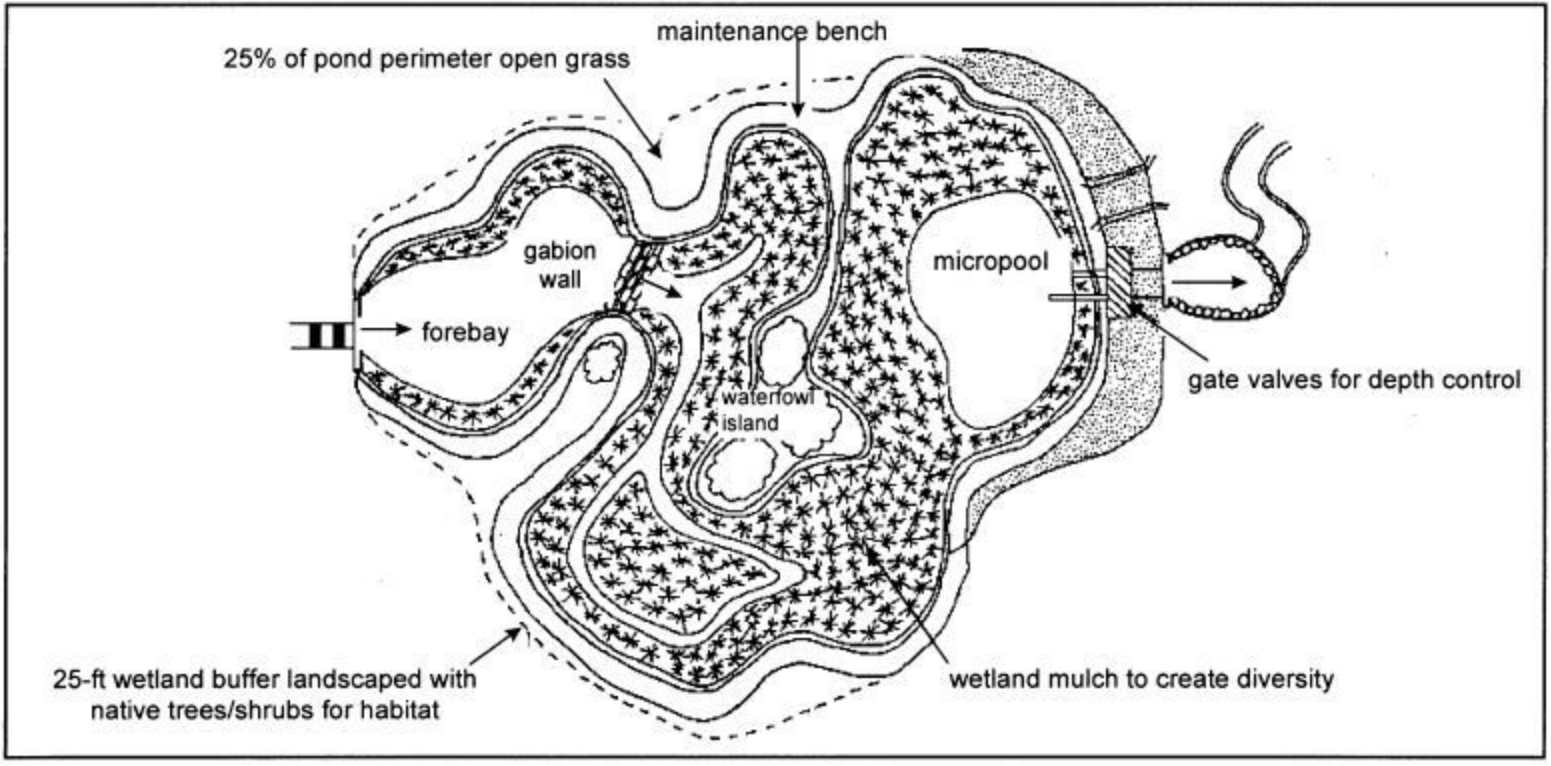
5.) REMOVE ALL ROCKS, CLODS, AND VEGETATION OR OTHER OBSTRUCTIONS SO THAT MATTING HAS DIRECT CONTACT WITH SOIL SURFACE.

6.) OVERLAP ADJACENT ROLLS 75 mm IN ANCHOR TRENCH.

PREL. TRACING	MJC	DESIGN	HJD	CHKD.	SK

1	TURF REINFORCEMENT MATTING	NOT TO SCALE	
2	CONCRETE OUTLET STRUCTURE	NOT TO SCALE	

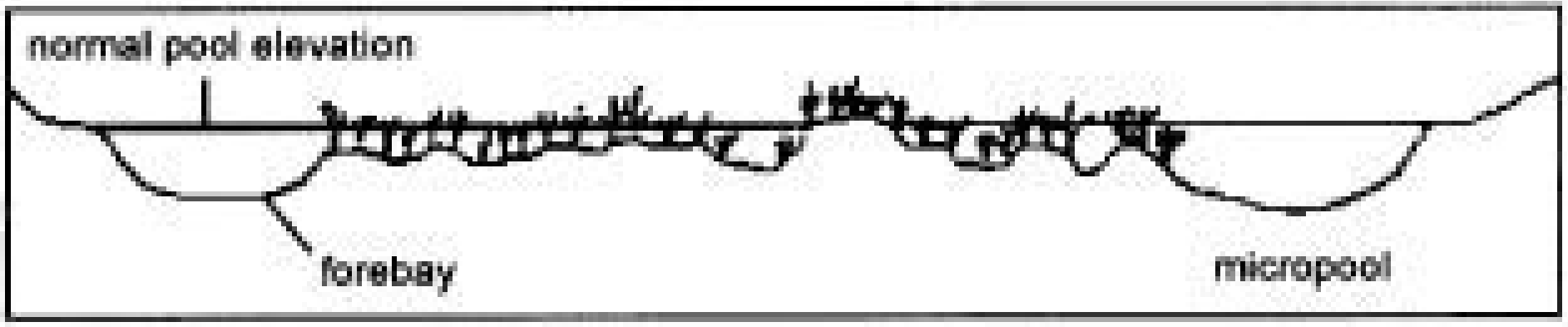
FILE: Pr\1996\9614301\\gwmDE02195.dgn
DATE: 04-Aug-99 13:11



Source: MWCOG, 1992a.

FIGURE 1 SHALLOW MARSH WETLAND

A. Shallow Marsh



DELDOT AGR. 2056

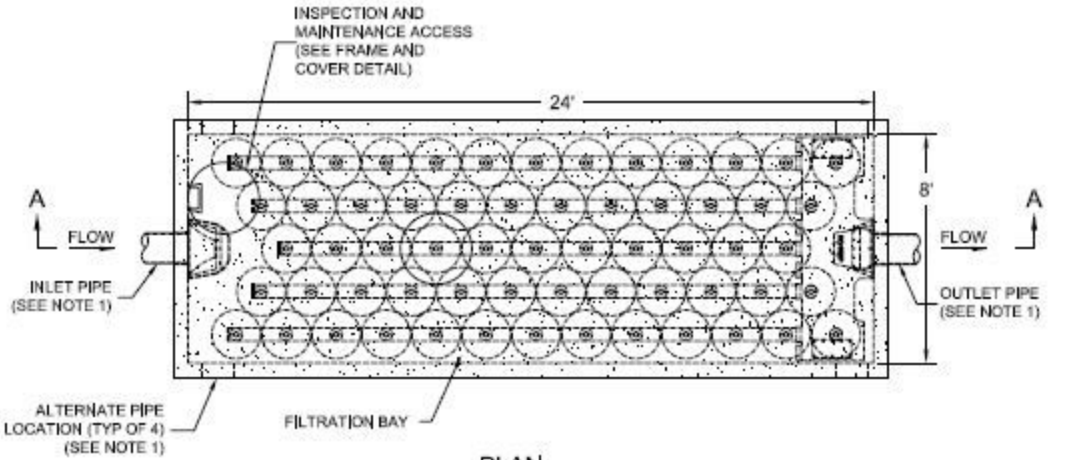
KCI PROJECT NO. 00008105_00001

BMP FIELD INVENTORY AND INSPECTION

STANDARD OPERATING PROCEDURES

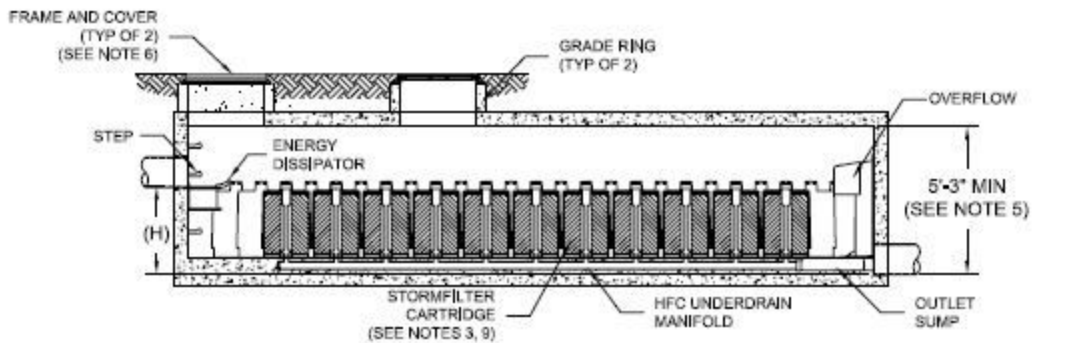
APPENDIX B-15

STORMFILTER STANDARD DETAILS



PLAN

(ACCESS FRAME AND COVERS
OMITTED FOR CLARITY)



SECTION A - A

DELDOT AGR. 2056

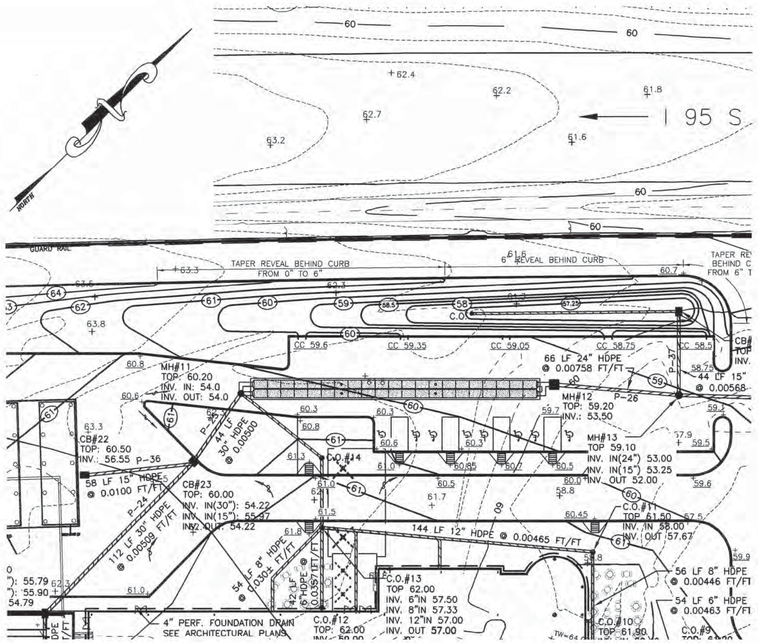
KCI PROJECT NO. 00008105_00001

BMP FIELD INVENTORY AND INSPECTION

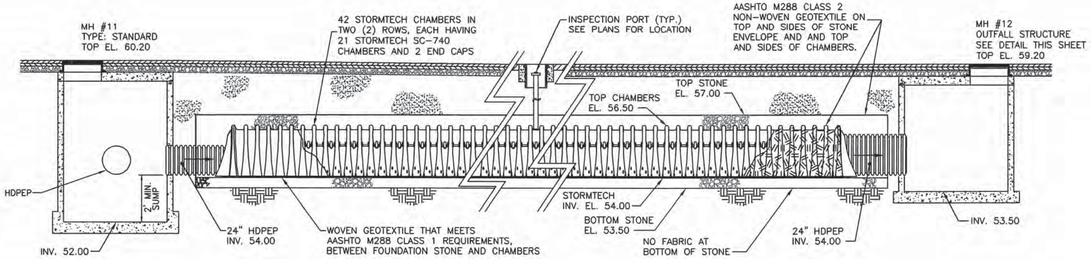
STANDARD OPERATING PROCEDURES

APPENDIX B-16

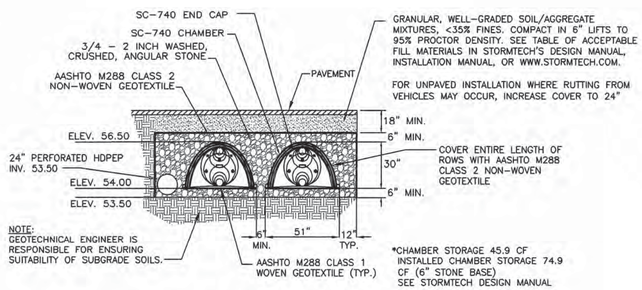
UNDERGROUND STORAGE STANDARD DETAILS



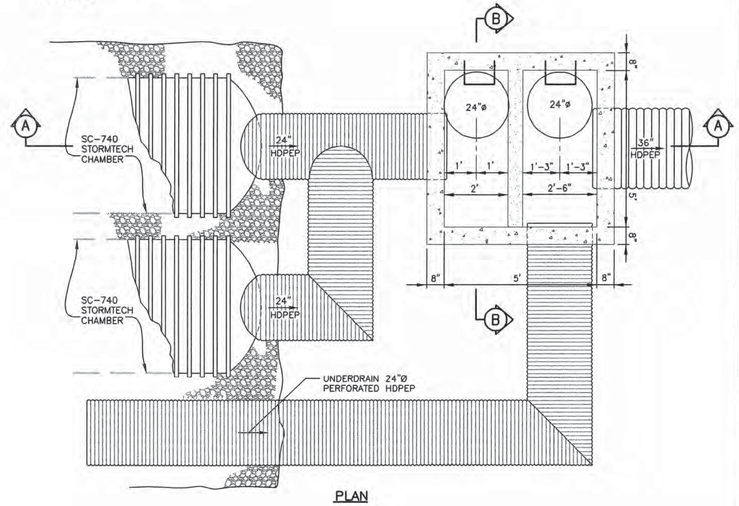
DEL DOT STORMWATER MANAGEMENT FACILITY #467
PLAN VIEW
1"= 40'



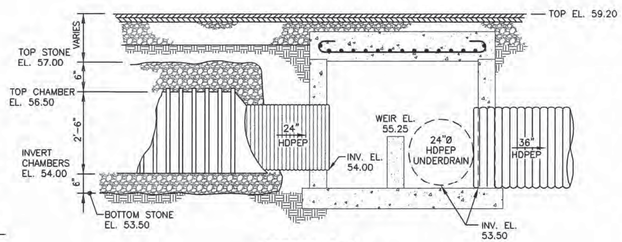
DEL DOT STORMWATER MANAGEMENT FACILITY #467
TYPICAL SECTION
ISOLATOR ROW SEDIMENT CHAMBER
NO SCALE



TYPICAL SECTION
DEL DOT STORMWATER MANAGEMENT FACILITY #467
NO SCALE



PLAN

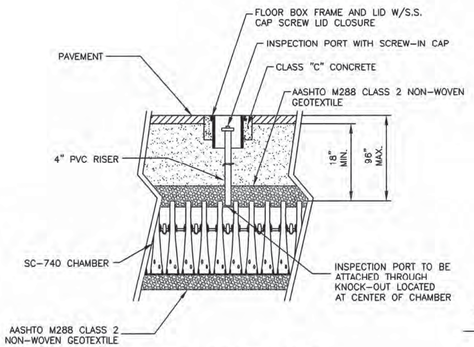


SECTION A-A

MAINTENANCE OF THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM

1. THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM SHALL BE MAINTAINED BY THE OWNER, ITS HEIRS OR ASSIGNS.
2. ISOLATOR ROW SEDIMENT CHAMBER MAINTENANCE: VISUALLY INSPECT ALL ISOLATOR ROWS FOR SEDIMENT DEPOSITION ON A BI-ANNUAL BASIS. IF SEDIMENT DEPTH IS 3 INCHES OR GREATER, REMOVE ACCUMULATED DEBRIS AND/OR SEDIMENT USING A JETVAC PROCESS. CONTACT STORMTECH AT 888-892-2694 FOR TECHNICAL SUPPORT.
3. VISUALLY INSPECT THE GRIT SUMPS IN MANHOLE #11 AND MANHOLE #12 ON A BI-ANNUAL BASIS FOR THE ACCUMULATION OF OIL, GREASE, FLOATABLE SOLIDS, AND SEDIMENT. VACUUM THE SUMPS AS REQUIRED.
4. MINIMUM MAINTENANCE SCHEDULE (SUGGESTED):
   A. GRIT SUMPS AND GREASE-TRAPPING DEVICES: CLEANED ONCE EACH YEAR
   B. ISOLATOR ROW SEDIMENT CHAMBER: SEE ITEM 2 ABOVE

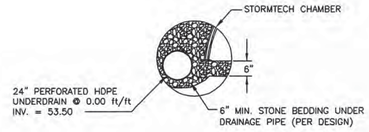
   NOTE: SHORTER CLEANING CYCLES MAY BE REQUIRED DUE TO HIGHER THAN ANTICIPATED POLLUTANT LOADINGS, OR AS DIRECTED BY DELDOT.
5. ALL WASTE MATERIALS AND WATER REMOVED FROM THE STORM DRAINAGE SYSTEM SHALL BE DISPOSED OF IN ACCORDANCE WITH APPLICABLE DNREC REQUIREMENTS. ALL OSHA RULES FOR CONFINED SPACE ENTRY MUST BE FOLLOWED.



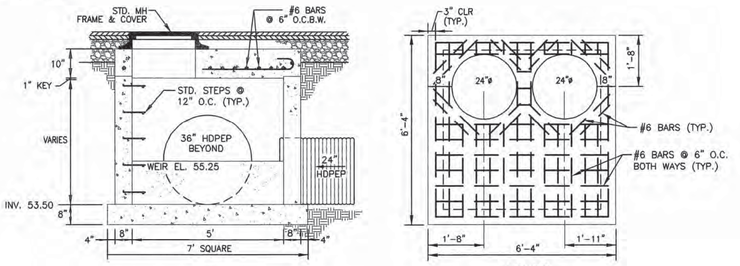
INSPECTION PORT
NO SCALE

DEL DOT STORMWATER MANAGEMENT FACILITY #467
HYDRAULIC DATA

STORM FREQ. (YRS.)	Q (CFS)	W.S. EL. (FT.)
WQ (P=2")	9.15	54.87
2	17.30	55.36
10	27.92	55.77
100	47.51	56.95



PERFORATED UNDERDRAIN DETAIL
NO SCALE



COVER

DEL DOT STORMWATER MANAGEMENT FACILITY #467
OUTFALL STRUCTURE DETAILS
NO SCALE

811 Know what's below. Call before you dig.
MISS UTILITY PHONE 1-800-257-7777
PROTECT YOURSELF, GIVE THREE WORKING DAYS NOTICE

THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY.

ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND THE RULES AND REGULATIONS THERETO APPURTENANT

File: P:\C2037 DE WELCOME CENTER\DWG\CNST\DETAILS\SWM.DWG
Saved: 3/18/2009 1:46:42 PM Plotted: 3/18/2009 3:34:19 PM User: Valerie N. Steenhoek

No.	Submittal / Revision	Appr'd	By	Date

HMS HOST FACILITY DESIGN & DEVELOPMENT

MANUFACTURED & SETTING OF ALL EQUIPMENT TO BE IN ACCORDANCE WITH THE LATEST APPLICABLE STATE AND/OR LOCAL LAWS

Drawing Copyright © 2007 Clough Harbour & Associates LLP

LANDMARK ENGINEERING
CIVIL AND SITE ENGINEERING SPECIALISTS
ONE CORPORATE COMMONS • SUITE 310 • NEW CASTLE, DELAWARE
PHONE: 302.324.8910 • FAX: 302.324.8909
INFO@LANDMARKENGINEERING.COM WWW.LANDMARKENGINEERING.COM

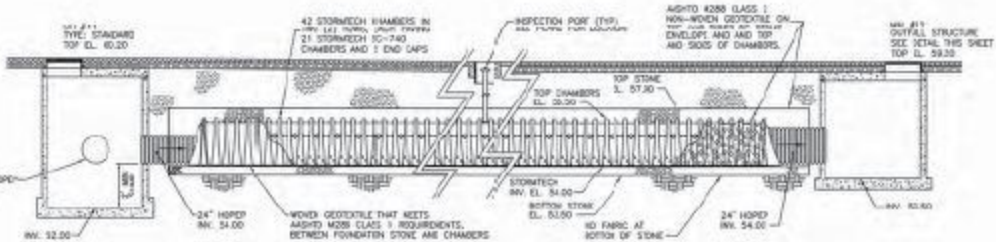
Designed: JRB | Drawn: | Checked: TCW

DELAWARE WELCOME CENTER
TRAVEL PLAZA (MM 5)
NEWARK, DELAWARE

STORMWATER MANAGEMENT PLAN

Issue Date: 10/2008 | Project No.: 17003 | Scale: 1" = 40'

C3.30



DEL DOT STORMWATER MANAGEMENT FACILITY #467

TYPICAL SECTION

ISOLATOR ROW SEDIMENT CHAMBER

NO SCALE

DELDOT AGR. 2056

KCI PROJECT NO. 00008105_00001

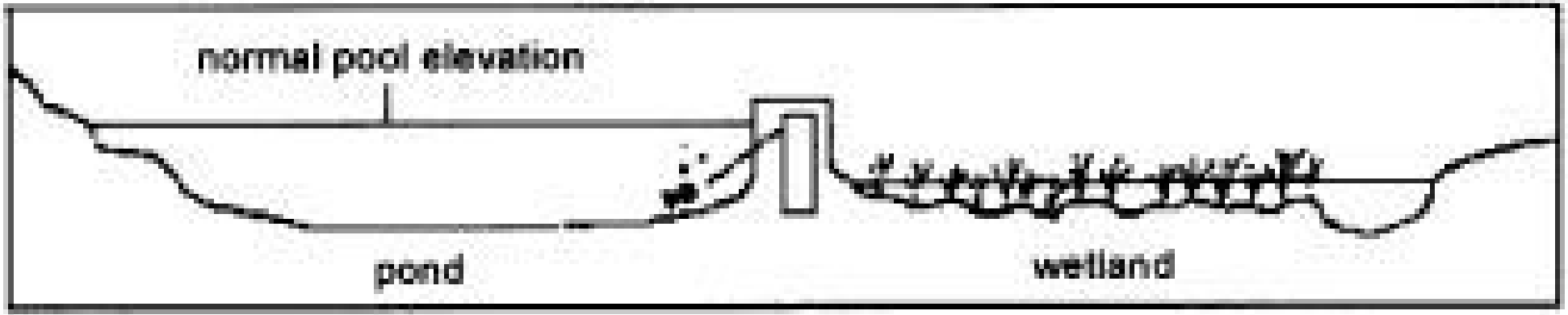
BMP FIELD INVENTORY AND INSPECTION

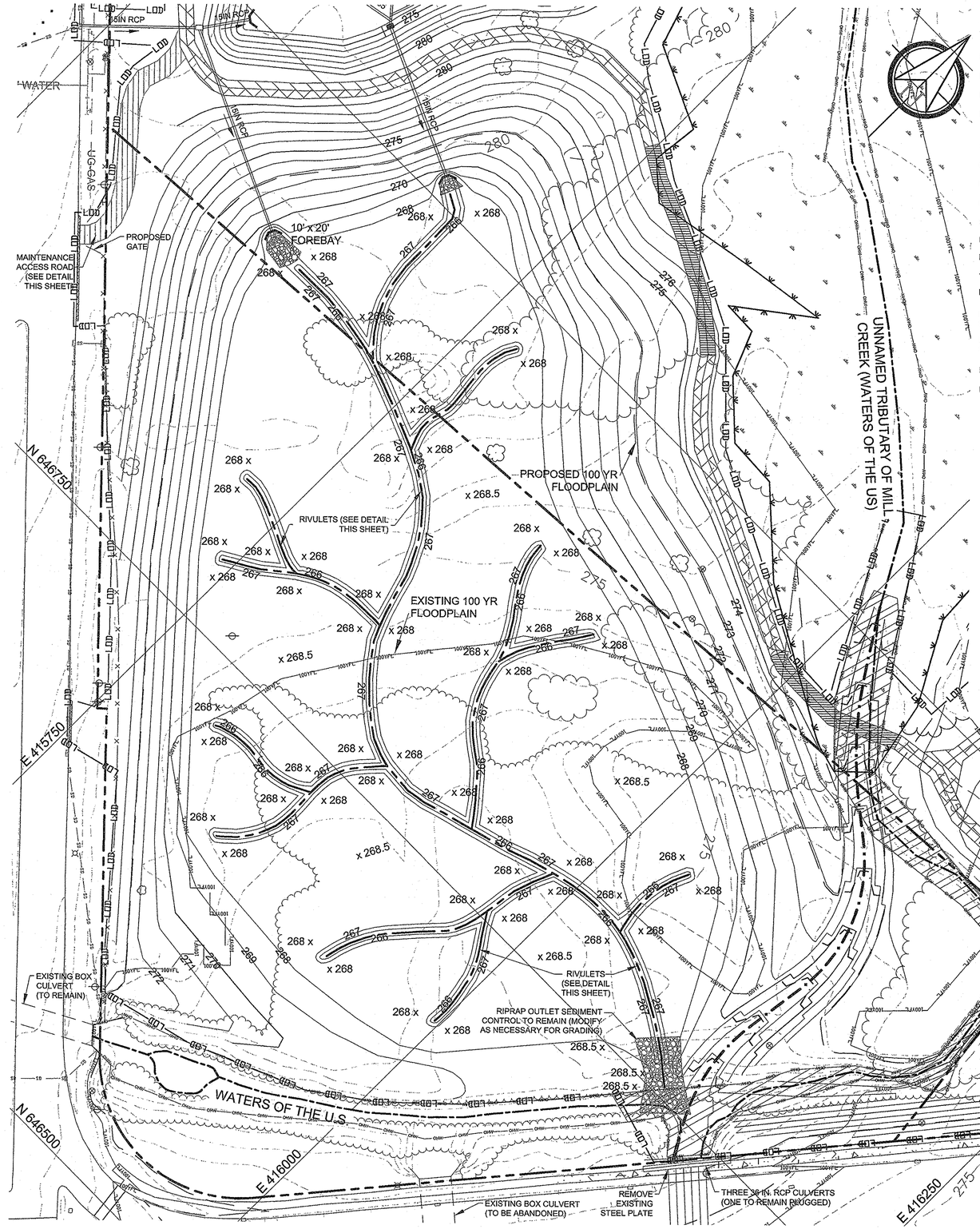
STANDARD OPERATING PROCEDURES

APPENDIX B-17

WET POND STANDARD DETAILS

C. Pond/Wetland System



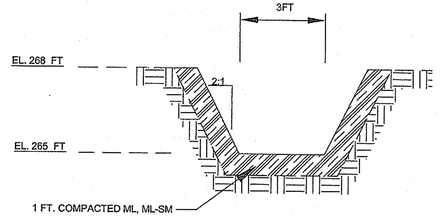


LEGEND:

- EXISTING TOPOGRAPHY
- PROPOSED TOPOGRAPHY
- EXISTING WOODS LINE
- LIMIT OF WOODS TO REMAIN
- LIMIT OF WETLANDS
- ARMY CORPS OF ENGINEERS IMPACT AREA
- ORDINARY HIGH WATER (OHW)
- PROPERTY LINES
- COCKEYSVILLE BOUNDARY
- STREAM CENTERLINE
- EXISTING 100-YEAR FLOODPLAIN (100YFL)
- PROPOSED 100-YEAR FLOODPLAIN
- 4' POST AND RAIL
- LIMIT OF DISTURBANCE (LOD)
- EXISTING CATCH BASIN / STORM DRAIN
- PROPOSED CATCH BASIN / STORM DRAIN-DELDOT
- PROPOSED WALKING PATH
- PROPOSED BOARDWALK

GENERAL NOTES:

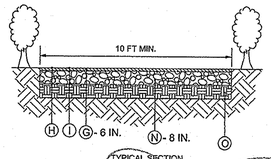
1) FOR INFORMATION REGARDING STREAM CHANNEL RESTORATION AND WETLANDS MITIGATION TO BE PERFORMED UNDER PHASE: STREAM RESTORATION, SEE PLANS TITLED "TWEEDS PARK STREAM RESTORATION" SHEETS W-1 TO W-5



NOTE:
RIVULETS SHALL BE LAID OUT IN THE FIELD TO APPROXIMATE ORIENTATION SHOWN, AS COORDINATED WITH ENGINEER.

DETAIL: RIVULETS

SCALE: NONE



TYPICAL SECTION

- (G) TOPSOIL (MIN. 6 INCHES)
- (H) PERMANENT SEEDING-DRY GROUND
- (I) SOIL RETENTION BLANKET TYPE 3
- (N) CRUSHER RUN (MIN. 8 INCHES)
- (O) COMPACTED SUBGRADE

NOTE: TO BE CONSTRUCTED IN PHASE: FINAL GRADING

NOT CONSTRUCTED

MAINTENANCE ACCESS ROAD

SCALE: NONE

DRAWING SCALE 1" = 30' (30 0 30 60)

WETLANDS AREA PLAN VIEW

SCALE: 1" = 30'

DUFFIELD ASSOCIATES
Consultants in the Environment
5400 LIMESTONE ROAD
WILMINGTON, DE 19808-1232
TEL (302)239-6634
FAX (302)239-8485
OFFICES IN PHILADELPHIA, PA
AND GEORGETOWN, DELAWARE
E-MAIL: DUFFIELD@DUFFIELD.COM

No.	REVISION	CHK'D BY	DATE
-	-	-	-
-	-	-	-
-	-	-	-
3	REVISED PER CLIENT REQUEST	LGT	10-3-05
4	ISSUED FOR FINAL REVIEW	LGT	10-27-05
5	REVISED PER DELDOT COMMENTS	LGT	11-15-05
6	REVISED RIVULETS	LGT	1-17-06
7	Per drawing mark-up	JFC	6-28-06
8	Per comments	JFC	10-25-06

DESIGNED BY: LGT
DRAWN BY: CMK
CHECKED BY: JFC
FILE NAME: D-5039PI-SWM
JAMES F. CLOONAN, P.E.
P.E. 7384
STATE: DE

OWNER:
DelDOT
DELAWARE DEPARTMENT OF TRANSPORTATION
P.O. BOX 778
DOVER, DELAWARE 19903
(302) 760-2228

WETLANDS AREA (FACILITY MNT. NO. 298)
STORMWATER MANAGEMENT PLAN & DETAILS
TWEEDS PARK/VALLEY ROAD STORMWATER MANAGEMENT & RECREATION FACILITY
MILL CREEK HUNDRED ~ NEW CASTLE COUNTY ~ DELAWARE

DATE: 22 SEPTEMBER 2005
SCALE: AS NOTED
PROJECT NO. 5039.PI
SHEET: C-21 OF C-21

N:\Projects\5000\5039\CADICivil\wg\LAND DEVELOPMENT PLANS\D-5039-PI-SWM.dwg, WETLAND, 1/17/2006 4:07:55 PM

STORMWATER MANAGEMENT – PLAN POND 1 (FACILITY MAINTENANCE NO. 192)

SM 1 OF 4

CONTRACT	COUNTY	F.A.P. NO.	SHEET NO.	TOTAL SHTS.
24-106-05	NEW CASTLE	SEE TITLE SHEET	95	246

0 10 20 30 40 50 60
1" = 30'

SR 141, US 202 – I-95 TO AUGUSTINE CUT OFF

REVISIONS

N

NOTE: MAINTENANCE ACCESS PULLOFF CAN BE DONE FROM U.S.202 IN THIS AREA

ROCK APRON (R-5)

PI-D SECTION

ROCK APRON (R-6)

PI-C SECTION

ROCK APRON (R-6)

FOUNDATION TRENCH CUTOFF LIMITS

PI-A SECTION

SOIL RETENTION BLANKET MULCH, TYPE 6

EMERGENCY SPILLWAY

ROCK APRON (R-6)

PI-B SECTION

FOUNDATION TRENCH CUTOFF LIMITS

OVER EXCAVATE 2' BELOW POND BOTTOM TO ALLOW FOR CONSTRUCTION SEDIMENTATION

TIE TO EXISTING

HOT-MIX HOT LAID BITUMINOUS CONCRETE CURB, 6" HT.

HOT-MIX HOT LAID BITUMINOUS CONCRETE CURB, 6" HT.

HOT-MIX HOT LAID BITUMINOUS CONCRETE CURB, 6" HT.

U.S. ROUTE 202 CONCORD

BIT. OVER CONC. PAV.

CONC. PAV.

BULLBOARD

12'X18' ACCMP

15" RCP

24" RCP

30" RCP

50" RCP

PREL. TRACING YLT DESIGN AHR CHK'D. HGG

y:\projects\Dell41-202\Dell41cont3W\SWTR-DRN\pondplans3w.dgn

10/28/2005

STORMWATER MANAGEMENT–PROFILE POND 1 (FACILITY MAINTENANCE NO. 192)

SM 2 OF 4

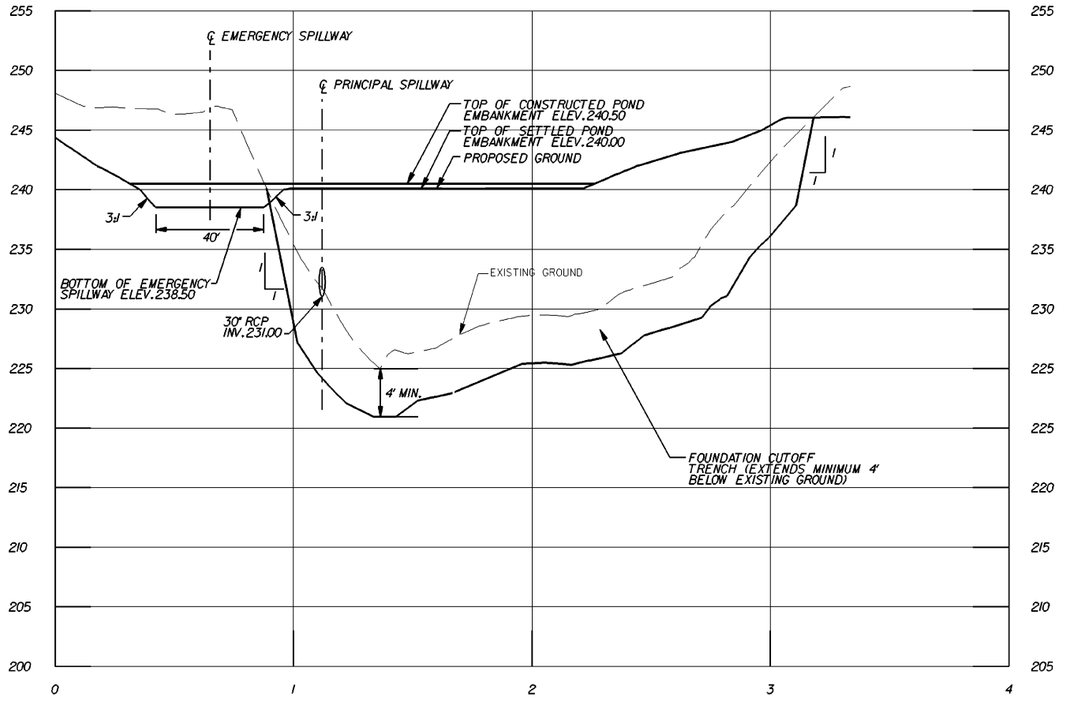
CONTRACT	COUNTY	F.A.P. NO.	SHEET NO.	TOTAL SHTS.
24-106-05	NEW CASTLE	SEE TITLE SHEET	96	246

SR 141, US 202 – I-95 TO AUGUSTINE CUT OFF

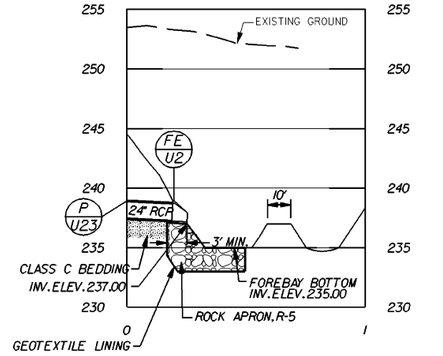
REVISIONS

HOR. 0 30 60 90 1" = 30'

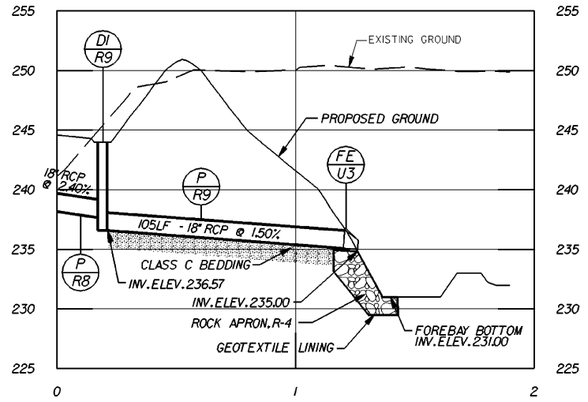
VER. 0 6 12 18 1" = 6'



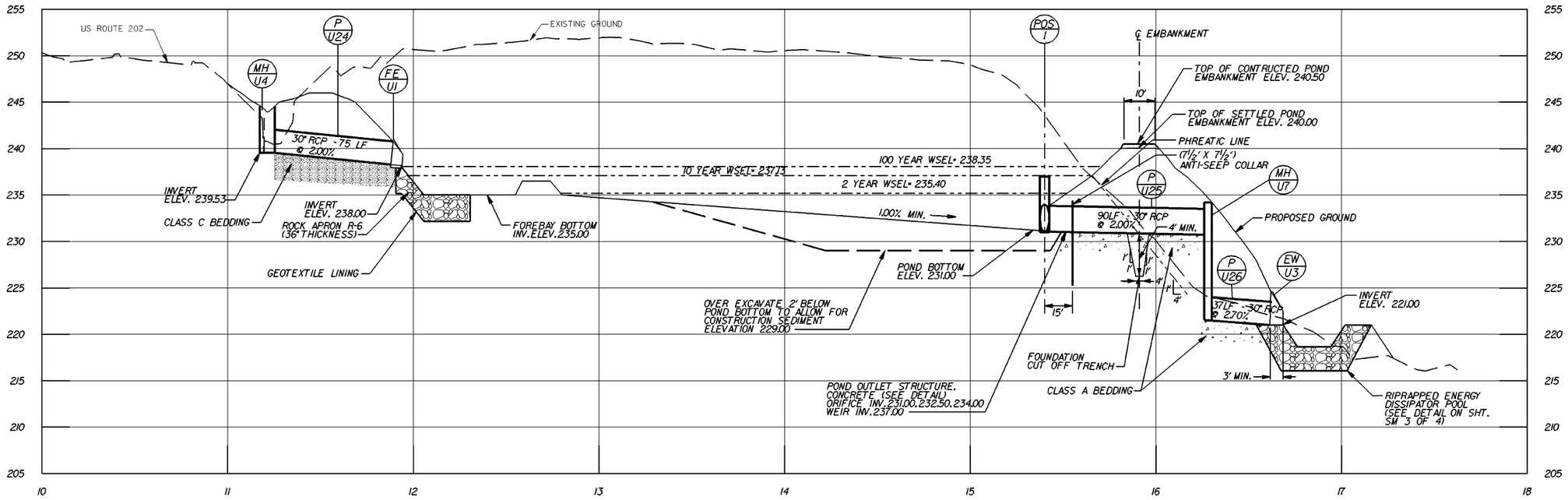
P1–B SECTION THROUGH EMBANKMENT BERM POND 1



P1–D SECTION THROUGH 24" RCP AND FOREBAY



P1–C SECTION THROUGH 18" RCP AND FOREBAY



P1–A SECTION THROUGH POND 1

10/28/2005

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PREL. TRACING WSB DESIGN AHR CHK'D. HGG

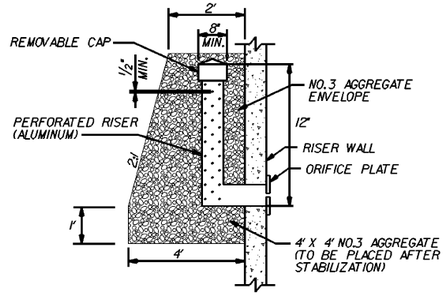
STORMWATER MANAGEMENT – DETAIL POND 1 (FACILITY MAINTENANCE NO.192)

SM 3 OF 4

CONTRACT	COUNTY	F.A.P. NO.	SHEET NO.	TOTAL SHTS.
24-106-05	NEW CASTLE	SEE TITLE SHEET	97	246

SR 141, US 202 – I-95 TO AUGUSTINE CUT OFF

REVISIONS



PERFORATED STANDPIPE WITH INTERNAL ORIFICE

NOT TO SCALE

PERFORATED STANDPIPE NOTES:

1. COST OF FURNISHING MATERIALS AND INSTALLING PERFORATED STANDPIPE TO BE INCIDENTAL TO THE POND OUTLET STRUCTURE, CONCRETE "I (NO.272000).
2. USE ON 2½" ORIFICE OPENING ONLY.
3. PLACE NO.3 AGGREGATE ENVELOPE AROUND STANDPIPE AFTER STABILIZATION OF PERMANENT STORMWATER MANAGEMENT FACILITY.

STORMWATER MANAGEMENT POND/SEDIMENT BASIN SEQUENCE OF CONSTRUCTION

THE STORMWATER MANAGEMENT POND SHALL FUNCTION AS A SEDIMENT BASIN DURING ROADWAY CONSTRUCTION AND SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE FOLLOWING SECTIONS OF THE STANDARD SPECIFICATIONS

SECTION 271 - STORMWATER MANAGEMENT POND
SECTION 272 - POND OUTLET STRUCTURE, CONCRETE
SECTION 274 - CLAY BORROW, STORMWATER MANAGEMENT POND

POND BASIN CONSTRUCTION

1. INSTALL STABILIZED CONSTRUCTION ENTRANCE.
2. CLEAR AND GRUB FOR INSTALLATION OF SEDIMENT BASIN PERIMETER EROSION AND SEDIMENT CONTROL DEVICES.
3. INSTALL SEDIMENT BASIN PERIMETER EROSION AND SEDIMENT CONTROL DEVICES.
4. CLEAR AND GRUB REMAINING AREA FOR SEDIMENT BASIN CONSTRUCTION.
5. EXCAVATE AND CONSTRUCT POND OUTLET STRUCTURE. INSTALL SKIMMER DEWATERING DEVICE, AND PLACE RIPRAP AT END OF OUTLET PIPE. PROVIDE CAST-IN-PLACE GASKETS AND WATERTIGHT CONNECTIONS IN ALL OUTFALL STRUCTURES
6. BEGIN BASIN EXCAVATION. DURING THE EXCAVATION THE CONTRACTOR SHALL SALVAGE AND STOCKPILE SILT-CLAY MATERIALS CLASSIFIED AS A-2-6, A-4, A-5, OR A-7 PER AASHTO M-145 (OR CH, CL, SC, GC AS PER UNIFIED SOIL CLASSIFICATION) TO BE USED TO CONSTRUCT THE FOUNDATION CUTOFF AND EMBANKMENT.
7. CONSTRUCT THE FOUNDATION CUTOFF, EMBANKMENT AND POND TO THE LINES, GRADES, AND DETAILS INDICATED ON PLANS.
8. STABILIZE ALL AREAS THAT WERE DISTURBED DURING CONSTRUCTION OF THE SEDIMENT BASIN.
9. DEACTIVATE SKIMMER DEWATERING DEVICE

SEDIMENT BASIN MAINTENANCE

1. THE SEDIMENT BASIN SHALL BE INSPECTED IMMEDIATELY AFTER EVERY RAIN AND REPAIRS MADE AS NEEDED.
2. SEDIMENT SHALL BE REMOVED DOWN TO ELEVATION 231.00 ONLY AND THE BASIN RESTORED TO ITS DESIGNED LINES, GRADES, AND PROFILES WHEN SEDIMENT HAS ACCUMULATED TO A DEPTH OF TWO FEET. THE CONTRACTOR SHALL CLEARLY MARK THE CLEAN OUT ELEVATION ON A STAKE DRIVEN INTO THE GROUND AT THE BOTTOM OF THE BASIN. SEDIMENT REMOVED FROM THE BASIN SHALL BE DISPOSED OF AT A LOCATION APPROVED BY THE ENGINEER.

CONVERSION OF SEDIMENT BASIN TO STORMWATER MANAGEMENT POND

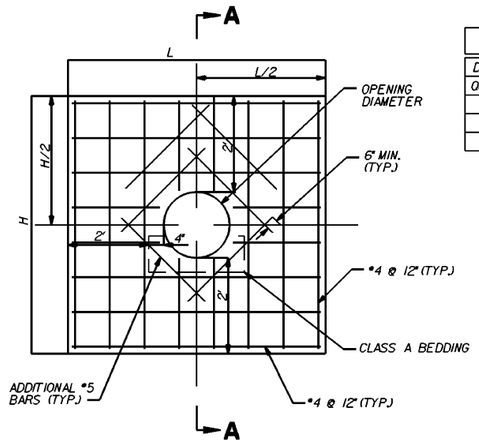
1. THE SEDIMENT BASIN SHALL BE CONVERTED INTO THE PERMANENT STORMWATER MANAGEMENT POND AFTER ALL AREAS DRAINING TO THE POND ARE PERMANENTLY STABILIZED AND THE ENGINEER HAS APPROVED THE CONVERSION.
2. REMOVE ACCUMULATED SEDIMENT FROM THE BASIN DOWN TO ELEVATION 231.00 ONLY AND DISPOSE OF AT A LOCATION APPROVED BY THE ENGINEER.
3. PERFORM EXCAVATION TO THE LINES, GRADES, PROFILES, AND CROSS-SECTIONS INDICATED ON THE PLANS.
4. INSTALL PERMANENT STABILIZATION.
5. REMOVE THE PERIMETER EROSION AND SEDIMENT CONTROL DEVICES. DEACTIVATE SKIMMER DEWATERING DEVICE.

NOTE:

PLACEMENT OF PERMANENT EROSION AND SEDIMENT CONTROLS FOR ALL PHASES SHALL BEGIN AS EARLY AS POSSIBLE.

ALL CLEANOUT MATERIAL FROM THE PONDS SHALL BE TAKEN TO AN APPROVED OFF SITE DISPOSAL AREA.

EXCAVATED MATERIAL FROM THE PONDS TO BE UTILIZED FOR SITE WORK MUST BE STOCKPILED FOR DRYING AND ANALYZED FOR SUITABILITY.

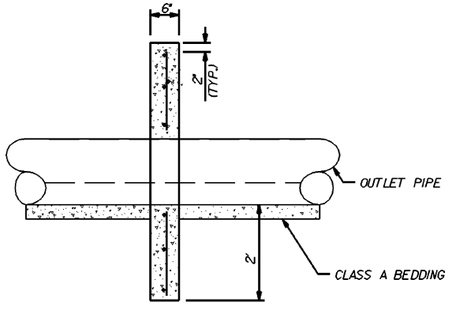


ANTI-SEEP COLLAR DESIGN

NOT TO SCALE

NOTE:

COST OF FURNISHING ALL MATERIALS AND INSTALLING THE ANIT-SEEP COLLAR TO BE INCIDENTAL TO THE POND OUTLET STRUCTURE, CONCRETE "I (ITEM NO.272000).



SECTION A-A

ANTI-SEEP COLLAR SCHEDULE

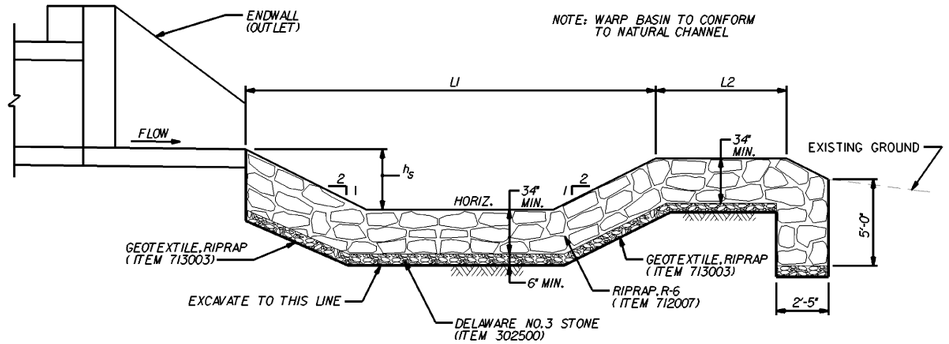
PIPE	QUANTITY	SIZE (L X H)	OPENING DIAM.
30"	1	7'-6" X 7'-6"	4'-0"

NOTES:

1. SEE STORMWATER MANAGEMENT PROFILE FOR COLLAR PLACEMENT.
2. CONCRETE MUST MEET THE REQUIREMENTS OF SECTION 812 PORTLAND CEMENT CONCRETE OF THE STANDARD SPECIFICATIONS.
3. REINFORCING STEEL SHALL BE GRADE 60 AND MEET THE REQUIREMENTS OF SECTION 603 OF THE STANDARD SPECIFICATIONS. ALL REINFORCING STEEL SHALL HAVE A CLEAR COVER OF 2" UNLESS OTHERWISE SPECIFIED.

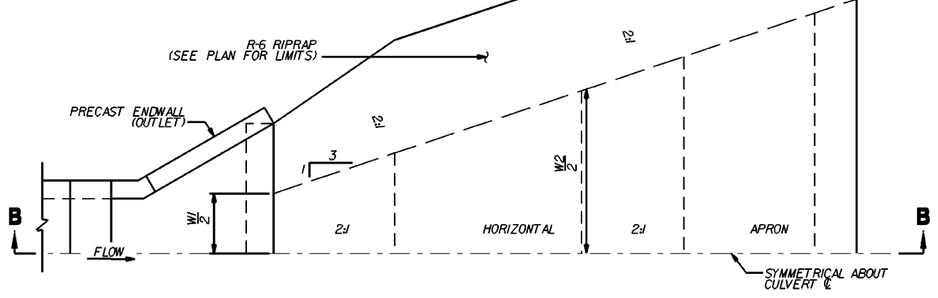
POND DESIGN SUMMARY

DESIGN STORM	FACILITY INFLOW	FACILITY DISCHARGE	WATER SURFACE ELEVATION	STORAGE VOLUME (AC.FT.)
QUALITY STORM	6.90 cfs	0.77 cfs	232.93	0.202
2 YEAR	37.81 cfs	18.60 cfs	235.40	0.816
10 YEAR	74.16 cfs	35.67 cfs	237.13	1.398
100 YEAR	117.67 cfs	65.56 cfs	238.35	1.951



SECTION B-B

NOT TO SCALE



RIPRAPPED ENERGY DISSIPATOR POOL

NOT TO SCALE

RIPRAPPED ENERGY DISSIPATOR POOL SCHEDULE

PIPE STRUCTURE	PIPE SIZE	PIPE #	W1	W2	L1	L2	hs	HORZ.	AREA
			FT.	FT.	FT.	FT.	FT.	FT.	S.Y.
POND 1	30" R.C.P./IV	U26	2.5	15	28	14	2.5	18	160

PREL. TRACING KMW DESIGN AHR CHK'D. RLB

10/28/2005

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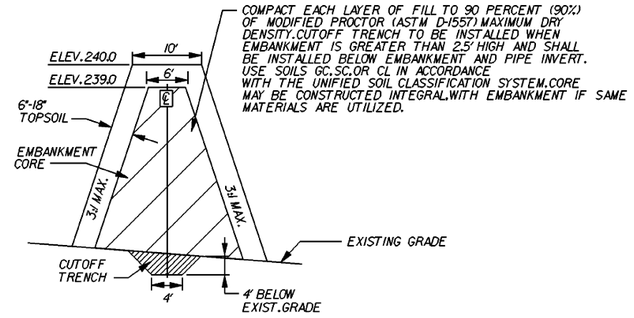
STORMWATER MANAGEMENT-DETAIL POND 1 (FACILITY MAINTENANCE NO. 192)

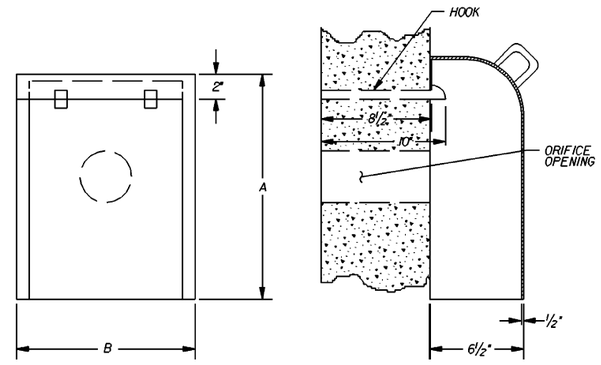
SM 4 OF 4	CONTRACT	COUNTY	F.A.P. NO.	SHEET NO.	TOTAL SHTS.
	24-106-05	NEW CASTLE	SEE TITLE SHEET	98	246

SR 141, US 202 – I-95 TO AUGUSTINE CUT OFF

REVISIONS



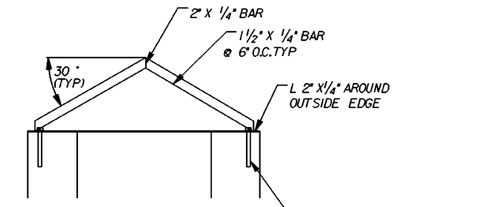
SECTION THROUGH EMBANKMENT
NOT TO SCALE



TRASH BAFFLE DIMENSIONS		
ORIFICE OPENING	A	B
12"	22"	16"
18"	28"	20"

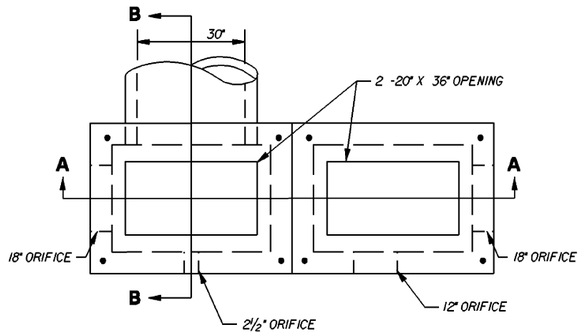
ORIFICE TRASH BAFFLE
NOT TO SCALE

NOTE: COST OF FURNISHING ALL MATERIALS AND INSTALLING TRASH BAFFLE TO BE INCIDENTAL TO THE POND OUTLET STRUCTURE, CONCRETE #1 (ITEM NO. 272000). REFER TO THE NEENAH CATALOG R-3701 FOR USABLE MATERIALS.

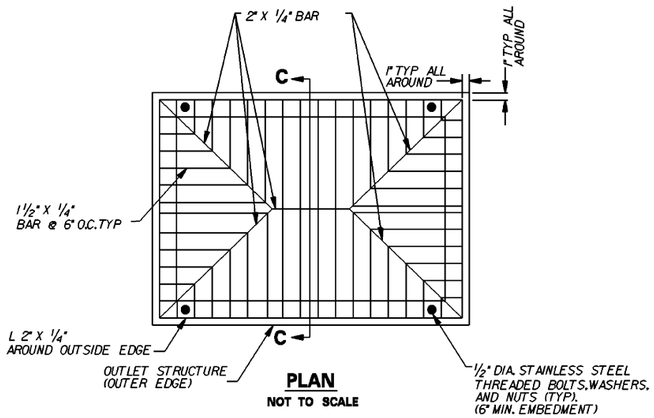


SECTION C–C

NOTE: ALL MATERIALS USED FOR TRASH RACK SHALL BE ALUMINUM UNLESS OTHERWISE NOTED.



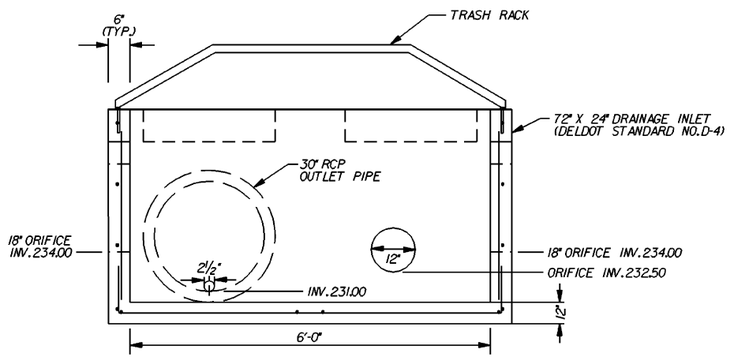
POS-1 (POND 1) PLAN VIEW
NOT TO SCALE



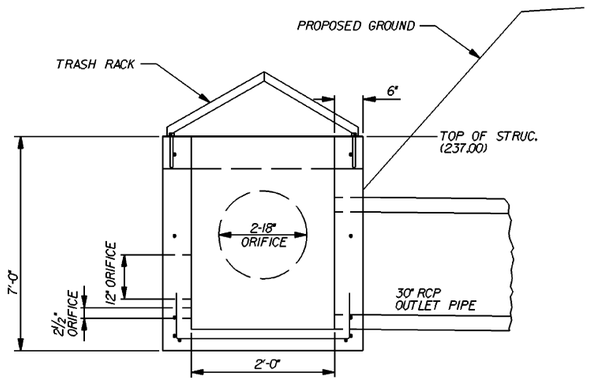
PLAN
NOT TO SCALE

NOTE: USE STAINLESS STEEL BOLTS IN ACCORDANCE WITH ASTM F593. STAINLESS STEEL WASHERS AND NUTS SHALL BE IN ACCORDANCE WITH ASTM F594.

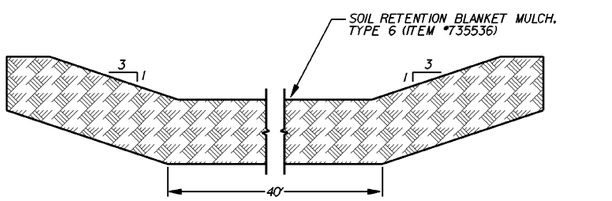
TRASH RACK DETAIL
NOT TO SCALE



SECTION A–A
NOT TO SCALE



SECTION B–B
NOT TO SCALE



SECTION THROUGH SPILLWAY
NOT TO SCALE

POND OUTLET STRUCTURE, CONCRETE, #1
ITEM #272000

10/28/2005

y:\projects\Dell41-202\Dell4cont3W\SWTR-DRN\pondldetails02c3w.dgn

DESIGN AHR CHK'D. HGG

PREL. TRACING IRL

DELDOT AGR. 2056

KCI PROJECT NO. 00008105_00001

BMP FIELD INVENTORY AND INSPECTION

STANDARD OPERATING PROCEDURES

APPENDIX C

BMP FIELD INVENTORY AND INSPECTION FORM

APPENDIX C
BMP FIELD INVENTORY & INSPECTION FORM

INVENTORY				
Field	**Domain**	**Value**	**Description**	**Format**
BMP #			Unique SWM facility no.	Small Integer
BMP Type	D_BMP_Type		BMP type including sub-category designation	String
Owner	D_BMPOwnership		Owner of BMP	String
Year Built			Year BMP was constructed	Date
BMP Marker	D_BooleanNA		BMP # Present (Yes/No)	String
Annual Spillway Inspection	D_BooleanNA		Does a Principal Spillway Inspection need to be conducted (Yes/No)	String
Drainage Area			Drianage area to BMP	Double
Record Found	D_Boolean		BMP Plans exist (Yes/No)	String
As Built Plan	D_Boolean		As Built Plans exist (Yes/No)	String
Paved Area (ac)	Add to Dbase		Paved drainage area to BMP	
Facility Location	Add to Dbase		Location of BMP	
Facility Size	Add to Dbase		Size of BMP	
Expiration Date	Add to Dbase		Date the BMP expires	
INSPECTION				
Inspection Date			Date of field inspection	Date
Inspection Type	D_Insp_Type		Type of Inspection	String
Personnel			Initials of inspector(s)	String
Firm	D_Company		Firm conducting Inspections	String
SpillWay Coas Insp	D_BooleanNA		A Principal Spillway Inspection was conducted (Yes/No)	String
Overall Condition	D_Insp_Rating		Overall facility inspection rating	String
SITE OVERVIEW				
1 - Access	D_Insp_Score		Scoring of access into and around the facility	String
2 - Fence	D_Insp_Score		Scoring of fence related to access into the facility	String
3 - Invasive Vegetation	D_Insp_Score		Scoring of unwanted vegetation impacting overall site	String
Invasive Type	D_Invasive		ID invasive vegetation from standard list	String
Invasive Amount			Estimate of approximate cumulative area (sq-feet)	Double
4 - Public Hazards	D_Insp_Score		Scoring of overall hazard of facility relating to public safety	String
WATER QUALITY OVERVIEW				
5 - Pre-Treatment	D_Insp_Score		Scoring of overall condition of pre-treatment features (e.g. forebay)	String
6 - Flow-in condition	D_Insp_Score		Scoring of overall condition of stormwater discharge point(s) into facility	String
7 - Conveyance Condition	D_Insp_Score		Scoring of stability of flow conveyance through and out the facility	String
8 - Downstream Condition	D_Insp_Score		Scoring of overall downstream condition beyond ROW	String
9 - Ponding	D_Insp_Score		Scoring of unwanted/extended ponding of drainage in the facility	String
10 - Water Quality Contamination	D_Insp_Score		Scoring of watershed and non-stormwater contamination impacting WQ functionality	String
11 - Water Quality Treatment	**D_Insp_Score**		**Not Rated: Potential future permit requirements regarding BMP performance**	String
12 - Overall Site Stability	D_Insp_Score		Scoring of facility condition relating to overall stability beyond treatment area	String
13 - Permanent Pool	D_Insp_Score		Scoring of condition of the designed Water Surface Elevation & Permanent Pool	String
14 - BMP Vegetation	D_Insp_Score		Scoring of vegetation planted to assist in treatment of stormwater throughout facility	String
EMBANKMENT INSPECTION				
15 - Cover - Upstream	D_Insp_Score		Scoring of cover condition related to upstream embankment	String
16 - Cover - Downstream	D_Insp_Score		Scoring of cover condition related to downstream embankment	String
17 - Seepage	D_Insp_Score		Scoring of seepage condition related to the downstream embankment / toe	String
OUTLET INSPECTION				
18 - Riser - Opening	D_Insp_Score		Scoring of riser opening(s) condition related to blockage & structural condition	String
19 - Riser - Low Flow	D_Insp_Score		Scoring of low-flow orifice opening related to blockage & structural condition	String
20 - Riser - Accumulation	D_Insp_Score		Scoring of riser accumulation of sediment / debris	String
21 - Riser - Structure	D_Insp_Score		Scoring of riser structural condition related to cracks, spalling, joint separation	String
22 - Principal Spillway	D_Insp_Score		Scoring of principal spillway condition related to cracks, spalling, joint separation	String
23 - Outfall	D_Insp_Score		Scoring of principle spillway outfall	String
24 - Emergency Spillway	D_Insp_Score		Scoring of spillway overall condition (if existing)	String

DELDOT AGR. 2056

KCI PROJECT NO. 00008105_00001

BMP FIELD INVENTORY AND INSPECTION

STANDARD OPERATING PROCEDURES

APPENDIX D

BMP DOMAINS AND STANDARD ACTIONS

APPENDIX D
BMP DOMAINS AND STANDARD ACTIONS

BMP Domains

D_Insp_Score

Code	Description
0 - Not Applicable	0 - Not Applicable
1 - No Issues	1 - No Issues
2 - Minor Issues not Affecting Performance	2 - Minor Issues not Affecting Performance
3 - Maintenance Work Order / Invasive Spray	3 - Maintenance Work Order / Invasive Spray
4 - Contracted Work	4 - Contracted Work
5 - Reftrofit	5 - Reftrofit

D_Insp_Rating

Code	Description
A - No Performance Issues	A - No Performance Issues
B - Minor Maintenance	B - Minor Maintenance
C - Major Maintenance	C - Major Maintenance
D - Retrofit	D - Retrofit

D_Invasive

Code	Description
Norway Maple	Norway Maple
Multiflora Rose	Multiflora Rose
Tree of Heaven	Tree of Heaven
Autumn Olive	Autumn Olive
Mile-a-Minute Vine/Devil's Tear Thumb	Mile-a-Minute Vine/Devil's Tear Thumb
Oriental Bittersweet	Oriental Bittersweet
Porcelain Berry	Porcelain Berry
Cattails	Cattails
Canada Thistle	Canada Thistle
Bull Thistle	Bull Thistle
Garlic Mustard	Garlic Mustard
Japanese Knotweed	Japanese Knotweed
Bradford Pear	Bradford Pear
Phragmites (Common Reed)	Phragmites (Common Reed)
Purple Loosestrife	Purple Loosestrife

Standard Actions List

D_Action

Code	Description
Stabilize Bare Areas	Stabilize Bare Areas
Perform detailed sediment depth measurements	Perform detailed sediment depth measurements
Remove accumulated sediment from all components of BMP	Remove accumulated sediment from all components of BMP
Slope Repair	Slope Repair
Construct Sediment Forebay	Construct Sediment Forebay
Recondition forebay to plan	Recondition forebay to plan
Repair inflow condition	Repair inflow condition
Install check dam as per plan	Install check dam as per plan
Recondition check dam	Recondition check dam
Revegetate per plan	Revegetate per plan
Construct missing BMP	Construct missing BMP
Recommend BMP redesign	Recommend BMP redesign
Recommend BMP reconstruction	Recommend BMP reconstruction
Future Monitoring Required	Future Monitoring Required
Remove Downed Trees	Remove Downed Trees
Further Investigate Unknown Drainage	Further Investigate Unknown Drainage
Repair Pipe/Structure	Repair Pipe/Structure
Re-grade Swale to Plan	Re-grade Swale to Plan
Repair Outflow Condition	Repair Outflow Condition
Repair fence	Repair fence
Repair Gate	Repair Gate
Replace lock	Replace lock
Inspect 72 hours after rain event	Inspect 72 hours after rain event
Clear trash/debris/sediment	Clear trash/debris/sediment
Remove Hazardous Waste	Remove Hazardous Waste
Replace manhole lid	Replace manhole lid
Repair pipe deflection	Repair pipe deflection
Repair trash rack	Repair trash rack
Install trash rack	Install trash rack
Replace monitoring well cap	Replace monitoring well cap
Repair erosion	Repair erosion
Replace rip-rap	Replace rip-rap
Repair seepage	Repair seepage
Repair sinkhole	Repair sinkhole
Stabilize saturated areas	Stabilize saturated areas
Repair undercutting	Repair undercutting
Cut/Remove trees	Cut/Remove trees
Clear brush - Vegetation	Clear brush - Vegetation
Mow grass	Mow grass
Not Required	Not Required

DELDOT AGR. 2056

KCI PROJECT NO. 00008105_00001

BMP FIELD INVENTORY AND INSPECTION

STANDARD OPERATING PROCEDURES

APPENDIX E

DELAWARE SAND FILTER INSPECTION SOP

APPENDIX E

DELAWARE SAND FILTER INSPECTION STANDARD OPERATING PROCEDURES

As part of DelDOT's NPDES General Permit Program Regulations Governing Stormwater Discharge, KCI is contracted to inspect all DelDOT-owned BMPs. This SOP pertains to the inspection of one BMP type, the Delaware Sand Filter (DSF). The SOP for DelDOT's other BMP types - BaySaver, Bioretention, Biofiltration, Dry Pond, Filter Strip, Infiltration Basin / Trench, Sediment Forebay, Storm Filter, Wet Pond, Wet Pond/Wetland - is provided in the front of this report.

1. BACKGROUND

KCI conducted a detailed study of various DSFs from 2006-2011 under DelDOT Agr. No. 1613. In March 2012, a Summary Report was prepared detailing the DSF study history, results, conclusions, and recommendations. In September 2013, an Addendum to the Summary Report was prepared, describing the revised process for annual inspection and maintenance recommendations. This process is described herein.

2. DSF LOCATIONS

Annual inspections are conducted at the following DSF locations:

- **Lancaster Pike DSF**
  - BMP 52.
    BMPs 54-73.
- **Kennett Pike DSF**
  - BMPs 364-397.
    BMPs 421-430.
- **US-40 DSF**
  - BMP 231.
- **Skyline Drive DSF**
  - BMP 144.
- **Dover DSF**
  - BMP 176.
- **Greenbank Road DSF**
  - BMP 538.
- **Washington Street DSF**
  - BMP 565-567.

3. INSPECTION PROTOCOLS

Twenty (20%) of the sedimentation chambers and sand chambers are inspected for each DSF. DSFs are graded as follows:

A = DSF performing satisfactorily, or,

C = DSF requires contracted maintenance

4. INSPECTION EQUIPMENT

The following items are required to perform DSF inspections:

- KCI Safety Vest.
- First Aid Kit.
- Field Tool on Laptop/Toughbook.
- Grate hook and red bar.
- Camera.
- 6 foot ruler.
- Post-hole digger.
- Bucket.

5. FIELD DATA SHEET

A blank field sheet is attached.

- **Upon arrival at each DSF, complete the following on the field data sheet:**

  - BMP Number.
  - Inspection Date.
  - Inspection Team.

- **Select and open the centermost sedimentation and sand chamber pair.**

  - Take a structure photo of each (Figures 1 and Figure 2).
  - Take a landscape photo of the entire DSF BMP (Figure 3).

- **Begin the inspection following the steps listed below:**

1) Sedimentation Chamber

- **Chamber Inspected**: 20% of the chambers should be inspected. Record the location (from left to right) of the sedimentation chamber being inspected. *If there are 10 sedimentation and sand chamber pairs in the DSF, and the inspection crew selects two. If they are the 1st and 5th they would write #1/10 and #5/10.*

- **Water Present**: Write "Y" if there is water in the chamber and "N" if there is not.

- **If Yes-Depth of Water**: If there is water present in the sedimentation chamber, record the depth in feet.

- **Depth of Sediment:** Measure the depth in feet of the sediment found at the bottom of the chamber.

- **Oil and Grease Present:** If there is oil and grease observed write "Y", if there is not, write "N".

- **Comments:** Record any additional observations made while inspecting the sedimentation chamber.

2) Sand Chamber

- **Chamber Inspected**: 20% of the chambers should be inspected. Record the location (from left to right) of the sedimentation chamber being inspected. *If there are 10 sedimentation and sand chamber pairs in the DSF, and the inspection crew selects two. If they are the 1st and 5th they would write #1/10 and #5/10.*

- **Water Present:** Write "Y" if there is water in the chamber and "N" if there is not.

- **If Yes-Depth of Water**: If there is water present in the sedimentation chamber, record the depth in feet.

- **Evidence of Clogging:** If there is any evidence of debris that could block the movement of water from the sand chamber to the sedimentation chamber, write "Y"; if there is no evidence of clogging, write "N".

- **Debris Coverage:** Record the percentage of the chamber that is covered by debris.

- Using a post-hole digger, remove a core of the sediment in the sand chamber and place it in a bucket. In the resulting cross-section, record the following:
    - **Depth of Debris (ft.).**
    - **Depth of Gravel (ft.).**
    - **Depth of Sand (ft.).**
    - **Depth of Discoloration:** Record the depth in feet of sediment that is discolored.
    - **Oil and Grease Present:** If there is oil and grease observed write "Y", if there is not, write "N".
    - **Comments:** Record any additional observations made while inspecting the sand chamber.
- Take a photo of the cross-section (Figure 4).
- Place the core back into the sand chamber and close both the sedimentation chamber and sand chamber.

3) Drainage Area

- Stabilized:
    - If the drainage area of the DSF is stabilized, write "Y",
    - If there is loose sediment and a lack of vegetation, write "N".

4) Overall Comments

a. Record any additional observations of the DSF BMP.

5) Performance Rating

a. "A" performance rating given if the DSF is performing satisfactorily.

b. "C" performance rating given if:

- Evidence of clogging and water in the sand chamber after 72 hours of dry weather.
- More than 75% of the sediment in the sand chamber is discolored.
- Either chamber is filled to the top with debris.
- Sand is missing from the sand chamber.

6. REPORTING

Once the DSF inspections are completed, the following procedures are followed to document the DSF inspections.

- **Field Data Sheet**

Upload photos and sync work area in field tool so reports can be generated.

- **Inspection Report**

Generate inspection reports in database for each sand filter.

- **Annual Report**

Compile all DSF Inspection Report and Rating Summary Tables into the Overall Summary Annual Report.

- **Upload to Map Viewer**

Upon DelDOT review and approval of the Overall Summary Annual Report, upload DSF Inspection Report PDFs to the DelDOT NPDES Database (via GeoSpatial Solutions Practice), where they will be available on the DelDOT NPDES Map Viewer.

FIGURES

FIGURE 1: SEDIMENTATION CHAMBER STRUCTURE PHOTO

FIGURE 2: SAND CHAMBER STRUCTURE PHOTO

FIGURES
(Continued)

FIGURE 3: LANDSCAPE PHOTO

FIGURE 4: SAND CHAMBER CROSS-SECTION PHOTO

DELDOT AGREEMENT 1852 **ANNUAL DSF INSPECTIONS**

BMP # _____

Inspection Date	
Inspection Team	
Prior Performance Rating	

SEDIMENTATION CHAMBER		
Chamber Inspected	L to R	
Water Present	Y/N	
If Yes – Depth of Water	ft	
Depth of Sediment	ft	
Oil or Grease Present	Y/N	
Comments		
SAND CHAMBER		
Chamber Inspected	L to R	
Water Present	Y/N	
If Yes – Depth of Water	ft	
Evidence of Clogging	Y/N	
Debris Coverage	%	
Depth of Debris	ft	
Depth of Gravel	ft	
Depth of Sand	ft	
Depth of Discoloration	ft	
Oil or Grease Present	Y/N	
Comments		
DRAINAGE AREA		
Stabilized	Y/N	
OVERALL COMMENTS		

BMP

INVENTORY DATA SUMMARY

Inspection Date		**INSERT PHOTO**
Inspection Team	Click here to enter text.	
District/ADC Grid	Click here to enter text.	
BMP Type	Click here to enter text.	
Prior Year Performance Rating		
Prior Year Performance Rating		
Action Item(s)		

INSERT MAP VIEWER MAP BELOW

BMP

INSPECTION DATA SUMMARY

SEDIMENTATION CHAMBER		
# of Chamber Inspected	L to R	
Water Present	Y/N	
If Yes – Depth of Water	ft	
Depth of Sediment	ft	
Oil or Grease Present	Y/N	
Comments		
SAND CHAMBER		
# of Chamber Inspected	L to R	
Water Present	Y/N	
If Yes – Depth of Water	ft	
Evidence of Clogging	Y/N	
Debris Coverage	%	
Depth of Debris	ft	
Depth of Gravel	ft	
Depth of Sand	ft	
Depth of Discoloration	ft	
Oil or Grease Present	Y/N	
Comments		
DRAINAGE AREA		
Stabilized	Y/N	
OVERALL COMMENTS		

DELDOT AGR. 2056

KCI PROJECT NO. 00008105_00001

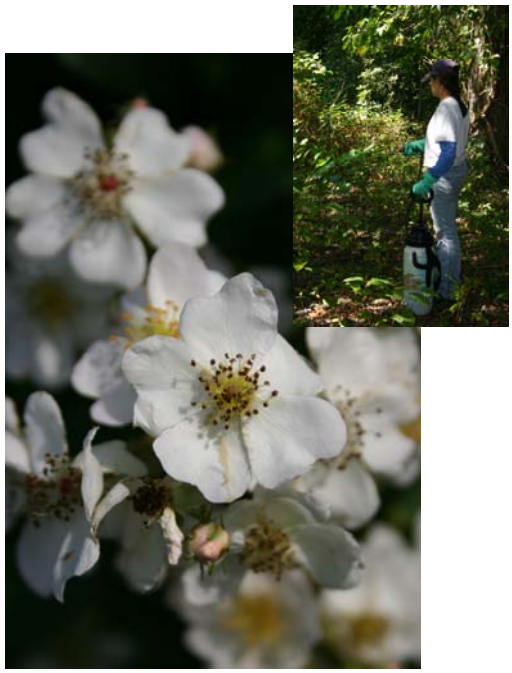
BMP FIELD INVENTORY AND INSPECTION

STANDARD OPERATING PROCEDURES

APPENDIX F

INVASIVE SPECIES IDENTIFICATION MANUAL

Invasive Plants of Delaware



Identification and Control of 20 Invasive Species

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Sommers, Asley Kroon, Lynne Staub
Environmental Stewardship Program
Delaware Division of Parks & Recreation

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Autumn Olive

Elaeagnus umbellata

Perennial deciduous shrub or small tree to fifteen feet tall.

Widespread in all three counties.

Undersides of leaves pale silver. Clusters of aromatic, white, drooping four-petaled flowers with long tube-like bases. Blooms in June and July. Small quarter-inch pink to reddish berries marked with silvery scales ripen Sept – Nov.

Autumn olive's tolerance of many soil conditions allows it to invade grasslands, fields, open woodlands, and disturbed areas.

Fruit is eaten by a wide variety of birds and mammals which aid in seed dispersal.

Autumn Olive - Control Methods

Hand Pulling – Effective for seedlings and young plants. Care must be taken to remove the entire root system to prevent resprouting.
Mar - Nov; or anytime identification is possible.

Cut Stump – Cut stem 2 - 3 inches above the ground and apply a pre-mixed 50% solution of a water–soluble triclopyr amine with water to the stump immediately following cutting. Avoid run-off onto the soil.
Mar – Nov; best following full leaf expansion in spring.

Basal Bark – Apply a 25% solution of oil-based triclopyr ester with an oil-based surfactant in a band several inches to a foot wide completely around the trunk and all stems. Avoid runoff or spraying chemical on the ground.
Mar – Nov; best following full leaf expansion in spring.

Foliar Spray – A 2% solution of glyphosate in a 0.5% non-ionic surfactant is effective when applied in an even coat to all foliage. Spray until wet but before it begins to drip off the leaves.
Early Summer through Fall

Bradford Pear

Pyrus calleryana

Deciduous tree to forty-five feet tall.

Common in all three counties.

White one-inch wide, five-petaled flowers, in small clusters bloom in mid – late-April. Small, half-inch olive-brown to tan fruit marked with small dots ripen in early fall.

Grows best in full sun but will tolerate partial shade and a wide range of soil conditions. Invades roadsides, old fields and disturbed woods.

Fruit is eaten by a wide variety of birds and mammals which aid in seed dispersal.

Bradford Pear - Control Methods

Hand Pulling – Effective for seedlings and young plants. Care must be taken to remove the entire root system to prevent resprouting.
Mar - Nov; or anytime identification is possible.

Cut Stump – Cut stem 2 - 3 inches above the ground and apply a pre-mixed 50% solution of a water–soluble triclopyr amine with water to the stump immediately following cutting. Avoid run-off onto the soil.
Mar – Nov; best following full leaf expansion in spring.

Basal Bark – Apply a 25% solution of oil-based triclopyr ester with an oil-based surfactant in a band several inches to a foot wide completely around the trunk and all stems. Avoid runoff or spraying chemical on the ground.
Mar – Nov; best following full leaf expansion in spring.

Foliar Spray – A 2% solution of triclopyr in a 0.5% non-ionic surfactant is effective when applied in an even coat to all foliage. Spray until wet but before it begins to drip off the leaves.
Early Summer through Fall

Bush Honeysuckle

Lonicera spp.

Deciduous shrubs to fifteen feet tall.

Three species widespread in all three counties.

White, two-lipped, tube-shaped flowers (turning yellow with age) bloom in May and early June. Red fruit ripe in Jun – Jul (Tartarian) or Sept to Nov.

Bush honeysuckles prefer open sunlight but may be found in forest edges, abandoned fields, pastures, roadsides and other open upland habitats. Morrow's honeysuckle is capable of invading fens, pond edges and other uncommon habitat types.

Bush Honeysuckle - Control Methods

Three bush honeysuckle species occur in Delaware: *L. mackii* Amur honeysuckle, *L. morrowii* Morrow's honeysuckle and *L. tatarica* Tartarian honeysuckle, each separated by minor differences in shape and hairiness of the leaves.

Hand Pulling – Effective for seedlings and young plants. Care must be taken to remove the entire root system to prevent resprouting.
Mar - Nov; or anytime identification is possible.

Cut Stump – Cut stem 2 - 3 inches above the ground and apply a pre-mixed 50% solution of a water–soluble triclopyr amine with water to the stump immediately following cutting. Avoid run-off onto the soil.
Mar – Nov; best following full leaf expansion in spring.

Foliar Spray – A 2% solution of glyphosate in a 0.5% non-ionic surfactant is effective when applied in an even coat to all foliage. Spray until wet but before it begins to drip off the leaves.
Early Summer through Fall

Common Reed

Phragmites australis (Haplotype M)

Tall perennial grass.

Widespread in all three counties.

Grows to fifteen feet tall and forms dense stands. Leaves one to one and one half inches wide and rough to the touch. Stems remain standing long after they die. Large feathery seed head is purple red turning grayish-tan when ripe in autumn.

Invades fresh and brackish tidal and non-tidal wetlands, river and lake edges, ditches, roadsides and disturbed areas. Prefers moist soils, but can be found in dry areas that have been disturbed.

Spreads mainly by large well established rhizomes.

Common Reed - Control Methods

At least one common introduced and extremely aggressive haplotype (genetic type M) and 11 native haplotypes of *Phragmites australis* occur in North America. Distinguishing Type M from the native haplotypes in the field is possible based on a combination of several key characteristics. For more information see http://www.invasiveplants.net/phragmites/natint.htm

Foliar Spray – For large infestations a 1.5% solution of a wetland-approved glyphosate with a 0.5% non-ionic surfactant may be the most efficient means of control. For effective control with herbicides, healthy green leaves must be present at application time and temperatures must be above 50^{o} F. Best success is following the emergence of bloom spikes in late summer. **Late August – Early October**

Burning - Burning alone will rarely kill an established stand. If burning occurs early in the growing season it may actually stimulate growth. However, burning following herbicide application can be an effective method to remove accumulated dead plant material and stimulate regrowth of desired native plants.

European Privet
Ligustrum vulgare

Perennial semi-evergreen shrub or small tree to fifteen feet tall.

Common in all three counties.

Small white four-lobed tubular flowers growing in clusters at end of stems bloom from April to June. Small quarter-inch, dark blue fruit ripen in Oct – Nov.

Invades forests, fields and roadsides. Can form dense thickets. Shade tolerant, but grows best with some sun.

Fruit is eaten by a wide variety of birds and mammals which aid in seed dispersal.

European Privet - Control Methods

Hand Pulling – Effective for seedlings and young plants. Care must be taken to remove the entire root system to prevent resprouting.
Mar - Nov; or anytime identification is possible.

Cut Stump – Cut stem 2 - 3 inches above the ground and apply a pre-mixed 50% solution of a water–soluble triclopyr amine with water to the stump immediately following cutting. Avoid run-off onto the soil.
Mar – Nov; best following full leaf expansion in spring.

Foliar Spray – A 2% solution of triclopyr in a 0.5% non-ionic surfactant is effective when applied in an even coat to all foliage. Spray until wet but before it begins to drip off the leaves.
Early Summer through Fall

Basal Bark – Apply a 25% solution of oil-based triclopyr ester with an oil-based surfactant in a band several inches wide completely around the trunk and all stems. Avoid runoff or spraying chemical on the ground.
Mar – Nov; best following full leaf expansion in spring.

Garlic Mustard

Alliaria petiolata

Evergreen biennial broadleaf herb.

Widespread in New Castle County, sporadic but ***increasing*** in Kent and Sussex Counties.

First year plants a short rosette of toothed roundish leaves. Mature second year plants to three feet tall with blooms. Small quarter-inch, four-petaled white flowers bloom late April – June. Thin, upright seed pods up to two-inches long, appear shortly after.

Occurs in moist, shaded soil of river floodplains, forests, roadsides, edges of woods, trail edges and forest openings.

Garlic Mustard - Control Methods

Hand Pulling – Very effective for both first year rosettes and mature plants. Rosettes can be pulled any time. If mature flowering plants are present with ANY developing seed pods, they must be bagged and removed from the site. Mature plants that have been pulled can still produce viable seeds from the oldest seedpods along the stem.
Rosette **– Year-round**
Mature **– April - May**

Foliar Spray – A 2% solution of Glyphosate and water in a 0.5% non-ionic surfactant is effective when applied to first year rosettes during the winter months when most desirable native species are dormant. For best results treatment should be done when air temperature is above 50^{o} F. Foliar spray can be used after first hard frosts **(late Nov.)** until the spring wildflowers begin to emerge **(late Feb-early March). Care to avoid native evergreen herbs must be taken.**

Due to potentially large seed bank, control effort may need to be repeated for several seasons.

Japanese Barberry

Berberis thunbergii

Deciduous thorny shrub.

Widespread in New Castle County, locally common in Kent and Sussex Counties.

Small one and one-half inch, oval or spatula-shaped leaves are arranged in tight clusters close to branches. Pale yellow, flowers borne singly or in clusters of 2 – 4 in April. Half-inch long oval fruits ripen from green to bright red in autumn and may persist throughout the winter. Interior of cut stem is yellow.

Highly shade tolerant. Alters soil chemistry. Occurs in a variety of habitats including closed canopy forests, open woodlands, wetlands, pastures, meadows and disturbed areas.

Deer do not eat this plant. Fruit are eaten by birds and small mammals.

Japanese Barberry - Control Methods

Hand Pulling – Effective for seedlings and young plants. Care must be taken to remove the entire root system to prevent resprouting.
Mar - Nov; or anytime identification is possible.

Cut Stump – Cut stem 2 - 3 inches above the ground and apply a pre-mixed 50% solution of a water–soluble triclopyr amine with water to the stump immediately following cutting. Avoid run-off onto the soil.
Mar – Nov; best following full leaf expansion in spring.

Foliar Spray – A 2% solution of triclopyr in a 0.5% non-ionic surfactant is effective when applied in an even coat to all foliage. Spray until wet but before it begins to drip off the leaves.
Early Summer through Fall

Japanese Knotweed
Polygonum cuspidatum

A shrubby herbaceous perennial which dies back after a frost leaving dead bamboo-like stems behind.

Fairly common in all three counties.

Grows to ten feet tall. Tiny greenish-white flowers, occur in attractive, branched sprays in summer. Winged fruit appears soon after.

Can tolerate adverse growing conditions including full shade, high temperature, high salinity and flooding.

Forms dense stands along streams, ditches, roadsides and in waste places and old home sites.

Japanese Knotweed - Control Methods

Cutting – Repeated cutting of all stems can be effective for small stands. A minimum of three cuttings in one growing season are required to reduce rhizome reserves.
April - October

Foliar Spray – A combination of cutting, or cut stump treatments in late spring or early summer, and foliar spray on late summer re-sprouts has proven most effective. Care must be taken to remove cut stems to a dry sunny location away from a water body as they can resprout in moist conditions. Cut all stems in spring while plant is actively growing. Apply a 2% solution of glyphosate or triclopyr and water in a 0.5% non-ionic surfactant to all foliage that resprouts from cut stems in summer before the plant flowers.
Cut Stem and Remove - May
Foliar Spray – July - August

Even following control, as long as some rhizomes remain in the soil *P. cuspidatum* returns once management is relaxed. Constant monitoring of sites is required. Multiple year treatments will be required.

Japanese Stilt Grass

Microstegium vimineum

Annual or short-lived perennial grass

Widespread in all three counties.

Grows to three feet tall, but most often in sprawling fashion. Flowers and seeds borne on one to six, slender, one to two inch long heads in Sept. and Oct. Best identified by silver streak along center of upper leaf surface.

Adapted to growing in full shade but can also tolerate full sun.

Invades a wide variety of habitats including stream banks, floodplains, ditches, roadsides, trail edges and yards.

Seeds remain viable in soil at least three years.

Japanese Stilt Grass - Control Methods

Hand pulling – For small patches, repeated pulling of entire plant and root systems is effective. The plants can self-fertilize. If seeds are developing the plant must be bagged and removed from the site. Repeated pulling may be required until seed bank is depleted.
April - August

Mowing – Mowing or 'weed whacking' is an effective control method if done in late summer (September) when the plants are in peak bloom but before seeds are produced. This method is best used in areas where mowing equipment will not disturb native vegetation.
September

Foliar Spray – For large infestations a 0.5% solution of Glyphosate may be the most efficient means of control. For effective control with herbicides, healthy green leaves must be present at application time and temperatures must be above 50^{o} F.
April – September

All equipment used in areas infested with stiltgrass must be cleaned entirely prior to use in uninfested areas to limit likelihood of spread.

Japanese Virgin's Bower

Clematis terniflora

Semi-woody to herbaceous vine.

Fairly common in all three counties.

Compound leaves with five or occasionally three leaflets. Numerous fragrant, one-inch wide, four-petaled white flowers bloom in August and September. Feathery, silver-gray seed heads appear after flowers.

Grows best in full sun. Can be found in woodland edges, fencerows, roadsides and waste places. Once established can completely engulf vegetation on which it grows.

This plant family contains toxins known to cause mild dermatitis and is mildly poisonous.

Clematis terniflora - Control Methods

Hand Pulling – Can be effective for young plants. Care should be taken to remove the entire root system. Wear gloves.
Mar - Nov; or anytime identification is possible.

Cut Stump – Cut stem 2 - 3 inches above the ground and apply a pre-mixed 50% solution of a water–soluble triclopyr amine with water to the stump immediately following cutting. Avoid run-off onto the soil.
Mar – Nov; best following full leaf expansion in spring.

Foliar Spray - Apply a 2% solution of triclopyr ester in water with a 0.5% non-ionic surfactant to the existing leaves. Herbicide will also be absorbed through the stem bark for additional effect. Alternately a 2% - 4% glyphosate solution with a 0.5% – 1% non-ionic surfactant may be used. Spray until wet but before it begins to drip off the leaves.
Early Summer through Fall

Mile-a-minute Weed

Persicaria perfoliata
previously Polygonum perfoliatum

Annual herbaceous trailing vine.

Common in all three counties.

Trailing vine that vigorously climbs into canopy. Inconspicuous white flowers bloom early July to fall. Spherical pea-sized, blue fruit containing several seeds ripen from early August to fall.

Does not tolerate shading. Colonizes open and disturbed areas along the edges of woods, wetlands, stream banks, roadsides, and uncultivated open fields.

Seeds can remain viable in the soil for at least two years.

Mile-a-minute Weed - Control Methods

Hand Pulling – Can be effective for young plants. Stems are armed with sharp recurved thorns, so care should be taken to avoid injury. Entire root system must be removed to avoid resprouts.
April - July

Cutting or mowing – Prior to flowering will reduce seed source. Site should be monitored to insure no plants flower and produce seed.
April - October

Foliar Spray – a 2% solution of Glyphosate with a 0.5% non-ionic surfactant may be effective for large infestations prior to fruit formation, where non-target damage of desirable native vegetation is unlikely.
Late July – Early August

Pre-emergent – the preemergent herbicides may be effective in upland sites where native vegetation is being entirely replaced.
March

Biological Control – field trials using a beetle are currently underway and may provide additional control options for this species in the near future.

Multiflora Rose
Rosa multiflora

A large deciduous prickly perennial shrub.

Widespread in all three counties.

Fragrant one-inch wide showy white to pink flowers appear in May and early June. Small, (< one quarter inch) berry-like fruit, called hips, develop in late summer. May darken, shrivel and remain on plant through winter months.

Invades woodlands, forest edges and meadows. Plants growing in full shade rarely produce flowers and fruit.

A single plant can produce over 500,000 seeds. Fruit is eaten, and seeds dispersed, by a wide variety of birds and small mammals.

Multiflora Rose - Control Methods

*Rose rosette disease is killing some plants.

Cut Stump – Cut stem one to two inches above the ground and apply a small amount of 15 - 20% Glyphosate and water.
July into dormant season

Foliar Spray – When tree and stand size allow, is one of the most effective treatment methods. In situations where non-target grass and broadleaf species will not be affected, a 2% solution of Glyphosate is effective.
When buds form until Fall

Field Spraying - An early spring application of dicotyledon specific herbicides such as Metsulfuron methyl (Escort) at one half to three quarter oz. per acre has proven to be successful. Escort can kill most broad-leaved plants, including trees if applied within their root zone. Care should be taken to identify other desirable dicots that are to be avoided.
March

Mowing/Grazing - In areas with large infestations where rare plants or habitats are not critical, grazing with goats (or intensive mechanical mowing) can be an effective initial control that can be easily followed up with a chemical spot-treatment over several years.

Norway Maple
Acer platanoides

Medium-sized deciduous tree to fifty feet tall.

Widespread in all three counties,

In April and early May, yellow-green flowers appear before leaves with male and female flowers on separate trees. Winged seeds up to one and three quarter inches long are attached in pairs at nearly 180^{o} angle from each other.

May be found invading a wide range of upland forest communities. Seedlings are very shade tolerant.

Only maple in Delaware with milky sap, which flows from leaf stems when removed from tree.

Norway Maple - Control Methods

Hand Pulling – Can be effective for young plants. Care should be taken to remove the entire root system. A weed wrench can be used on saplings if soil disturbance is not an issue.
Mar - Nov; or anytime identification is possible.

Cut Stump – Cut stem 2 - 3 inches above the ground and apply a pre-mixed 50% solution of a water–soluble triclopyr amine with water to the stump immediately following cutting. Avoid run-off onto the soil.
Mar – Nov; best following full leaf expansion in spring.

Basal Bark - is the most effective method for control of this species. A 20% solution of Triclopyr ester in an oil-based surfactant should be applied in a 1' band completely around the trunk of the tree in summer. Follow-up foliar spray of root suckers may be necessary.
June – September, February – April.

Foliar Spray – When tree and stand size allow, is one of the most effective treatment methods for seedlings. In situations where non-target native species will not be effected use a 2% solution of Glyphosate with a 0.5% non-ionic surfactant.
Late Spring, Summer and Fall

Oriental Bittersweet

Celastrus orbiculata

Perennial woody vine or trailing shrub.

Widespread in all three counties.

Clusters of small greenish flowers in leaf axils bloom May – June. Globular green to yellow quarter-inch "berries" burst open, September – November to reveal fleshy, bright orange three-parted fruit.

Infests forest edges, woodlands, early successional fields, hedgerows, coastal areas and salt marsh edges. Especially common in areas suffering some form of land disturbance.

Climbing Bittersweet, *Celastrus scandens*, a rare native species has pointed leaves and flowers and fruit in terminal clusters.

Oriental Bittersweet - Control Methods

Hand Pulling – Can be effective for young plants. Care should be taken to remove the entire root system.
Mar-Nov; or when positive ID is possible.

Cut Stump – Cut the stem 2-3 inches above ground and apply a pre-mixed 50% solution of a water–soluble triclopyr amine mixed with water to the stump immediately following cutting. Removal of a 4 ft section of vine will reduce chance of young vines using dead vine as a trellis to climb into canopy.
Mar – Nov; best following full leaf expansion.

Basal Bark – Apply a 25% solution of oil-based triclopyr ester with an oil-based surfactant in a band several inches wide completely around all of the vines. Avoid runoff or spraying chemical on the ground.
Mar – Nov; best following full leaf expansion

Foliar Spray – A 2% solution of Triclopyr ester in an oil based surfactant applied in an even coat to all foliage is best used for sprawling shrub forms where non-target damage can be greatly minimized. **Mid-summer, fall, dormant season**

Porcelain-berry
Ampelopsis brevipedunculata

Deciduous perennial woody vine.

Common in all three counties.

Alternate leaves hairy on the undersides and variably lobed. Bark has lenticels, does not peel away from stems as in our native grapes. Small greenish flowers bloom from May to August. Quarter-inch fruit ripens from white to yellow to pale violet and ultimately bright blue in fall.

Occurs in forest edges, disturbed woods, pond edges, stream banks, thickets and waste places.

Not very shade tolerant, so probably more of a threat on edges, in successional habitats and in forest canopy gaps. Fruit eaten by birds and small mammals.

Porcelain-berry - Control Methods

Hand Pulling – Can be effective for seedlings and young plants. Care should be taken to remove the entire root system to prevent resprouting.
March – November; or anytime positive identification is possible

Cut Stump – Cut the stem 2-3 inches above ground and apply a pre-mixed 50% solution of a water–soluble triclopyr amine mixed with water to the stump immediately following cutting. Removal of a 4 ft section of vine will reduce chance of young vines using dead vine as a trellis to climb into canopy. Retreatment with a foliar application of Glyphosate may be necessary for any sprouts.
Mar – Nov; best following full leaf expansion.

Foliar Spray application of a 2% concentration of Glyphosate and water or Triclopyr amine plus a 0.5% non-ionic surfactant to thoroughly wet all foliage is best used for sprawling shrub forms where non-target damage can be greatly minimized.
Apr – Oct; best following full leaf expansion.

Purple Loosestrife
Lythrum salicaria

Perennial broadleaf herb.

Widespread in New Castle County, sporadic in Kent and Sussex Counties.

Opposite lance-shaped leaves arranged in pairs along the stem. Five to six-petaled magenta to purple flowers arranged in a tall spike and bloom from July to September.

Occurs in marshes, stream margins, floodplains, and wet meadows. It can tolerate drier conditions and may occur along roadsides and low fields.

Individual plants can produce up to 2 million seeds.

Purple Loosestrife - Control Methods

Cut Stem – An effective treatment option for small colonies. Cut stems one to two inches above the ground and apply a 50 % solution of glyphosate formulated for use in wetlands to the cut stump. Treatment is most effective prior to flowering in early summer.
Late May - June

Foliar Spray – a 2% solution of Glyphosate and water in a 0.5% non-ionic surfactant formulated for use in wetlands is effective for larger populations. Treatment should be done prior to seed production, or collect seed heads in bags and remove from site and dispose of properly.
June - July

Biological Control - Biological control using several imported beetle species approved by the USDA is the most effective method for long-term control of large infestations. Although these beetles occasionally feed on native plant species, their potential impact to non-target plants is considered to be minimal.
Spring

Due to potentially large seedbank, control effort may need to be repeated for several seasons.

Tree-of-Heaven
Ailanthus altissima

Large deciduous tree to 80’ tall.

Widespread in all three counties.

Greenish, foul-smelling flowers bloom in up to eight inch long clusters at the tips of branches from June to early July. Large clusters of reddish, winged fruit ripen on female trees in August and persist into winter.

Most common in old fields and wood edges. Grows rapidly. Leaves and bark contain chemical that inhibits growth of nearby plants.

May be confused with sumac and walnut.

Tree-of-Heaven - Control Methods

Hand Pulling – Effective for seedlings and young plants. Care must be taken to remove the entire root system to prevent resprouting.
Mar - Nov; or anytime identification is possible.

Cut Stump – Cut stem 2 - 3 inches above the ground and apply a pre-mixed 50% solution of a water–soluble triclopyr amine with water to the stump immediately following cutting. Avoid run-off onto the soil.
Mar – Nov; best following full leaf expansion in spring.

Basal Bark - is the most effective method for control of this species. Apply a 20% solution of Triclopyr ester in an oil-based surfactant in a 1' band completely around the trunk of the tree in summer. Follow-up foliar spray of root suckers may be necessary.
June – September, February – April.

Care should be taken when treating this plant as a chemical in the leaves and bark may cause rash, headache, nausea and lowered heart rate.

Wineberry
Rubus phoenicolasius

Perennial broadleaf herb.

Widespread in all three counties.

Long upright arching stems are covered with distinctive red hairs and spines. Compound leaves have three purple-veined toothed, heart-shaped leaflets. White, five-petaled flowers bloom in June. Red to reddish-purple edible raspberries ripen in July and August.

Occurs in woodlands, roadsides, edges of woods, trail edges and forest openings.

Wineberry - Control Methods

Hand Pulling – Hand pulling can be an effective treatment. Care should be taken to remove the entire root and rhizome system. Thick gloves are a must to avoid the many spines.
Mar - Nov; or anytime identification is possible.

Foliar Spray – Mowing of small populations followed by foliar spray of resprouting stems with glyphosate or triclopyr (either oil-based ester or water-based amine) can be effective.
May – August

Winged Euonymus

Euonymus alatus

Deciduous shrub or small tree to 10 feet tall.

Widespread in New Castle County, locally common in Kent and Sussex Counties.

Two to four corky wings grow on most twigs and branches. Small four-petaled greenish-white flowers bloom late April to June. Half-inch long red to purple fruit ripen September to October. Foliage turns deep red in fall.

Can tolerate both full sun and full shade. Occurs in a variety of forest types, floodplains and disturbed lands.

Winged Euonymus - Control Methods

Hand Pulling – Can be effective for seedlings and young plants. Care should be taken to remove the entire root system to prevent resprouting.
Mar – Nov; or anytime identification is possible.

Cut Stem – Cut the stem 2-3 inches above ground and apply a pre-mixed 50% solution of a water–soluble Triclopyr amine mixed with water to the stump immediately following cutting. Avoid run-off on to the surrounding soil.
Mar – Nov; best following full leaf expansion in spring.

Basal Bark – Apply a 25% solution of oil-based Triclopyr ester mixed with an oil-based surfactant in a band several inches to a foot wide completely around the trunk and all stems. Avoid runoff or spraying chemical on the ground.
Mar – Nov; best following leaf expansion in spring.

Foliar Spray – A 2% solution of Glyphosate mixed in water with a non-ionic surfactant is effective when applied in an even coat to all foliage. Spray until wet but before it begins to drip off the leaves.
Early Summer through Fall

Wisteria

Wisteria spp.

Woody vine

Two species occur in all three counties

Chinese wisteria *W. sinensis* with 7 – 13 leaflets twines counter-clockwise around host plant. Japanese wisteria *W. floribunda* has 13 to 19 leaflets and twines clockwise.

Showy, fragrant violet–blue flowers hang in large bunches from stems before leaves emerge from April to July. Velvety brown four to six inch long seed pods ripen in late summer and early fall.

Occurs in forest edges, roadsides and old home sites.

Wisteria - Control Methods

Hand Pulling – Can be effective for seedlings and young plants. Care should be taken to remove the entire root system to prevent resprouting.
Mar – Nov; or anytime identification is possible.

Cut Stem – Cut the stem 2-3 inches above ground and apply a pre-mixed 50% solution of a water–soluble Triclopyr amine mixed with water to the stump immediately following cutting. Avoid run-off on to the surrounding soil.
Mar – Nov; best following full leaf expansion in spring.

Foliar Spray – A 2% solution of Triclopyr (both water and oil formulations are effective) in a 0.5% non-ionic surfactant are effective when applied to young plants. Cut established plants in winter and apply herbicide to resprouts in spring. Cut stump is preferred treatment when adjacent to desirable native trees and shrubs.
May – November

Refrences

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Addendum

The following pages describe aquatic plant species invasive to Delaware.

These pages were created by
Diana Koch of the Aquatic Resources Education Center to compliment the work of Chris Bennett.

Hydrilla

Hydrilla verticillata

Herbaceous submersed perennial.

The leaves are finely and sharply serrated and appear in whorls of 3-10 along the stem. Subterranean tubers at the ends of rhizomes distinguish hydrilla from other family members.

Infests fresh or brackish water ponds, rivers, marshes, and tidal zones. Can be found in depths of only a few inches to up to 20 feet.

Hydrilla is most commonly spread when stem fragments are transported naturally or by man to new areas where they then take root. Their tubers can remain viable in the soil for more than four years.

Hydrilla – Control Methods

Hydrilla can be controlled, though not generally eradicated, by one of two methods:

Chemical – Several herbicides are effective such as those containing diquat, endothall, complexed copper, or flouridone as the active ingredient. It will be necessary to apply at one or two year intervals to counteract the presence of the tubers.

Biological – Triploid grass carp, a plant-eating fish, can be stocked within an infested pond but only with a permit from the Delaware Division of Fish and Wildlife. This is a non-native fish and there are several restrictions that must be met in order to obtain the permit.

For more information on either of these control methods contact Cathy Martin at the Aquatic Resources Education Center at 302-653-2887.

Parrot-feather

Myriophyllum aquaticum

Herbaceous emergent perennial.

The stems may be tinged with red or orange. The submerged leaves are fine giving a feathery appearance. The emersed leaves occur in whorls of 3-6 and are actually bracteal leaves of the inflorescence but parrot-feather is not often found in flower.

Infests freshwater ponds, swamps, channels, and slow-moving streams at depths up to 3 feet. Will form extensive mats usually in late fall, winter, and spring.

Parrot-feather reproduces from fragments that can be transported to new areas naturally or by man. It is commonly sold in the water garden trade and sometimes escapes from residential landscapes.

Parrot-feather – Control Methods

Dense mats of Parrot-feather impede the growth of native aquatic plants, provide breeding habitat for mosquitoes, and clog waterways interfering with commercial and recreational water activities. Such growths are extremely expensive to control.

Manually - Attempting to control by manual or mechanical means only tends to spread the plants and should only be conducted in small, contained water bodies.

Chemical - Control with chemicals is difficult as the emergent stems and leaves have a waxy cuticle that repels herbicides.

Biological - Research into biological controls is ongoing.

For more information on control of Parrot-feather and to report infestations contact Cathy Martin at the Aquatic Resources Education Center at 302-653-2887.

Creeping Water Primrose

Ludwigia grandiflora

Semi-herbaceous emergent perennial.

Creeping Water Primrose can be easily spotted due to its bright yellow flowers. Early in the season the leaves are rounded and grow in rosettes, later in the season the plant will produce lanceolate leaves that come to a clear point.

Infests margins of lakes, ponds, and rivers, forming floating mats in spring. By summer it becomes slightly woody, forming stalks that will flower above the surface.

Primrose produces abundant seeds that disperse readily. It will also reproduce when stem fragments are transported naturally or by man to new areas; roots will readily grow from the nodes.

Creeping Primrose – Control Methods

Dense growths of creeping water primrose provide breeding areas for mosquitoes and will degrade both water quality and habitat for fish and wildlife.

Manual – manual and mechanical control methods are difficult and costly and can lead to the spread of stem fragments. For these reasons only hand removal of small infestations within closed waterbodies should be attempted.

Chemical – Herbicides suggested for chemical control of water primrose have been limited to 2,4-D, glyphosate, and fluridone.

Biological – no biological control agents have been found at this time.

For more information on control of Creeping Water Primrose and to report infestations contact Cathy Martin at the Aquatic Resources Education Center at 302-653-2887.

Yellow Iris

Iris pseudacorus

Herbaceous emergent perennial.

Stiff, erect, broad, sword-shaped leaves surpass the length of the stems which bear 3-5 bright yellow flowers in May. Fruits are green, 6-angled, cylindrical capsules.

The Yellow Iris forms dense colonies in fresh and brackish wetlands such as wet meadows, fens, swamps, and marshes, and also along pond, river, and stream shorelines.

Spreads by broken rhizome and by seed. The fruits can produce as many as 120 D-shaped seeds each. Due to its attractiveness, plants continue to be sold through garden centers and online for use in residential landscaping.

Yellow Iris – Control Methods

Yellow iris plants contain large amounts of glycosides, especially in the rhizomes, which are toxic to a wide variety of wildlife. Outcompetes other wetland plants by forming almost impenetrable thickets.

Manual – manual and mechanical control methods pose the risk of spreading broken pieces of rhizome to new areas and are only advised for smaller areas.

Chemical – there are several varieties of herbicides that can be successfully used to control Yellow Iris.

Biological – there are currently no biological options for controlling Yellow Iris.

APPENDIX D

D-4: KENT COUNTY CONSERVATION DISTRICT MOA

MEMORANDUM OF AGREEMENT (MOA) BY AND BETWEEN THE DELAWARE DEPARTMENT OF TRANSPORTATION AND THE KENT CONSERVATION DISTRICT FOR RESPONSIBILITIES RELATING TO POST CONSTRUCTION STORMWATER MANAGEMENT INSPECTION

This agreement made this 30th day of January 2025, by and between the Kent Conservation District and the Delaware Department of Transportation,

WHEREAS, the Delaware Department of Transportation, herein referred to as "DelDOT", is subject to the requirements of a National Pollution Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Phase II permit (WPCC 3212/20 / NPDES DE 0051195); and

WHEREAS, the Kent Conservation District, herein referred to as "KCD", is the Delegated Agency for stormwater management plan review and inspection through the State of Delaware's Sediment and Stormwater Program; and

WHEREAS, a permit requirement for DelDOT is to visually inspect, in order to ascertain proper function, all stormwater management systems that discharge into DelDOT's MS4 system, once in a permit term; and

WHEREAS, DelDOT has determined that thirteen (13) stormwater management systems, also known as best management practices (BMPs), located outside of DelDOT right-of-way and/or property, drain into DelDOT's Phase II MS4, as depicted in Appendix A; and

WHEREAS, KCD has responsibility as a Delegated Agency to oversee the inspection of these thirteen (13) BMPs and coordinate their maintenance to ensure function in accordance with the State's Sediment and Stormwater Regulations;

NOW, THEREFORE, DelDOT and KCD hereby agree that:

1. KCD will conduct post construction inspection of the above-identified BMPs at minimum once every 5 years, with the first round complete by December 31, 2028 and continuing once every five years from thereon in; and

2. KCD will provide to DelDOT at the end of each calendar (by January 31st of the subsequent year), copies of the inspections and any maintenance follow-up conducted during that calendar year; and

3. KCD will provide to DelDOT at the end of each calendar year (by January 31st of the subsequent year) a record of any BMPs newly accepted under their jurisdiction during that calendar year, so that DelDOT can confirm if any additional BMPs drain into their MS4; and

4. Any new BMPs identified above will be added to this MOA via an updated Appendix A provided by DelDOT to KCD; and.

5. DelDOT remains ultimately responsible and liable for all compliance assistance and enforcement actions relating inspection conditions contained within DelDOT's MS4 permit; however, KCD shall notify DelDOT by January 31, 2028 if they foresee any challenges in inspecting all identified BMPs by the end of the permit term (December 31, 2028), and every five years from thereon in, so that DelDOT can plan accordingly to remain in permit compliance.

SIGNATURE OF PARTIES

The authorized signatures below constitute acceptance of this Memorandum of Agreement between DelDOT and KCD.

Robert A Killen

Robert A. Killen,
Chairman, Board of Supervisors
Kent Conservation District:

1/27/25
Date

Brian Urbanek, PE
Assistant Director Statewide Support Services
Delaware Department of Transportation

1/30/25
Date

APPENDIX D

D-5: BMPS DRAINING TO DELDOT PHASE II AREA MAP

Non-Phase II Area BMPs Draining to DelDOT Phase II Area

APPENDIX D

D-6: BMPS DRAINING TO DELDOT PHASE II AREA SUMMARY TABLE

Non-DelDOT BMPs Draining to DelDOT Phase II Area*

Name	Designation	Type of Facility	Latitude	Longitude	ID Number	Drainage Area	Receiving Waterbody	Facility Location	Year Constructed	Impervious Acres Treated
Bombay Woods	Residential	Wet Pond	39.288904	-75.588303	339	33	Roadside ditch		2002	12.54
Byler's Country Store	Commercial	Wet Pond	39.155193	-75.600055	893	6	Cahoon Branch	Route 8 Forrest Avenue	2000	
Kent General Psychiatric	Institutional	Wet Pond	39.152655	-75.48425	303	5.07	Saint Jones River	South Side Next to Activity Towers	1994	
Lakeshore Village	Residential	Wet Pond	39.240885	-75.587481	919	21.09	Garrisons Lake	North Corner Phase 5 Between Messina Hill & Carton Lane	2005	
Longacre Village	Residential	Wet Pond	39.080727	-75.549983	1013	12.5	Newell Branch		2007	4.337
Longacre Village	Residential	Wet Pond	39.08151	-75.546382	1014	19.36	Newell Branch		2007	7.254
Longacre Village	Residential	Wet Pond	39.080805	-75.549866	1747	12.04	Newell Branch	Just North of Library	2007	7.96
M & L Ventures	Commercial	Detention Practice	39.147378	-75.488241	1812	26.7			2011	3.204
New Life Family Worship Center	Institutional	Bio-Swale	39.092373	-75.548621	950	34.5	Tidbury Creek	Along Driveway Back to Church Both Sides	2006	6
Ponds at Willow Grove	Residential	Wet Pond	39.08598	-75.587069	1026	15.39	Cow Marsh Ditch		2007	4.617
Rosewood Farms	Residential	Wet Pond	39.01161	-75.586763	1261	15.46	Murderkill River	Cattle Drive	2007	5.87
Royal Farms Cheswold	Commercial	Dry Pond	39.224277	-75.576472	773	1.91	Leipsic River Branch	Along 13	2004	
Steeles Ridge Estates	Residential	Wet Pond	39.081709	-75.58933	758	59.9	Tidbury Creek	On Either Side of Street as Enter Subdivision	2004	17

* - Table generated baed on data provided by the Kent Conservation District on 02/21/24.

APPENDIX D

D-7: JULY 26, 2024 DELDOT AND DNREC CORRESPONDENCE

Esposito, Sara B. (DelDOT)

From: Capes, Alexis (DNREC)
Sent: Friday, July 26, 2024 5:33 PM
To: Esposito, Sara B. (DelDOT)
Subject: RE: Phase II Permit Requirement Part II.D.5.c

Good evening Sara,

The Alternative Compliance request is not needed, as long you describe in the plan that DelDOT does not have jurisdiction over other entities and are delegated for the operation and maintenance of your own systems. Have a nice weekend !

Alexis T. Capes
Environmental Scientist III
MS4 Program
Commercial and Government Services Section
Department of Natural Resources and Environmental Control
302-612-1441
Alexis.Capes@Delaware.gov

From: Capes, Alexis (DNREC)
Sent: Monday, July 15, 2024 1:52 PM
To: Esposito, Sara B. (DelDOT) <Sara.Esposito@delaware.gov>
Subject: RE: Phase II Permit Requirement Part II.D.5.c

Hey Sara, let me double check with Gordon. He is out this week so I will get back with you early next week.

Alexis T. Capes
Environmental Scientist III
MS4 Program
Commercial and Government Services Section
Department of Natural Resources and Environmental Control
302-612-1441
Alexis.Capes@Delaware.gov

From: Esposito, Sara B. (DelDOT) <Sara.Esposito@delaware.gov>
Sent: Monday, July 15, 2024 1:29 PM
To: Capes, Alexis (DNREC) <Alexis.Capes@delaware.gov>
Cc: Woodrow, Gordon (DNREC) <gordon.woodrow@delaware.gov>; Urbanek, Brian (DelDOT) <Brian.Urbanek@delaware.gov>; Sanders, Skip (DelDOT) <Skip.Sanders@delaware.gov>
Subject: Phase II Permit Requirement Part II.D.5.c

Alexis,

Question for you on permit requirement Park II.D.5.c: *The permittee shall update, implement, and enforce a program to address post-construction runoff from new development and redevelopment projects to ensure adequate long-term operation and maintenance of stormwater management systems in accordance with 7 Admin. Code 5101.*

Because we're not a municipality with authority over other entities development or redevelopment projects, I think this becomes redundant for DelDOT with the permit requirements already stated in Part II.D.4.a: Review and Approval of Sediment and Stormwater Plans and the maintenance requirements in Part II.D.5.a: BMP Inspection and Maintenance within MS4.

I was going to state essentially that in our SWMP making the permit requirement Not Applicable, unless you think I should officially submit an Alternative Compliance request? Not sure best avenue since its more N/A than alternative compliance.

Thanks!
Sara

APPENDIX E – POLLUTION PREVENTION AND GOOD HOUSEKEEPING

APPENDIX E

E-1: MAGNOLIA, CHESWOLD, AND DOVER MAINTENANCE SHOP SWPPP TEXT

STORMWATER POLLUTION PREVENTION PLAN

MAGNOLIA MAINTENANCE YARD – AREAS 7 & 21

Magnolia, Delaware

March 2024

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
DOVER, DELAWARE

Magnolia Maintenance Yard

CERTIFICATION OF STORMWATER PLAN

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted.

Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for willful violations.

NON-STORMWATER DISCHARGES CERTIFICATION

I certify that no non-stormwater discharges to the stormwater system exist at the Magnolia Maintenance Yard.

Name:	Matt Lichtenstein
Title:	Central District Engineer
Date:	9/11/19
Signature:	

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1. INTRODUCTION

In 1972 Congress passed the Federal Water Pollution Control Act (FWPCA), also known as the Clean Water Act (CWA), to restore and maintain the quality of the nation's waterways. The ultimate goal was to ensure that rivers and streams were fishable, swimmable, and drinkable. In 1987 the Water Quality Act (WQA) added provisions to the CWA that allowed the EPA to govern stormwater discharges from industrial activities. EPA published the final notice for Phase I of the Multi-Sector General Stormwater Permit Program (Federal Register Volume 60 No. 189, September 20, 1995, page 50804) in 1995, which included provisions for the development of a Stormwater Pollution Prevention Plan (SWPPP) by each industrial facility discharging stormwater, including transportation facilities.

Development, implementation, and maintenance of the SWPPP provides the Magnolia Maintenance Yard (Areas 7 & 21) with the tools to reduce pollutants contained in stormwater discharges and comply with the requirements of Delaware's "Regulations Governing Stormwater Discharges Associated with Industrial Activity."

The primary goal of the SWPPP is to:

- Identify potential sources of pollutants that affect stormwater discharges from the site.
- Describe the practices that will be implemented to prevent or control the release of pollutants in stormwater discharges.
- Create an implementation schedule to ensure that the practices described in the SWPPP are implemented to evaluate the plan's effectiveness in reducing the pollutant levels in stormwater.

The SWPPP includes the following information:

- Identification of SWPPP team personnel
- Description of the facility including the facility's location and activities, as well as a site map, and summary of the stormwater drainage system
- Potential sources of stormwater contamination
- Inventory of spills and leaks
- Description of stormwater management controls and various best management practices (BMPs) necessary to reduce pollutants in discharge
- Description of the facility monitoring and inspection programs

2. FACILITY DESCRIPTION AND CONTACT INFORMATION

Facility Information	
Facility Owner, Address, & Telephone:	Delaware Department of Transportation 1235 Briarbush Rd. Magnolia, Delaware 19962 302-672-7610
Latitude/Longitude:	Latitude 38°04'49" Longitude 75°29'58”
SIC:	1611 (Highway/Street Construction, Except Elevated Highways) 41-73 (Terminal/Service Facilities for Motor Vehicle Passengers)
Acreage:	42.68
Receiving Water:	St. Jones River
Location of SWPPP:	Facility Office

2.1 FACILITY EMERGENCY CONTACTS

Site Emergency Contacts:

District Engineer: Matt Lichtenstein; (302) 760-2412 ***(Authorized Personnel)***

Supervisors: Wayne Mast (A7); (302) 672-7612 (o); (302) 632-2571 (c)
Billy Keen (A21); (302) 697-7617 (o); 302-632-2521 (c)

Assist. Supervisor: Alex Dills; (302) 672-7611 (o) (302) 632-2572 (c)

After Hours: Transportation Management Center; (302)-659-4600

NPDES Contacts *(for regular correspondence)*:

NPDES Program Manager: Sara Esposito; (302) 760-2346 (o)
NPDES Environmental Scientist: Kerin Hume; (302) 760-2195 (o)

2.2 FACILITY DESCRIPTION

The total area of the site is approximately 42.68 acres. Approximately 26 percent of the site is impervious (i.e., pavement, buildings). The remainder of the site consists of approximately 16 percent of compacted gravel and stockpile storage areas, and approximately 58 percent of undeveloped grass and pond areas. **Appendix A** contains a site map detailing the facility's features, layouts, and drainage plan.

The site is located in Magnolia within Kent County. The site is rectangular in shape bordered by wooded and agricultural land to the north, Briarbush Rd., a residential property and agricultural fields to the south, a residential development to the east, and agricultural fields to the west.

2.3 SITE ACTIVITIES

The Magnolia Maintenance Yard typically operates from 7:00 am to 3:00 pm, five days per week, and maintains a staff of approximately 30 people. Operations are extended during major storm events. The primary operations at the Magnolia Maintenance Yard consist of the following:

Stockpiling of Materials for Road Maintenance - Materials stored at the facility are used for maintenance of existing state roadways and bridges and for planned new construction projects for the Central District of DelDOT. Material routinely staged at the site includes salt, sand, gravel, cement, concrete and metal piping, metal guardrails, treated lumber, crash attenuators, galvanized metal, and milled and cold mix asphalt.

Vehicle Maintenance and Storage - Trucks and miscellaneous construction equipment (trackhoes, backhoes, etc.) used in the maintenance of existing roadways for the Central District of DelDOT are staged at the site. In addition, routine vehicle maintenance such as replacement of motor oil, coolants, other engine/vehicle fluids, and batteries occurs at this facility. Vehicles are also routinely washed at the site in areas with appropriate drainage treatment trains.

Staging of Miscellaneous Waste - Waste materials (not including roadway maintenance materials) collected along state roadways in the South District of DelDOT during routine roadway maintenance are staged at the site pending disposal at licensed waste disposal facilities and recycling facilities. Waste staged at the site includes scrap lumber, household waste (appliances and furniture), construction waste (concrete and steel), brush and stumps, tires, and sweeper waste. Materials are handled and disposed of in accordance with applicable standards and regulations. DelDOT collects a variety of materials from Delaware's roadways but strives to follow safe and environmentally friendly practices for storage and removal of these materials.

3. POLLUTION PREVENTION TEAM

DelDOT is a multi-sector organization, and as such, many people are responsible for the yard and the NPDES compliance. The ultimate responsible party is the Central District Engineer, who is overseen by the Director of Maintenance and Operations. The District Engineer has responsibility of the yards' budget, daily operations, personnel and compliance. The team outlined below has job responsibilities that ensure the Pollution Prevention Plan is followed.

NPDES Contact:	Sara Esposito	**Title**: **Office Phone:**	NPDES Program Manager (302) 760-2346
NPDES Contact:	Kerin Hume	**Title**: **Office Phone:**	NPDES Program Scientist (302) 760-2195
Owner:	Matt Lichtenstein	**Title**: **Office Phone:**	Central District Engineer (302) 760-2412
Owner's Representative:	Timothy Stynchula	**Title**: **Office Phone:**	Central District Maint Engineer (302) 760-2418

Responsibilities:

- Implement the SWPPP plan;
- Oversee maintenance practices identified as BMPs in the SWPPP;
- Prepare and submit reports;
- Ensure that any changes in facility operation are addressed in the SWPPP; and
- Ensure quarterly monitoring program is implemented.

Site Contact:	Wayne Mast	**Title**: **Office Phone:**	Area 7 Supervisor (302) 672-7611
Site Contact:	Alex Dills	**Title**: **Office Phone:**	Area 7 Asst Supervisor (302) 672-7612

Responsibilities:

- Create a SWPPP team to aid in the implementation of the SWPPP;
- Implement and oversee employee training;
- Act as spill response coordinator;
- Identify other potential pollutant sources and make sure they are added to the plan;
- Identify any deficiencies in the SWPPP and make sure they are corrected; and
- Conduct or provide for quarterly inspection or monitoring activities.

4. IDENTIFICATION OF POTENTIAL STORMWATER CONTAMINANTS

This section identifies the following:

- The existing stormwater drainage system.
- Significant materials located at the facility that may potentially contaminate stormwater.
- Records of past spills and leaks.
- Potential areas for stormwater contamination.
- Available stormwater sampling data.

4.1 EXISTING STORMWATER DRAINAGE SYSTEM

The site can be divided into two major drainage areas. **Table 1** describes the significant characteristics of each drainage area. **Appendix A** shows the locations of the drainage areas and the apparent stormwater drainage patterns. Drainage areas are not based on a topographic survey.

Drainage Area 1

Flow from the offices, maintenance shops, vehicle storage, fueling station, wash pad, material stockpiles, and part of the salt barn drains to catch basins and a series of swales that lead to a stormwater wet pond that ultimately discharges off-site. Water from the automated indoor wash bay collects in an oil/grit separator before discharging into a system of catch basins and swales that lead to the onsite stormwater pond.

Drainage Area 2

Flow from the back of a vehicle storage shed, part of the salt barn, and minimally used pavement and gravel areas flow into a grassed swale that discharges off-site.

Table 1 - Characteristics of Stormwater Drainage Areas

Drainage Area[1]	Stormwater Flow Description	Total Size (acres)	Impervious Area (acres/% of area)	Runoff coefficient[2]	Drainage Discharge Point
DA 1	Runoff from office buildings, vehicle storage, equipment storage, vehicle maintenance, salt barn, and material stockpiles, enters a stormwater management pond via swales and discharges at outfall MAG01.	39.91	8.98 (23%)	Low	Swales/ SWM Pond/ MAG01
DA 2	Sheet flow from part of vehicle storage area and salt barn, enters one of 4 swales before discharging offsite via outfall MAG02.	2.77	2.20 (79%)	High	Swale/ MAG02/ Offsite

[1] See Appendix A for drainage areas

[2] Runoff coefficient:

High: 70-100% impervious (example: asphalt, buildings, paved surfaces)
Medium: 40-70% impervious (example: packed soils)
Low: 0-40% impervious (example: grassy area)

4.2 MATERIAL INVENTORY

Materials used or stored at the facility are listed in **Appendix B**. It describes which materials may potentially be exposed to precipitation or runoff and typical annual quantities of such materials. Those used or stored at the facility that have a high potential to be present in stormwater runoff are considered significant materials, and are labeled with either a high or medium discharge potential based on their containment. Materials present at the facility that are stored inside structures are not likely to be impacted by stormwater runoff and are labeled with a low discharge potential. Other low potential materials include non-liquid materials, such as treated lumber.

4.3 HISTORIC SPILL AND LEAK RECORD

Records of spills and leaks can be found in **Appendix F.4** Spill Documentation Form. In the event of a spill or leak, the procedures in the facility's Spill Prevention Control and Countermeasures (SPCC) Plan should be followed.

4.4 POTENTIAL AREAS FOR STORMWATER CONTAMINATION

Potential contaminants include total petroleum hydrocarbons (TPH), oil and grease, heavy metals,

surfactants, total dissolved solids (TDS), and total suspended solids (TSS). The following potential source areas of stormwater contamination were identified and evaluated:

Vehicle and Equipment Storage Sheds and Maintenance Shop:

Trucks and equipment awaiting maintenance, or simply not in use, are generally stored in the equipment sheds when space allows. Maintenance to trucks and equipment is performed in the maintenance shops. If stormwater enters these areas it can be contaminated by fluids leaking onto the paved surface from the trucks or equipment. These contaminants may contain TPH, oil and grease, heavy metals, surfactants, TDS, and TSS.

Truck Loading Area:

Trucks load and unload their cargo in truck loading area. Stormwater from this area can be potentially contaminated by fluids leaking on gravel surface from trucks. These contaminants may include, but are not limited to, oil/grease, heavy metals, TPH, surfactants, TDS, and TSS.

Vehicle Wash Area:

Trucks and other vehicles are rinsed in an area with an appropriate drainage treatment train. Stormwater from this area can be potentially contaminated by fluids leaking on the paved surface from trucks and truck cleaning operations. These contaminants may include oil and grease, heavy metals, TPH, surfactants, TDS, and TSS.

Salt Barn/Salt Mixing Area and Truck Loading Area:

These areas contain the road salt and sand used by DelDOT to deice the roadways during winter storms. Stockpiles of rock salt are stored in an enclosed area and stockpiles of solar salt are stored under cover to prevent exposure to precipitation. Brine solutions are also mixed and stored in tanks in this area. Material can spill and build up as the DelDOT vehicles are loaded. This concentrated amount of sand and salt can harm vegetation and adversely impact water quality in receiving streams. Stormwater from this area can be potentially contaminated with TDS, TSS, oil and grease, heavy metals, TPH, and surfactants.

Material Stockpile Area:

Materials used for maintenance and upkeep of State roads are stored on the gravel surfaced stockpile area of this site. In addition, trucks load and unload their cargo in the stockpile areas. Rainfall contact with these materials and with fluids leaking on the gravel surface from trucks can lead to uncontrolled stormwater runoff. Stormwater from this area can be potentially contaminated with TDS, TSS, oil and grease, heavy metals, TPH, and total surfactants.

Aboveground Storage Tanks (ASTs):

Aboveground storage tanks are located at this facility for fueling, vehicle maintenance, and emergency generator power. Stormwater from the areas with ASTs can be potentially

contaminated by spills, fluid leaking from cracks or holes, or from overfill during filling operations. The contaminants may include, but are not limited to, TPH, TSS, and heavy metals. The location of the tanks in addition to secondary containment measures and spill response procedures can be found in the facility's Spill Prevention Control and Countermeasures (SPCC) Plan, stored on site.

Table 2 presents site-specific information regarding stormwater pollution potential from each of these areas.

Table 2 - Stormwater Pollution Potential at Magnolia Maintenance Yard

Drainage Area[1]	Potential Stormwater Contamination Point	Potential Pollutant[2]	Potential Problem
DA 1,2	Vehicle and Equipment Storage Area	Oil and grease, TPH	Leaking fluids from equipment can impact stormwater
DA 1	Maintenance Area	Oil and grease, lead, cadmium, nickel, copper, zinc, TPH, total surfactants, pH, TDS, TSS	Leaking fluids from trucks and equipment can impact stormwater
DA 1	Vehicle Wash Area	Oil and grease, lead, cadmium, nickel, copper, zinc, TPH, salt, total surfactants, pH, TDS, TSS	Leaking fluids from tucks and wastewater from cleaning operations can impact stormwater
DA 1,2	Parking Lot	Oil and grease, lead, cadmium, nickel, copper, zinc, TPH	Leaking fluids from employee vehicles can impact stormwater
DA 1,2	Roadways	Oil and grease, lead, cadmium, nickel, copper, zinc, TPH	Leaking fluids from vehicles can impact stormwater
DA 1	Salt Barn/Mixing Area	TSS, TDS, pH, TPH	Rainfall contact with material. Leaking fluids from trucks and spilled materials can impact stormwater
DA 1	Truck Loading Area	Oil and grease, lead, cadmium, nickel, copper, zinc, TPH, total surfactants, pH, TDS, TSS	Leaking fluids from trucks and spilled materials during loading/unloading can impact stormwater
DA 1,2	Material Stockpile Area	PCBs, BOD, TDS, TSS, TPH, oil and grease, pH, lead, zinc, cadmium, chromium, copper, nickel	Rainfall contact with material. Uncontrolled stormwater runoff
DA 1	AST Storage Area	TPH, TSS, lead, zinc, cadmium, chromium, copper, nickel	Spills, leaking fluids from cracks or holes in ASTs, and overflow during fueling or delivery operations can impact stormwater

1 See Appendix A for drainage areas

2 BOD – Biological Oxygen Demand PCB – Polychlorinated Biphenyl
TPH – Total Petroleum Hydrocarbons TDS – Total Dissolved Solids
TSS – Total Suspended Solids

4.5 SUMMARY OF AVAILABLE STORMWATER SAMPLING DATA

As of June 27, 2013, DNREC has required wet weather sampling at each of the DelDOT facility outfalls that discharge runoff from areas with industrial activities. Prior to this date, DelDOT's General Permit Pollution Prevention Plans required wet weather stormwater monitoring from the pond outfalls at only four facilities. These facilities were chosen, with DNREC's approval, as representative of the 16 facilities located throughout the state. The four yards were: Kiamensi, Bear, Cheswold, and Harrington. Thus, prior to July 2013, data are available only for those sites.

A summary of available stormwater sampling data at Magnolia Yard can be found in **Appendix C**. All of the original field and laboratory data sheets, as well as documentation of follow-up actions taken when benchmark values are exceeded, are kept in the offices of the DelDOT NPDES Section, 800 Bay Road, Dover DE 19901.

5. STORMWATER BEST MANAGEMENT PRACTICES

This section discusses the stormwater management controls required by the permit and describes the management practices selected to address the areas of concern identified in Section 4 of this SWPPP.

Best management practices (BMPs) are measures used to prevent or mitigate pollution from any type of activity. Baseline BMPs include processes, procedures, schedules of activities, prohibitions on practices, and other management practices to prevent or reduce water pollution. They keep stormwater from impacting the materials stored on the site and activities that occur at the facility, by keeping the areas clean and well maintained, and properly training employees. These BMPs are listed in **Appendix D**.

5.1 SPILL PREVENTION AND RESPONSE

The SWPPP is designed to minimize the potential for spills and leaks, and prevent spilled materials from discharging pollutants from the facility to the MS4. Employees on the Stormwater Management Team receive annual training on spill prevention and good housekeeping procedures. Reference the Spill Prevention, Control, and Countermeasure (SPCC) Plan for more information on spill prevention and response.

All significant spills will be recorded on the Spill Log (**Appendix F**) and kept with the SWPPP.

6. VEHICLE AND EQUIPMENT WASH PLAN

Untreated vehicle washwater has the potential to carry harmful pollutants through the storm sewer system or overland, and ultimately into the aquatic ecosystem or drinking water supplies. Washwater may contain oil and grease, suspended solids, heavy metals, and surfactants (detergents). These pollutants can be toxic to aquatic organisms, including fish, and the ingestion of affected fish by people can also be harmful. The EPA encourages the use of phosphate-free, biodegradable surfactants, and discourages the use of cleaning agents containing solvents and emulsifiers. This practice reduces the amount of contaminants that enter storm drains. To capture sediment from washing activities, DelDOT uses sediment traps, catch basin inserts, or aboveground sediment screens.

6.1 VEHICLE AND EQUIPMENT WASH STANDARD OPERATING PROCEDURES

There are two indoor wash bays and an outdoor wash pad for vehicle and equipment washing. The wash bay located within the maintenance shop goes to an oil/grit separator and then into the sanitary sewer system. The larger automated indoor vehicle wash bay also collects into an oil/grit separator before discharging to the sanitary sewer system. During emergency operations overflow relief for the system may be provided by pumping into stormdrain pipes that discharge to the swale that leads to the onsite stormwater pond. Soap is not used during emergency operations. The outdoor wash pad drainage flows through a sediment screen and then into a sediment trap basin before flowing to the grassed swale that leads to the stormwater pond.

Wash in Designated Areas – Wash on the designated concrete wash pad or wash bays. As the first step in the treatment train process, this isolates and concentrates the sediment and debris in one location for easier clean-up and identification. Washing outside of the wash pad or bays may only occur if the drainage flows to an equivalent treatment train.

Use Environmentally Safe, Biodegradable Detergent – Phosphate free, biodegradable detergent is used to wash trucks and equipment on an as needed basis for outdoor operations; primarily just water is used.

Clean the Wash Area – If an accumulation of sediment is present at the end of a wash event, the pad is manually cleaned and the material is properly disposed.

Clean the Sediment Trap & Sediment Screen – After washing when capacity in the sediment trap, sediment screen, or catch basin insert exceeds half full, the device is excavated and the waste is disposed in the sweeper waste pile.

Oil/Grit Separator – The oil/grit separators are inspected annually. Follow the maintenance recommendation from the most recent inspection.

Sweeping Frequency – Routine mechanical sweeping is performed at the facility. Visual observation determines appropriate frequency.

6.2 WATER QUALITY MONITORING

Reference Section 7 for facility monitoring information. Surfactants, oil and grease, total suspended solids, and pH are the parameters tested in the bi-annual wet weather sampling.

7. FACILITY MONITORING PLAN

This section discusses the facility monitoring plan required by the permit and describes the management practices selected to address the responsibilities identified in Section 3. Any deficiencies noted during inspections must be corrected within 14 days after the inspection.

7.1 QUARTERLY DRY WEATHER INSPECTIONS

Visual inspections of catch basins, drainage swales, BMPs, and other good housekeeping measures will be made quarterly by the responsible Pollution Prevention Team member (see Section 3) during dry weather conditions for evidence of non-stormwater discharges. The visual inspection may be completed by an employee under the Pollution Prevention Team member's direction. The dry weather inspections will verify the site is not discharging sanitary or processed water to catch basin inlets. Information recorded on the inspection sheet shall include: date of inspection, inspection results, catch basin or drainage swale location, and potential significant sources of non-stormwater, if discovered through testing. Blank dry-weather inspection forms can be found in **Appendix F** of this SWPPP.

7.2 QUARTERLY WET WEATHER INSPECTIONS

Visual inspections of all catch basins, drainage swales, and BMPs will be made quarterly by the responsible Pollution Prevention Team member (see Section 3) during rain events to look for evidence of stormwater contamination. The visual inspection may be completed by an employee under the Pollution Prevention Team member's direction. Inspections will be conducted within the first 30 minutes of discharge or soon thereafter, but not exceeding 60 minutes. The visual inspection shall include any observations of color, odor, turbidity, floating solids, foam, oil sheen, or other obvious indicators of stormwater pollution. Information recorded on the inspection sheet shall include: date of inspection, inspection results, catch basin or drainage swale location, and potential significant sources of stormwater contaminants, if discovered. Blank wet-weather inspection forms can be found in **Appendix F** of this SWPPP.

7.3 BI-ANNUAL COMPREHENSIVE SITE EVALUATIONS

Bi-annual comprehensive site evaluations will be performed at the yard by DelDOT NPDES staff. These evaluations may take the place of the dry weather inspections for the quarter in which they are performed. Blank annual compliance inspection forms can be found in **Appendix F** of this SWPPP. The inspection will include:

- Evaluating the implemented BMP conditions and effectiveness
- Reviewing the good housekeeping and spill prevention materials
- Evaluating areas identified in the Inventory of Industrial Materials
- Inspecting the stormwater outfalls and areas immediately downstream
- Checking that all required records have been recorded
- Determining if site operations have changed since development of this SWPPP. If there are changes will impact stormwater quality, the Pollution Prevention Team will develop new BMPs to address the change(s). All operational changes and new BMPs will be recorded in this SWPPP.
- Recording the following: inspection date, inspection personnel, scope of the inspection, major observations, and any needed revisions. Revisions to the plan should occur within 14 days after the annual inspection.

7.4 SEMI-ANNUAL ANALYTICAL MONITORING

Monitoring at Magnolia Yard is conducted twice per year. Sampling Techniques are performed in accordance with the Environmental Protection Agency (EPA) *Stormwater Sampling Guidance Document*, EPA 833-B-92-001 (July 1992). Semi-annual grab samples must be collected once in each of the following six-month periods: January through June, and July through December. A summary of available stormwater sampling data at Magnolia Yard can be found in **Appendix C**.

The wet weather monitoring protocol includes 72 hours of antecedently dry conditions, minimum predicted rainfall depth of 0.10 inches, and two full days of standard maintenance yard operations since the last rainfall event. A first flush grab sample is collected within 30 minutes from the first noticeable flow, and delivered to the laboratory for analysis of total suspended solids, surfactants, chloride, pH, and oil & grease. Measurements of air temperature, water temperature, pH and turbidity are recorded on-site at the time of sample collection. Flow at the outfall is not measured at the time of sampling. At each outfall, the total stormwater volume is calculated based on the precipitation received and the amount of pervious and impervious area within the drainage area. For discharges from holding ponds or other impoundments with a 24-hour or greater retention capacity, grab samples of the discharge may be taken at any time for pollution analysis.

Benchmark monitoring concentrations for each parameter are shown below.

Parameter	Benchmark Value
Total Suspended Solids	100 mg/L
Surfactants	1.0 mg/L
Chlorides	No Benchmark
Oil and Grease	15 mg/L
pH	6-9 S.U.

8. COMPLIANCE AND REPORTING REQUIREMENTS

8.1 SWPPP SUMMARY

The SWPPP will be kept at the facility and will be made available to the state or federal compliance inspection officer upon request.

8.2 EMPLOYEE TRAINING

An employee training program was developed and implemented by the DelDOT NPDES Manager to educate maintenance yard staff about the requirements of the SWPPP. This education program includes background on the components and goals of the SWPPP and training in spill prevention and response, good housekeeping, proper material handling, disposal and control of waste, container filling and transfer, and proper storage, washing, and inspection procedures.

Maintenance yard staff will be required to participate in the training courses annually. An employee sign-in sheet for the course can be found in **Appendix E** of this document. New employees are informed about the SWPPP requirements during job orientation. The training program will be reviewed annually by the SWPPP coordinator to determine its effectiveness and to make any necessary changes to the program.

8.3 IMPLEMENTATION SCHEDULE

In accordance with State regulations, the SWPPP implementation schedule is shown in **Appendix D**. A simplified schedule is provided below to assist the facility with compliance (**Table 3**).

Table 3 - Implementation Schedule Overview

Activity	Schedule
Employee Training	Annually, all training completed by December 31st . New employee training within 1 week of start date
Semi-Annual Analytical Monitoring of Outfalls	Once during each of the following six-month periods: January through June and July through December
Quarterly Visual Monitoring during Dry Weather	By March 31st, June 30th, September 30th, and December 31st each year
Quarterly Visual Monitoring during Wet Weather	By March 31st, June 30th, September 30th, and December 31st each year
Comprehensive Site Compliance Evaluation	Twice per year between April-June and September-November
Implementation of BMPs	See Appendix D

8.4 RECORD RETENTION REQUIREMENTS

Records described in the SWPPP, including employee training records, must be retained on site for five years and shall be made available to the State or Federal Compliance Inspection Officer upon request.

8.5 PRINCIPAL EXECUTIVE OFFICER SIGNATURE

In accordance with the State of Delaware, this plan has been approved and signed by the DelDOT Central District Engineer, the authorized representative responsible for the operation of the facility.

8.6 ASSESSMENT OF RUNOFF MANAGEMENT

Based on an assessment of potential sources of stormwater pollution, the control measures at this facility are suitable for the management of runoff. Stormwater controls will be monitored and if changes or additional measures are necessary then the SWPPP will be amended.

8.7 PROVISIONS FOR AMENDMENT OF THE PLAN

If the facility expands, experiences any significant production increases or process modifications, or changes any significant material handling or storage practices that could impact stormwater, the SWPPP will be amended appropriately. The amended SWPPP will have a description of the new activities that contribute to the increased pollutant loading and planned source control activities. The SWPPP will also be amended if the State or Federal Compliance Inspection Officer determines that it is ineffective in controlling stormwater pollutants discharged to waters.

Magnolia Maintenance Yard - SWPPP Map

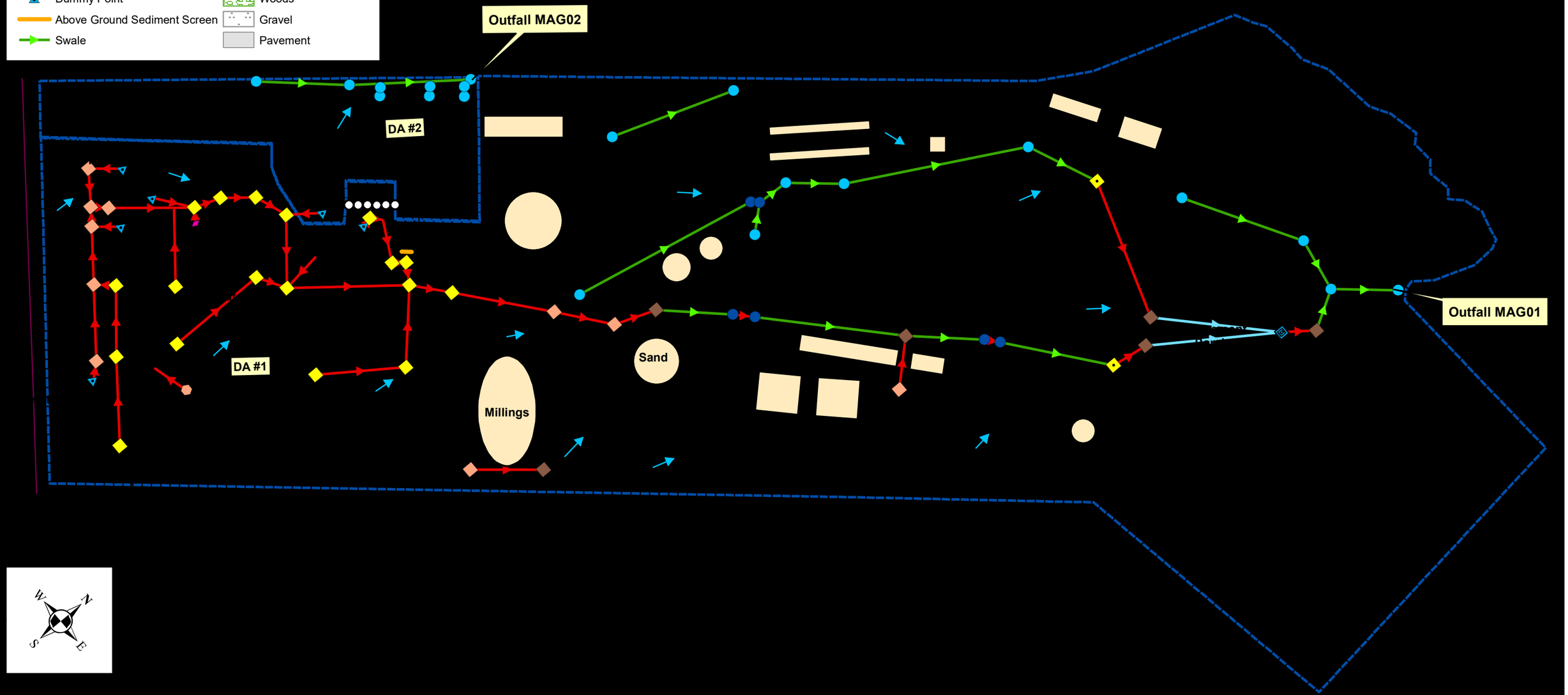
Legend

- Catch Basin with Insert
- Catch Basin without Insert
- Inlet Pipe
- Floor Drain
- Pipe End
- Culvert Point
- Swale Point
- Riser
- Junction Box
- Dummy Point
- Above Ground Sediment Screen
- Swale
- Hydraulic Connection
- Pipe
- Flow Arrow
- Centerline
- Drainage Area (DA)
- BMP
- Material Stockpile
- Building
- Grass
- Woods
- Gravel
- Pavement

Industrial Drainage Area: 42.68 acres
Impervious Area: 26.19% (11.18 acres)

*Maintenance Shops may store waste oil, antifreeze, lubricating oil, transmission fluid, motor oil, and other vehicle maintenance oils, gasoline, and fluids.

Reference SPCC plan for additional above ground storage tank information.



MATERIAL INVENTORY AT MAGNOLIA MAINTENANCE YARD

Material	Discharge Potential	Stormwater Pollutants	Method of Storage	Location of Storage/Disposal	Quantity
Diesel Tank	Low	TPH	Stored outdoors in double walled AST	Fueling Station	4,000 gal
Diesel	Low	TPH	Stored outdoors in double walled AST	Generators	300, 300, & 300 gal
Motor Oil	Low	TPH, copper, lead, zinc	Stored indoors in double walled AST	Maintenance Shop	280 gal
Hydraulic oil/fluids	Low	Oil & grease, TPH	Stored indoors in double walled AST	Maintenance Shop	280 & 180 gal
Antifreeze/ coolant	Low	TPH, copper, lead, zinc	Stored indoors, in double walled AST	Maintenance Shop	150 gal
Used Oil	Low	TPH, copper, lead, zinc, oil & grease	Stored outdoors in double walled AST	Outside of Maintenance Shop. Waste hauler removes.	250 & 250 gal
ATF	Low	TPH, copper, lead, zinc, oil & grease	Stored indoors, in double walled AST	Maintenance Shop	60 gal
Waste Antifreeze	Medium	TPH, copper, lead, zinc	Stored indoors in 55 gal drums. Open drums stored on spill pallets	Inside of Maintenance Shop. Waste hauler removes.	Multiple 55 gal drums
Brake Cleaner	Low	Oil & grease, chromium, copper, nickel	Stored indoors in 55 gal drums. Open drums stored	Maintenance Shop	55 gal
Vehicle Wash	Low	Total surfactants, pH	Stored indoors in 55 gal drums. Open drums stored	Vehicle wash area	55 gal
Tires	Low	Lead, zinc, cadmium	Covered stockpile	Maintenance Shop	200 tires
Sweeper/pipe waste	Medium	pH, TSS	Stockpile outdoors, surrounded by jersey barriers.	Material Stockpile Area	Varies
Batteries	Low	Lead, zinc, cadmium, chromium, copper, nickel	Stored indoors	Maintenance Shop	25
Roto Mills	Medium	TPH, TSS	Stockpile outdoors	Material Stockpile Area	6,000 tons
Topsoil	Medium	TSS, TDS, pH	Stockpile outdoors	Material Stockpile Area	90 tons
Brush/Stumps	Low	BOD	Stockpile outdoors	Material Stockpile Area	20 tons
Guardrails	Low	Metals	Stockpile outdoors	Material Stockpile Area	Minimal

Material	Discharge Potential	Stormwater Pollutants	Method of Storage	Location of Storage/Disposal	Quantity
Scrap Metal/Wire	Medium	Lead, zinc, cadmium, chromium, copper	Stockpile outdoors. Waste hauler removes.	Waste metal dumpster	10-20 tons
Lumber (Treated)	Low	PCBs	Stockpile outdoors	Material Stockpile Area	Minimal
Concrete	Low	TPH, TSS, TDS, pH	Stockpile outdoors	Material Stockpile Area	Varies
Metal Pipes	Medium	Metals	Stockpile outdoors	Material Stockpile Area	Varies
Signal Heads	Low	N/A	Stockpile outdoors	Material Stockpile Area	Varies
Crash Attenuators	Low	Metals	Stockpile outdoors	Material Stockpile Area	5 units
Plastic Cones	Low	N/A	Stockpile outdoors	Material Stockpile Area	400 units
Freon (within applicances)	Low	CFC	Stockpile outdoors	Material Stockpile Area	20 gal
Brine	Low	TSS, TDS, pH	Stored in tank	Tank near salt barn	12,000, 6,000, 6,000, 5,000, 5,000 gal
Sand	Medium	TSS	Stockpile outdoors, surrounded by jersey barriers	Material Stockpile Area	200 tons
Salt	Low	TSS, TDS, pH	Covered salt barn	Salt barn	3,000 tons
Solar Salt	Low	TSS, TDS, pH	Covered	Salt barn	500 tons
#57 Stone	Low	TSS, TDS, pH	Stockpile outdoors	Material Stockpile Area	500 tons
Rip Rap	Low	TSS, TDS, pH	Stockpile outdoors	Material Stockpile Area	1,500 tons
Stone Rice	Low	TSS, TDS, pH	Stockpile outdoors	Material Stockpile Area	815 tons
Cold Patch	Low	TPH, TSS	Stockpile outdoors, surrounded by jersey barriers	Material Stockpile Area	60 tons

1 Data obtained from MSDSs when available

TPH–Total Petroleum Hydrocarbons; TDS–Total Dissolved Solids; TSS–Total Suspended Solids
PCBs–Polychlorinated Biphenols; BOD – Biological Oxygen Demand; N/A – Not Applicable

Best Management Practices and Implementation Schedule

Practice/Program	Schedule / Frequency	Implementation Date
Good Housekeeping:		
Trash will be stored in covered receptacles	Ongoing	Currently Implemented
Minimize waste staged on-site by disposing of materials (roadside trash and household waste) at licensed off-site facilites, at a minimum, by the end of each calendar year	As needed	Currently Implemented
Facility is secured by fencing with cameras, lighting and security systems, and only accessible by key card after hours	Ongoing	Currently Implemented
Maintain clean work areas using basic clean-up procedures (sweeping, shoveling, and/or vaccuming)	Ongoing	Currently Implemented
Pave primary parking areas	As needed	Currently Implemented
Storage areas will be orderly and well maintained	Ongoing	Currently Implemented
Chemical containers, drums, and AST's will have clear labels, that identify stored contents and be checked for leaks or deterioration	Ongoing	Currently Implemented
Promptly transfer used fluids to the proper waste or recycling drum	As needed	Currently Implemented
Use non-toxic or low toxicity materials	Ongoing	Currently Implemented
Use sorbent pads on top of 55-gallons drums that are actively in use	Ongoing	Currently Implemented
Preventive Maintenance:		
Place drip pans under leaking vehicles and equipment; empty drip pans regularly	Ongoing	Currently Implemented
Perform routine equipment maintenance	Ongoing	Currently Implemented
Evaluate efficiency of equipment	Ongoing	Currently Implemented
Conduct quarterly dry and wet weathering monitoring	Quarterly	Currently Implemented
Conduct semi-annual comprehensive inspections	Semi-annually	Currently Implemented
Spill Prevention and Response:		
Reference the Spill Prevention Control and Countermeasure Plan (SPCC)	As needed	Currently Implemented
An outside contractor removes waste oil from the site utilizing a spill-free extraction system	As needed	Currently Implemented
Use outside contractor, such as Safety Kleen, to provide parts washers, etc.	As needed	Currently Implemented
Keep spill kits in areas designated in the SPCC	Ongoing	Currently Implemented
Follow SPCC guidance for all spills. For spill greater than 10 gallons, follow emergency procedures as outlined in SPCC	As needed	Currently Implemented
Minimizing Exposure:		
Sweeper waste is stockpiled separartely and tested prior to disposal at the landfall	Annually	Currently Implemented
Vehicle maintenance is performed indoors	Ongoing	Currently Implemented
Vehicles/equipment stored indoors when space allows	Ongoing	Currently Implemented
Vehicle washing is performed in designated wash areas or areas with equivalent treatment trains	Ongoing	Currently Implemented
Paving and maintenance bays inspected for cracks	Bi-Annually	Currently Implemented
Roofs are checked for cracks	Bi-Annually	Currently Implemented

Practice/Program	Schedule / Frequency	Implementation Date
Sediment and Erosion Control:		
Grassed areas and swales monitored for adequate vegetation coverage	Quarterly	Currently Implemented
Inspect stromwater system for signs of erosion or evidence of contaminants draining from the yard	Quarterly	Currently Implemented
Catch basin inserts installed in the drainage inlets receiving high industrial flow	As needed	Currently Implemented
Best Management Practices:		
The majority of the yard drains to a network of grassed swales that lead to a stormwater management pond, allowing for the settling of particulate matter and the infiltration and absorption of nutrients and contaminants	Ongoing	Currently Implemented
Only environmentally safe, phosphate-free biodegradable detergent (or no detergent) is used to wash vehicles and equipment	Ongoing	Currently Implemented
A statewide maintenance system is used to issue work orders for tasks specified in the SWPPP	Ongoing	Currently Implemented
Additional Requirements for Salt:		
Salt stockpile stored in covered structure	Ongoing	Currently Implemented
Inspect salt barn for leaks	Quarterly	Currently Implemented
Perform salt loading/unloading in paved areas only	Ongoing	Currently Implemented
Clean up (sweep and shovel) salt loading and unloading areas after each snow event and/or each salt loading/unloading operation	As needed	Currently Implemented
Direct runoff from salt loading and unloading area through gravel or stone filter berms, vegetated filter strips, or grassed swales to the existing stormwater retention pond, where possible	Ongoing	Currently Implemented
Management of Runoff:		
Stormwater runoff directed through gravel or stone filter berms, vegetated filter strips, or grassed swales to the existing stormwater retention pond, where possible	Ongoing	Currently Implemented
Use engineering controls (grading, curbing, berming) around paved areas to prevent problems from runon of potentially contaminated stormwater from adjacent areas	Ongoing	Currently Implemented
Off-site Vehicle Tracking:		
Trucks routinely cleaned and sediment not tracked off-site	As needed	Currently implemented
Employee Training:		
Employees will be trained to clean up spills immediately and appropriately dispose of materials	Annually	Currently Implemented
Employees will be trained in basic clean-up procedures (sweeping and shoveling procedures)	Annually	Currently Implemented
Employees will be trained on proper material handling and storage procedures	Annually	Currently Implemented
“Winter Workshop”	2 days/year	Currently Implemented
Informal sessions on Stormwater Contamination and Spill Prevention, Facility and Vehicle Maintenance, Vegetative Control and Pollution Prevention on Public Roads, Regulatory Requirements, Roadside Events, Spill Response and Emergency Procedures	Annually	Currently Implemented
Informal bulletins, Miscellaneous webinars, and other trainings when available to remind staff of good housekeeping procedures	As needed	Currently Implemented

STORMWATER POLLUTION PREVENTION PLAN

CHESWOLD MAINTENANCE YARD – AREA 8

Cheswold, Delaware

SEPTEMBER 2024

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
DOVER, DELAWARE

Cheswold Maintenance Yard

CERTIFICATION OF STORMWATER PLAN

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted.

Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for willful violations.

NON-STORMWATER DISCHARGES CERTIFICATION

I certify that no non-stormwater discharges to the stormwater system exist at the Cheswold Maintenance Yard.

Name:	Matt Lichtenstein
Title:	Central District Engineer
Date:	9/11/19
Signature:	

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1. INTRODUCTION

In 1972 Congress passed the Federal Water Pollution Control Act (FWPCA), also known as the Clean Water Act (CWA), to restore and maintain the quality of the nation's waterways. The ultimate goal was to ensure that rivers and streams were fishable, swimmable, and drinkable. In 1987 the Water Quality Act (WQA) added provisions to the CWA that allowed the EPA to govern stormwater discharges from industrial activities. EPA published the final notice for Phase I of the Multi-Sector General Stormwater Permit Program (Federal Register Volume 60 No. 189, September 20, 1995, page 50804) in 1995, which included provisions for the development of a Stormwater Pollution Prevention Plan (SWPPP) by each industrial facility discharging stormwater, including transportation facilities.

Development, implementation, and maintenance of the SWPPP provides the Cheswold Maintenance Yard (Area 8) with the tools to reduce pollutants contained in stormwater discharges and comply with the requirements of Delaware's "Regulations Governing Stormwater Discharges Associated with Industrial Activity."

The primary goal of the SWPPP is to:

- Identify potential sources of pollutants that affect stormwater discharges from the site.
- Describe the practices that will be implemented to prevent or control the release of pollutants in stormwater discharges.
- Create an implementation schedule to ensure that the practices described in the SWPPP are implemented to evalute the plan's effectivness in reducing the pollutant levels in stormwater.

The SWPPP includes the following information:

- Identification of SWPPP team personnel
- Description of the facility including the facility's location and activities, as well as a site map, and summary of the stormwater drainage system
- Potential sources of stormwater contamination
- Inventory of spills and leaks
- Description of stormwater management controls and various best management practices (BMPs) necessary to reduce pollutants in discharge
- Description of the facility monitoring and inspection programs

2. FACILITY DESCRIPTION AND CONTACT INFORMATION

Facility Information	
Facility Owner, Address, & Telephone:	Delaware Department of Transportation 4275 Seven Hickories Rd. Cheswold, Delaware 19936 302-678-4420
Latitude/Longitude:	Latitude 39°13'07" Longitude 75°35'28"
SIC:	1611 (Highway/Street Construction, Except Elevated Highways) 41-73 (Terminal/Service Facilities for Motor Vehicle Passengers)
Acreage:	10.13
Receiving Water:	Leipsic River
Location of SWPPP:	Facility Office

2.1 FACILITY EMERGENCY CONTACTS

Site Emergency Contacts:

District Engineer: Matt Lichtenstein; (302) 760-2412 ***(Authorized Personnel)***

Supervisor: Brian Parton; (302) 678-4423 (o); (302) 632-2581 (c)

Assistant Supervisor: Dave Faulkner; (302) 678-4422 (o)

After Hours: Transportation Management Center; (302)-659-4600

NPDES Contacts *(for regular correspondence)*:

NPDES Program Manager: Sara Esposito; (302) 760-2346

NPDES Environmental Scientist: Vacant; (302) 760-2195

2.2 FACILITY DESCRIPTION

The total area of the site is approximately 10.13 acres. Approximately 53 percent of the site is impervious (i.e., pavement, buildings). The remainder of the site consists of approximately 23 percent of compacted gravel and millings stockpile storage areas, and approximately 24 percent of undeveloped grass and pond areas. **Appendix A** contains a site map detailing the facility's features, layouts, and drainage plan.

The site is located in Cheswold within Kent County. The site is square in shape bordered by a small county-operated airport to the north, residential land to the west, by Seven Hickories Road and agricultural fields to the south, and residential land and Cheswold United Methodist Church to the east.

2.3 SITE ACTIVITIES

The Cheswold Maintenance Yard typically operates from 7:00 am to 3:00 pm, five days per week, and maintains a staff of approximately 24 people. Operations are extended during major storm events. The primary operations at the Cheswold Maintenance Yard include:

Stockpiling of Materials for Road Maintenance - Materials stored at the facility are used for maintenance of existing state roadways and bridges and for planned new construction projects for the Central District of DelDOT. Material routinely staged at the site includes salt, sand, gravel, cement, concrete and metal piping, metal guardrails, treated lumber, crash attenuators, galvanized metal, and milled and cold mix asphalt.

Vehicle Maintenance and Storage - Trucks and miscellaneous construction equipment (trackhoes, backhoes, etc.) used in the maintenance of existing roadways for the Central District of DelDOT are staged at the site. In addition, routine vehicle maintenance such as replacement of motor oil, coolants, other engine/vehicle fluids, and batteries occurs at this facility. Vehicles are also routinely washed at the site in areas with appropriate drainage treatment trains.

Staging of Miscellaneous Waste - Waste materials (not including roadway maintenance materials) collected along state roadways in the South District of DelDOT during routine roadway maintenance are staged at the site pending disposal at licensed waste disposal facilities and recycling facilities. Waste staged at the site includes scrap lumber, household waste (appliances and furniture), construction waste (concrete and steel), brush and stumps, tires, and sweeper waste. Materials are handled and disposed of in accordance with applicable standards and regulations. DelDOT collects a variety of materials from Delaware's roadways but strives to follow safe and environmentally friendly practices for storage and removal of these materials.

3. POLLUTION PREVENTION TEAM

DelDOT is a multi-sector organization, and as such, many people are responsible for the yard and the NPDES compliance. The ultimate responsible party is the Central District Engineer, who is overseen by the Director of Maintenance and Operations. The District Engineer has responsibility of the yards' budget, daily operations, personnel and compliance. The team outlined below has job responsibilities that ensure the Pollution Prevention Plan is followed.

NPDES Contact:	Sara Esposito	**Title**:	NPDES Program Manager
		Office Phone:	(302) 760-2346
NPDES Contact:	Vacant	**Title**:	NPDES Program Scientist
		Office Phone:	(302) 760-2195
Owner:	Matt Lichtenstein	**Title**:	Central District Engineer
		Office Phone:	(302) 760-2412
Owner's Representative:	Timothy Stynchula	**Title**:	Central District Maint Engineer
		Office Phone:	(302) 760-2418

Responsibilities:

- Implement the SWPPP plan;
- Oversee maintenance practices identified as BMPs in the SWPPP;
- Prepare and submit reports;
- Ensure that any changes in facility operation are addressed in the SWPPP; and
- Ensure quarterly monitoring program is implemented.

Site Contact:	Brian Parton	**Title**:	Area 8 Supervisor
		Office Phone:	(302) 678-4423
Site Contact:	Dave Faulkner	**Title**:	Area 8 Assistant Supervisor
		Office Phone:	(302) 678-4422

Responsibilities:

- Create a SWPPP team to aid in the implementation of the SWPPP;
- Implement and oversee employee training;
- Act as spill response coordinator;
- Identify other potential pollutant sources and make sure they are added to the plan;
- Identify any deficiencies in the SWPPP and make sure they are corrected; and
- Conduct or provide for quarterly inspection or monitoring activities.

4. IDENTIFICATION OF POTENTIAL STORMWATER CONTAMINANTS

This section identifies the following:

- The existing stormwater drainage system.
- Significant materials located at the facility that may potentially contaminate stormwater.
- Records of past spills and leaks.
- Potential areas for stormwater contamination.
- Available stormwater sampling data.

4.1 EXISTING STORMWATER DRAINAGE SYSTEM

The site can be divided into two major drainage areas. **Table 1** describes the significant characteristics of each drainage area. **Appendix A** shows the locations of the drainage areas and the apparent stormwater drainage patterns. Drainage areas are not based on a topographic survey.

Drainage Area 1

Sheet flow drains to catch basins from parking areas, office building, maintenance shop and portions of vehicle storage buildings. Runoff from the back of the vehicle storage drains to a swale along 7 Hickories Road. Runoff is collected and discharged offsite via catch basin CHE01.

Drainage Area 2

Flow from vehicle storage, salt barn, and stockpile areas enter catch basins that lead to a stormwater pond that discharges offsite. Flow from the wash pad, fueling area, and stockpile area drain to a swale before entering the stormwater pond that discharges to CHE02.

Table 1 - Characteristics of Stormwater Drainage Areas

Drainage Area[1]	Stormwater Flow Description	Total Size (acres)	Impervious Area (acres/% of area)	Runoff coefficient[2]	Drainage Discharge Point
DA 1	Runoff from part of the vehicle storage drains to a swale. Sheet flow from parking areas, maintenance shop, and office drains to catch basins. Water from vehicle washing in the wash bay collects in an oil/grit separator before discharging into the catch basin just outside the wash bay. Flow from this drainage area discharges off-site via catch basin CHE01.	3.30	1.79 (54%)	Medium	CHE01/Off-site
DA 2	Flow from part of vehicle storage, salt barn, and stockpile area enters catch basins that lead to a SWM pond. Flow from the wash pad, fueling area, and part of stockpile area, drain to a swale before entering the SWM pond. The pond discharges off-site via outfall CHE02.	6.83	3.57 (52%)	Medium	Swale/SWM Pond/ CHE02/Off-site

[1] See Appendix A for drainage areas

[2] Runoff coefficient:

High: 70-100% impervious (example: asphalt, buildings, paved surfaces)
Medium: 40-70% impervious (example: packed soils)
Low: 0-40% impervious (example: grassy area)

4.2 MATERIAL INVENTORY

Materials used or stored at the facility are listed in **Appendix B**. It describes which materials may potentially be exposed to precipitation or runoff and typical annual quantities of such materials. Those used or stored at the facility that have a high potential to be present in stormwater runoff are considered significant materials, and are labeled with either a high or medium discharge potential based on their containment. Materials present at the facility that are stored inside structures are not likely to be impacted by stormwater runoff and are lableled with a low discharge potential. Other low potential materials include non-liquid materials, such as treated lumber.

4.3 HISTORIC SPILL AND LEAK RECORD

Records of spills and leaks can be found in **Appendix F.4** Spill Documentation Form. In the event of a spill or leak, the procedures in the facility's Spill Prevention Control and Countermeasures (SPCC) Plan should be followed.

4.4 POTENTIAL AREAS FOR STORMWATER CONTAMINATION

Potential contaminants include total petroleum hydrocarbons (TPH), oil and grease, heavy metals, surfactants, total dissolved solids (TDS), and total suspended solids (TSS). The following potential source areas of stormwater contamination were identified and evaluated:

Vehicle and Equipment Storage Sheds and Maintenance Shop:
Trucks and equipment awaiting maintenance, or simply not in use, are generally stored in the equipment sheds when space allows. Maintenance to trucks and equipment is performed in the maintenance shops. If stormwater enters these areas it can be contaminated by fluids leaking onto the paved surface from the trucks or equipment. These contaminants may contain TPH, oil and grease, heavy metals, surfactants, TDS, and TSS.

Truck Loading Area:
Trucks load and unload their cargo in truck loading area. Stormwater from this area can be potentially contaminated by fluids leaking on gravel surface from trucks. These contaminants may include, but are not limited to, oil/grease, heavy metals, TPH, surfactants, TDS, and TSS.

Vehicle Wash Area:
Trucks and other vehicles are rinsed in an area with an appropriate drainage treatment train. Stormwater from this area can be potentially contaminated by fluids leaking on the paved surface from trucks and truck cleaning operations. These contaminants may include oil and grease, heavy metals, TPH, surfactants, TDS, and TSS.

Salt Barn/Salt Mixing Area and Truck Loading Area:
These areas contain the road salt and sand used by DelDOT to deice the roadways during winter storms. Stockpiles of rock salt are stored in an enclosed area and stockpiles of solar salt are stored under cover to prevent exposure to precipitation. Brine solutions are also mixed and stored in tanks in this area. Material can

spill and build up as the DelDOT vehicles are loaded. This concentrated amount of sand and salt can harm vegetation and adversely impact water quality in receiving streams. Stormwater from this area can be potentially contaminated with TDS, TSS, oil and grease, heavy metals, TPH, and surfactants.

Material Stockpile Area:
Materials used for maintenance and upkeep of State roads are stored on the gravel surfaced stockpile area of this site. In addition, trucks load and unload their cargo in the stockpile areas. Rainfall contact with these materials and with fluids leaking on the gravel surface from trucks can lead to uncontrolled stormwater runoff. Stormwater from this area can be potentially contaminated with TDS, TSS, oil and grease, heavy metals, TPH, and total surfactants.

Aboveground Storage Tanks (ASTs):
Aboveground storage tanks are located at this facility for fueling, vehicle maintenance, and emergency generator power. Stormwater from the areas with ASTs can be potentially contaminated by spills, fluid leaking from cracks or holes, or from overfill during filling operations. The contaminants may include, but are not limited to, TPH, TSS, and heavy metals. The location of the tanks in addition to secondary containment measures and spill response procedures can be found in the facility's Spill Prevention Control and Countermeasures (SPCC) Plan, stored on site.

Table 2 presents site-specific information regarding stormwater pollution potential from each of these areas.

Table 2 - Stormwater Pollution Potential at Cheswold Maintenance Yard

Drainage Area[1]	Potential Stormwater Contamination Point	Potential Pollutant[2]	Potential Problem
DA 1,2	Vehicle and Equipment Storage Area	Oil and grease, TPH	Leaking fluids from vehicles and equipment can impact stormwater
DA 1,2	Maintenance Area	Oil and grease, lead, cadmium, nickel, copper, zinc, TPH, total surfactants, pH, TDS, TSS	Leaking fluids from vehicles and equipment can impact stormwater
DA 2	Vehicle Wash Area	Oil and grease, lead, cadmium, nickel, copper, zinc, TPH, salt, total surfactants, pH, TDS, TSS	Leaking fluids from tucks and wastewater from cleaning operations can impact stormwater
DA 1,2	Parking Lot	Oil and grease, lead, cadmium, nickel, copper, zinc, TPH	Leaking fluids from employee vehicles can impact stormwater
DA 1,2	Roadways	Oil and grease, lead, cadmium, nickel, copper, zinc, TPH	Leaking fluids from vehicles can impact stormwater
DA 2	Salt Barn/Mixing Area	TSS, TDS, pH, TPH	Rainfall contact with material. Leaking fluids from trucks and spilled materials can impact stormwater
DA 2	Truck Loading Area	Oil and grease, lead, cadmium, nickel, copper, zinc, TPH, total surfactants, pH, TDS, TSS	Leaking fluids from trucks and spilled materials during loading/unloading can impact stormwater
DA 2	Material Stockpile Area	PCBs, BOD, TDS, TSS, TPH, oil and grease, pH, lead, zinc, cadmium, chromium, copper, nickel	Rainfall contact with materials can cause polluted runoff from material stockpiles
DA 1,2	AST Storage Area	TPH, TSS, lead, zinc, cadmium, chromium, copper, nickel	Spills, leaking fluids from cracks or holes in ASTs, and overflow during fueling or delivery operations can impact stormwater

1 See Appendix A for drainage areas
2 BOD – Biological Oxygen Demand
PCB – Polychlorinated Biphenyl
TPH – Total Petroleum Hydrocarbons
TDS – Total Dissolved Solids
TSS – Total Suspended Solids

4.5 SUMMARY OF AVAILABLE STORMWATER SAMPLING DATA

As of June 27, 2013, DNREC has required wet weather sampling at each of the DelDOT facility outfalls that discharge runoff from areas with industrial activities. Prior to this date, DelDOT's General Permit Pollution Prevention Plans required wet weather stormwater monitoring from the pond outfalls at only four facilities. These facilities were chosen, with DNREC's approval, as representative of the 16 facilities located throughout the state. The four yards were: Kiamensi, Bear, Cheswold, and Harrington. Thus, prior to July 2013, data are available only for those sites.

A summary of available stormwater sampling data at Cheswold Yard can be found in **Appendix C**. All of the original field and laboratory data sheets, as well as documentation of follow-up actions taken when benchmark values are exceeded, are kept in the offices of the DelDOT NPDES Section, 800 Bay Road, Dover DE 19901.

5. STORMWATER BEST MANAGEMENT PRACTICES

This section discusses the stormwater management controls required by the permit and describes the management practices selected to address the areas of concern identified in Section 4 of this SWPPP.

Best management practices (BMPs) are measures used to prevent or mitigate pollution from any type of activity. Baseline BMPs include processes, procedures, schedules of activities, prohibitions on practices, and other management practices to prevent or reduce water pollution. They keep stormwater from impacting the materials stored on the site and activities that occur at the facility, by keeping the areas clean and well maintained, and properly training employees. These BMPs are listed in **Appendix D**.

5.1 SPILL PREVENTION AND RESPONSE

The SWPPP is designed to minimize the potential for spills and leaks, and prevent spilled materials from discharging pollutants from the facility to the MS4. Employees on the Stormwater Management Team receive annual training on spill prevention and good housekeeping procedures. Reference the Spill Prevention, Control, and Countermeasure (SPCC) Plan for more information on spill prevention and response.

All significant spills will be recorded on the Spill Log (**Appendix F**) and kept with the SWPPP.

6. VEHICLE AND EQUIPMENT WASH PLAN

Untreated vehicle washwater has the potential to carry harmful pollutants through the storm sewer system or overland, and ultimately into the aquatic ecosystem or drinking water supplies. Washwater may contain oil and grease, suspended solids, heavy metals, and surfactants (detergents). These pollutants can be toxic to aquatic organisms, including fish, and the ingestion of affected fish by people can also be harmful. The EPA encourages the use of phosphate-free, biodegradable surfactants, and discourages the use of cleaning agents containing solvents and emulsifiers. This practice reduces the amount of contaminants that enter

storm drains. To capture sediment from washing activities, DelDOT uses sediment traps, catch basin inserts, or aboveground sediment screens.

6.1 VEHICLE AND EQUIPMENT WASH STANDARD OPERATING PROCEDURES

The vehicle wash plan uses phosphate free, biodegradable detergents, or commonly just water. There is a wash pad and wash bay on site for vehicle and equipment washing. Water from the wash pad flows through an above-ground sediment screen to a vegetated swale prior to entering the stormwater management pond.

Wash in Designated Areas – Wash on the designated concrete wash pads. As the first step in the treatment train process, this isolates and concentrates the sediment and debris in one location for easier clean-up and identification. Washing outside of the wash pad may only occur if the drainage flows to an equivalent treatment train.

Use Environmentally Safe, Biodegradable Detergent – Most vehicle washing uses only water. Environmentally safe, biodegradable detergent is used to wash trucks and equipment on an as needed basis.

Clean the Wash Area – If an accumulation of sediment is present at the end of a wash event, the pad is cleaned and the material is properly disposed.

Clean the Sediment Trap & Sediment Screen – After washing when capacity in the sediment trap, sediment screen, or catch basin insert exceeds half full, the device is excavated and the waste is disposed in the sweeper waste pile.

Sweeping Frequency – Routine mechanical sweeping is performed at the facility. Visual observation determines appropriate frequency.

6.2 WATER QUALITY MONITORING

Reference Section 7 for facility monitoring information. Surfactants, oil and grease, total suspended solids, and pH are the parameters tested in the bi-annual wet weather sampling.

7. FACILITY MONITORING PLAN

This section discusses the facility monitoring plan required by the permit and describes the management practices selected to address the responsibilities identified in Section 3. Any deficiencies noted during inspections must be corrected within 14 days after the inspection.

7.1 QUARTERLY DRY WEATHER INSPECTIONS

Visual inspections of catch basins, drainage swales, BMPs, and other good housekeeping measures will be made quarterly by the responsible Pollution Prevention Team member (see Section 3) during dry weather conditions for evidence of non-stormwater discharges. The visual inspection may be completed by an employee under the Pollution Prevention Team member's direction. The dry weather inspections will verify the site is not discharging sanitary or processed water to catch basin inlets. Information recorded on the inspection sheet shall include: date of inspection, inspection results, catch basin or drainage swale location, and potential significant sources of non-stormwater, if discovered through testing. Blank dry-weather inspection forms can be found in **Appendix F** of this SWPPP.

7.2 QUARTERLY WET WEATHER INSPECTIONS

Visual inspections of all catch basins, drainage swales, and BMPs will be made quarterly by the responsible Pollution Prevention Team member (see Section 3) during rain events to look for evidence of stormwater contamination. The visual inspection may be completed by an employee under the Pollution Prevention Team member's direction. Inspections will be conducted within the first 30 minutes of discharge or soon thereafter, but not exceeding 60 minutes. The visual inspection shall include any observations of color, odor, turbidity, floating solids, foam, oil sheen, or other obvious indicators of stormwater pollution. Information recorded on the inspection sheet shall include: date of inspection, inspection results, catch basin or drainage swale location, and potential significant sources of stormwater contaminants, if discovered. Blank wet-weather inspection forms can be found in **Appendix F** of this SWPPP.

7.3 BI-ANNUAL COMPREHENSIVE SITE EVALUATIONS

Bi-annual comprehensive site evaluations will be performed at the yard by DelDOT NPDES staff. These evaluations may take the place of the dry weather inspections for the quarter in which they are performed. Blank annual compliance inspection forms can be found in **Appendix F** of this SWPPP. The inspection will include:

- Evaluating the implemented BMP conditions and effectiveness
- Reviewing the good housekeeping and spill prevention materials
- Evaluating areas identified in the Inventory of Industrial Materials
- Inspecting the stormwater outfalls and areas immediately downstream
- Checking that all required records have been recorded
- Determining if site operations have changed since development of this SWPPP. If there are changes will impact stormwater quality, the Pollution Prevention Team will develop new BMPs to address the change(s). All operational changes and new BMPs will be recorded in this SWPPP.
- Recording the following: inspection date, inspection personnel, scope of the inspection, major observations, and any needed revisions. Revisions to the plan should occur within 14 days after the annual inspection.

7.4 SEMI-ANNUAL ANALYTICAL MONITORING

Monitoring at Cheswold Yard is conducted twice per year. Sampling Techniques are performed in accordance with the Environmental Protection Agency (EPA) *Stormwater Sampling Guidance Document*, EPA 833-B-92-001 (July 1992). Semi-annual grab samples must be collected once in each of the following six-month periods: January through June, and July through December. A summary of available stormwater sampling data at Cheswold Yard can be found in **Appendix C**.

The wet weather monitoring protocol includes 72 hours of antecedently dry conditions, minimum predicted rainfall depth of 0.10 inches, and two full days of standard maintenance yard operations since the last rainfall event. A first flush grab sample is collected within 30 minutes from the first noticeable flow, and delivered to the laboratory for analysis of total suspended solids, surfactants, chloride, pH, and oil & grease. Measurements of air temperature, water temperature, pH and turbidity are recorded on-site at the time of sample collection. Flow at the outfall is not measured at the time of sampling. At each outfall, the total stormwater volume is calculated based on the precipitation received and the amount of pervious and impervious area within the drainage area. For discharges from holding ponds or other impoundments with a 24-hour or greater retention capacity, grab samples of the discharge may be taken at any time for pollution analysis.

Benchmark monitoring concentrations for each parameter are shown below.

Parameter	Benchmark Value
Total Suspended Solids	100 mg/L
Surfactants	1.0 mg/L
Chlorides	No Benchmark
Oil and Grease	15 mg/L
pH	6-9 S.U.

8. COMPLIANCE AND REPORTING REQUIREMENTS

8.1 SWPPP SUMMARY

The SWPPP will be kept at the facility and will be made available to the state or federal compliance inspection officer upon request.

8.2 EMPLOYEE TRAINING

An employee training program was developed and implemented by the DelDOT NPDES Manager to educate maintenance yard staff about the requirements of the SWPPP. This education program includes background on the components and goals of the SWPPP and training in spill prevention and response, good housekeeping, proper material handling, disposal and control of waste, container filling and transfer, and proper storage, washing, and inspection procedures.
Maintenance yard staff will be required to participate in the training courses annually. An employee sign-in sheet for the course can be found in **Appendix E** of this document. New employees are informed about the

SWPPP requirements during job orientation. The training program will be reviewed annually by the SWPPP coordinator to determine its effectiveness and to make any necessary changes to the program.

8.3 IMPLEMENTATION SCHEDULE

In accordance with State regulations, the SWPPP implementation schedule is shown in **Appendix D**. A simplified schedule is provided below to assist the facility with compliance (**Table 3**).

Table 3 - Implementation Schedule Overview

Activity	Schedule
Employee Training	Annually, all training completed by December 31st . New employee training within 1 week of start date
Semi-Annual Analytical Monitoring of Outfalls	Once during each of the following six-month periods: January through June and July through December
Quarterly Visual Monitoring during Dry Weather	By March 31st, June 30th, September 30th, and December 31st each year
Quarterly Visual Monitoring during Wet Weather	By March 31st, June 30th, September 30th, and December 31st each year
Comprehensive Site Compliance Evaluation	Twice per year between April-June and September-November
Implementation of BMPs	See Appendix D

8.4 RECORD RETENTION REQUIREMENTS

Records described in the SWPPP, including employee training records, must be retained on site for five years and shall be made available to the State or Federal Compliance Inspection Officer upon request.

8.5 PRINCIPAL EXECUTIVE OFFICER SIGNATURE

In accordance with the State of Delaware, this plan has been approved and signed by the DelDOT Central District Engineer, the authorized representative responsible for the operation of the facility.

8.6 ASSESSMENT OF RUNOFF MANAGEMENT

Based on an assessment of potential sources of stormwater pollution, the control measures at this facility are suitable for the management of runoff. Stormwater controls will be monitored and if changes or additional measures are necessary then the SWPPP will be amended.

8.7 PROVISIONS FOR AMENDMENT OF THE PLAN

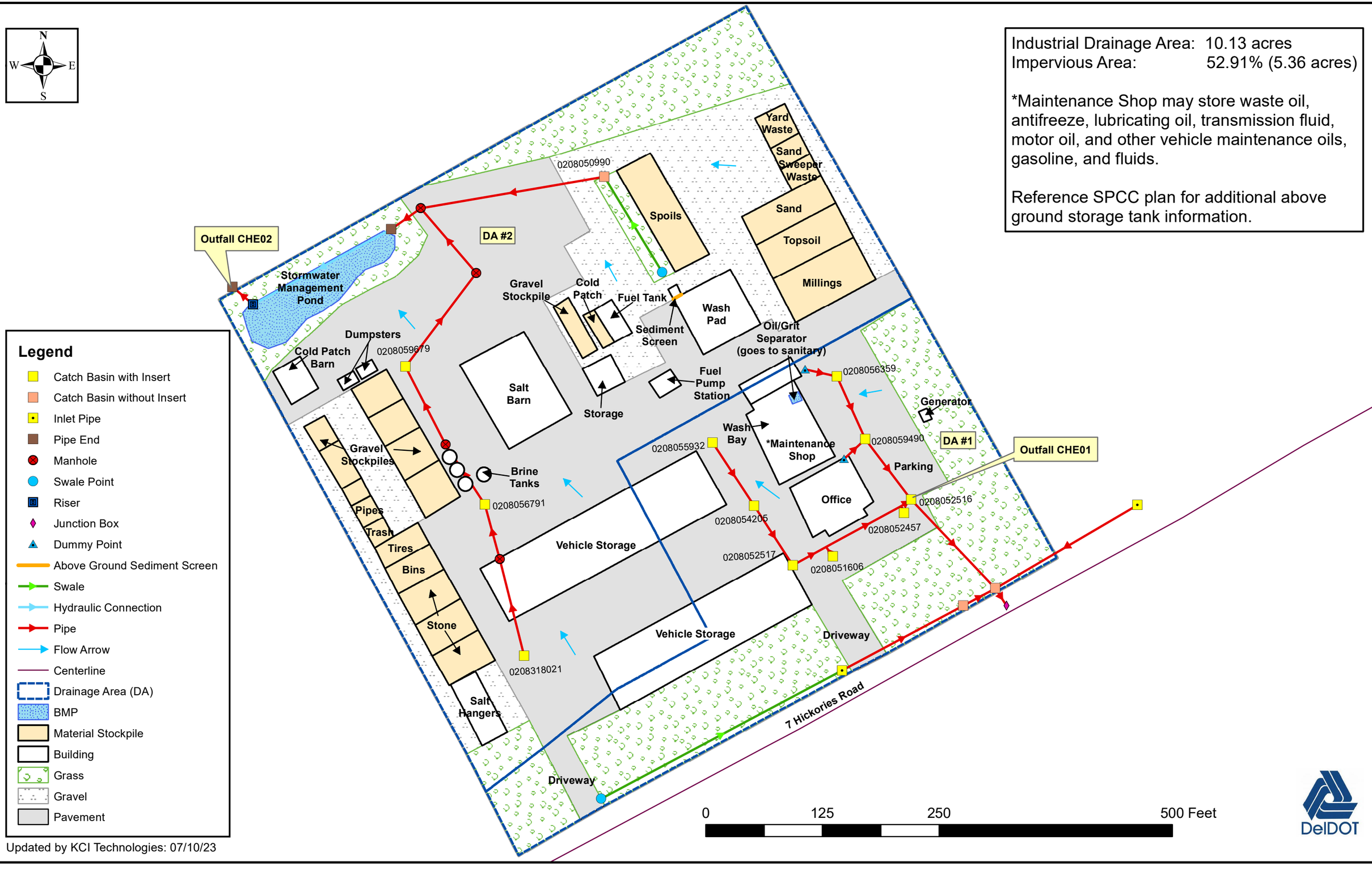
If the facility expands, experiences any significant production increases or process modifications, or changes any significant material handling or storage practices that could impact stormwater, the SWPPP will be amended appropriately. The amended SWPPP will have a description of the new activities that contribute to the increased pollutant loading and planned source control activities. The SWPPP will also be amended if the State or Federal Compliance Inspection Officer determines that it is ineffective in controlling stormwater pollutants discharged to waters.

Cheswold Maintenance Yard - SWPPP Map

Industrial Drainage Area: 10.13 acres
Impervious Area: 52.91% (5.36 acres)

*Maintenance Shop may store waste oil, antifreeze, lubricating oil, transmission fluid, motor oil, and other vehicle maintenance oils, gasoline, and fluids.

Reference SPCC plan for additional above ground storage tank information.



Legend

- Catch Basin with Insert
- Catch Basin without Insert
- Inlet Pipe
- Pipe End
- Manhole
- Swale Point
- Riser
- Junction Box
- Dummy Point
- Above Ground Sediment Screen
- Swale
- Hydraulic Connection
- Pipe
- Flow Arrow
- Centerline
- Drainage Area (DA)
- BMP
- Material Stockpile
- Building
- Grass
- Gravel
- Pavement

Updated by KCI Technologies: 07/10/23

MATERIAL INVENTORY AT CHESWOLD MAINTENANCE YARD

Material	Discharge Potential	Stormwater Pollutants	Method of Storage	Location of Storage/Disposal	Quantity
Diesel Tank	Low	TPH	Stored outdoors in double walled AST	Fueling Station	6,000 gal
Diesel	Low	TPH	Stored outdoors in double walled AST	Generators	300 & 300 gal
Motor Oil	Low	TPH, copper, lead, zinc	Stored indoors, in double walled AST	Maintenance Shop	60 gal & 60 gal
Hydraulic oil/fluids	Low	Oil & grease, TPH	Stored indoors, in double walled AST	Maintenance Shop	60, 60 & 60 gal
Antifreeze/ coolant	Low	TPH, copper, lead, zinc	Stored indoors in 55 gal drums. Open drums stored	Maintenance Shop	Multiple 55 gal drums
Gear Oil	Low	TPH, oil & grease	Stored indoors in 55 gal drums. Open drums stored	Maintenance Shop	Multiple 55 gal drums
Transmission Fluid	Low	TPH, copper, lead, zinc, oil & grease	Stored indoors in 55 gal drums. Open drums stored	Maintenance Shop	Multiple 55 gal drums
Lubricants	Low	Oil & grease, lead, cadmium, nickel	Stored indoors in 55 gal drums. Open drums stored	Maintenance Shop	Multiple 55 gal drums
Used Oil	Low	TPH, copper, lead, zinc, oil & grease	Stored outdoors in double walled AST	Outside of Maintenance Shop. Waste hauler removes.	250 gal
Waste Antifreeze	Medium	TPH, copper, lead, zinc	Stored indoors in 55 gal drums. Open drums stored on spill pallets	Inside of Maintenance Shop. Waste hauler removes.	Multiple 55 gal drums
Brake Cleaner	Low	Oil & grease, chromium, copper, nickel	Stored indoors in 55 gal drums. Open drums stored	Maintenance Shop	55 gal
Vehicle Wash	Low	Total surfactants, pH	Stored indoors in 55 gal drums. Open drums stored	Vehicle wash area	55 gal
Tires	Low	Lead, zinc, cadmium	Covered stockpile	Maintenance Shop	25 tires
Sweeper/pipe waste	Medium	pH, TSS	Stockpile outdoors, surrounded by jersey barriers.	Stockpile	Varies
Batteries	Low	Lead, zinc, cadmium, chromium, copper, nickel	Stored indoors	Maintenance Shop	25
Roto Mills	Medium	TPH, TSS	Stockpile outdoors	Material Stockpile Area	400 tons

Material	Discharge Potential	Stormwater Pollutants	Method of Storage	Location of Storage/Disposal	Quantity
Topsoil	Medium	TSS, TDS, pH	Stockpile outdoors	Material Stockpile Area	350 tons
Brush/Stumps	Low	BOD	Stockpile outdoors	Material Stockpile Area	20 tons
Guardrails	Low	Metals	Stockpile outdoors	Material Stockpile Area	Minimal
Scrap Metal/Wire	Medium	Lead, zinc, cadmium, chromium, copper	Stockpile outdoors. Waste hauler removes.	Waste metal dumpster	10-20 tons
Lumber (Treated)	Low	PCBs	Stockpile outdoors	Material Stockpile Area	Minimal
Concrete	Low	TPH, TSS, TDS, pH	Stockpile outdoors	Material Stockpile Area	Varies
Metal Pipes	Medium	Metals	Stockpile outdoors	Material Stockpile Area	Varies
Signal Heads	Low	N/A	Stockpile outdoors	Material Stockpile Area	Varies
Crash Attenuators	Low	Metals	Stockpile outdoors	Material Stockpile Area	5 units
Plastic Cones	Low	N/A	Stockpile outdoors	Material Stockpile Area	400 units
Freon (within applicances)	Low	CFC	Stockpile outdoors	Material Stockpile Area	20 gal
Brine	Low	TSS, TDS, pH	Stored in tank	Tank near salt barn	10,000, 6,000, 5,000, 5,000 gal
Sand	Medium	TSS	Stockpile outdoors, surrounded by jersey barriers	Road construction stockpile	50 tons
Salt	Low	TSS, TDS, pH	Covered salt barn	Salt barn	2,000 tons
Solar Salt	Low	TSS, TDS, pH	Covered	Salt barn	20 tons
#57 Stone	Low	TSS, TDS, pH	Stockpile outdoors	Material Stockpile Area	200 tons
Rip Rap	Low	TSS, TDS, pH	Stockpile outdoors	Material Stockpile Area	1,500 tons
Stone Rice	Low	TSS, TDS, pH	Stockpile outdoors	Material Stockpile Area	250 tons
Cold Patch	Low	TPH, TSS	Stockpile outdoors, surrounded by jersey barriers	Material Stockpile Area	10 tons

1 Data obtained from MSDSs when available

TPH–Total Petroleum Hydrocarbons; TDS–Total Dissolved Solids; TSS–Total Suspended Solids
PCBs–Polychlorinated Biphenols; BOD – Biological Oxygen Demand; N/A – Not Applicable

Best Management Practices and Implementation Schedule

Practice/Program	Schedule / Frequency	Implementation Date
Good Housekeeping:		
Trash will be stored in covered receptacles	Ongoing	Currently Implemented
Minimize waste staged on-site by disposing of materials (roadside trash and household waste) at licensed off-site facilites, at a minimum, by the end of each calendar year	As needed	Currently Implemented
Facility is secured by fencing with cameras, lighting and security systems, and only accessible by key card after hours	Ongoing	Currently Implemented
Maintain clean work areas using basic clean-up procedures (sweeping, shoveling, and/or vaccuming)	Ongoing	Currently Implemented
Pave primary parking areas	As needed	Currently Implemented
Storage areas will be orderly and well maintained	Ongoing	Currently Implemented
Chemical containers, drums, and AST's will have clear labels, that identify stored contents and be checked for leaks or deterioration	Ongoing	Currently Implemented
Promptly transfer used fluids to the proper waste or recycling drum	As needed	Currently Implemented
Use non-toxic or low toxicity materials	Ongoing	Currently Implemented
Use sorbent pads on top of 55-gallons drums that are actively in use	Ongoing	Currently Implemented
Preventive Maintenance:		
Place drip pans under leaking vehicles and equipment; empty drip pans regularly	Ongoing	Currently Implemented
Perform routine equipment maintenance	Ongoing	Currently Implemented
Evaluate efficiency of equipment	Ongoing	Currently Implemented
Conduct quarterly dry and wet weathering monitoring	Quarterly	Currently Implemented
Conduct semi-annual comprehensive inspections	Semi-annually	Currently Implemented
Spill Prevention and Response:		
Reference the Spill Prevention Control and Countermeasure Plan (SPCC)	As needed	Currently Implemented
An outside contractor removes waste oil from the site utilizing a spill-free extraction system	As needed	Currently Implemented
Use outside contractor, such as Safety Kleen, to provide parts washers, etc.	As needed	Currently Implemented
Keep spill kits in areas designated in the SPCC	Ongoing	Currently Implemented
Follow SPCC guidance for all spills. For spill greater than 10 gallons, follow emergency procedures as outlined in SPCC	As needed	Currently Implemented
Minimizing Exposure:		
Sweeper waste is stockpiled separartely and tested prior to disposal at the landfall	Annually	Currently Implemented
Vehicle maintenance is performed indoors	Ongoing	Currently Implemented
Vehicles/equipment stored indoors when space allows	Ongoing	Currently Implemented
Vehicle washing is performed in designated wash areas or areas with equivalent treatment trains	Ongoing	Currently Implemented
Paving and maintenance bays inspected for cracks	Bi-Annually	Currently Implemented
Roofs are checked for cracks	Bi-Annually	Currently Implemented

Practice/Program	Schedule / Frequency	Implementation Date
Sediment and Erosion Control:		
Grassed areas and swales monitored for adequate vegetation coverage	Quarterly	Currently Implemented
Inspect stromwater system for signs of erosion or evidence of contaminants draining from the yard	Quarterly	Currently Implemented
Catch basin inserts installed in the drainage inlets receiving high industrial flow	As needed	Currently Implemented
Best Management Practices:		
Only environmentally safe, phosphate-free biodegradable detergent (or no detergent) is used to wash vehicles and equipment	Ongoing	Currently Implemented
A statewide maintenance system is used to issue work orders for tasks specified in the SWPPP	Ongoing	Currently Implemented
Additional Requirements for Salt:		
Salt stockpile stored in covered structure	Ongoing	Currently Implemented
Inspect salt barn for leaks	Quarterly	Currently Implemented
Perform salt loading/unloading in paved areas only	Ongoing	Currently Implemented
Clean up (sweep and shovel) salt loading and unloading areas after each snow event and/or each salt loading/unloading operation	As needed	Currently Implemented
Direct runoff from salt loading and unloading area through gravel or stone filter berms, vegetated filter strips, or grassed swales to the existing stormwater retention pond, where possible	Ongoing	Currently Implemented
Management of Runoff:		
Stormwater runoff directed through gravel or stone filter berms, vegetated filter strips, or grassed swales to the existing stormwater retention pond, where possible	Ongoing	Currently Implemented
Use engineering controls (grading, curbing, berming) around paved areas to prevent problems from runon of potentially contaminated stormwater from adjacent areas	Ongoing	Currently Implemented
Off-site Vehicle Tracking:		
Trucks routinely cleaned and sediment not tracked off-site	As needed	Currently implemented
Employee Training:		
Employees will be trained to clean up spills immediately and appropriately dispose of materials	Annually	Currently Implemented
Employees will be trained in basic clean-up procedures (sweeping and shoveling procedures)	Annually	Currently Implemented
Employees will be trained on proper material handling and storage procedures	Annually	Currently Implemented
“Winter Workshop”	2 days/year	Currently Implemented
Informal sessions on Stormwater Contamination and Spill Prevention, Facility and Vehicle Maintenance, Vegetative Control and Pollution Prevention on Public Roads, Regulatory Requirements, Roadside Events, Spill Response and Emergency Procedures	Annually	Currently Implemented
Informal bulletins, Miscellaneous webinars, and other trainings when available to remind staff of good housekeeping procedures	As needed	Currently Implemented

STORMWATER POLLUTION PREVENTION PLAN

DOVER MAINTENANCE YARD –
CENTRAL DISTRICT HEADQUARTERS AND
AREA 30- BEAUTIFICATION

Dover, Delaware

SEPTEMBER 2022

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
DOVER, DELAWARE

Dover Maintenance Yard

CERTIFICATION OF STORMWATER PLAN

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted.

Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for willful violations.

NON-STORMWATER DISCHARGES CERTIFICATION

I certify that no non-stormwater discharges to the stormwater system exist at the Dover Maintenance Yard.

Name:	Matt Lichtenstein
Title:	Central District Engineer
Date:	9/11/19
Signature:	

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1. INTRODUCTION

In 1972 Congress passed the Federal Water Pollution Control Act (FWPCA), also known as the Clean Water Act (CWA), to restore and maintain the quality of the nation's waterways. The ultimate goal was to ensure that rivers and streams were fishable, swimmable, and drinkable. In 1987 the Water Quality Act (WQA) added provisions to the CWA that allowed the EPA to govern stormwater discharges from industrial activities. EPA published the final notice for Phase I of the Multi-Sector General Stormwater Permit Program (Federal Register Volume 60 No. 189, September 20, 1995, page 50804) in 1995, which included provisions for the development of a Stormwater Pollution Prevention Plan (SWPPP) by each industrial facility discharging stormwater, including transportation facilities.

Development, implementation, and maintenance of the SWPPP provides the Dover Maintenance Yard (Central District Headquarters and Area 30 Beautification) with the tools to reduce pollutants contained in stormwater discharges and comply with the requirements of Delaware's "Regulations Governing Stormwater Discharges Associated with Industrial Activity."

The primary goal of the SWPPP is to:

- Identify potential sources of pollutants that affect stormwater discharges from the site.
- Describe the practices that will be implemented to prevent or control the release of pollutants in stormwater discharges.
- Create an implementation schedule to ensure that the practices described in the SWPPP are implemented to evaluate the plan's effectiveness in reducing the pollutant levels in stormwater.

The SWPPP includes the following information:

- Identification of SWPPP team personnel
- Description of the facility including the facility's location and activities, as well as a site map, and summary of the stormwater drainage system
- Potential sources of stormwater contamination
- Inventory of spills and leaks
- Description of stormwater management controls and various best management practices (BMPs) necessary to reduce pollutants in discharge
- Description of the facility monitoring and inspection programs

2. FACILITY DESCRIPTION AND CONTACT INFORMATION

Facility Information	
Facility Owner, Address, & Telephone:	Delaware Department of Transportation 930 Public Safety Blvd. Dover, Delaware 19901 302-760-2432
Latitude/Longitude:	Latitude 38°09'04" Longitude 75°30'39”
SIC:	1611 (Highway/Street Construction, Except Elevated Highways) 41-73 (Terminal/Service Facilities for Motor Vehicle Passengers)
Acreage:	8.67
Receiving Water:	St. Jones River
Location of SWPPP:	Facility Office

2.1 FACILITY EMERGENCY CONTACTS

Site Emergency Contacts:

District Engineer: Matt Lichtenstein; (302) 760-2412 ***(Authorized Personnel)***

Primary: Frank Kerpen (Automotive Supervisor II); (302) 760-2422 (o)

Secondary: David Leager (Equipment Superintendent); (302)760-2414 (o); (302) 632-2514 (c)

After Hours: Transportation Management Center; (302)-659-4600

NPDES Contacts (*for regular correspondence*):

NPDES Program Manager: Sara Esposito; (302) 760-2346 (o)
NPDES Environmental Scientist: Kerin Hume; (302) 760-2195 (o)

2.2 FACILITY DESCRIPTION

The total area of the site is approximately 8.67 acres. Approximately 61 percent of the site is impervious (i.e., pavement, buildings). The remainder of the site consists of approximately 39 percent of undeveloped grass and wooded areas. **Appendix A** contains a site map detailing the facility's features, layouts, and drainage plan.

The site is located in Dover within Kent County. The site bounded to the north by an automotive dealership and wooded areas, to the east by a shopping center, and to the west by a residential development and the Kent County Emergency Services property.

2.3 SITE ACTIVITIES

The Dover Maintenance Yard typically operates from 7:00 am to 3:00 pm, five days per week, and maintains a staff of approximately 25 people. Operations are extended during major storm events. The primary operations at the Dover Maintenance Yard consist of the following:

Stockpiling of Materials for Landscaping - Miscellaneous materials used in roadside control and development are stored within the Roadside Control and Development Building.

Vehicle Maintenance and Storage - Trucks and miscellaneous construction equipment (trackhoes, backhoes, etc.) used in the maintenance of existing roadways for the Central District of DelDOT are maintained and repaired at the site. Routine vehicle maintenance includes replacement of motor oil, coolants, other engine/vehicle fluids, and batteries.

3. POLLUTION PREVENTION TEAM

DelDOT is a multi-sector organization, and as such, many people are responsible for the yard and the NPDES compliance. The ultimate responsible party is the Central District Engineer who is overseen by the Director of Maintenance and Operations. The District Engineer has responsibility of the yards' budget, daily operations, personnel and compliance. The team outlined below has job responsibilities that ensure the Pollution Prevention Plan is followed.

NPDES Contact:	Sara Esposito	**Title**: **Office Phone:**	NPDES Program Manager (302) 760-2346
NPDES Contact:	Kerin Hume	**Title**: **Office Phone:**	NPDES Program Scientist (302) 760-2195
Owner:	Matt Lichtenstein	**Title**: **Office Phone:**	Central District Engineer (302) 760-2412
Owner's Representative:	Timothy Stynchula	**Title**: **Office Phone:**	Central District Maint Engineer (302) 760-2418

Responsibilities:

- Implement the SWPPP plan;
- Oversee maintenance practices identified as BMPs in the SWPPP;
- Prepare and submit reports;
- Ensure that any changes in facility operation are addressed in the SWPPP; and
- Ensure quarterly monitoring program is implemented.

Site Contact:	Frank Kerpen	**Title**: **Office Phone:**	Automotive Supervisor II (302) 760-2422
Site Contact:	David Leager	**Title**: **Office Phone:**	Equipment Superintendent (302) 760-2414

Responsibilities:

- Create a SWPPP team to aid in the implementation of the SWPPP;
- Implement and oversee employee training;
- Act as spill response coordinator;
- Identify other potential pollutant sources and make sure they are added to the plan;
- Identify any deficiencies in the SWPPP and make sure they are corrected; and
- Conduct or provide for quarterly inspection or monitoring activities.

4. IDENTIFICATION OF POTENTIAL STORMWATER CONTAMINANTS

This section identifies the following:

- The existing stormwater drainage system.
- Significant materials located at the facility that may potentially contaminate stormwater.
- Records of past spills and leaks.
- Potential areas for stormwater contamination.
- Available stormwater sampling data.

4.1 EXISTING STORMWATER DRAINAGE SYSTEM

The site can be divided into two major and two minor drainage areas. **Table 1** describes the significant characteristics of each drainage area. **Appendix A** shows the locations of the drainage areas and the apparent stormwater drainage patterns. Drainage areas are not based on a topographic survey.

Drainage Area 1
Sheet flow from part of the roofs of the office and maintenance shop enters a landscaped depression. Samples are collected at the end of a small swale with limited flow potential before it conveys runoff to a series of catch basins along the roadway. All of the floor drains in the maintenance shop flow to an oil/grit separator before discharging to sanitary sewer.

Residual Drainage Area 1
Sheet flow from part of the roofs of the office and maintenance shop discharges into a wooded area.

Drainage Area 2
Runoff from Roadside Control & Development building, equipment storage, part of the maintenance shop, and back parking area sheet flows offsite. Samples are collected at DOV02.

Residual Drainage Area 2
Runoff from part of the maintenance shop, parking area, and one small drain located under cover flow into an offsite swale.

Table 1 - Characteristics of Stormwater Drainage Areas

Drainage Area[1]	Stormwater Flow Description	Total Size (acres)	Impervious Area (acres/% of area)	Runoff coefficient[2]	Drainage Discharge Point
DA 1	Sheet flow from part of the roofs of the office and maintenance shop enters a landscaped depression. Samples are collected at the end of a small swale with limited flow potential before it conveys runoff to a series of catch basins along the roadway. All of the floor drains in the maintenance shop flow to an oil/grit separator before discharging to sanitary sewer.	3.86	1.83 (47%)	Medium	Landscaped Depression/ Swale DOV01/ Offsite
DA 2	Runoff from Roadside Control & Development, equipment storage, part of maintenance shop, and back parking area sheet flows offsite. Samples are collected at DOV02.	2.16	1.90 (88%)	High	DOV02/ Offsite
Residual DA 1	Sheet flow from part of office discharges into a wooded area.	1.60	0.49 (31%)	Low	Woods
Residual DA 2	Runoff from part of parking area, roof of maintenance shop, and one small drain located under cover flow into a swale offsite.	1.05	1.03 (98%)	High	Offsite

[1] See Appendix A for drainage areas

[2] Runoff coefficient:

High: 70-100% impervious (example: asphalt, buildings, paved surfaces)
Medium: 40-70% impervious (example: packed soils)
Low: 0-40% impervious (example: grassy area)

4.2 MATERIAL INVENTORY

Materials used or stored at the facility are listed in **Appendix B**. It describes which materials may potentially be exposed to precipitation or runoff and typical annual quantities of such materials. Those used or stored at the facility that have a high potential to be present in stormwater runoff are considered significant materials, and are labeled with either a high or medium discharge potential based on their containment. Materials present at the facility that are stored inside structures are not likely to be impacted by stormwater runoff and are labeled with a low discharge potential. Other low potential materials include non-liquid materials, such as treated lumber.

4.3 HISTORIC SPILL AND LEAK RECORD

Records of spills and leaks can be found in **Appendix F.4** Spill Documentation Form. In the event of a spill or leak, the procedures in the facility's Spill Prevention Control and Countermeasures (SPCC) Plan should be followed.

4.4 POTENTIAL AREAS FOR STORMWATER CONTAMINATION

Potential contaminants include total petroleum hydrocarbons (TPH), oil and grease, heavy metals, surfactants, total dissolved solids (TDS), and total suspended solids (TSS). The following potential source areas of stormwater contamination were identified and evaluated:

Vehicle and Equipment Storage Sheds and Maintenance Shop:
Trucks and equipment awaiting maintenance, or simply not in use, are generally stored in the equipment sheds when space allows. Maintenance to trucks and equipment is performed in the maintenance shops. If stormwater enters these areas it can be contaminated by fluids leaking onto the paved surface from the trucks or equipment. These contaminants may contain TPH, oil and grease, heavy metals, surfactants, TDS, and TSS.

Vehicle Wash Area:

Trucks and other vehicles are rinsed in an area with an appropriate drainage treatment train. Stormwater from this area can be potentially contaminated by fluids leaking on the paved surface from trucks and truck cleaning operations. These contaminants may include oil and grease, heavy metals, TPH, surfactants, TDS, and TSS.

Aboveground Storage Tanks (ASTs):
Aboveground storage tanks are located at this facility for fueling, vehicle maintenance, and emergency generator power. Stormwater from the areas with ASTs can be potentially

contaminated by spills, fluid leaking from cracks or holes, or from overfill during filling operations. The contaminants may include, but are not limited to, TPH, TSS, and heavy metals. The location of the tanks in addition to secondary containment measures and spill response procedures can be found in the facility's Spill Prevention Control and Countermeasures (SPCC) Plan, stored on site.

Table 2 presents site-specific information regarding stormwater pollution potential from each of these areas.

Table 2 - Stormwater Pollution Potential at Dover Maintenance Yard

Drainage Area[1]	Potential Stormwater Contamination Point	Potential Pollutant[2]	Potential Problem
DA 2, RA2	Vehicle and Equipment Storage Area	Oil and grease, TPH	Leaking fluids from equipment can impact stormwater
DA 1,2 RA 1,2	Maintenance Area	Oil and grease, lead, cadmium, nickel, copper, zinc, TPH, total surfactants, pH, TDS, TSS	Leaking fluids from trucks and equipment can impact stormwater
DA 1,2	Vehicle Wash Area	Oil and grease, lead, cadmium, nickel, copper, zinc, TPH, salt, total surfactants, pH, TDS, TSS	Leaking fluids from tucks and wastewater from cleaning operations can impact stormwater
DA 1, 2 RA 1, 2	Parking Lot	Oil and grease, lead, cadmium, nickel, copper, zinc, TPH	Leaking fluids from employee vehicles can impact stormwater
DA 1,2	Roadways	Oil and grease, lead, cadmium, nickel, copper, zinc, TPH	Leaking fluids from vehicles can impact stormwater
DA 1,2 RA 2	AST Storage Area	TPH, TSS, lead, zinc, cadmium, chromium, copper, nickel	Spills, leaking fluids from cracks or holes in ASTs, and overflow during fueling or delivery operations can impact stormwater

1 See Appendix A for drainage areas
2 BOD – Biological Oxygen Demand
PCB – Polychlorinated Biphenyl
TPH – Total Petroleum Hydrocarbons
TDS – Total Dissolved Solids
TSS – Total Suspended Solids

4.5 SUMMARY OF AVAILABLE STORMWATER SAMPLING DATA

As of June 27, 2013, DNREC has required wet weather sampling at each of the DelDOT facility outfalls that discharge runoff from areas with industrial activities. Prior to this date, DelDOT's General Permit Pollution Prevention Plans required wet weather stormwater monitoring from the pond outfalls at only four facilities. These facilities were chosen, with DNREC's approval, as representative of the 16 facilities located throughout the state. The four yards were: Kiamensi, Bear, Cheswold, and Harrington. Thus, prior to July 2013, data are available only for those sites.

A summary of available stormwater sampling data at Dover Yard can be found in **Appendix C**. All of the original field and laboratory data sheets, as well as documentation of follow-up actions taken when benchmark values are exceeded, are kept in the offices of the DelDOT NPDES Section, 800 Bay Road, Dover DE 19901.

5. STORMWATER BEST MANAGEMENT PRACTICES

This section discusses the stormwater management controls required by the permit and describes the management practices selected to address the areas of concern identified in Section 4 of this SWPPP.

Best management practices (BMPs) are measures used to prevent or mitigate pollution from any type of activity. Baseline BMPs include processes, procedures, schedules of activities, prohibitions on practices, and other management practices to prevent or reduce water pollution. They keep stormwater from impacting the materials stored on the site and activities that occur at the facility, by keeping the areas clean and well maintained, and properly training employees. These BMPs are listed in **Appendix D**.

5.1 SPILL PREVENTION AND RESPONSE

The SWPPP is designed to minimize the potential for spills and leaks and prevent spilled materials from discharging pollutants from the facility to the MS4. Employees on the Stormwater Management Team receive annual training on spill prevention and good housekeeping procedures. Reference the Spill Prevention, Control, and Countermeasure (SPCC) Plan for more information on spill prevention and response.

All significant spills will be recorded on the Spill Log (**Appendix F**) and kept with the SWPPP.

6. VEHICLE AND EQUIPMENT WASH PLAN

Untreated vehicle washwater has the potential to carry harmful pollutants through the storm sewer system or overland, and ultimately into the aquatic ecosystem or drinking water supplies. Washwater may contain oil and grease, suspended solids, heavy metals, and surfactants (detergents). These pollutants can be toxic to aquatic organisms, including fish, and the ingestion of affected fish by people can also be harmful. The EPA encourages the use of phosphate-free, biodegradable surfactants, and discourages the use of cleaning agents containing solvents and emulsifiers. This practice reduces the amount of contaminants that enter storm drains. To capture sediment from washing activities, DelDOT uses sediment traps, catch basin inserts, or aboveground sediment screens.

6.1 VEHICLE AND EQUIPMENT WASH STANDARD OPERATING PROCEDURES

The vehicle wash plan uses phosphate free, biodegradable detergents, or commonly just water. There is a wash bay on site for vehicle and equipment washing. Wash bay drainage drains through floor drains and into an oil/grit separator prior to entering sanitary sewer.

Wash in Designated Areas – Wash in the designated wash bay. As the first step in the treatment train process, this isolates and concentrates the sediment and debris in one location for easier clean-up and identification.

Use Environmentally Safe, Biodegradable Detergent – Most vehicle washing uses only water. Environmentally safe, biodegradable detergent is used to wash trucks and equipment on an as needed basis.

Clean the Wash Area – If an accumulation of sediment is present at the end of a wash event, the pad is cleaned and the material is properly disposed.

Clean the Sediment Trap & Sediment Screen – After washing when capacity in the sediment trap, sediment screen, or catch basin insert exceeds half full, the device is excavated and the waste is disposed in the sweeper waste pile.

Sweeping Frequency – Routine mechanical sweeping is performed at the facility. Visual observation determines appropriate frequency.

6.2 WATER QUALITY MONITORING

Reference Section 7 for facility monitoring information. Surfactants, oil and grease, total suspended solids, and pH are the parameters tested in the bi-annual wet weather sampling.

7. FACILITY MONITORING PLAN

This section discusses the facility monitoring plan required by the permit and describes the management practices selected to address the responsibilities identified in Section 3. Any deficiencies noted during inspections must be corrected within 14 days after the inspection.

7.1 QUARTERLY DRY WEATHER INSPECTIONS

Visual inspections of catch basins, drainage swales, BMPs, and other good housekeeping measures will be made quarterly by the responsible Pollution Prevention Team member (see Section 3) during dry weather conditions for evidence of non-stormwater discharges. The visual inspection may be completed by an employee under the Pollution Prevention Team member's direction. The dry weather inspections will verify the site is not discharging sanitary or processed water to catch basin inlets. Information recorded on the inspection sheet shall include: date of inspection, inspection results, catch basin or drainage swale location, and potential significant sources of non-stormwater, if discovered through testing. Blank dry-weather inspection forms can be found in **Appendix F** of this SWPPP.

7.2 QUARTERLY WET WEATHER INSPECTIONS

Visual inspections of all catch basins, drainage swales, and BMPs will be made quarterly by the responsible Pollution Prevention Team member (see Section 3) during rain events to look for evidence of stormwater contamination. The visual inspection may be completed by an employee under the Pollution Prevention Team member's direction. Inspections will be conducted within the first 30 minutes of discharge or soon thereafter, but not exceeding 60 minutes. The visual inspection shall include any observations of color, odor, turbidity, floating solids, foam, oil sheen, or other obvious indicators of stormwater pollution. Information recorded on the inspection sheet shall include: date of inspection, inspection results, catch basin or drainage swale location, and potential significant sources of stormwater contaminants, if discovered. Blank wet-weather inspection forms can be found in **Appendix F** of this SWPPP.

7.3 BI-ANNUAL COMPREHENSIVE SITE EVALUATIONS

Bi-annual comprehensive site evaluations will be performed at the yard by DelDOT NPDES staff. These evaluations may take the place of the dry weather inspections for the quarter in which they are performed. Blank annual compliance inspection forms can be found in **Appendix F** of this SWPPP. The inspection will include:

- Evaluating the implemented BMP conditions and effectiveness
- Reviewing the good housekeeping and spill prevention materials
- Evaluating areas identified in the Inventory of Industrial Materials
- Inspecting the stormwater outfalls and areas immediately downstream
- Checking that all required records have been recorded
- Determining if site operations have changed since development of this SWPPP. If there are changes will impact stormwater quality, the Pollution Prevention Team will develop new BMPs to address the change(s). All operational changes and new BMPs will be recorded in this SWPPP.
- Recording the following: inspection date, inspection personnel, scope of the inspection, major observations, and any needed revisions. Revisions to the plan should occur within 14 days after the annual inspection.

7.4 SEMI-ANNUAL ANALYTICAL MONITORING

Monitoring at Dover Yard is conducted twice per year. Sampling Techniques are performed in accordance with the Environmental Protection Agency (EPA) *Stormwater Sampling Guidance Document*, EPA 833-B-92-001 (July 1992). Semi-annual grab samples must be collected once in each of the following six-month periods: January through June, and July through December. A summary of available stormwater sampling data at Dover Yard can be found in **Appendix C**.

The wet weather monitoring protocol includes 72 hours of antecedently dry conditions, minimum predicted rainfall depth of 0.10 inches, and two full days of standard maintenance yard operations since the last rainfall event. A first flush grab sample is collected within 30 minutes from the first noticeable flow, and delivered to the laboratory for analysis of total suspended solids, surfactants, chloride, pH, and oil & grease. Measurements of air temperature, water temperature, pH and turbidity are recorded on-site at the time of sample collection. Flow at the outfall is not measured at the time of sampling. At each outfall, the total stormwater volume is calculated based on the precipitation received and the amount of pervious and impervious area within the drainage area. For discharges from holding ponds or other impoundments with a 24- hour or greater retention capacity, grab samples of the discharge may be taken at any time for pollution analysis.

Benchmark monitoring concentrations for each parameter are shown below.

Parameter	Benchmark Value
Total Suspended Solids	100 mg/L
Surfactants	1.0 mg/L
Chlorides	No Benchmark
Oil and Grease	15 mg/L
pH	6-9 S.U.

8. COMPLIANCE AND REPORTING REQUIREMENTS

8.1 SWPPP SUMMARY

The SWPPP will be kept at the facility and will be made available to the state or federal compliance inspection officer upon request.

8.2 EMPLOYEE TRAINING

An employee training program was developed and implemented by the DelDOT NPDES Manager to educate maintenance yard staff about the requirements of the SWPPP. This education program includes background on the components and goals of the SWPPP and training in spill prevention and response, good housekeeping, proper material handling, disposal and control of waste, container filling and transfer, and proper storage, washing, and inspection procedures.

Maintenance yard staff will be required to participate in the training courses annually. An employee sign-in sheet for the course can be found in **Appendix E** of this document. New employees are informed about the SWPPP requirements during job orientation. The training program will be reviewed annually by the SWPPP coordinator to determine its effectiveness and to make any necessary changes to the program.

8.3 IMPLEMENTATION SCHEDULE

In accordance with State regulations, the SWPPP implementation schedule is shown in **Appendix D**. A simplified schedule is provided below to assist the facility with compliance (**Table 3**).

Table 3 - Implementation Schedule Overview

Activity	Schedule
Employee Training	Annually, all training completed by December 31st . New employee training within 1 week of start date
Semi-Annual Analytical Monitoring of Outfalls	Once during each of the following six-month periods: January through June and July through December
Quarterly Visual Monitoring during Dry Weather	By March 31st, June 30th, September 30th, and December 31st each year
Quarterly Visual Monitoring during Wet Weather	By March 31st, June 30th, September 30th, and December 31st each year
Comprehensive Site Compliance Evaluation	Twice per year between April-June and September-November
Implementation of BMPs	See Appendix D

8.4 RECORD RETENTION REQUIREMENTS

Records described in the SWPPP, including employee training records, must be retained on site for five years and shall be made available to the State or Federal Compliance Inspection Officer upon request.

8.5 PRINCIPAL EXECUTIVE OFFICER SIGNATURE

In accordance with the State of Delaware, this plan has been approved and signed by the DelDOT Central District Engineer, the authorized representative responsible for the operation of the facility.

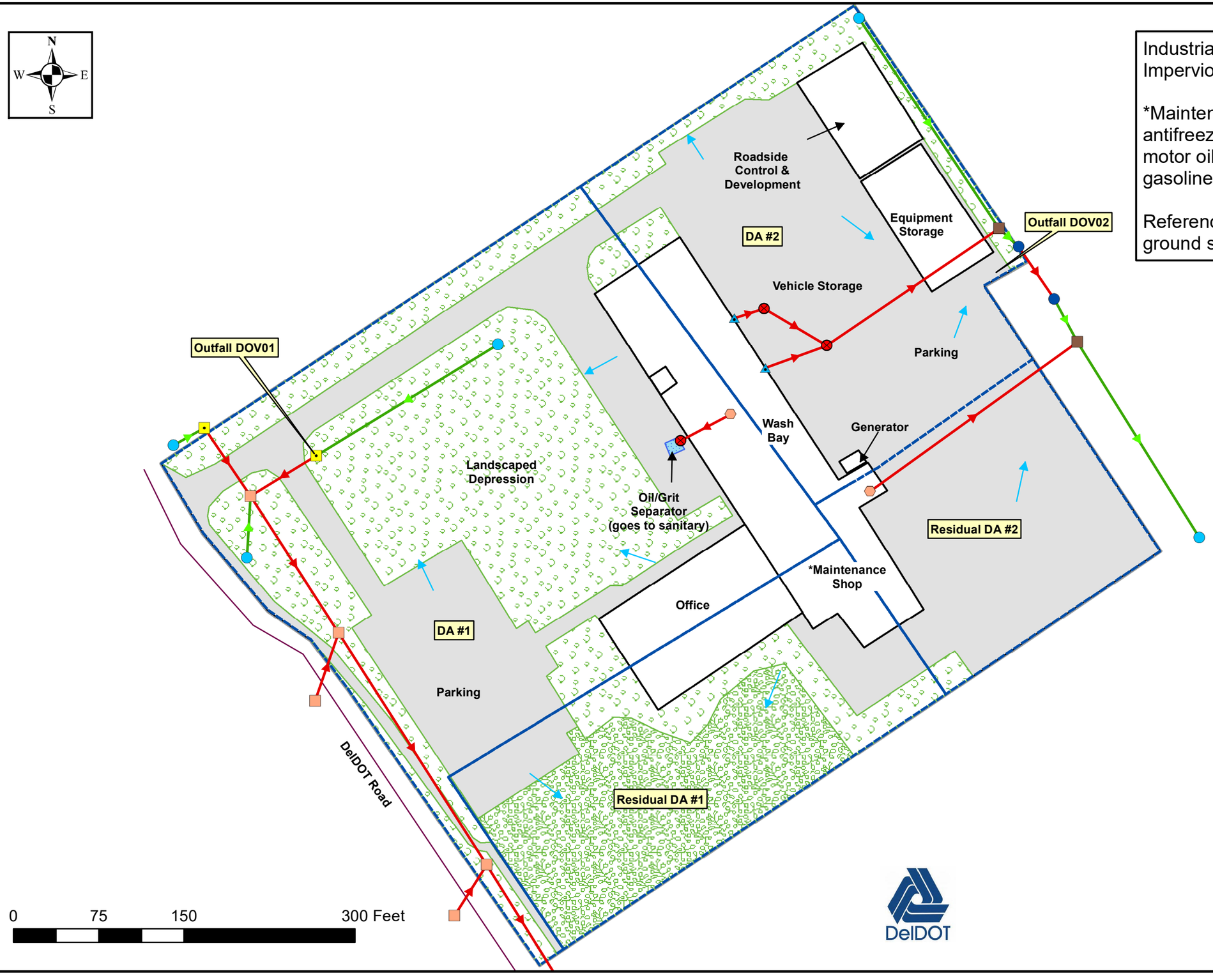
8.6 ASSESSMENT OF RUNOFF MANAGEMENT

In accordance with the Based on an assessment of potential sources of stormwater pollution, the control measures at this facility are suitable for the management of runoff. Stormwater controls will be monitored and if changes or additional measures are necessary then the SWPPP will be amended.

8.7 PROVISIONS FOR AMENDMENT OF THE PLAN

If the facility expands, experiences any significant production increases or process modifications, or changes any significant material handling or storage practices that could impact stormwater, the SWPPP will be amended appropriately. The amended SWPPP will have a description of the new activities that contribute to the increased pollutant loading and planned source control activities. The SWPPP will also be amended if the State or Federal Compliance Inspection Officer determines that it is ineffective in controlling stormwater pollutants discharged to waters.

Dover Maintenance Yard - SWPPP Map



Industrial Drainage Area: 8.67 acres
Impervious Area: 60.55% (5.25 acres)

*Maintenance Shop may store waste oil, antifreeze, lubricating oil, transmission fluid, motor oil, and other vehicle maintenance oils, gasoline, and fluids.

Reference SPCC plan for additional above ground storage tank information.

Legend

- Catch Basin without Insert
- Inlet
- Floor Drain
- Pipe End
- Manhole
- Culvert Point
- Swale Point
- Dummy Point
- Swale
- Pipe
- Flow Arrow
- Centerline
- Drainage Area (DA)
- BMP
- Building
- Grass
- Woods
- Pavement

Updated by KCI Technologies: 01/07/21

MATERIAL INVENTORY AT DOVER MAINTENANCE YARD

Material	Discharge Potential	Stormwater Pollutants	Method of Storage	Location of Storage/Disposal	Quantity
Diesel	Low	TPH	Stored outdoors in double walled AST	Generator outside of Maintenance Shop	775 gal
Motor Oil	Low	TPH, copper, lead, zinc	Stored indoors in double walled AST and in 55 gallon drums on spill pallets (in Area 30)	Maintenance Shop	275 / 500 gal & 55 gal durms
Hydraulic oil/fluids	Low	Oil & grease, TPH	Stored indoors in double walled AST and in 55 gallon drums on spill pallets (Area 30)	Maintenance Shop	500 gal & 55 gal durms
Antifreeze/ coolant	Low	TPH, copper, lead, zinc	Stored indoors in double walled AST and in 55 gallon drums on spill pallets (in Area 30)	Maintenance Shop. Waste hauler removes.	275 gal & 55gal durms
Gear Oil	Low	TPH, oil & grease	Stored indoors in double walled AST	Maintenance Shop	275 gal
Transmission Fluid	Low	TPH, copper, lead, zinc, oil & grease	Stored indoors in double walled AST	Maintenance Shop	275 gal
Lubricants	Low	Oil & grease, lead, cadmium, nickel	Stored indoors in 55 gal drums. Open drums stored on spill	Maintenance Shop	Multiple 55 gal drums
Used Oil	Low	TPH, copper, lead, zinc, oil & grease	Stored outdoors in double walled AST	Outside of Maintenance Shop. Waste hauler removes.	500 gal
Waste Antifreeze	Medium	TPH, copper, lead, zinc	Stored indoors in 55 gal drums. Open drums stored on spill pallets	Outside of Maintenance Shop. Waste hauler removes.	55 gal drum
Brake Cleaner	Low	Oil & grease, chromium, copper, nickel	Stored indoors in 55 gal drums. Open drums stored on spill	Maintenance Shop	55 gal
Vehicle Wash	Low	Total surfactants, pH	Stored indoors in 55 gal drums. Open drums stored on spill	Vehicle wash area	55 gal
Tires	Low	Lead, zinc, cadmium	Covered stockpile	Maintenance Shop	50 tires
Batteries	Low	Lead, zinc, cadmium, chromium, copper, nickel	Stored indoors	Maintenance Shop	25
Scrap Metal/Wire	Medium	Lead, zinc, cadmium, chromium, copper	Stockpile outdoors. Waste hauler removes.	Waste metal dumpster	10 tons
Plastic Cones	Low	N/A	Stockpile outdoors	Road construction stockpile	100 units

1 Data obtained from MSDSs when available

TPH–Total Petroleum Hydrocarbons; TDS–Total Dissolved Solids; TSS–Total Suspended Solids
PCBs–Polychlorinated Biphenols; BOD – Biological Oxygen Demand; N/A – Not Applicable

Best Management Practices and Implementation Schedule

Practice/Program	Schedule / Frequency	Implementation Date
Good Housekeeping:		
Trash will be stored in covered receptacles	Ongoing	Currently Implemented
Minimize waste staged on-site by disposing of materials (roadside trash and household waste) at licensed off-site facilites, at a minimum, by the end of each calendar year	As needed	Currently Implemented
Facility is secured by fencing with cameras, lighting and security systems, and only accessible by key card after hours	Ongoing	Currently Implemented
Maintain clean work areas using basic clean-up procedures (sweeping, shoveling, and/or vaccuming)	Ongoing	Currently Implemented
Pave primary parking areas	As needed	Currently Implemented
Storage areas will be orderly and well maintained	Ongoing	Currently Implemented
Chemical containers, drums, and AST's will have clear labels, that identify stored contents and be checked for leaks or deterioration	Ongoing	Currently Implemented
Promptly transfer used fluids to the proper waste or recycling drum	As needed	Currently Implemented
Use non-toxic or low toxicity materials	Ongoing	Currently Implemented
Use sorbent pads on top of 55-gallons drums that are actively in use	Ongoing	Currently Implemented
Preventive Maintenance:		
Place drip pans under leaking vehicles and equipment; empty drip pans regularly	Ongoing	Currently Implemented
Perform routine equipment maintenance	Ongoing	Currently Implemented
Evaluate efficiency of equipment	Ongoing	Currently Implemented
Conduct quarterly dry and wet weathering monitoring	Quarterly	Currently Implemented
Conduct semi-annual comprehensive inspections	Semi-annually	Currently Implemented
Spill Prevention and Response:		
Reference the Spill Prevention Control and Countermeasure Plan (SPCC)	As needed	Currently Implemented
An outside contractor removes waste oil from the site utilizing a spill-free extraction system	As needed	Currently Implemented
Use outside contractor, such as Safety Kleen, to provide parts washers, etc.	As needed	Currently Implemented
Keep spill kits in areas designated in the SPCC	Ongoing	Currently Implemented
Follow SPCC guidance for all spills. For spill greater than 10 gallons, follow emergency procedures as outlined in SPCC	As needed	Currently Implemented
Minimizing Exposure:		
Vehicle maintenance is performed indoors	Ongoing	Currently Implemented
Vehicles/equipment stored indoors when space allows	Ongoing	Currently Implemented
Vehicle washing is performed in designated wash areas or areas with equivalent treatment trains	Ongoing	Currently Implemented
Paving and maintenance bays inspected for cracks	Bi-Annually	Currently Implemented
Roofs are checked for cracks	Bi-Annually	Currently Implemented
Sediment and Erosion Control:		
Grassed areas and swales monitored for adequate vegetation coverage	Quarterly	Currently Implemented

Practice/Program	Schedule / Frequency	Implementation Date
Inspect stromwater system for signs of erosion or evidence of contaminants draining from the yard	Quarterly	Currently Implemented
Catch basin inserts installed in the drainage inlets receiving high industrial flow	As needed	Currently Implemented
Best Management Practices:		
The internal wash bay drains to an oil/grit separator before discharing to sanitary sewer	Ongoing	Currently Implemented
Only environmentally safe, phosphate-free biodegradable detergent (or no detergent) is used to wash vehicles and equipment	Ongoing	Currently Implemented
A statewide maintenance system is used to issue work orders for tasks specified in the SWPPP	Ongoing	Currently Implemented
Additional Requirements for Salt:		
No salt is stored at this facility.		
Management of Runoff:		
Stormwater runoff directed through large grassed swale, vegetated filter strips, or grassed swales to the existing stormwater retention pond, where possible	Ongoing	Currently Implemented
Use engineering controls (grading, curbing, berming) around paved areas to prevent problems from runon of potentially contaminated stormwater from adjacent areas	Ongoing	Currently Implemented
Off-site Vehicle Tracking:		
Trucks routinely cleaned and sediment not tracked off-site	As needed	Currently implemented
Employee Training:		
Employees will be trained to clean up spills immediately and appropriately dispose of materials	Annually	Currently Implemented
Employees will be trained in basic clean-up procedures (sweeping and shoveling procedures)	Annually	Currently Implemented
Employees will be trained on proper material handling and storage procedures	Annually	Currently Implemented
“Winter Workshop”	2 days/year	Currently Implemented
Informal sessions on Stormwater Contamination and Spill Prevention, Facility and Vehicle Maintenance, Vegetative Control and Pollution Prevention on Public Roads, Regulatory Requirements, Roadside Events, Spill Response and Emergency Procedures	Annually	Currently Implemented
Informal bulletins, Miscellaneous webinars, and other trainings when available to remind staff of good housekeeping procedures	As needed	Currently Implemented

APPENDIX E

E-2: MINOR MAINTENANCE INSPECTION FORM

DELDOT NON-PERMITTED FACILITY – STORMWATER INSPECTION REPORT

FACILITY:	
DISTRICT:	
INSPECTOR(S):	
INSPECTION DATE:	**TIME:**
WEATHER CONDITIONS:	
DATE LAST RAINFALL:	

For the purpose of this inspection report: N/A = Not Applicable S/C = See Comments

STORMWATER SEWER SYSTEM / BMPs	YES	NO	N/A	S/C
1. Catch basins, storm water conveyance clean?				
2. Visible evidence of oil sheen, discoloration, turbidity, odor, foam?				
3. Evidence of other signs of contamination?				
4. Evidence of pollution within a BMP (e.g. trash, oil, sediment)?				
5. Stormwater BMP(s) functioning as designed?				

COMMENTS:

VEHICLE / EQUIPMENT CLEANING, FUELING, STORAGE AREAS	YES	NO	N/A	S/C
1. Equipment washed and/or cleaned only in designated areas?				
2. Evidence of stormwater contamination?				
3. Fueling areas free of contaminant buildup?				
4. Evidence of chronic leaks/spills?				
5. Appropriate spill cleanup materials available?				
6. All drums / containers of fluids stored with proper cover and containment?				
7. All drums labeled?				
8. Evidence of leaks or spills?				

COMMENTS:

SALT MANAGEMENT	YES	NO	N/A	S/C
1. Salt storage structure in good condition?				
2. Salt loading area clean?				
3. All salt under cover?				
4. If tarped, is it secure and covering entire salt pile?				

COMMENTS:

DELDOT NON-PERMITTED FACILITY STORMWATER INSPECTION REPORT

FACILITY:_____

POTENTIAL SIGNIFICANT MATERIAL	YES	NO	N/A	S/C
1. Truck storage area clean?				
2. Truck loading area clean?				
3. Material stockpile area contained?				
4. Batteries under cover?				
5. Parking lot clean?				
COMMENTS:				

GOOD HOUSEKEEPING	YES	NO	N/A	S/C
1. Paved surfaces free of accumulated dust/sediment and debris?				
2. Any eroded areas or sediment/dust sources that discharge to storm drains?				
3. Waste receptacles in good condition and not leaking contaminants?				
4. Stockpiled materials stored to prevent contaminant discharge to MS4?				
5. Other areas of concern?				
COMMENTS:				

ADDITIONAL COMMENTS

SUMMARY OF ACTION ITEMS

FACILITY:_____

PHOTOS

<INSERT PHOTOS & CAPTIONS WITH DATES = XX-XX-XX>

Example:

"Mount Spill Kits on Walls 10-12-20"

APPENDIX E

E-3: STREET SWEEPING ALTERNATIVE COMPLIANCE REQUEST

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

SHANTÉ A. HASTINGS
SECRETARY

February 26, 2025

Gordon Woodrow
Program Manager I
Surface Water Discharges Section
Delaware Dept of Natural Resources and Environmental Control
89 Kings Highway
Dover, DE 19901

Dear Mr. Woodrow:

The Delaware Department of Transportation (DelDOT) requests Alternative Compliance per Part IV, Section C of the Phase II, Tier I MS4 General Permit for the Part II, Section D.6.c.1 Street Sweeping requirements. The permit states "*all curbed streets with storm drains owned or operated by the permittee shall be swept a minimum of four times annually, weather and surface conditions permitting, unless and until it is demonstrated that pollutant removal and improved water quality would be adequately achieved otherwise.*"

DelDOT is currently sweeping at a 4:2:1 frequency, where major roads are swept four times a year, collectors are swept two times a year and local roads, including subdivisions, are swept one time a year. For the new permit, DelDOT is prepared to comply to with the four times a year for all curbed streets[1], with a variance request that subdivision streets are only swept one time a year.

There are several factors that differentiate the 119 miles of curbed subdivision roads within the Phase II permitted area from typical state-numbered DelDOT roadways:

- Subdivisions have significantly reduced average daily traffic (ADT) compared to traditional roadways. Therefore, there is less grit and debris being generated due to the lower number of vehicles.

[1] Excluding isolated segments approximately 1,000 feet or less in length, which are primarily located at subdivision entrances. These entrance locations will be swept when DelDOT sweeps the associated subdivision streets, if they are DelDOT accepted subdivisions.

- Subdivisions have a higher percentage of having onsite stormwater management facilities compared to traditional state-numbered roadways, which provide additional treatment prior to discharge compared to direct outfalls.[2]
- Subdivision streets are approved by a local landuse authority, ie, in Phase II by the Kent County Levy Court. By state law, DelDOT is required to accept newly approved subdivision streets into our roadway inventory if they are built to DelDOT design standards. However, we have no control over the rate of subdivision streets being added. In the previous permit, we provided once a year sweeping without fully analyzing the impacts of it. If more than one time a year of street sweeping is required, we would look to cost share the street sweeping with Kent County Levy Court, as the entity responsible for approving the roadways. However, at this time, Kent County is not a regulated MS4.

For consistency between subdivisions, we are proposing as part of the variance request to street sweep both curbed and non-curbed subdivision streets once annually. While in lesser need due to vegetated swales, we feel that is important from a public education, and public perception standpoint, to treat all subdivisions equally and sweep them on a same frequency, and also since non-curbed subdivisions were swept in the previous 4:2:1 sweeping regime so residents are used to having their streets swept. As such, we are proposing to volunteer 50 miles of non-curbed subdivision roads to be swept once annually in addition to the curbed subdivision roads.

We apologize for not bringing this request to DNREC's attention earlier during the SWMP development process. Street sweeping is large and expensive endeavor at DelDOT, and it took us to the end of the development process to fully weigh the ramifications of the additional street sweeping in subdivision roads. At four times a year, we would be going from 119 curbed subdivision miles to 476 curbed subdivision miles. In a typical workday, approximately 15 subdivision miles can be swept, so we would be going from 8 days of subdivision sweeping to 32 days, or over 6 work weeks of sweeping just curbed subdivisions. Given our limited operating state budget and staffing challenges, and the fact that DelDOT did not create the subdivision roadways for the general traveling public, rather they were approved by a local land authority, we think any additional sweeping of the subdivision road warrants further discussions. However, we are committed to providing the same level of service as previously volunteered.

[2] From a GIS analysis performed by KCI: 70% of the roadways in Phase II communities were built after the 1992 Sediment and Stormwater Regulations, while only 12% of state numbered roadways within the Phase II area were built after 1992.

We hope this information is sufficient, however if you have any questions regarding the alternative compliance request, DelDOT is available to discuss the topic in further detail. Due to timing, DelDOT's forthcoming Phase II Stormwater Management Plan (SWMP) will include a street sweeping analysis with the subdivision streets denoted as stated in this request. Please do not hesitate to contact me at sara.esposito@delaware.gov or 302.760.2346 with questions. Thank you.

Sincerely,

Sara Esposito, PE
DelDOT NPDES Program Manager

SE:
cc: Brian Urbanek, DelDOT, M&O Asst Director, Statewide Support Services
Matt Lichtenstein, DelDOT, Central District Engineer
Duwayne Shaffer, DelDOT, Central District Maintenance Superintendent
Skip Sanders, DelDOT, NPDES Engineer
Alexis Capes, DNREC, Env Scientist
Gavin Ferris, DNREC, Env Scientist
Bruce Thompson, KCI, Water Quality Team Lead
Matt Ortynsky, KCI, Senior Project Manager

APPENDIX E

E-4: STREET SWEEPING MAP

Curbed Roadways Street Sweeping Plan - Initial
Kent County Phase II Area

Roadway Type	Kent County Phase II Area Centerline Miles	Kent County Phase II Area Sweeping Miles	Kent County Phase II Area Annual Sweeping Miles
Curbed Roadway Left Side Miles - 4x/yr	9.44	9.44	37.76
Curbed Roadway Right Side Miles - 4x/yr	14.25	14.25	57.00
Curbed Roadway Both Side Miles - 4x/yr	10.96	21.92	87.68
Curbed Roadway Subdivision Miles - 4x/yr	122.46	244.92	979.68
Total Miles	**157.11**	**290.53**	**1,162.12**

ROADWAY CATEGORIES

Curbed Roadways Left Side (4x/year)

- Curbed Roadways on left side of roadway only.

Curbed Roadways Right Side (4x/year)

- Curbed Roadways on right side of roadway only.

Curbed Roadways Both Sides (4x/year)

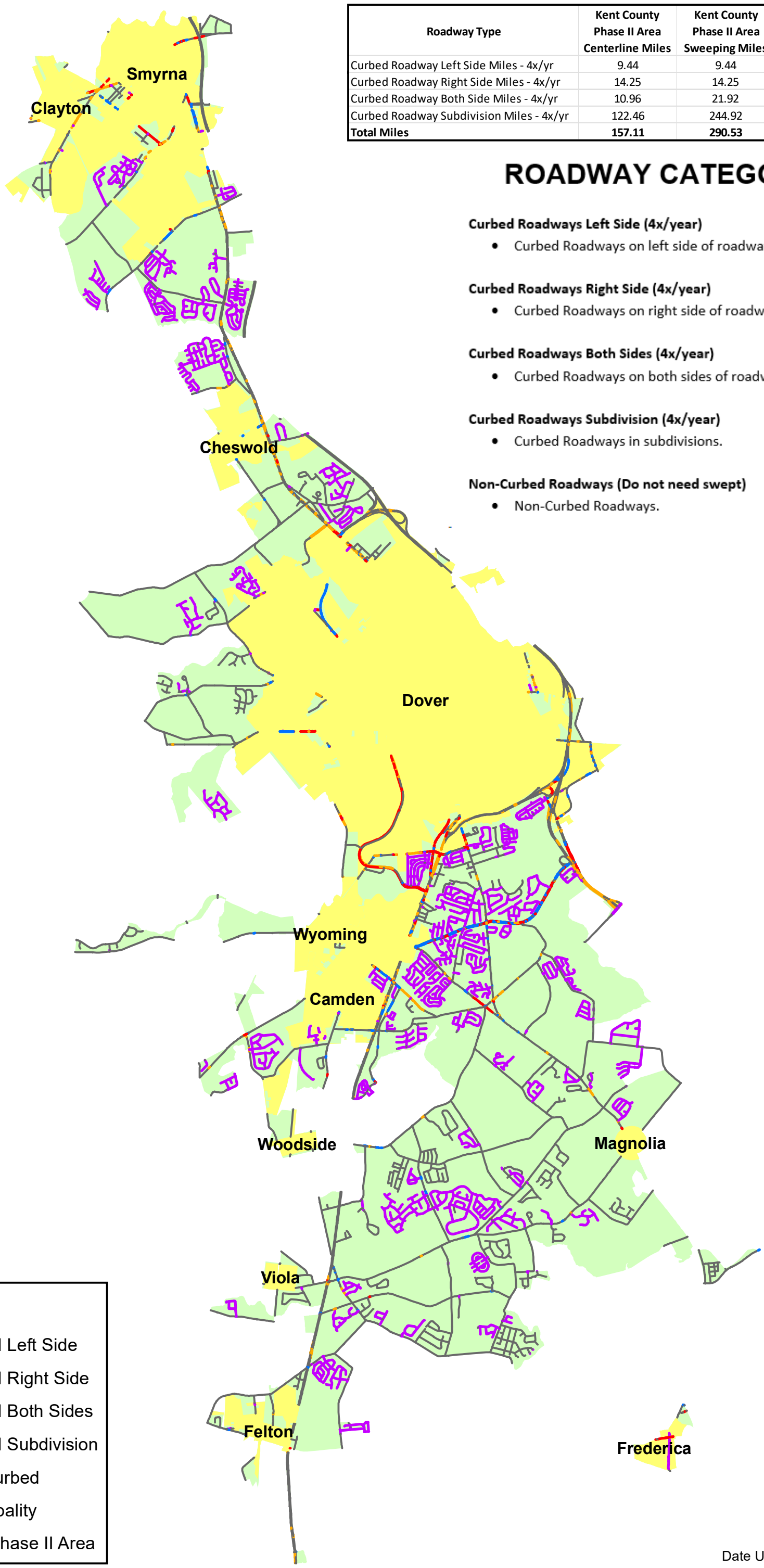
- Curbed Roadways on both sides of roadway.

Curbed Roadways Subdivision (4x/year)

- Curbed Roadways in subdivisions.

Non-Curbed Roadways (Do not need swept)

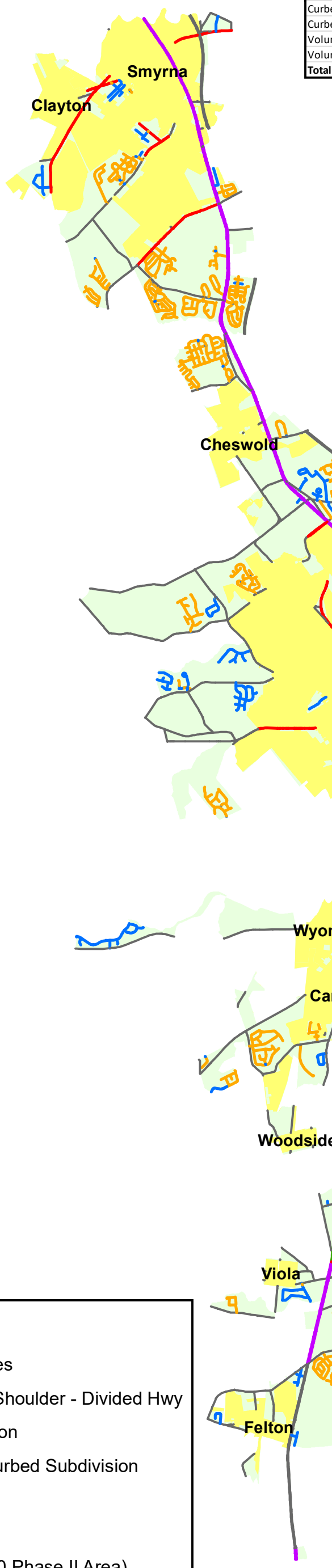
- Non-Curbed Roadways.



Date Updated: September 2024

Smoothed Curbed Roadways Street Sweeping Plan - Final
Kent County Phase II Area

Sweeping Summary			
Roadway Type	Kent County Phase II Area Centerline Miles	Kent County Phase II Area Sweeping Miles	Kent County Phase II Area Annual Sweeping Miles
Curbed Roadway Both Sides Miles - 4x/yr	54.89	109.78	439.12
Curbed Roadway Outside Shoulder Miles (Divided Hwy) - 4x/yr	32.28	32.28	129.12
Curbed Roadway Subdivision Miles - 1x/yr	119.29	238.58	238.58
Voluntary Non-Curbed Subdivision Roadway Miles - 1x/yr	49.69	99.38	99.38
Voluntary Roadway Sweeping Miles - 4x/yr	7.57	7.57	30.28
Total Miles	**263.72**	**487.59**	**936.48**



ROADWAY CATEGORIES

Curbed Roadways Both Sides (sweep 4x/year)

- Curbed Roadways on both sides of roadway.

Curbed Roadways Outside Shoulder – Divided Hwy (sweep 4x/year)

- Curbed Roadways along divided highways where only the outside shoulder on the right side of the road is swept.

Curbed Roadways Subdivision (sweep 1x/year)

- Curbed Roadways within a subdivision.

Voluntary Non-Curbed Roadways Subdivision (sweep 1x/year)

- Non-Curbed Roadways within a subdivision voluntarily added to be swept.

Voluntary Roadways (sweep 4x/year)

- Roadways not in the Phase II Area voluntarily added to be swept.

Low Priority Roadways (No sweep)

- Roadways with minimal to no curb.

Legend

- Curbed Both Sides
- Curbed Outside Shoulder - Divided Hwy
- Curbed Subdivision
- Voluntary Non-Curbed Subdivision
- Voluntary
- Low Priority
- Municipality (2010 Phase II Area)
- 2010 Phase II Area

Date Updated: February 2025

APPENDIX E

E-5: DSWA APPROVAL LETTER

DELAWARE SOLID WASTE AUTHORITY

Richard P. Watson P.E., BCEE
Chief Executive Officer

Robin M. Roddy P.E., BCEE
Chief Operating Officer

Board Of Directors

Gerard L. Esposito
Chairman

Timothy P. Sheldon
Vice Chairman

Tonda L. Parks
Norman D. Griffiths

A. Temple Carter III
William J. Riddle

Michael R. Paraskewich, Jr., Ph.D, P.E.

August 1, 2024

Sara Esposito, PE
DelDOT NPDES Program Manager
State of Delaware
Department of Transportation
800 Bay Road
P.O. Box 778
Dover, Delaware 19903

Re: Special Waste Approval: Street Sweepings (DE State Fair)
Special Waste Approval Number: CSW24.10

Dear Mr. Hume:

I have received your special waste application dated July 31, 2024, and analytical testing results dated July 31, 2024. Delaware Solid Waste Authority (DSWA) approves your request for disposal of approximately ten (10) tons of Street Sweepings from the Delaware State Fair. The material will be accepted at the Central Solid Waste Management Center (CSWMC) located in Sandtown, Delaware. The material must be delivered in segregated loads and not mixed with other waste. Wastes not accurately represented by the information submitted in the special waste application or as stipulated in the DSWA *Special Waste Policy* may be rejected.

The rate charged for the material will be at our current tipping rate at the time of disposal. **A copy of this approval letter must accompany each load of waste delivered to CSWMC. This approval expires September 30, 2025.**

If you have any questions, please feel free to contact me at 302-284-8851.

Sincerely,

Michael R. Lenkiewicz, P.E., BCEE
Facility Manager

MRL:blw

Cc: Jason M. Munyan, P.E., BCEE
Fred Oehler
Jason C. Nicholson
CSWMC\Special Waste\2410 Deldot

FOR DSWA USE ONLY	
WM INITIALS	
EXP DATE	
PERMIT #	

APPENDIX E

E-6: WORK ORDER PROTOCOL SOP

Statewide Stormwater BMP
&
Stormdrain Infrastructure Inventory and Inspection Maintenance Work Orders

March 27, 2023

Edited March 29, 2023

1. Clear Vegetation (ACCESS)

Issues related to vegetation around structures/conveyances

Priority 3

Vegetation impeding flow in and around structure.

2. Replace / Broken Grate (RPLGRT)

Issues related to grate/cover

Priority 3 = Broken grate/cover; grate missing bar (s) – R/W

Priority 5 = Broken grate/cover; grate missing bar (s) – Out of R/W

Broken:

Priority 2 = Missing grate/ severely damaged – R/W.

Priority 4 = Missing grate/ severely damaged – Out of R/W.

Missing / Severely Damaged:

→ Missing grates outside the R/W will trigger an immediate action workorder even though Priority 4 if a public safety concern.

3. Replace Frame (RPLFRME)

Issues related to frame

Priority 3 = Broken frame / severely damaged –R/W

Priority 5 = Broken frame / severely damaged – Out of R/W

Priority 5 = Moderately broken / damaged frame – R/W

4. Remove Accumulated Sediment/Debris throughout Structure (VACBAS)

Issues related to accumulated sediment/debris in structure

Priority 2 = ≥50% full; flow is severely restricted causing flooding.

Priority 3 = ≥50% full; flow is severely restricted not causing flooding.

Priority 5 = 25 to 50% full; flow is minimally restricted

5. Remove Accumulated Sediment from Pipe (CLGPIPE)

Issues related to accumulated sediment/debris in closed drainage pipe

Priority 2 = ≥50% full; flow is severely restricted causing flooding.

Priority 3 = ≥50% full; flow is severely restricted not causing flooding.

Priority 5 = 25 to 50% full; flow is minimally restricted.

* Note, the highest % of debris in a pipe will be recorded (previously the average)

6. Pipe Buried (BURPIPE)

Issues related to accumulated sediment/debris in open drainage pipe

Priority 2 = ≥50% full; flow is severely restricted causing flooding.

Priority 3 = ≥50% full; flow is severely restricted not causing flooding.

Priority 5 = 25 to 50% full; flow is minimally restricted.

7. Pipe Replace/Repair (PIPEREP)

Issues related to damaged pipe

Priority 2 = **<u>Severe</u>** pipe damage – R/W.

Priority 3 = **<u>Severe</u>** pipe damage – Out of R/W.

Priority 3 = Significant Pipe damage – R/W

Priority 4 = Pipe damage with sinkhole – Out of R/W*

<u>*Unless Severe, Not a Work Order if No Sinkhole is Present and Out of R/W.</u>

7. Pipe Replace/Repair (PIPEREP)- Con't

Issues related to damaged pipe

Priority 2 = **<u>Severe</u>** pipe damage – R/W.

Priority 3 = **<u>Severe</u>** pipe damage – Out of R/W.

Priority 3 = Significant Pipe damage – R/W

Priority 4 = Pipe damage with sinkhole – Out of R/W*

<u>* Unless Severe, Not a Work Order if No Sinkhole is Present and Out of R/W.</u>

7. Pipe Replace/Repair (PIPEREP)- Con't

Issues related to damaged pipe

Priority 2 = **<u>Severe</u>** pipe damage – R/W.

Priority 3 = **<u>Severe</u>** pipe damage – Out of R/W.

Priority 3 = Significant Pipe damage – R/W

Priority 4 = Pipe damage with sinkhole – Out of R/W*

<u>* Unless Severe, Not a Work Order if No Sinkhole is Present and Out of R/W.</u>

7. Pipe Replace/Repair (PIPEREP)- Con't

Issues related to damaged pipe

Priority 2 = **<u>Severe</u>** pipe damage – R/W.

Priority 3 = **<u>Severe</u>** pipe damage – Out of R/W.

Priority 3 = Significant Pipe damage – R/W

Priority 4 = Pipe damage with sinkhole – Out of R/W*

<u>* Unless Severe, Not a Work Order if No Sinkhole is Present and Out of R/W.</u>

7. Pipe Replace/Repair (PIPEREP)- Con't

Issues related to damaged pipe

Priority 2 = **<u>Severe</u>** pipe damage – R/W.

Priority 3 = **<u>Severe</u>** pipe damage – Out of R/W.

Priority 3 = Significant Pipe damage – R/W

Priority 4 = Pipe damage with sinkhole – Out of R/W*

<u>* Unless Severe, Not a Work Order if No Sinkhole is Present and Out of R/W.</u>

7. Pipe Replace/Repair (PIPEREP)- Con't

Issues related to damaged pipe

Priority 2 = **<u>Severe</u>** pipe damage – R/W.

Priority 3 = **<u>Severe</u>** pipe damage – Out of R/W.

Priority 3 = Significant Pipe damage – R/W

Priority 4 = Pipe damage with sinkhole – Out of R/W*

<u>* Unless Severe, Not a Work Order if No Sinkhole is Present and Out of R/W.</u>

8. Repair Pipe Joint (RPRJOINT)

Issues related to pipe joint

Priority 2 = Pipe joint **severely** damaged with sinkhole – R/W.

Priority 3 = Pipe joint **severely** damaged no sinkhole – Out of R/W.

Priority 3 = Pipe joint damage no sinkhole – R/W

Priority 4 = Pipe joint damage with sinkhole – Out of ROW

*Unless Severe, Not a Work Order if No Sinkhole is Present and Out of R/W.

8. Repair Pipe Joint (RPRJOINT) – Con't

Issues related to pipe joint

Priority 2 = Pipe joint **severely** damaged with sinkhole – R/W.

Priority 3 = Pipe joint **severely** damaged no sinkhole – Out of R/W.

Priority 3 = Pipe joint damage no sinkhole – R/W

Priority 4 = Pipe joint damage with sinkhole – Out of ROW

*Unless Severe, Not a Work Order if No Sinkhole is Present and Out of R/W.

8. Repair Pipe Joint (RPRJOINT) – Con't

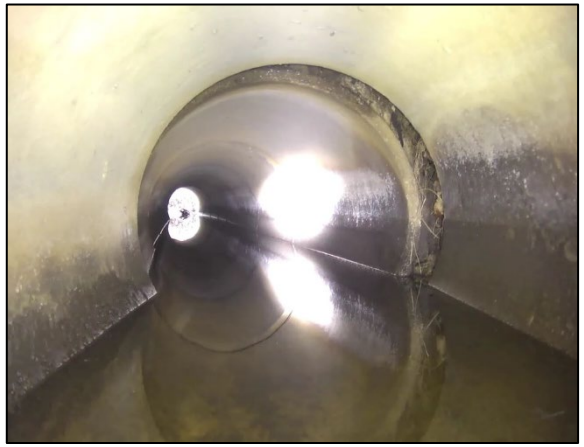
Issues related to pipe joint

Priority 2 = Pipe joint **severely** damaged with sinkhole – R/W.

Priority 3 = Pipe joint **severely** damaged no sinkhole – Out of R/W.

Priority 3 = Pipe joint damage no sinkhole – R/W

Priority 4 = Pipe joint damage with sinkhole – Out of ROW



*Unless Severe, Not a Work Order if No Sinkhole is Present and Out of R/W.

8. Repair Pipe Joint (RPRJOINT) – Con't

Issues related to pipe joint

Priority 2 = Pipe joint **severely** damaged with sinkhole – R/W.

Priority 3 = Pipe joint **severely** damaged no sinkhole – Out of R/W.

Priority 3 = Pipe joint damage no sinkhole – R/W

Priority 4 = Pipe joint damage with sinkhole – Out of ROW

*Unless Severe, Not a Work Order if No Sinkhole is Present and Out of R/W.

8. Repair Pipe Joint (RPRJOINT) – Con't

Issues related to pipe joint

Priority 2 = Pipe joint **severely** damaged with sinkhole – R/W.

Priority 3 = Pipe joint **severely** damaged no sinkhole – Out of R/W.

Priority 3 = Pipe joint damage no sinkhole – R/W

Priority 4 = Pipe joint damage with sinkhole – Out of ROW

*Unless Severe, Not a Work Order if No Sinkhole is Present and Out of R/W.

9. Repair Curb Opening (REPCURBO)

Issues related to curb opening of structure

Priority 2 = Curb opening severely damaged – Adjacent to sidewalk.

Priority 3 = Curb opening damage – No sidewalk.

*Cosmetic concerns will not trigger a work order.

10. Repair Curb (CURBREP)

Issues related to solid curb behind structure

Priority 2 = Curb severely damaged – Adjacent to sidewalk.

Priority 3 = Moderate curb damaged – No sidewalk.

*Cosmetic concerns will not trigger a work order.

11. Closed Drainage Sinkhole (CLSINK)

Issues related to sinkhole near structure/conveyance

Priority 2 = Large sinkhole adjacent to structure.

Priority 3 = Smaller sinkhole adjacent to structure.

12. Erosion Around Structure (EROSION)

Issues related to erosion around structure/conveyance

Priority 2 = Severe erosion in ROW within 10’ of roadway.

Priority 3 = Severe erosion not within 10’ of roadway but in R/W.

Priority 3 = Moderate erosion within 10’ of roadway and in R/W.

*Severe erosion out of R/W will still be noted as poor condition but with no work order generated.

13. Catch Basin Repair (CTCHBAS)

Issues related to a compromised wall of structure

Priority 2 = Catch Basin Collapsing

Priority 3 = Catch Basin damaged / frame / grate moderately unstable

*Cosmetic concerns will not trigger a work order.

13. Catch Basin Repair (CTCHBAS) – Cont'd

Issues related to a compromised wall of structure

Formerly: Repair Loose/Missing Brick or Block; Tree Roots Breaking Wall of Structure (RPRBAS)

Priority 2 = Catch basin wall severely damaged / collapsing

Priority 3 = Catch basin wall has structural damage

*Cosmetic concerns will not trigger a work order

15. Open Drainage Standing Water (OPSTWATE)

Issues related to standing water in swale
(must be present 72hrs after last rainfall)

Priority 3

>75% full of water

16. Open Drainage Flooding (OPFLOOD)

Issues related to water encroaching roadway - open drainage system

Priority 1 – KCI CALL TO DISTRICT

Significant amount of water present in travel lanes and poses immediate safety concern

Priority 3

Water pooling on roadway around open drainage structure

17. Closed Drainage Flooding (CLFLOOD)

Issues related to water encroaching roadway - closed drainage system

Priority 1 – KCI CALL TO DISTRICT

Significant amount of water present in travel lanes and poses immediate safety concern

Priority 2

Water pooling on roadway around closed drainage structure

APPENDIX E

E-7: PESTICIDE SOP

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

SHANTÉ HASTINGS
SECRETARY

Standard Operating Procedures for the Storage and Use of Pesticides

Objective: To provide information for the safety of our employees and the public on the use and storage of General-Use Pesticides.

Statement: This procedure shall be followed by all Maintenance & Operations personnel.

Procedure: Use and Application of Pesticides

1. All personnel involved in the mixing, application, and storage of pesticides shall be a licensed certified applicator with the Delaware Department of Agriculture (DDA).

2. All equipment to be used in the application of pesticides should be inspected before each use and calibrated at least periodically or as required by the product label.

3. All pesticide applications shall be made in accordance with the product label.

4. All personnel involved with the mixing and application of pesticides are required to wear appropriate personal protective equipment as outlined within the product label.

5. All vehicles used in the application of pesticides shall be equipped with emergency spill kits and copies of Labels & MSDS Sheets for the pesticides being applied.

6. Pesticides shall not be applied while it's raining or when rain is forecasted for that day (Read Product Label for applicability & possibly additional restrictions).

7. Any use of a Restricted Use Pesticide is forbidden. Should the need arise to apply a Restricted Use Pesticide, the application will need to be approved beforehand by the Roadside Environmental Program (RSE).

8. Pesticide applications completed for DelDOT by its hired contractors shall only be performed after authorization is granted by RSE. RSE will also be responsible for the indirect supervision of their daily activities.

9. RSE shall be responsible for the issuance of the Department's Notice of Intent (NOI) and ensuring compliance within the DNREC/NPDES Pesticide General Permit. Additional responsibilities include reporting total quantities for each pesticide used by M&O and its hired contractors on an annual basis.

Procedure: Storage of Pesticides

1. All pesticides shall be stored within dry, temperature-controlled spaces in accordance with the product label and located on spill containment pallets or within locked storage cabinets designed for pesticide storage.

2. All pesticide storage buildings and cabinets should have signs posted on all entry doors that denote the area as a Pesticide Storage Area.

3. All pesticide storage areas should be equipped with emergency spill kits.

4. A written inventory of all pesticides located within each storage facility shall be maintained by the Certified Applicators for that respective area.

5. Old pesticides and associated waste materials should be disposed of annually in accordance with label requirements and DDA regulations.

APPENDIX E

E-8: DELDOT SALT BEST MANAGEMENT PRACTICES

Statewide Salt Best Management Practices

2024 Edition

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1.0 INTRODUCTION

Maintaining a safe and efficient road network in Delaware during winter storm events is essential to DelDOT's motto: "Every Trip, Every Mode, Every Dollar, Everyone". Salt has become the industry standard as the deicer of choice for keeping roads passable and safe during storms. It is effective, economical and reliable. However, the use of road salts comes at a cost, both economic and environmental.

There is increasing concern about the environmental impacts of handling and applying road salt and anti-icing measures. Because salt is highly soluble in water, it moves easily with the flow of both surface water and groundwater. It can enter the environment from storage piles, spilled salt or salt spread on roadways. Salt that enters the environment can travel great distances and potentially impact - directly or indirectly - soils, vegetation, groundwater and wells, aquatic habitats, and wildlife. It also puts stress on our infrastructure, increasing potholes, and deteriorating metal in bridges, guardrails, signs, drainage pipes and inlets.

At DelDOT the term salt refers to sodium chloride (NaCl). While calcium chloride (CaCl) and magnesium chloride (MgCl) are also road salt application options, DelDOT has chosen NaCl as its typical deicing agent. The considerations in this determination are balancing the cost, the effectiveness in Delaware's typical temperature range, and the effects on infrastructure and the environment. DelDOT uses both the rock salt form of NaCl, which is a mined product, and solar salt, which is NaCl resulting after evaporation. Due to lower impurities resulting from the evaporation process, solar salt is used to form liquid brine for anti-icing applications. All future references generally just state "salt".

Highway maintenance yards can be sources of significant salt loss to the environment if not properly managed. Potential sources of salt loss to the environment include:

- Spillage during delivery, handling and loading
- Runoff from unprotected salt storage
- Wind blowing salt from unprotected salt storage
- Washing of vehicles

Effective salt management practices can help reduce the amount of road salt that enters the environment. This document outlines strategies for DelDOT's Division of Maintenance and Operations (M&O) to utilize for proper salt management at DelDOT maintenance facilities and on roadways during storm events. Effective maintenance facility design and salt handling practices are essential to preventing unnecessary salt loss, as is DelDOT's continued effort to utilize latest technology and equipment to track precipitation, temperatures and apply brine or salt as effectively as possible. This translates into savings for DelDOT, safer roadways for the traveling public, and minimization of impacts of salt on our environment.

2.0 OPERTIONAL PRACTICES AND STRATEGIES FOR STORAGE

This section looks at the cycle of salt handling at our maintenance facilities and other satellite salt storage facilities. The typical salt handling cycle flows from delivery, to stockpiling, to loading and then off-loading any unspent salt from the hoppers. The section will present the strategies related to the effective management of salt for each of the main elements of the handling cycle. Salt is needed to ensure public safety on the roadways in the winter months, but there is also a need to reduce the environmental effects as well. These measures will assist in the protection of surface and ground waters.

2.1 Salt Delivery

Deliveries of salt should be arranged such that material is placed within the covered storage facility as soon as possible upon delivery. Deliveries should be scheduled for periods of good weather with no predicted precipitation until all salt is loaded into the barn.

All deliveries should be covered when being transported to the maintenance yard. This is required if transported in DelDOT vehicles and strongly encouraged for any outsourced deliveries.

2.2 Salt Stockpiling

Facilities under the NPDES General Permit for Industrial Activities require all salt to be stored under cover to protect against exposure to rain or snow. Failure to comply with this regulation can result in fines. Dissolved salt does not “disappear,” but rather enters the surface and groundwater and may create problems offsite.

Stockpiles frequently have portions that have become frozen. These frozen blocks need to be properly managed and should not be placed into hoppers. These blocks should be pushed into the corner of the storage facility and allowed to thaw and dry. Once they have thawed and dried, the material should be broken up and reintroduced to the pile.

There are a variety of types of covers in use around the State. They range from tarps to sheds, to large domes and barns. Salt should never be stored long-term uncovered outside.

Inside Storage

All rock salt is kept within a salt barn at the yards unless in emergency situations noted in Outside Storage section. The roof and exterior of the storage structures should be constructed of waterproof material to prevent precipitation from entering the building. Most older salt barns are wood with a shingled roof. Newer salt barns typically have a concrete foundation and sides with a fabric hoop system roof. Solar salt for brine making is kept in the main salt barn with the rock salt, or in a separate solar salt shed so more strategically placed closer to brine making operations.

These solar salt sheds typically just store the solar salt during the winter months and are typically concrete blocks arranged in a three-sided bin with a fabric hoop roof.

The entrance to a salt storage structure should have a door, curtain or a sufficient overhang to minimize precipitation entering the structure. If no door is present, or the door is not operational, and precipitation can come in contact with the salt, then the front face should be tarped. The tarp can cover either the doorway itself or the front slope of salt. All tarps should be securely fastened to protect the wind from loosening and creating areas where the salt is exposed.

The exceptions for when a tarp is not necessary are below. In all situations, precipitation should not be able to make contact with the salt; if not, a tarp is required regardless of the below.

- For solar salt barns, if the barn is less than three quarters full and all salt is pushed behind the three quarters full mark, the front face can be left untarped.
- For regular salt barns, the determination for no tarp depends on the amount full, the prevailing wind direction, the height of the opening, any overhangs, and if any toe protection is provided, such as jersey barrier wall and/or compost log. These all affect the likelihood of precipitation making contact with the salt. If there is a question about needing to tarp the front face of the salt within a salt barn, please contact the NPDES Program at npdes@delaware.gov.

When roof, foundation or siding holes, tears or other damages are detected either through quarterly reporting, daily observations, or during a storm event, an action plan should be developed to address. Any damage should be temporarily repaired as soon as possible to reduce the entrance of precipitation and/or loss of salt, with permanent repairs being completed prior to the next winter season as possible. If the permanent repair is a new structure, then the temporary repair must be kept functioning until the new salt barn is constructed.

The storage shed floor as well as the loading area should be an impervious surface such as asphalt or concrete.

Outside Storage

Outside storage is only used on a temporary basis if necessary for repairs of existing structures. If salt stockpiles must be stored outside a structure, an asphalt or concrete pad must be utilized. The pile should be located where there is minimal runoff flowing towards the pile as possible. The pile will also require a cover.

All covers must meet the following requirements:

- Be water-resistant or impermeable.
- Be secured against wind with weights or tie-downs, such as ropes, cables or wire-mesh.
- Completely cover the entire pile.
- Opened only at working face by:
    - Uncovering only while salt is actively being removed and recovering in between loads

- Opening only to the minimum dimensions reasonably necessary.

These measures will prevent both loss to the environment and protection of the integrity of the salt by not introducing moisture/precipitation into the salt pile.

2.3 Liquid Storage Facilities

DelDOT maintenance yards store salt brine in polyethylene or fiberglass tanks. These tanks should be inspected annually by District or yard staff for any scratches, cracks, or crazing, utilizing the DelDOT Annual Brine Inspection Checklist. The purpose of the inspection is to monitor the tanks' integrity and ensure that there are no potential tank failures. The tests incorporate a visual inspection to identify any potential tank problems such as cracks, fading, and tank bulging, and a marker test to better document any cracking or crazing. Inspections should be reviewed at the District level, and if concerns are evident, they should be passed to NPDES and Facilities staff. The brine tanks will be replaced by Facilities at the end of their usable service.

For disposal, brine reuse will be incorporated whenever possible. All brine within tanker trucks should be put back into the storage system as expediently after use as possible in order to prevent damage to the tanker. If room is not available within the brine tanks, it can be transported to other maintenance facilities for reuse. It should not be discharged directly into a storm sewer system, on pavement or on grass.

For cleaning storage and brine making systems, brine should be utilized as much as possible. Any remaining brine should be pumped into tanker trucks or other holding facility while the tank is cleaned. Solids should be removed and reutilized as rock salt if possible. Disposal of any unsuitable residual material will occur at a landfill. The salt residue shall be kept under cover until disposal.

Evaporation is another option for unsuitable residual material. With a sludge pump, remove what is left in the salt brine tanks into loader bucket or equivalent. Contain the sludge within the salt barn or other contained area, allowing the liquid to evaporate. A roll-off concrete washout is ideal for storage as the mixture evaporates. Once all liquid has evaporated, blend the salt into the salt pile, or dispose of properly in a landfill.

If none of these options are possible, the yard should contact the NPDES Program at npdes@delaware.gov.

2.4 Salt/Sand Mixing

Sand and salt mixtures are not used in DelDOT plows; however, in some areas barrel drums are prepared with a sand and salt mixture and given to residential subdivisions for use at areas of frequent concern (ie, steep sections of road, typically icy intersections, etc). Mixing should be done during good weather. This will reduce salt loss due to precipitation and wind and minimize the moisture content of the sand/salt mix. After the sand and salt have been mixed, the mixing area should be swept and the sweepings returned to the storage facility.

2.5 Loading

Spillage during stockpiling and hopper loading is a key source of salt loss. Care to minimize spillage and practices to clean up spilled salt can reduce costly losses and the amount entering the environment. Spilled materials should be swept up and returned to the pile promptly after loading operations are completed.

Overloaded hoppers are prone to spilling salt during operations. Therefore, hoppers should not be loaded beyond their capacity.

Salt that is spilled outside of storage facilities or within, or adjacent to maintenance yards should be collected and returned to the storage facility as soon as possible following the completion of the storm event. Ideally any spilled salt would be cleaned prior to any rain precipitation or snow melt to minimize the salt being dissolved and entering the environment. However, given the nature of some storms starting as snow and ending in rain, this can be difficult. The best protection is being as careful as possible to not spill during loading activities.

Excess salt remaining in the hopper following a storm should be returned to the storage facility and deposited within or as close to the entrance of the salt storage facility as possible. Care should be taken to unload all of the material to minimize the amount that is washed off. Where materials are off-loaded outside of the storage facility, they must be placed into the storage facility as soon as possible, and before precipitation.

2.6 Equipment Storage

At the end of seasonal salting operations, the hoppers, which have been thoroughly emptied prior to cleaning, should be returned to their storage areas. It is preferred to have salt hoppers kept under cover; however if appropriately cleaned and decommissioned by draining hydraulic oil and plugging connections, the salt hoppers can be left outside.

2.7 Site Drainage

The maintenance yard should be graded to direct drainage away from the salt storage areas to minimize the amount of runoff entering. Snow plowed within the yard should be stockpiled where the melt water will not be directed towards the salt storage area.

Though there is no ideal scenario for the runoff that is generated near the salt storage, brine mixing and loading areas, the most preferred option is to have the runoff filtered through salt tolerant vegetation and/or directed to an extended wet detention pond. The salt water is generally denser than freshwater and will settle towards the bottom of the pond.

3.0 OPERTIONAL PRACTICES AND STRATEGIES FOR APPLICATION

Effective salt application practices can help reduce the amount of road salt that enters the environment. This can translate both into savings for DelDOT, and minimization of impacts of salt on our environment. Using advanced techniques in snow and ice removal help meet our goal of improving service to customers, reducing the impact to the infrastructure, and conserving salt.

3.1 Data Analysis

DelDOT uses several data sources to track upcoming snow or icing events in terms of precipitation make-up and duration, air temperatures, and road temperatures. We follow the National Oceanic and Atmospheric Administration (NOAA) National Weather Service forecasts and also pay for DTN ClearPath Weather Service. Weather stations throughout the state are utilized to monitor dew points, wind direction and speed, and air, road and subsurface temperatures.

The decision whether to provide pretreatment, also known as anti-icing, and the strategy for continued brine or rock salt application during the event is made by M&O leadership using these data analysis tools and relayed to District staff. Typically, if the road surface temperature will be above 15 degrees Fahrenheit and will remain relatively dry before the snowstorm, then anti-icing brine may be applied beforehand.

During the event, M&O leadership staff continue to monitor these tools, plus in the addition to vehicle mounted roadway sensor that give live feedback on road and air temperatures and will alter the application strategies as needed.

3.2 Storm Preparation

Salt application rates can vary depending on storm conditions; the goal is typically 100 to 400 pounds of salt per lane mile as recommended by the American Association of State Highway and Transportation Officials (AASHTO). This rate is achieved by calibrating the equipment annually and having management inspect all salt and brine equipment in a pre-season “Snow Plow Inspection”.

Operators, supervisors, and management are sent to training opportunities as they arise, which vary from snow plow simulators for all new operators, to workshops teaching proper salt application procedures for supervisors and District staff. At the beginning of the winter season snow routes are assigned to operators so they are familiar with their routes and any areas of safety concern, and salt guidance, such as prewetting rates, are given.

3.3 Anti-Icing

Anti-icing is the application of liquid deicers (salt brine) to road surfaces prior to a winter precipitation event to prevent the formation or development of bonded snow and ice. DelDOT uses 6,000 gallon tanker trucks and 1,300 to 3,000 gallon capacity units that slide into the bed of a dump truck. The brine solution activates the melting effects of the salt sooner, reducing the overall amount of rock salt that should be applied during the storm. Typically, a 23.3% salt

solution is applied. If rain is expected at the onsite of a storm, then typically anti-icing treatment is not applied, as it will not be as effective.

3.4 During Storm

Pre-wetting, or pretreatment, adds moisture to rock salt to "jump start" the melting action of the salt and causes the salt to stick to the road, minimizing scatter or bouncing of the salt outside of the applied area. Nearly all DelDOT trucks are outfitted with pre-wetting systems.

Plow balance systems are typically used and decrease the amount of weight that the plow cutting edge bears on the road surface to around 500 lbs. The plow balance system, combined with rubber blades with carbide middle portion on the front plows, makes better contact with the road surface, removing more accumulation and reducing the amount of deicing product that is needed to be applied. The plow balance system with rubber/carbide blades also provides a quieter operation and is less likely to damage the plow if an object is accidentally struck. The blades are secured on the plow to move independently and should not be over tightened preventing the movement needed to have effective contact with the road surface.

Ground speed controls for snow operations can help ensure that snow and ice removal equipment is used efficiently and effectively. These controls can adjust the rate at which deicing materials and liquids are spread based on the speed of the snowplow truck. This can help to conserve resources and keep roads safe.

Each snow season equipment operators are reminded to limit the use of the blast mode salt application option to circumstances where additional salt is needed to address spot locations with safety issues, such as an intersection or sharp curve with known icing problems. After the storm, roadways with known spills or too much salt are cleaned up by hand or with equipment to remove excess rock salt.

3.5 Oversight

Winter weather operations are managed by each of the four maintenance district's engineers, superintendent, and other district level staff. In addition to snow plow operators and supervisors reporting back road conditions, district staff are deployed in the field to monitor and adjust operations based on the changing road and weather conditions. For each four-hour period during a storm event, a summary report is prepared by the District indicating the road conditions, the roads being treated/plowed, the number of trucks in operation, the number of workers available, and the amount of salt or brine being applied.

These reports are sent to upper management staff including the Secretary, the M&O Director, other District leaders, and Traffic Safety staff managing the Transportation Management Center which keeps track of road closures, accidents, traffic signal operations, and citizen complaints. These reports and verbal communications keep the Secretary appraised of the winter storm impact on travel for discussions with the Governor if travel warnings or a State of Emergency should be issued. Public safety is the top priority of the winter weather operations, but with advancements in technology and a better understanding on the science of anti-icing and rock salt application, DelDOT strives to maintain effective maintenance of the roadways while minimizing the effects to the environment, and the cost spent on purchasing rock salt and solar salt.