Stormwater Pollution Prevention Plan (SWPPP)
Associated with Construction Activities

CONTRACT NO.: D015624    PIN NO.: X729.77

REPLACEMENT OF THE KOSCIUSZKO BRIDGE OVER NEWTOWN CREEK
KINGS AND QUEENS, NEW YORK

ɜ ɬɭ 2013
PREPARER OF THE SWPPP

"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(s) 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 false statements made herein are punishable as a class A misdemeanor pursuant to Section 29.45 of the Penal Law."

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Stormwater Pollution Prevention Plan
Associated with Construction Activities for the
Replacement of the Kosciuszko Bridge
Over the Newtown Creek
Construction Contract D900011

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1.0 INTRODUCTION

This Stormwater Pollution Prevention Plan (SWPPP) has been prepared in accordance with the State Pollutant Discharge Elimination System (SPDES) General Permit No. GP-0-10-001, the New York Standards and Specifications for Erosion and Sediment Control, and the August 2010 New York State Stormwater Management Design Manual.

The proposed project includes demolition and replacement of the existing Kosciuszko Bridge structure and approaches between Kingsland Avenue in Brooklyn and the Long Island Expressway (LIE, Interstate 495) Interchange in Queens. The proposed project will replace the existing bridge by constructing a new eastbound bridge that will be parallel to and on the eastbound side of the existing bridge and building a new westbound bridge within the footprint of the existing structure.

When completed, the new structures will carry five lanes of eastbound traffic and four lanes of westbound traffic. A new bikeway/walkway also will be included on the westbound portion of the new bridge. The project also includes at-grade street realignments, and streetscape improvements. In addition, as part of the proposed project, parkland will be improved. The existing Sergeant William Dougherty Playground will be reconfigured and improved, and two new park areas will be created; one near westbound Meeker Avenue in Brooklyn and the other along Laurel Hill Boulevard in Queens. The project will also include a new drainage system to collect the new bridge’s runoff. The runoff will be treated in Vortechs Chambers before being discharged to Newtown Creek through one of two new outfalls. All storm water runoff from resurfaced, and realigned local streets affected under this project will be directed to the existing New York City Department of Environmental Protection (NYCDEP) sewer systems except for the proposed drainage placed along relocated Cherry Street between Porter Avenue and Gardner Avenue. Refer to Section 5.3 for additional information.

In total, 34.5 acres of site disturbance is expected during construction of this project. However, no more than 5 acres of soil disturbance is anticipated at any one time because the project will be completed in several stages. Construction staging for the project is discussed in Section 3.0.

The NYSDOT is now beginning the procurement process for Phase 1 as a Design-Build Contract. Phase 1 will demolish the buildings on the site, construct the new eastbound portion of the bridge and after transferring all traffic to the new eastbound portion, demolish the existing bridge. The award of the Contract is anticipated in the summer of 2013. Construction of Phase 2, which will construct the new westbound portion, will be completed as a future contract. Once the westbound structure is completed, the westbound traffic that was temporarily diverted to the new eastbound structure will be shifted back to the new westbound structure. This SWPPP addresses both Phase 1 and Phase 2 construction activities.

According to the SPDES General Permit, an Erosion and Sediment Control Plan is required for this project because construction activities will result in soil disturbances of more than 1 acre. Since much of the new bridge structure is not serviced by a combined sewer system, this
SWPPP includes post-construction stormwater management practices, as well. Disturbances greater than 5 acres are not anticipated.

The Design-Builder(s) and subcontractors performing any activity that involves soil disturbance will be required to comply with the terms and conditions of the SWPPP for the project identified as a condition of authorization to discharge stormwater. The Design-Builder(s) shall provide signed certifications (See Section 11.3) for itself and all applicable subcontractors expected to perform activities that involve soil disturbance at the preconstruction meeting. These signed certifications shall be included as part of the SWPPP. The SPDES General Permit, provided in Appendix L – SPDES General Permit (GP-0-10-001) and the remainder of this SWPPP must be kept on file at the project field office. The authorized NYSDOT representative must be informed of all proposed offsite storage areas. These areas must be in compliance with the SPDES General Permit and this SWPPP and must be checked and certified by the authorized NYSDOT representative.

As required by the conditions described in the SPDES General Permit, the SWPPP shall be kept current and updated to reflect changes in the design, construction and operation, or in the maintenance of the project. Any changes to the certified SWPPP and related plans will require the submission of a revised SWPPP to the New York State Department of Environmental Conservation (NYSDEC) for re-certification. The revised SWPPP and related plans must meet all current New York State SPDES General Construction Permit Standards. A letter of explanation shall accompany all revisions.

A copy of the updated SWPPP and related drawings shall be maintained at the project site and it should be made available to the public, as well as EPA and other government agencies for inspection. If possible, the SWPPP should be posted on the internet.

The proposed city street drainage system in Brooklyn and Queens will tie into the existing combined sewer system except for the proposed drainage placed along relocated Cherry Street between Porter Avenue and Gardner Avenue, which will be tied into the proposed bridge drainage system which outfalls to Newtown Creek. For location of existing city system refer to Appendix M – NYCDEP Existing Sewer Maps. As a result, this document contains erosion and sediment control plans for both local street and elevated BQE drainage arrangement for this project. For portions of the drainage system that outlet to adjacent surface waters, this SWPPP will address prevention of potential post-construction stormwater quality impacts and limitation of increased stormwater runoff resulting from the proposed construction.

It is noted that this SWPPP has been prepared by a Qualified Professional, defined as “a person knowledgeable in the principles and practices of stormwater management and treatment, such as a licensed Professional Engineer, licensed Landscape Architect or other endorsed individual(s).” Any post-construction stormwater management practice components have been prepared by an individual with an understanding of the principles of hydrology, water quality management practice design, water quantity control design, and the principles of hydraulics in order to prepare a SWPPP that conforms to NYSDEC’s technical standards.
2.0 GENERAL PROJECT INFORMATION

2.1 Project Location

The Kosciuszko Bridge is located in New York City and carries a 1.1 mile segment of the Brooklyn-Queens Expressway (BQE, Interstate 278) over Newtown Creek between Kingsland Avenue in Brooklyn and the Long Island Expressway (LIE, Interstate 495) Interchange in Queens. The project limits also include the entrance and exit ramps in the area of Vandervoort Avenue in Brooklyn. See Appendix A – Site Location Map & Construction Plans for a Site Location Map and Site Plan.

2.2 Project Description

The project will replace the existing Kosciuszko Bridge by constructing a new eastbound bridge that is parallel to and on the eastbound side of the existing bridge, demolishing the existing structure and building a new westbound bridge within the footprint of the existing structure. When completed, the new structures will include auxiliary lanes in both directions, carrying five lanes of eastbound traffic and four lanes of westbound traffic with a multi-use path on the westbound bridge. The project will also require construction of new bridge foundations along the length of the new structures. Placement of these foundations will require relocation of existing utilities within the project limits.

The project also includes construction of new streetscape elements along selected local streets within the project areas in Brooklyn and Queens. Additionally, the construction of the new parallel structure to the south of the existing bridge in Brooklyn requires the acquisition of Cherry Street between Vandervoort Avenue and Gardner Avenue. To maintain accessibility into and within the Brooklyn industrial area, Cherry Street will be realigned to the south terminating at Stewart Avenue. The impacts to the local streets in Brooklyn will also include the reconstruction of eastbound Meeker Avenue between Hausman Street and Vandervoort Avenue, westbound Meeker Avenue between Hausman Street and Van Dam Street, and Vandervoort Avenue between westbound Meeker Avenue and Anthony Street.

In Queens, construction of the new structures requires the reconstruction of a portion of Laurel Hill Boulevard east of 54\textsuperscript{th} Avenue. The street reconstruction will not change the circulation patterns in the area. The alterations to the local street network are shown in the Drainage Report and Plans provided in Appendix C – Drainage Design Report and Plans.

In addition to improvements to the existing streets with proposed streetscape and landscaping elements, the project will include replacement of Sergeant Dougherty Playground in Brooklyn, as well as the creation of new parks and open spaces in both Brooklyn and Queens.

The project will also include the construction of a new drainage system. Storm water runoff from a portion of the Brooklyn Connector, the Brooklyn Approach, and the Main Span and the Queens Approach will be collected in scuppers and downspouts and discharged into Newtown Creek via a new storm sewer and two new outfalls, one on each side of Newtown Creek. The
bridge runoff will be collected and treated in Vortechs Chambers that will remove oils and solids from the first flush before discharging into the Creek. Currently, the elevated roadway runoff free falls to grade surface below the existing bridge.

All storm water runoff from reconstructed, resurfaced, and realigned local streets affected under this project will be directed to the existing New York City Department of Environmental (NYCDEP) sewer systems or will be tied into the proposed bridge drainage system. Under the proposed conditions, part of the storm water runoff from the Brooklyn Connector and LIE Interchange will be redirected from the existing NYCDEP sewer systems to the new bridge stormwater drainage systems. Therefore, the proposed bridge drainage system construction will reduce the runoff entering the NYCDEP system in effect providing additional capacity for that system.

2.3 Surface Waters

The Kosciuszko Bridge crosses Newtown Creek, which is a tributary of the East River in the New York Harbor and the Port of New York/New Jersey. It is considered a narrow tidal arm of the East River and forms a portion of the boundary between the Boroughs of Brooklyn and Queens. The mouth of the creek is located on the east bank of the East River about 3.6 miles above The Battery. The creek extends 3.3 miles eastward and southward and has several short tributaries and basins. Newtown Creek lies in a highly industrialized area of New York City. Almost the entire water frontage is developed for terminal and industrial purposes.

Newtown Creek is not a 303(d) water body. The project area is not located in a Total Maximum Daily Load (TMDL) Watershed.

During construction, two temporary platforms are anticipated in Newtown Creek in order to facilitate construction material and equipment delivery via barge as committed to in the Record of Decision (ROD). It is anticipated that they would be supported on temporary steel piles and constructed using steel beams and a timber or concrete deck. The depths of the platforms would be 2 to 3 feet, and would likely be designed to support a crane that could transfer materials to and from barges. The temporary platforms will be located outside the navigation channel along both the Brooklyn and Queens shorelines. When a barge is being loaded/unloaded at either platform a channel width of approximately 75 feet will be maintained. It is anticipated that the maximum draft required will be less than 15 feet. Just upstream from the crossing the Creek widens so there is anchorage and a turning basin that could be used to stage marine operations. The temporary platforms will likely be in place throughout construction for an estimated duration of 5 to 7 years.
2.4 Wetlands

Newtown Creek is the only wetland identified on United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) mapping within 150 ft. of the project area. The NWI mapping assigns the waters within the defined creek banks a habitat classification E1UBL (System E = Estuarine, Subsystem 1 = Subtidal, Class UB = Unconsolidated Bottom, Modifier L = Subtidal Water Regime).

According to the New York State Department of Environmental Conservation (NYSDEC) tidal wetland map 590-508, Newtown Creek in the area of the proposed project, is classified as Littoral Zone (LZ). The LZ is defined as the tidal wetland zone that includes all lands under tidal waters that are not included in any other category and are no deeper than 6 feet at Mean Low Water (MLW).

Refer to Appendix N - “Wetland Location Map” for NYSDEC Classified Streams Map, and the U.S. Fish and Wildlife Service, National Wetlands Inventory Map.

2.5 Historic and Cultural Resources

A Section 106 Memorandum of Agreement (MOA) between FHWA, NYSDOT and the State Historic Preservation Office SHPO (September 9, 2008) was appended to the FEIS. The MOA indicated that the proposed project would result in adverse affect on the Kosciuszko Bridge but would not adversely affect the Old Calvary Cemetery (both National Register of Historic Places (NRHP) eligible sites). A Phase I study conducted for the project indicated the potential for intact archaeological sites to occur beneath existing paved areas that could be NRHP-eligible and could be affected by the proposed project. A draft archaeological work plan is being prepared. The plan will refine the area of potential effect (APE). The archaeological work plan will be reviewed and approved by FHWA, NYSDOT, and the SHPO prior to implementation. The plan will include procedures, if necessary, for monitoring during construction to investigate potential archaeological resources within the APE that are identified as sensitive.

Included in Appendix K – NYSHPO Correspondence/Documentation is the MOA dated September 2008.

3.0 CONSTRUCTION ACTIVITIES

3.1 Construction Phasing Plan

In order to maintain the existing six lanes of traffic on the BQE throughout construction, the project will be completed in stages as indicated in Table 1. Proposed construction staging plans are included in Appendix A.
3.1.1 Bridge Demolition

The existing Kosciuszko Bridge will be removed during the demolition process. The means and methods of demolition will be determined by the Contractor, but will be subject to the approval of the NYSDOT and will also be in compliance with all applicable permits and regulations.

Prior to bridge demolition, the NYSDOT Design Build contractor shall raze all building structures, in both Brooklyn and Queens which have been identified on the Stage 1, Construction Staging Plan. Prior to demolition, all identified hazardous materials, including asbestos will be removed from the bridge as well as any building facility. Lead was previously removed from the bridge and as a result, lead abatement is likely not necessary.

After stripping off lights, signs, railings and barriers, it is anticipated that the existing superstructure deck will be cut into pieces and then placed on trucks using deck mounted equipment working from center of the main span outwards. Then for the removal of the main span it is anticipated that tie backs will be used to temporarily support the trusses as the floor system and then trusses will be cut into sections and removed. The use of tie backs will prevent using falsework in the creek and will be consistent with how the bridge was constructed. This could be accomplished using barge-mounted cranes that will temporarily block the channel during picks. The land side trusses will be removed in a similar fashion except that all work will be from land based equipment and will include temporary falsework rather than tie backs.

The two existing main span bridge piers are steel frames that will be cut and removed in pieces (similar to the trusses) using barge-mounted or land-based cranes. The existing concrete footings associated with the main span piers will likely be removed through the use of wire saws and/or hoe-rams within sheet steel pile enclosures. The footings will be removed to 2 feet below the creek bed using barge mounted or land based equipment. All work will be within the sealed sheetpile enclosure, which shall be dewatered prior to the commencement of any demolition activity. Any excess soil or debris that is released to the creek shall be removed, and the banks of the creek shall be restored. The void in the creek bed created by removal of the concrete foundations will be backfilled with clean fill and rip rap. The rip rap will be sloped back to restore a natural shoreline.

The approach piers will likely be removed using hoe rams, wire saws or controlled demolition down to the tops of the footings. The footings will remain in place although some portions of a limited number of footings may need to be demolished to accommodate the new eastbound bridge foundations. The area above the abandoned footings will be backfilled.

Best Management Practices (BMPs) will be used to minimize impact to the shoreline and waterway during demolition and construction activities. BMPs will include use of sheeting and weighted turbidity curtains during removal of the footings and backfilling activities. Temporary steel sheeting will be placed around the existing bridge piers to prevent loss of materials in the waterway. After construction is complete the sheeting will be extracted with a crane mounted vibratory hammer. The crane could be barge mounted or deployed land side. The turbidity...
curtains will be placed outside the sheeting and will function to confine the disturbed area and prevent sediment from migrating downstream and potentially impacting other areas. The curtain will remain in place until the operations/activities are completed and will be inspected daily. In addition, temporary netting will be suspended from the bridge over the waterway to minimize debris from entering the waterway during construction and demolition.

Prior to demolition and after construction activities are completed, underwater side-scan sonar surveys will be conducted to verify if construction materials and debris did enter the waterway. The survey shall also include any portion of the creek affected by the temporary mooring platforms. Any materials identified from the sonar survey which entered the water from the bridge reconstruction project shall be removed and disposed of by the Contractor. The Contractor shall develop and implement a surface sediment sampling program at the conclusion of the main span demolition and replacement. The samples shall cover the portion of the Newtown Creek where activities related to the construction and demolition occur, including any portion of the creek that may be affected by the release of soil or debris following the removal of said soil or debris and bank restoration. The sampling shall include suitable north/south and east/west transects within the area of where demolition, construction, and any other in water activity occur. See Appendix P – Newtown Creek Group for further detail.

Varying degrees of contamination occur across much of the project site. Contaminants include VOCs, SVOCs, metals, and PCBs. Groundwater could also be impacted with dissolved phase and free phase petroleum and chlorinated solvents, and subsurface soil vapor with elevated levels of VOCs and methane gas.

Work activities along the Queens side of Newtown Creek have the potential to affect the former Phelps Dodge Refining site. Since the site contains hazardous materials, the foundation installation will require special handling, disposal and health and safety procedures (i.e., Material Handling Plans). Similarly, removal of the existing bridge piers and rip rap slope treatments are likely to disturb the materials. Handling, disposal and stockpiling of contaminated and hazardous materials shall be done in accordance with the approved Contaminant Management Plan.

Under all stages of construction, as indicated in Table 1 – Construction Staging, erosion and sediment controls will be utilized during construction.

For further discussion on Erosion and Sediment Control Measures see Section 4.3 and Appendix B – Soil Erosion and Sediment Control Details.
### Table 1 - Construction Staging

<table>
<thead>
<tr>
<th>Contract / Phase</th>
<th>Stage</th>
<th>Description of Work</th>
<th>Erosion and Sediment Control Devices</th>
</tr>
</thead>
</table>
| **Phase 1**      | Stage 1 | ▪ Demolish existing buildings within the Right of Way acquired by NYSDOT  
▪ Construct asphalt caps and site access  
▪ Construct eastbound main span and eastbound approaches parallel to and on the eastbound side of the existing bridge | ▪ The Design-Builder shall utilize silt fence, temporary chain link fence, inlet protection, dust control, turbidity curtains, stabilized construction entrances, and silt sacks where required. |
|                  | Stage 2 | ▪ Construct Brooklyn and Queens connectors and LIE Interchange ramps  
▪ Transfer all traffic to the new eastbound structure  
▪ Improve Sergeant William Dougherty Playground | ▪ The Design-Builder shall utilize silt fence, temporary chain link fence, inlet protection, and dust control where required. |
|                  | Stage 3 | ▪ Demolish existing bridge approaches and main span | ▪ The Design-Builder shall utilize silt fence, temporary chain link fence, inlet protection, and dust control where required. |
| **Phase 2**      | Stage 4 | ▪ Construct westbound main span (within footprint of existing structure) and westbound approaches  
▪ Transfer all westbound traffic to the new westbound structure  
▪ Complete local park and streetscape improvements. | ▪ The Design-Builder shall utilize silt fence, temporary chain link fence, inlet protection, and dust control where required. |

The first three stages will be completed as part of Phase 1 as a Design-Build Contract. Phase 2 will be issued as a separate future contract once Phase 1 work is complete. Construction for Phase 1 is anticipated to begin in the summer of 2013.

### 3.2 Potential Construction Site Pollutants

The principal pollutant at the site during construction activities will be sediment. Sediment control BMPs are described in detail in Sections 4.2, 4.3 and 4.4. Other pollutants may include petroleum products due to spills during refueling of the equipment and general construction debris. Control of spills is covered in Sections 4.5 and 5.4. In addition, Section 6.0 describes good housekeeping BMPs that will be used to control all pollutants.
Construction and waste materials expected to be stored on site are debris from removal of asphalt or concrete pavements, excavated soil and other materials on an as needed basis. Litter shall be controlled by construction fencing around storage areas and construction debris shall be removed as soon as it builds up.

Selected locations within the project limits, specifically parcels OU1Aa, OU9a, OU2, and OU5, may contain hazardous materials. These materials include possible metals, petroleum and VOC’s. The Design Builder will need to test all waters on site prior to discharge. If the water samples are confirmed contaminated, then the Design Builder shall develop a dewatering plan which will address all on site contaminates. The Design Builder shall take all the necessary precautions during the construction/dewatering process on these sites. A NY-2C application was submitted to NYSDEC to address these parcels and the dewatering discharges.

For a comprehensive list of possible contaminants, and sample locations, refer to EPM’s report dated April 1, 2011, with revisions May 30, 2012, entitled, “Final Contaminated Material Investigation Findings Report”.

4.0 SOIL EROSION AND SEDIMENT CONTROL

The Erosion and Sediment Control Plan (ESCP) has been prepared to comply with the SPDES General Permit No. GP-0-10-001 for activities associated with the replacement of the Kosciuszko Bridge and its approach structures in the Boroughs of Brooklyn and Queens, New York City. The proposed project consists of the replacement of the existing elevated roadway. The project will also include, but is not limited to, the reconstruction of the Brooklyn and Queens connectors to the BQE, ramps to and from the BQE, installation of stormwater drainage systems and utilities, and other transportation elements within the interchange.

This plan addresses the impacts associated with the proposed project and the measures planned to avoid adverse impacts. The objective of this plan is to prevent potential stormwater quality impacts and erosion and sedimentation resulting from the proposed construction.

4.1 Existing Soils

A geotechnical subsurface investigation was performed between September and November, 2009. The subsurface investigations including the logging of soil borings and rock coring, and the preparation of field records and final boring logs have been completed in accordance with the NYSDOT, Geotechnical Engineering Bureau (GEB) standards.

After reviewing the boring logs, the subsurface stratigraphy of the project site consists of 5 soil strata along the alignment of the Kosciuszko Bridge above the bedrock. The soil strata above the bedrock consist of fill material, organic deposits, silty sands (glacial deposits), silty clay (Raritan formation) and decomposed rock, beginning from existing ground surface, respectively.

The Notice of Intent (NOI, Appendix I) includes a breakdown of the Hydrologic Soil Group (HSG) based on the existing soil information for this project. This information is contained in
Section 9, of the NOI. For a detailed description on the types of Hydrologic Soil Groups, refer to Appendix O, United States Department of Agriculture (USDA) Natural Resource Conservation Service –Part 630 Hydrology National Engineering Handbook, Chapter 7 – Hydrologic Soil Groups. According to the United States Department of Agriculture, Natural Resource Conservation Service, Soil Survey Area-New York, the soil mapping for Kings and Queens Counties are still in progress or has not yet been started, therefore, tabular or spatial data is not available.

Fill material consists of a brown to black mix of silt, sand, gravel and cobbles with varying amounts of debris including cinders, brick, fragments of wood, metal pieces, concrete and other materials. The stratum thickness varies from approximately 6 ft. up to 37.5 ft. Though areas of thick fill appear to be localized, that strata thickens along the shoreline of the Newtown Creek to approximately 27 ft.

The organic deposits consist of very soft organic silt and clay, occasionally with sand, organic fibers and/or peat. This stratum underlies the fill, but is discontinuous throughout the project site. The organic deposits are localized within the floodplain of the Newtown Creek and ranges in thickness from approximately 5 ft. to 8.5 ft.

The silty clay stratum consists of glacial drift deposits consisting of mainly very dense silty sand (till) and at some locations varied silt, clay and fine sand. In locations outside the floodplain of the creek, this stratum directly underlies the fill. The stratum varies in thickness from approximately 45 ft. up to 110 ft.

Silty clay is the fourth stratum, consisting of gray to dark gray, brown, orange to light green mixture of clay and silt, occasionally with fine sand laminations and/or gravel. The stratum thickness varies from approximately 5 ft. up to 80 ft. The thickness is highly variable over the entire site, but appears to thicken in the vicinity and east of Newtown Creek.

The decomposed bedrock ranges in color from gray, green, black, white and occasionally red. It consists of mostly fine sandy and/or gravelly silts and clays. Although a thickness of 25 ft. is typical, the thickness of the decomposed rock ranged from 5 ft. to 70 ft.

A dark gray to black, medium to coarse grained Gneissic bedrock layer underlies the entire project site. The top of the rock elevation varies considerably across the site. On the Brooklyn side, the top of the rock elevation was encountered from 128 ft. to 192 ft. below the existing ground surface. On the Queens side, rock was encountered at depths from 165 ft. to 200 ft. Along the proposed main span of the bridge, rock was encountered at a depth of 160 ft. near the Brooklyn support and 165 ft. at the Queens support.

The groundwater elevation ranged throughout the site from 1.7 ft. to 43 ft. below the existing ground surface. Near Newtown Creek, the water level depth ranged from 7-15 ft. and to depths of 27-47 ft. at higher ground away from the creek on both the Brooklyn and Queens sides.
4.2 Erosion and Sediment Control Phasing

All erosion and sediment control measures will be required to be in place prior to any soil disturbance. The Erosion Control Plans are included in Appendix B – Soil Erosion and Sediment Control Details. The following is a summary of the suggested sequence of construction operations:

The following procedure should be followed for each phase of the proposed work:

1. Install temporary erosion and sedimentation control measures including inlet filter sediment controls, vegetation protection barrier, turbidity curtains, and silt fence at the locations indicated on the plans prior to the commencement of each phase of work.
2. Install work zone traffic controls;
3. Perform all necessary clearing and grubbing. Install stabilized construction entrance(s).
4. Complete all bridge replacement operations, building demolition, roadway reconstruction, utility installations, utility relocations, and cap construction.
5. Complete any remaining work including earthwork, plantings, topsoil placement and seeding, etc.
6. Remove erosion control measures subsequent to the approval of the qualified individual.

The Design-Builder will also be required to obtain the approval of the authorized NYSDOT representative for any on-site storage areas. This would include the storage of construction materials, waste, equipment, etc. This SWPPP shall be amended as appropriate if additional on-site storage beyond what is defined within the plans in Appendix B – Soil Erosion and Sediment Control Details are utilized by the Design-Builder. Any amendments shall include details of all erosion control measures deemed necessary.

4.3 Construction Erosion and Sediment Controls

The specific erosion and sediment control measures will depend on the type of construction activities and will be determined by the Design-Builder. NYSDEC must review and approve site-specific BMPs/Erosion and Sediment Control plans including locations, types, and any changes thereto, proposed by the Design-Build Contractor before they are implemented. The Design-Build Contractor shall ensure that robust runoff controls are in place in the areas adjacent to the creek that will be affected by construction activity. Stormwater discharges from the areas affected by construction activities shall be periodically sampled during the course of the project.

The Design-Builder shall follow all standard specifications, where applicable, from Section 209 of the New York State Standard Specifications.

**Pollution Prevention Measures**

A site specific soil erosion and sediment control plan was developed for the project to contain and control the migration of water and wind dispersed soil and dust particles (See Appendix B –
Soil Erosion and Sediment Control Details). All disturbed areas will be maintained in accordance with the SPDES General Permit No. GP-0-10-001 and the soil erosion and sediment control plan. Additional minor temporary disturbances may be required to accommodate the Design-Builder’s staging and/or spoil areas. These temporary disturbances will not result in any change to the design or function of the permanent practice. All temporary disturbances not associated with spoil areas will be restored to their original condition. Spoil areas will be covered with topsoil and permanently seeded. All temporary soil erosion and sediment controls will be employed as directed by the authorized NYSDOT and as shown in Appendix B – Soil Erosion and Sediment Control Details.

The Design-Builder will be held responsible to review the erosion and sediment control plans included in the contract documents and, if necessary, modify the plan for compatibility with the Design-Builder’s intended sequence of construction operations. The Design-Builder shall submit for approval a plan of erosion and sedimentation control on material storage areas and a plan for disposal of surplus excavated materials. Any changes to the erosion and sediment control plans included in the contract documents made by the Design-Builder to facilitate his/her sequence of construction shall be prepared in accordance with the technical requirements contained in the EPA Stormwater Management for Construction Activities, latest edition and the “New York Standards and Specifications for Erosion and Sediment Control”, August 2005, distributed by the Empire State Chapter of the Soil and Water Conservation Society.

Erosion and Sediment Control Practices

A soil erosion and sediment control plan was developed for the limits of this project (see Appendix B – Soil Erosion and Sediment Control Details).

Two temporary mooring platforms are proposed in order to facilitate construction materials and equipment delivery via barge, this option reduces the truck traffic congestion to the local street network. Below is a brief description of each:

The Brooklyn temporary mooring platform will be located outside the navigation channel along the shoreline, south of the existing Kosciuszko Bridge pier, and inside the proposed Fee line. The property adjacent to temporary platform has an existing asphalt concrete pavement and will be used as haul road and staging area.

The Queens temporary mooring platform will be located outside the navigation channel along the shore line at the southeast corner of Parcel OU1Aa.

To protect the existing underground groundwater collection system located in Parcel OU9A a temporary bridge will be constructed to span from the proposed mooring platform to Parcel OU1Aa.

In order to minimize the impact of the aforementioned temporary structures, the Contractor shall utilize turbidity curtains during installation and removal of all pilings, evaluate the potential for propeller scour based on the size of vessels anticipated to be involved with the project, and if
necessary, based upon such evaluation, use scour protection. The Contractor shall also install perimeter fencing (or equivalent) to prevent trespassers from gaining access to the Newtown Creek Study Area via the temporary structures. The Contractor shall also develop and implement surface sediment sampling in the portion of the creek in any way affected by the temporary structures. For additional information, see Appendix P – Newtown Creek Group.

The approximate location of both temporary mooring platforms is provided in Appendix B – Soil Erosion and Sediment Control Details.

Erosion and sediment control measures will be inspected in accordance with SPDES requirements as follows:

For construction sites where soil disturbance activities are ongoing, the qualified inspector shall conduct a site inspection at least once every seven (7) calendar days.

For construction sites where soil disturbance activities are ongoing and the owner or operator has received authorization in accordance with Part II.C.3 to disturb greater than five (5) acres of soil as any one time, the qualified inspector shall conduct at least two (2) site inspections every seven (7) calendar days. When performing two (2) inspections every seven (7) calendar days, the inspections shall be separated by a minimum of two (2) full calendar days.

For construction sites where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and temporary stabilization measures have been applied to all disturbed areas, the qualified inspector shall conduct a site inspection at least once every thirty (30) calendar days. The owner or operator shall notify the Regional Office stormwater contact person (see contact information in Section 11.2) in writing prior to reducing the frequency of inspections.

For construction sites where soil disturbance activities have been shut down with partial project completion, the qualified inspector can stop conducting inspections if all areas disturbed as of the project shutdown date have achieved final stabilization and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational. The owner or operator shall notify the Regional Office stormwater contact person (see contact information in Section 11.2) in writing prior to shut down. If soil disturbance activities are not resumed within 2 years from the date of shutdown, the owner or operator shall have the qualified inspector(s) perform a final inspection and certify that all disturbed areas have achieved final stabilization, and all temporary, structural erosion and sediment control measures have been removed; and that all post-construction stormwater management practices have been constructed in conformance with the SWPPP by signing the “Final Stabilization” and “Post-Construction Stormwater Management Practice” certification statements on the Notice of Termination (NOT). The owner or operator shall then submit the completed NOT form.
The measures will be cleaned or repaired as required. Section 11.3 contains the Standard Site Inspection Form.

Standard soil erosion and sediment control methods will be utilized on the project. All erosion and sediment control measures will be implemented prior to disturbing any existing vegetation and will remain in place until new slopes and all areas disturbed due to construction activities have been stabilized with vegetation. The Design-Builder will be held responsible for removing waste and debris to minimize exposure of the waste and debris to stormwater.

The NYSDEC’s “New York Standards and Specifications for Erosion and Sediment Control”, August 2005, addresses protecting all water resources within the project limits and measures to maintain water quality of receiving water bodies. The Design-Builder will be held responsible for this issue, to review the erosion and sediment control plans included in the contract documents and, if necessary, modify the plan for compatibility with the Design-Builder’s intended sequence of construction operations. The Design-Builder shall submit for approval a plan of erosion and sedimentation control on material storage areas; borrow pits and a plan for disposal of surplus hazardous and non-hazardous excavated materials. Any change shall be documented and the SWPPP updated accordingly.

The Design-Builder will furnish, install, inspect, maintain and removed the soil erosion and sediment control measures as shown on the contract documents or as ordered by the authorized NYSDOT representative during the life of the contract to provide soil erosion and sediment control. These measures have been included to control the impact on water quality during construction. The locations of these measures are noted on the project plans and can be changed by the authorized NYSDOT representative based on the field conditions.

The following soil erosion and sediment control measures, at a minimum, will be required for the project:

Silt Fence:
A silt fence will be constructed along the areas of earthwork. The locations are shown on the contract plans. The provision of the silt fence will prevent/reduce sediment from migrating off the construction site and entering the drainage system or waterbody.

Chain link Fence:
A chain link fence will be constructed along the perimeter of the work zone. The locations are shown on the contract plans. The provision of the chain link fence will to prevent pedestrians and motorists to enter the active construction site.

Turbidity Curtain:
A turbidity curtain will be installed around any construction activities on the banks of Newtown Creek or in the physical waterway. The locations are shown on the contract plans. The provision of the turbidity curtain will prevent/reduce sediment from migrating off the construction site and entering the waterbody. The turbidity curtain will also contain any disturbed sediment from the creek bed during construction activities in the creek.
Inlet Protection:
Existing catch basins within the project limits, and newly installed catch basins adjacent to disturbed soil shall be fitted with inlet protection during the remainder of soil disturbance activities. The Design-Builder shall use inlet protection for inlets in paved areas, both new and existing, as detailed on Dwg. No. ECD-2 in Appendix B. Inlet protection, inspection and maintenance shall also comply with the specified NYSDOT item description, provided at the end of this section.

Straw Bale Dike:
If necessary, these temporary straw barriers may be installed in areas of increased stormwater velocity in conjunction with the silt fence.

Construction Entrance:
Stabilized construction entrances will be constructed to access the site.

Dust Control:
The Design-Builder will be required to minimize dust generation during the construction activities. Provisions such as watering, the use of cover materials, and the application of calcium chloride have proven effective in dust control and can be approved by the authorized NYSDOT representative for use in the affected areas. Refer to the NYSDOT list of approved dust control products.

Temporary Surface Stabilization:
Areas within the project limits that may be disturbed more than once during the construction activities will be stabilized using temporary seed and mulch or as directed by the authorized NYSDOT representative. Refer to the NYSDOT list of approved temporary surface stabilization products. Disturbed areas remaining exposed for more than seven (7) days during construction operations shall be stabilized temporarily.

In areas of steeper slopes, rolled erosion control mats will also be utilized. These mats will assist in stabilizing the slopes, they will allow vegetation to grow and will limit erosion on the slopes.

Tree/Vegetation Protection Barrier:
A protective fence will be erected around trees at the drip line to prevent damage during the construction activities.

Surface Stabilization:
Stabilizing of the graded surface will be accomplished by applying topsoil to the newly graded areas and using various seed mixes for vegetation.

Final Inspection:
Prior to the final acceptance of the project, all areas affected by the Design-Builders work shall be inspected for any evidence of erosion or slope failure. If any such condition becomes apparent upon final inspection, temporary soil erosion and sediment controls shall be installed immediately as directed by the authorized NYSDOT representative. The situation
shall be corrected according to a schedule agreed to by the NYSDOT and the Design-Builder.

A schedule for the installation and removal of the above practices is as follows. Please refer to the Erosion Control Plans located in Appendix B – Soil Erosion and Sediment Control Details of this report for approximate locations and details of the E&SC practices.

Construction Start-The following will be performed for each Phase, as applicable:

1. Mobilize to site and stake clearing and grading limits.
2. Apply dust control, sediment traps and straw bale dikes, as needed.
3. Install temporary erosion control measures including silt fence, chain link fence, construction entrances and inlet protection.
4. Perform all necessary clearing and grubbing.
5. Remove topsoil, stockpile and stabilize.
6. Rough grade site per plans.
7. Perform all construction activities as depicted in the project plans.
8. Permanently topsoil, seed/sod, hay if required, any remaining exposed areas.
9. Clean accumulated sediment from roadways and stormwater structures.
10. At the completion of all construction activities and the stabilization of all disturbed areas, remove erosion and sediment control facilities and reseed any disturbed areas.

Project erosion and sediment control devices shall be in conformance with the latest NYSDOT requirements.

4.4 Best Management Practices

During construction, the following procedures and practices will be utilized:

1. Equipment cleaning, maintenance, and repair will be conducted in designated areas protected by berms.
2. For construction sites where soil disturbance activities are ongoing and the owner or operator has received authorization to disturb greater than five (5) acres of soil as any one time, the qualified inspector shall conduct at least two (2) site inspections every seven (7) calendar days with the inspections separated by a minimum of two (2) full calendar days. For construction sites with less than five (5) acres (20,234 square meters) of disturbance, sediment and erosion controls will be inspected every seven (7) calendar days. The controls will be cleaned at the discretion of the qualified inspector responsible for the stormwater inspections.
3. Sediment and erosion controls will be checked weekly for sediment build-up and failure. The controls will be cleaned at the discretion of the qualified professional responsible for the stormwater inspections.
4. Cleared brush, debris (asphalt, gravel, concrete, etc.), and soils will be stockpiled up slope from and protected by erosion and sedimentation controls.

5. Paved areas shall be swept and kept clean of eroded soil and sediments to limit migration into catch basins and storm sewers. Off-site vehicle tracking of sediments, and the generation of dust shall be minimized. All roads and vehicles shall be cleaned as needed and kept clean during non-construction periods. All vehicles entering a hazardous site must be decontaminated prior to leaving the work area. Decontamination facilities and methods shall be approved by the authorized NYSDOT representative.

6. Materials brought on-site shall be in the minimum quantities required.

7. All materials stored on-site will be stored in a neat, orderly manner in their appropriate containers, and if possible, under a roof or other enclosure. Toxic materials such as paints, solvents, etc. must be stored in waterproof containers and kept in storage facilities.

8. Products shall be kept in their original containers with the original manufacturer’s labels and material safety data sheets retained.

9. Substances will not be mixed with one another unless recommended by the manufacturer.

10. Whenever possible, the entire product will be used up before container disposal. Recycle empty containers as applicable.

11. Manufacturer’s recommendations for proper use and disposal shall be followed.

12. The Design-Builder shall prohibit washing of tools, equipment and machinery in or within 100-feet of any watercourse or wetland.

13. All above grade storage tanks are to be protected from vehicle damage by temporary barriers, approved by the E.I.C.

14. The Design-Builder will be required to ensure that litter will be controlled via designated disposal facilities (trash cans, etc.) and a schedule for site and facility pick-up and disposal at designated disposal sites.

15. Construction debris that is not salvageable will be required to be disposed of in accordance with all applicable laws and regulations.

4.5 Spill Prevention Best Management Practices

The following practices will be followed for spill prevention and cleanup. The site Design-Builder responsible for the day-to-day site operations will be the spill prevention and cleanup coordinator. He will designate at least one other site personnel who will receive spill prevention and cleanup training. These individuals will each become responsible for a particular phase of prevention and cleanup. The names of responsible spill personnel will be posted in the material storage area and in the on-site construction office or trailer.

1. Manufacturers’ recommended methods for spill cleanup will be clearly posted and site personnel will be made aware of the procedures and the location of the information and cleanup supplies. Any spill in excess or suspected to be in excess
of two gallons will be reported to the NYSDEC Regional Spill Response Unit. Notification to the NYSDEC (1-800-457-7362) must be completed within two hours of the discovery of the spill. This is a legal requirement that must be complied with.

2. Materials and equipment necessary for spill cleanup will be kept in the material storage area on-site. Equipment and materials will include but not be limited to absorbent pads, brooms, dust pans, mops, rags, gloves, goggles, activated clay, sand, sawdust, and plastic and metal trash containers specifically for this purpose.

3. All spills will be cleaned up immediately after discovery.

4. The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with a spilled substance.

5. Spills of toxic or hazardous material will be reported to the appropriate State or local government agency, regardless of the size.

6. Concrete trucks will not be allowed to wash out or discharge surplus concrete or drum wash water on-site, except in areas specified by the authorized NYSDOT representative.

7. Asphalt trucks shall not discharge surplus asphalt on-site, except in areas specified by the authorized NYSDOT representative.

5.0 STORM WATER QUANTITY/QUALITY MANAGEMENT

5.1 Rainfall Data

New York City Department of Environmental Protection (NYCDEP) rainfall intensity formulas are used to determine runoff flows to the storm water network. As detailed in the Drainage Report, the 5-yr, 10-yr and 50-yr storms are analyzed varying depending on the classification of roadway and if the analysis location is at a low point.

5.2 Stormwater Quantity Control

As discussed and approved by the NYSDEC, Newtown Creek is classified as a tidal waterway and based on NYSDEC’s Storm Water Manual, Chapter 4, Section 4.4 the creek does not need to satisfy their water quantity requirements.

5.3 Stormwater Quality Control

Water quality volume (WQv) requirements are met using structural treatment devices. Vortechs water quality systems are proposed at the two major outfall points at the Newtown Creek, a dual unit system on the Brooklyn side of the project and a single unit on the Queens’ side. The systems (model number #1319 and #1522 respectively) are sized to treat the Water Quality Storm runoff and excess flows are bypassed with the use of a bypass manhole and weir. A separate overland flow channel for Parcel OU1Aa is located south of the proposed structure. A double catch basin will collect the surface runoff within the parcel and drain overland to an open channel to the creek.
Additional green infrastructure, including tree pits or pervious sidewalks will be determined as the streetscape design is finalized in the Design Build bid document.

Included herein under Appendix C is a CD which contains the project’s Drainage Report. For a complete drainage analysis summary, please refer to the included CD. Excerpts identifying the project’s basic drainage areas are included below:

5.3.1 Brooklyn Connector - Western Project Limit to Hausman Street

Stormwater runoff from the portion of the Brooklyn Connector between the western project limit and Hausman Street will be collected in scuppers and downspouts and directed to the existing NYCDEP sewer system via proposed catch basins and manholes connected to the existing manhole M296K at the intersection of eastbound Meeker Avenue and Sutton Street. At locations where the roadway embankment is enclosed by walls, two types of systems will be used. Along the eastbound cantilever section, stormwater runoff will be collected in scuppers and downspouts and directed into the catch basins via a concrete splash pad. The westbound stormwater runoff will be collected in the proposed shallow catch basins connected to the proposed 12 inch DIP storm sewer trunk pipe located along the westbound roadway and to the, downspout pipes that will go through openings in the walls. The runoff in the downspout pipes will be directed into the proposed catch basins via a concrete splash pad.

Currently, manhole M296K also handles stormwater runoff for the existing Brooklyn Connector from Hausman Street to Vandervoort Avenue. Under the proposed condition, this section of the Brooklyn Connector will be diverted to the proposed 42 inch diameter concrete pipe that will outfall into Newtown Creek. This was done to reduce the demand on the existing manhole M296K drainage network and will allow for enough capacity to connect the proposed network from the western project limit to Hausman Street as described above in the first paragraph. As a check on the capacity of the existing drainage network at manhole M296K, a comparison of existing and proposed tributary areas was prepared. The existing tributary area (1.435ac) is greater than the proposed (1.415 ac) and confirms that the existing sewer network capacity will not see an increased flow. The proposed drainage network plan and profiles are provided in Appendix A (Plan 1) of the Drainage Report, and the tributary drainage area comparison is provided in Appendix B of the Drainage Report.

5.3.2 Brooklyn Connector - Hausman Street to Vandervoort Avenue (including the Vandervoort Avenue span)

Stormwater runoff from a portion of the Eastbound Brooklyn Connector between Hausman Street and Vandervoort Avenue will be collected in scuppers and downspouts and directed to the proposed storm sewer trunk main located along the re-aligned Cherry Street via the proposed catch basins and manholes. The westbound stormwater runoff between Hausman Street and Vandervoort Avenue will be collected in the proposed shallow catch basins connected to the proposed 12 inch diameter DIP storm sewer trunk pipe and downspout pipe that will go through an opening in the Vandervoort Avenue west abutment wall. The runoff in the downspout pipe
will be directed into the proposed catch basin via a concrete splash pad to the proposed storm sewer trunk main located along the re-aligned Cherry Street.

This portion of the Brooklyn Connector runoff is being redirected as described above, from the existing drainage network connected to manhole M296K to the proposed 42 inch diameter concrete pipe that will outfall into Newtown Creek. The proposed drainage alignment allows for the connection of the proposed Brooklyn Connector drainage network located from the western project limit to Hausman Street.

5.3.3 Brooklyn Connector - Vandervoort Avenue to Varick Avenue

The roadway stormwater runoff from this portion of the Brooklyn Connector between Vandervoort Avenue and Varick Avenue (embankment section) will be collected in the proposed catch basins connected to the proposed 24 inch diameter concrete storm sewer trunk main located along the re-aligned Cherry Street, and to the proposed 18 inch diameter concrete storm sewer trunk main located just north of the proposed exit ramp to westbound Meeker Avenue. The 24 inch and 18 inch diameter pipes connect to the proposed 42 inch diameter pipe, located beneath the structure, that will outfall into Newtown Creek.

5.3.4 Brooklyn Connector - Varick Avenue to Brooklyn Approach, Brooklyn Approach, and Main Span

The proposed bridge deck stormwater runoff will be collected in scuppers and downspouts and directed to the proposed 42 inch diameter concrete pipe located directly beneath the proposed bridge. Stormwater runoff from the Brooklyn Approach spans as well as a portion of the Main Span west of the crest curve top point, will also be collected in scuppers and downspouts and directed to the proposed 42 inch diameter pipe that will outfall into Newtown Creek. The proposed 42 inch diameter outfall pipe will have an invert elevation of 1.50 ft. (Inner top elevation 5 ft.) at the Newtown Creek, which will satisfy the NYCDEP requirement to set outfall pipe inner top a minimum of 6” above the Creek MHW elevation of 1.45 ft. The proposed 42 inch diameter outfall pipe will be located beneath the footprint of the Brooklyn Approach and Main Span.

Treatment of stormwater prior to the outfall into the creek is proposed to be provided by the installation two Vortechs Chamber system Model# 1319 placed in parallel to the proposed outfall pipe. The Vortechs Chamber system was sized according to NYSDOT Design Requirements to treat the Target Water Quality Volume (WQV). Water Quality Volume (initial) was designed to improve water quality sizing to capture and treat 90% of the average annual rainfall event based on 100% of the new and replaced impervious areas. To provide the required Water Quality Volume, the dual Vortechs Chamber system Model# 1319 were selected based on a calculated project Water Quality Flow (WQF=23.09cfs). Each chamber provides a peak treatment flow of 11.85cfs for a total of 23.7 cfs. The Vortechs chamber details and specifications are shown in Appendix H of the Drainage Design Report and Appendix D - Vortechs Calculations and Details of the SWPPP document.
The proposed network layout and profiles are provided in Appendix A (Plans 1&2) of the project’s Drainage Design Report and associated tributary areas are provided in Appendix B of the project’s Drainage Design Report.

5.3.5 Queens Approach, Queens Connector, and Main Span

The proposed bridge deck stormwater runoff from the Queens Approach, Queens Connector, and a portion of the Main Span east of the crest curve top point, will be collected in scuppers and downsputs and directed to Newtown Creek via a proposed 36 inch diameter concrete pipe located directly beneath the proposed bridge. This proposed 36 inch diameter pipe will outfall into the Newtown Creek and will have an invert elevation of 0.00 ft. (Inner top elevation 3.0 ft.) at Newtown Creek, which will satisfy the NYCDEP requirement to set outfall inner top 6” above the Creek MHW elevation of 1.45 ft. The proposed 36 inch diameter outfall pipe will be located beneath the footprint of the Queens approach. It is proposed that treatment of stormwater prior to outfall into the creek will be provided by the installation of a Vortechs Chamber system, Model #1522, placed in parallel to the proposed outfall pipe. The Vortechs chamber was sized according to NYSDOT Design Requirements to treat the Target Water Quality Volume (WQ\text{v}). Water Quality Volume was designed to improve water quality sizing to capture and treat 90% of the average annual rainfall event for NYS based on 100% of the new and replaced impervious areas. The Vortechs Chamber systems Model #1522 was selected based on a calculated Water Quality Flow (WQ\text{f}=15.19cfs) and a Peak Treatment Flow (15.77cfs) for this model. To provide the required Water Quality Volume, the Vortechs chamber details and specifications are shown in Appendix H of the Drainage Report and Appendix D - Vortechs Calculations and Details of the SWPPP document.

The proposed network layout and profiles are provided in Appendix A (Plan 3) of the project’s Drainage Report and associated tributary areas are provided Appendix B of the project’s Drainage Report.

5.3.6 LIE Interchange

The roadway of the LIE Interchange is to be reconstructed on fill. Under the existing condition, the roadway runoff from this area is directed into the 66 inch diameter outfall pipe located along 43rd street. Under the proposed condition, the roadway runoff along the EB BQE, WB BQE, and EB BQE to EB LIE ramp will be collected by proposed catch basins that will direct the flow into the proposed 36 inch diameter pipe that will outfall into Newtown Creek. By directing this flow into the proposed 36 inch diameter outfall pipe, the demand on the existing 66 inch diameter outfall pipe will be reduced. The remaining roadway runoff along the WB LIE to WB BQE ramp, 43rd Street to WB BQE ramp and EB LIE to WB BQE ramp will be collected by proposed catch basins and be connected to existing MO69Q (MH71). As a check on the capacity of the existing drainage network at manhole MO69Q (MH71), a comparison of existing and proposed tributary areas for the ramps was conducted. The new profile for LIE ramps and proposed median location contributing pavement areas for MO69Q (MH71) reduced the tributary area by 0.14 ac: confirming that the existing sewer network capacity can sufficiently handle the proposed...
flow. Network layout and profiles are provided in Appendix A (Plan 3) of the project’s Drainage Design Report and tributary areas are provided in Appendix B of the project’s Drainage Design Report.

5.3.7 Local Streets

In areas of local street reconstruction, all catch basins and manhole tops will be either reset or reconstructed. At the reconstructed Hausman Street and Meeker Avenue intersection, one catch basin will be installed and an existing catch basin will be removed. At the Apollo Street & Meeker Avenue intersection, two catch basins will be replaced. At the Van Dam Street intersection with Meeker Avenue one existing catch basin will be replaced. All proposed local street drainage networks were designed to direct stormwater runoff to the existing NYCDEP sewer system, with the exception of the portion of realigned Cherry Street between Porter Avenue and Gardner Avenue which is directed to the proposed bridge drainage system.

Stormwater runoff from the portion of realigned Cherry Street between Vandervoort Avenue and Porter Avenue will be collected by the proposed catch basins that will direct the flow to the existing NYCDEP sewer system connected to the existing manhole MO21K at Vandervoort Avenue.

Under the existing conditions, manhole MO21K also handles the existing stormwater runoff for the existing Brooklyn Connector from Vandervoort Avenue to Porter Avenue. Under the proposed condition, this section of the Brooklyn Connector will be diverted to the proposed 42 inch diameter concrete pipe that will outfall into the Newtown Creek. This was done to separate the highway stormwater flows, to reduce the demand on the existing manhole MO21K drainage network and allow for enough capacity to connect the proposed local street drainage network from the realigned Cherry Street as described above in the second paragraph. As a check on the capacity of the existing drainage network at manhole MO21K, a comparison of existing and proposed tributary areas was conducted. The existing tributary area (3.047ac) is greater than the proposed tributary area (2.79ac); confirming that the existing sewer network capacity can sufficiently handle the proposed flow.

Storm water runoff from the portion of the realigned Cherry Street between Porter Avenue and Stewart Avenue will be collected by the proposed catch basins and directed to the proposed bridge drainage system. Storm water runoff from realigned Cherry Street between Porter Avenue and Varick Avenue, and between Varick Avenue and Stewart Avenue, will be directed to proposed MH-15 and proposed MH-104 respectively which are connected to the proposed bridge drainage system. A portion of Anthony Street between Porter Avenue and Varick Avenue will also be directed to proposed MH-15 and proposed MH-104, which are connected to the proposed bridge drainage system. Storm water runoff from the portion of Thomas Street between Varick Avenue and Stewart Avenue and a portion of Stewart Avenue between Thomas Street and the proposed structure, will be collected in proposed catch basins and connected to the proposed bridge drainage system at proposed MH-104 on Stewart Avenue.
Under the existing condition, the existing manhole M023K handles the existing stormwater runoff for the existing Brooklyn Connector and Brooklyn Approach from Porter Avenue to Stewart Avenue. Under the proposed condition, this section of the Brooklyn Connector and Brooklyn Approach will be diverted to the proposed 42 inch diameter concrete pipe that will outfall into Newtown Creek. This was done to separate the highway drainage runoff from the local street system, to reduce the demand on the existing manhole M023K drainage network and to allow for enough capacity to connect the proposed network from the realigned Cherry Street and Thomas Street described above. As a check on the capacity of the existing drainage network at existing manhole M023K, a comparison of existing and proposed tributary areas was conducted. The existing tributary area (2.68ac) is greater than the proposed tributary area (2.52 ac); confirming that the sewer network will not see an increased flow.

The proposed drainage network plan and profiles are provided in Appendix A (Plan 1&2) of the project’s Drainage Design Report, and the tributary drainage area comparison is provided in Appendix B of the project’s Drainage Design Report.

5.3.8 Block 2520 Lot 60 (Parcel OU2)

Parcel OU2 is located between the Long Island Railroad (LIRR) and 56th Road in Queens. A portion of this parcel falls within the limits of the permanent easement (PE) for this project and will be used as a staging area for the Department’s design build contractor. To be used as a staging area, a section of this parcel will be capped under this project by installing an impervious asphalt-concrete pavement. For parcel drainage during construction, two NYCDEP Standard TYPE-2 catch basins and one TYPE B-1 manhole will be installed within this parcel and will provide site drainage. These new drainage structures will be connected to the proposed bridge drainage system which outfalls to Newtown Creek. Upon completion of construction of the proposed bridge structures, the cap drainage will be disconnected from the bridge drainage and capped.

The proposed drainage network plan is provided in Appendix A (Plan 2) of the project’s Drainage Design Report, and the tributary drainage area is provided in Appendix B (Plan 2) of the project’s Drainage Design Report.

5.3.9 Block 2529 Lot 1 (Parcel OU1Aa)

Parcel OU1Aa is located between Sagres’ Parcel OU9A, adjacent to Newtown Creek, and the Long Island Railroad (LIRR) in Queens. For this project, the NYSDOT will acquire a temporary easement for use of this parcel to allow construction of the proposed bridge. Parcel OU1Aa will be utilized as a contractor staging area, and as a haul road from the proposed temporary mooring platforms located on the banks of Newtown Creek. To create a haul road and staging area surface, this parcel will be capped under this project by installing a 14" thick impervious asphalt-concrete pavement over the parcel limits. Currently, there is one access roadway available to access Parcel OU1Aa, detailed on the general plan. The access location will be the responsibility of the Design Build Contractor.
Drainage for this site will comprise of standard NYCDEP double catch basins with two 12" diameter outfall pipes thru a proposed head wall. The storm run-off from the site will be discharged directly to Newtown Creek thru an overland flow channel, constructed under this project. The proposed site plan and drainage details for Parcel OU1Aa are provided in Appendix A of the Drainage Report. Upon completion of this project, the Parcel OU1Aa cap and drainage structure are to remain for future use by the property owner.

5.4 Reportable Spills/Releases

Tarpaulins, screens and other applicable protective devices shall be used to minimize exposure of stormwater to pollutants and prevent product releases or spills into undergrowth, natural landscapes and waters in the vicinity of the work site. Spill pallets or other secondary containment shall be provided for product storage, and shielded from contact with rain water, as applicable. Spill kits including absorbent pads, booms, drain blockers, etc., shall be provided on site to assist in containing a spill, should it occur. In addition to the spill kits, a minimum of 50 ft. of filter fabric shall be provided. If a spill should occur at the site, clean-up will commence and the authorized NYSDOT representative shall be notified immediately, and the following agencies shall also be notified within two (2) hours of such occurrence:

The United States Coast Guard if the spill or release has the potential to impact the water at 1-718-354-4119/4120 (24-hour number);

The NYSDEC Spill Bureau at 1-800-457-7362 (24-hour hotline number); and

The National Response Center (1-800-424-8802) and NYSDEC if the release is reportable under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980.

Note: The NYSDEC defines reportable releases as 5 gallons or greater, except if the spill is contained and under the control of the spiller, does not and will not reach the State’s water or any land, and the spill is cleaned up within two hours of discovery.

The spill shall be immediately contained and the spilled material removed using approved materials and equipment including but not limited to absorbent materials, HEPA vacuums, water booms and/or boats with skimmers. Within two (2) days of the incident, the authorized NYSDOT representative shall be provided with a written report of the cause of the problem, the estimated quantity of hazardous material spilled, the method and/or action(s) taken to clean up the materials, and corrective action taken to prevent a recurrence.

6.0 GOOD HOUSEKEEPING BEST MANAGEMENT PRACTICES

All construction activities shall be conducted such that dust, debris, waste materials and construction materials are not released or spilled into the soil, water, sediment and/or sewers in accordance with all applicable laws, codes, rules and regulations. The NYCDEP will inspect and maintain the proposed stormwater drainage system (pipes, catch basins and manholes)
according to the existing protocols and maintenance schedules for such structures. Off-site construction activities shall be confined to areas shown on the Contract Drawings and/or as specified by the resident engineer. Also, servicing and fueling of all equipment shall be confined to areas shown on the Contract Drawings and/or as specified by the authorized NYSDOT representative. Spill prevention and cleanup should conform to the requirements of Sections 4.5 and 5.4. Erosion and sediment control measures shall be provided to protect catch basins, drainage channels, waterways, etc. from sediment and pollutants, as specified in Section 4.3.

In addition to the general guidelines above and in Sections 4.4 and 4.5, the following management practices shall be employed to store construction materials at the site:

1. **Concrete:** All slurry materials shall be contained with polyurethane or manual post-placement cleanup. No “wash out” material shall be disposed of in unconfined areas. No dry cement shall be allowed to spill and become unconfined sediment or dust. The Design-Builder shall provide a concrete washout facility located at least 50 ft. away from the nearest storm drain. The washout pit should be lined with plastic sheeting of at least 10-mil thickness that has no holes or tears to prevent leaching of liquids into the ground. Using prefabricated washout containers is highly recommended. When the washout has been filled to 75% capacity, the accumulated material shall be removed. Hardened solids can be removed with equipment available at the site and reused or hauled away for recycling. If the liquids have not fully evaporated, they shall be vacuumed and disposed of in an approved manner. The Design-Builder shall check with the local authority the requirements for disposal of concrete wash water. The washout facilities should be covered before predicted rainstorms and inspected daily to make sure they have not been overfilled and there is no leakage.

2. **Detergents and Cleaning Solvents:** Detergents shall, whenever possible be biodegradable. When not in use for appropriate purposes, such as cleaning of paving equipment or steel girders prior to application of coatings, detergents and solvents shall be kept in closed containers at all other times. Containers shall have secondary containment measures in place. Any accidental spills shall be reported per the regulations of the NYSDEC.

3. **Paints:** When not in use, paints shall be stored in closed containers, such as, but not limited to, “conex” boxes, or suitable storage facilities. When the paints are in use, the work zone shall be subject to full containment. Excess paint shall not be discharged to any sewer system but shall be properly disposed of according to manufacturers’ instructions or state and local regulations.

4. **Petroleum-Based Products:** Any petroleum-based products present on the site shall be stored in tightly sealed and clearly labeled NYC fire department containers placed in storage bins with a secondary containment system. The storage area for petroleum-based products shall be a secured area at all times. Any dispensing of petroleum-based products shall be done with care and in designated areas only. Cleanup of any spills shall be immediate. All on-site vehicles shall be monitored for leaks and receive regular preventative maintenance to reduce the chance for leakage. Measures shall be implemented to contain dripping spills that occur during refueling of equipment. Asphalt substances shall be used in accordance with
manufacturer’s recommendations. No petroleum products shall be allowed to flow into a watercourse or a sewer system. Any accidental spills shall be reported as per NYSDEC regulations.

5. **Wood**: Any treated wood products must be contained. Containers must be covered at the end of each work shift or multiple work shifts with a secured tarp. Untreated wood products may be stored without containment in compliance with OSHA regulations. No sawdust or wood “chips” shall be permitted to flow into watercourses, catch basins or the storm sewer system.

6. **Masonry Block**: Masonry block shall be stored on wood pallets in a neat and orderly fashion. No mortar or cement used for masonry work shall be allowed to become airborne (dust) or spill into a watercourse or sewer system. All such powdered materials shall be stored in secure areas inside and on platforms. Any accidental spills shall be cleaned and/or reported per the regulations of the NYSDEC. Cleanup and appropriate dust control shall be implemented immediately upon breakage of any mortar or cement bags.

Presently, the following materials are not expected to be used during construction of this project:

1. **Fertilizers**

However, in the event that the above materials are introduced on the project, the SWPPP shall be updated accordingly prior to implementation.
7.0 POST CONSTRUCTION BEST MANAGEMENT PRACTICES

All existing vegetation, ground cover and pavement will be restored after construction.

Water Quality Structures - Two Vortechs Systems manufactured by Contech are proposed to treat the required Water Quality Volume. The units will be located offline along the 42” and 36” diameter pipes (in Brooklyn and Queens respectively) that drain to the Newtown Creek beneath the bridge. The chamber details and NICAT Technology Verification/Certification for the proposed Vortechs units are included in Appendix D – Vortechs Calculations and Details.

Regular inspection of the Water Quality devices is required. Pollutant deposition and transport may vary from year to year and regular inspections will help ensure that the system is cleaned out at the appropriate time. Initial inspections should be performed twice per year (i.e. spring and fall) and adjusted thereafter for the observed conditions at the sites. A log of each inspection should be retained.

The Vortechs chamber systems should be cleaned when inspection reveals that the sediment depth has accumulated to within 12 to 18-inches of the dry-weather water surface elevation. This determination can be made by taking two measurements with a stadia rod or similar measuring device; one measurement from the manhole opening to the top of the sediment pile and the other from the manhole opening to the water surface.

Note: To avoid underestimating the volume of sediment in the chamber, the measuring device must be carefully lowered to the top of the sediment pile. Finer, silty particles at the top of the pile typically offer less resistance to the end of the rod than larger particles toward the bottom of the pile.

Cleaning of the Vortechs chamber systems should be done during dry weather conditions when no flow is entering the system. Cleanout of the Vortechs system with a vacuum truck is generally the most effective and convenient method of excavating pollutants from the system. If such a truck is not available, a “clamshell” grab may be used.

Sediment disposal shall be in accordance with local and state regulations. A comprehensive Inspection, Cleaning and Maintenance Plan is provided by the manufacturer.

Spill Containment Structures

The FDNY and NYSDEC expressed concerns over an oil spill/tanker accident on the proposed Kosciuszko Bridge. These agencies suggested a permanent form of treatment for capturing and or treating a potential petroleum spill from the main span structure over Newtown Creek.

The NYSDEC Spills Response Unit was contacted with regard to this matter. NYSDEC stated that a chamber/storage unit capable of handling 500 gallons would be sufficient for general conditions and typical bridge requirements.

Contech Engineered Solutions LLC was consulted with regard to this requirement and
determined that the proposed Vortech Chamber Models #1319 and #1522 will address the projects WQV requirements and oil spill concerns. Since the units will have a sump of 3 feet and 4 feet below the pipe invert respectively, there will always be at least 3 feet of water in the units. Oil will be held on the upstream side of the oil baffle wall until the unit reaches its capacity and then after that, excess oil will enter the downstream pipe. Therefore, Contech recommends that in the case of a major oil spill, the treatment unit be pumped and cleaned immediately after the spill. Contech further determined that the oil storage capacity of the proposed units (dual #1319s and #1522) is in the vicinity of 1640 gallons and 1396 gallons respectively, which surpasses the suggested design requirements (500 gallons) by NYSDEC. The purpose for cleaning the unit immediately is that when the unit is at the full capacity of oil storage and a large rain event occurs it would prevent some of the captured oil from washing through the treatment unit. Cleaning shall be as stated in Section 8.3.

8.0 INSPECTION AND MAINTENANCE

8.1 Delegation of Authority

The NYSDOT shall have a qualified inspector conduct an assessment of the site prior to the commencement of construction and certify in an inspection report that the appropriate erosion and sediment controls described in this SWPPP have been adequately installed/implemented.

A qualified inspector is a NYSDOT representative that conducts site inspections for compliance with the SPDES General Permit. This is defined as a “person that is knowledgeable in the principles and practices of erosion and sediment control, such as a licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, or other NYSDEC endorsed individual(s). It can also mean someone working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect, provided that person has training in the principles and practices of erosion and sediment control. Training in the principles and practices of erosion and sediment control means that the individual working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect has received four (4) hours of NYSDEC endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other NYSDEC endorsed entity. After receiving the initial training, the individual working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect shall receive four (4) hours of training every three (3) years.

Inspections of any post-construction stormwater management practices that include structural components, such as a dam for an impoundment, shall be performed by a licensed Professional Engineer.

A qualified inspector can also be an authorized NYSDOT representative, CEC or Environmental Specialist, provided that they are a licensed Professional Engineer or Registered Landscape Architect, or under the supervision of a licensed Professional Engineer or Registered Landscape Architect.
Architect.

The SWPPP must include a Delegation of Authority Form that identifies the qualified inspector. See Appendix E – Delegation of Authority Form for a copy of this form. In accordance with the Memorandum of Understanding (MOU), NYSDOT and NYSDEC have mutually agreed that prior authorization is not required for disturbances greater than 5 acres (20,234 square meters) provided adequate erosion and sediment controls are implemented and site inspections are conducted in accordance with the SPDES General Permit.

### 8.2 Inspections

Following the commencement of construction, site inspections shall be conducted by the qualified inspector at least once every seven (7) calendar days. The NYSDOT qualified inspector and the erosion control supervisor working for the Design-Builder are required to have a 4-hr DEC certified training. They must both provide copies of their certification to the authorized NYSDOT representative at project commencement. These will be filed in the site log book. For construction sites where soil disturbance activities are ongoing and the owner or operator has received authorization in accordance with Part II.C.3 to disturb greater than five (5) acres of soil at any one time, the qualified inspector shall conduct at least two (2) site inspections every seven (7) calendar days. When performing two (2) inspections every seven (7) calendar days, the inspections shall be separated by a minimum of two (2) full calendar days.

At the end of the construction season or other shutdown period, when soil disturbance activities will be finalized or suspended until the following spring, the frequency of the required inspections may be reduced to once a month at the minimum, provided the site is properly stabilized.

During each inspection, the NYSDOT qualified inspector shall indicate on a site map:

1. The extent of disturbed areas;
2. Areas that have undergone temporary or permanent stabilization;
3. The condition of the soil erosion and sediment control practices that have been installed;
4. The status of areas used for the storage of materials that are exposed to precipitation and that have not been finally stabilized; and
5. The status of locations where vehicles enter or exit the site.

Following each site inspection, any worn or damaged materials shall be replaced immediately and accumulated sediment should be removed when 50% of the storage capacity of any retention structure becomes filled. Material shall only be disposed of at a NYSDEC approved upland facility and transported by an approved hauler. All facilities must verify that it is lawful for such material to be disposed of at the respective site.
At the conclusion of the project and prior to filing the NOT form, NYSDOT qualified inspector shall perform a final site inspection. The qualified inspector shall certify that the site has undergone final stabilization (defined as indicating that all soil-disturbance activities have ceased and a uniform, perennial vegetative cover with a density of eighty (80) percent over the entire pervious surface has been established; or other equivalent stabilization measures have been employed on all pervious areas), and that all temporary erosion controls (e.g. silt fencing) not needed for long-term erosion control have been removed. Copies of the referenced certification forms are located in the Site Log Book.

8.3 Maintenance

The NYCDEP will inspect and maintain the proposed stormwater drainage system (e.g. pipe, catch basins and manholes). The Vortech Stormwater Treatment Units will be maintained by the NYSDOT according to existing protocols and maintenance schedules for such structures.

Additional maintenance requirements can be located in Appendix B- Soil Erosion and Sediment Control Devices on each respective control device drawing. Please refer to the notes section on those details.

The long term maintenance of post-construction stormwater management practices will be governed by the latest NYCDEP Standard Maintenance Protocol. The long term maintenance of post-construction Vortech stormwater treatment system will be governed by the NJDEP/NJCAT Technology Verification/Certification requirement and maintained by the NYSDOT.

The following maintenance schedule was obtained from the New Jersey Department of Environmental Protection (NJDEP) stormwater website:

Vortechs® Maintenance

The Vortechs system shall be inspected at regular intervals and maintained when necessary to ensure optimum performance. The rate at which the system collects pollutants will depend more heavily on site activities than the size of the unit, e.g., unstable soils or heavy winter sanding will cause the swirl chamber to fill more quickly but regular sweeping will slow accumulation.

Inspection

Inspection is the key to effective maintenance and is easily performed. Pollutant deposition and transport may vary from year to year and regular inspections will help ensure that the system is cleaned out at the appropriate time. Inspections should be performed twice per year (i.e. spring and fall) however more frequent inspections may be necessary in equipment washdown areas and in climates where winter sanding operations may lead to rapid accumulations. It is useful and often required as part of a permit to keep a record of each inspection. A simple inspection and maintenance log form for doing so is provided on the following page, and is also available on contechstormwater.com.
The Vortechs system should be cleaned when inspection reveals that the sediment depth has accumulated to within 12 to 18-inches (300 to 450 mm) of the dry-weather water surface elevation. This determination can be made by taking two measurements with a stadia rod or similar measuring device; one measurement from the manhole opening to the top of the sediment pile and the other from the manhole opening to the water surface.

Note: To avoid underestimating the volume of sediment in the chamber, the measuring device must be carefully lowered to the top of the sediment pile. Finer, silty particles at the top of the pile typically offer less resistance to the end of the rod than larger particles toward the bottom of the pile.

Cleaning

The Design-Builder shall be responsible for cleaning the Vortechs System until project turnover. Cleaning of the Vortechs system should be done during dry weather conditions when no flow is entering the system. Cleanout of the Vortechs system with a vacuum truck is generally the most effective and convenient method of excavating pollutants from the system. If such a truck is not available, a “clamshell” grab may be used, but it is difficult to remove all accumulated pollutants using a “clamshell”.

In installations where the risk of petroleum spills is small, liquid contaminants may not accumulate as quickly as sediment. However, an oil or gasoline spill should be cleaned out immediately. Motor oil and other hydrocarbons that accumulate on a more routine basis should be removed when an appreciable layer has been captured. To remove these pollutants, it may be preferable to use adsorbent pads to solidify the oil since these pads are usually much easier to remove from the unit individually and less expensive to dispose of than the oil/water emulsion that may be created by vacuuming the oily layer. Floating trash can be netted out if you wish to separate it from the other pollutants.

Cleaning of a Vortechs system is typically done by inserting a vacuum hose into the swirl chamber and evacuating this chamber of water and pollutants. As water is evacuated, the water level outside of the swirl chamber will drop to a level roughly equal to the crest of the lower aperture of the swirl chamber. The water outside the swirl chamber should remain near this level throughout pumping as the bottom and sides of the swirl chamber are sealed to the tank floor and walls. This “water lock” feature prevents water from migrating into the swirl chamber, exposing the bottom of the baffle wall and creating excess pump-out volume. Floating pollutants will decant into the swirl chamber as the water level is drawn down. This allows most floating material to be withdrawn from the same access point above the swirl chamber. Floating material that does not decant into the swirl chamber during draw down should be skimmed from the baffle chamber. If maintenance is not performed as recommended, sediment may accumulate outside the swirl chamber. If this is the case, it may be necessary to pump out other chambers. It is advisable to check for sediment accumulation in all chambers during inspection and maintenance.
These maintenance recommendations apply to all Vortechs systems with the following exceptions:

1. It is strongly recommended that when cleaning systems larger than the Model 16000 the baffle chamber be drawn down to depth of three feet prior to beginning clean-out of the swirl chamber. Drawing down this chamber prior to the swirl chamber reduces adverse structural forces pushing upstream on the swirl chamber once that chamber is empty.

2. Entry into a Vortechs system is generally not required as cleaning can be done from the ground surface. However, if manned entry into a system is required the entire system should be evacuated of water prior to entry regardless of the system size.

Manhole covers should be securely seated following cleaning activities to prevent leakage of runoff into the system from above and also to ensure proper safety precautions. If anyone physically enters the unit, Confined Space Entry procedures need to be followed.

Disposal of all material removed from the Vortechs system should be done in accordance with local regulations. In many locations, disposal of evacuated sediments may be handled in the same manner as disposal of sediments removed from catch basins or deep sump manholes. Check your local regulations for specific requirements on disposal.
### VORTECHS INSPECTION AND MAINTENANCE LOG

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<th>Date</th>
<th>Water Depth to Sediment</th>
<th>Floatable Layer Thickness</th>
<th>Describe Maintenance Performed</th>
<th>Maintenance Personnel</th>
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1. The water depth to sediment is determined by taking two measurements with a stadia rod: one measurement from the manhole opening to the top of the sediment pile and the other from the manhole opening to the water surface. If the difference between these measurements is less than eighteen inches the system should be cleaned out. Note: To avoid underestimating the volume of sediment in the chamber, the measuring device must be carefully lowered to the top of the sediment pile.

2. For optimum performance, the system should be cleaned out when the floating hydrocarbon layer accumulates to an appreciable thickness. In the event of an oil spill, the system should be cleaned immediately.

3. The baffle chamber of the models #1319 and #1522 should be drawn down to a depth of three feet prior to beginning clean-out of the swirl chamber.

This maintenance will be conducted by a *Trained Individual* who shall conduct site inspections for maintenance of erosion and sediment control practices, in accordance with Section 209 of the standard Specifications of the NYSDOT Construction Inspection Manual. This *Trained Individual* is defined as “an employee from a contracting (construction) firm that has received 4 hours of training, which has been endorsed by the NYSDEC or other endorsed entity, in proper erosion and sediment control principles no later than November 1, 2011. After receiving the initial training, the trained individual must receive 4 hours of training every 3 years, thereafter.” The training requirement does not apply to those persons who are a licensed Professional Engineer, licensed Landscape Architect, or CPESC. The Design-Builder is responsible to ensure that a *Trained Individual* be on-site when soil disturbance activities occur.
8.4 Corrective Actions

A notice of deficiencies is served by providing the Design-Builder with a copy of the MURK 6 inspection report (See Section 11.3). The Design-Builder must address the deficiencies within 3 days of receipt of the MURK 6 inspection report. The following weeks Murk 6 report will document the corrective action.

9.0 RECORDKEEPING AND TRAINING

9.1 Recordkeeping

NYSDOT or designate shall maintain on-site a record of all site inspections in a Site Log Book, which shall be made available to the permitting authority (NYSDEC) upon request. A copy of the NYSDEC-recommended site logbook, including inspection checklists, certification forms, and other permit guidance material is included in the Appendices. Project owner, Design-Builder, and SWPPP preparer certification forms are also provided in Section 11. On a monthly basis, NYSDOT or designate shall post a summary of the site inspection activities in a publically accessible location at the site. Also, as indicated in Section 5 of the site log book, NYSDOT or designate shall prepare a written summary every three months of the site status with respect to compliance with the stormwater permit requirements.

9.2 Changes to SWPPP

This SWPPP must be amended under one or more of the following circumstances:

1. There is a change in design, construction, operation or maintenance, which has a significant effect on the potential for the discharge of pollutants to receiving waters and which has not otherwise been addressed in the plan.

2. The stormwater pollution prevention plan proves to be ineffective in:
   a. Eliminating or significantly minimizing pollutants from sources identified under this permit, or
   b. Achieving the general objectives of controlling pollutants in stormwater discharges from construction activities.

3. The plan shall be amended to identify any new Design-Builder and/or subDesign-Builder that will work at the site and implement measures of the stormwater pollution prevention plan.

4. Any change applicable to protecting surface and groundwater resources in other sediment and erosion control plans or permits, stormwater management plans or permits, or duly adopted regulations approved by local officials or any authorized agency for which a written notice is received, shall adhere to the requirements of this SWPPP and SPDES permit. Where such written notice of a change is received, a re-certification shall be provided to NYSDEC to show that the stormwater pollution prevention plan has been modified to address such changes.

5. If the operator whose construction activities resulting in stormwater discharges is
replaced, then that operator must submit a NOT form in accordance with this permit. The new operator must be notified of the requirement to submit a new Notice of Intent (NOI) form to obtain coverage under this permit upon reviewing, signing and certifying compliance with this pollution prevention plan.

Changes and updates to the SWPPP should be recorded in a log. A copy of the Log of Changes to SWPPP is included as Form CONR 8 at the end of this document.

9.3 Training

The site’s construction workers and subDesign-Builders have to be trained in the basics of soil erosion control, stormwater management, good housekeeping and pollution prevention. At a minimum, the training shall cover the following subjects:

1. Spill prevention and cleanup measures Soil Erosion and Stormwater BMPs Good Housekeeping BMPs
2. Inspection and maintenance recordkeeping requirements
3. Potential penalties associated with stormwater noncompliance

The qualified inspector working for the state (or designated consultant) and the erosion control supervisor working for the Design-Builder are required to have a 4-hr DEC certified training. They must both provide copies of their certification to the authorized NYSDOT representative at project commencement. These will be filed in the site log book. This training requirement does not apply to those persons who are a licensed Professional Engineer, licensed Landscape Architect or CPESC. The Design-Builder is responsible to ensure that a Trained Individual be on-site when soil disturbance activities occur.

The construction site operator should maintain a Training Log with the details of the training topics, objectives, names of the instructors and the attendees. A copy of the training log is located in Appendix H – Training Log.

10.0 FINAL STABILIZATION AND PERMIT TERMINATION

When the construction work is completed on the whole project, or an area within the project, the Design-Builder must take steps to permanently and finally stabilize it. The permanent stabilization will be accomplished when all existing pavements are restored in kind and uniform, evenly distributed perennial vegetative cover with a density of 80 percent of the native background cover is installed on all unpaved areas. After any area has been fully stabilized, the temporary sediment and erosion control devices, such as silt fences, can be removed.

At the conclusion of the project, NYSDOT or designate shall have a qualified inspector perform a final site inspection and certify that the site has undergone final stabilization and that all temporary erosion controls have been removed. Copies of the referenced certification forms are included in the site log book.
Once the construction activities have been completed and the site has undergone final stabilization, the Design-Builder should submit the NOT form, to end the coverage under the construction general permit. A copy of the NOT form is included in Appendix J – Notice of Termination.

11.0 SWPPP IMPLEMENTATION

11.1 SWPPP Committee

For this project, the SWPPP committee will primarily consist of the Resident Engineer or other NYSDOT designee and appointed assistants. Specific responsibilities of the committee include the following:

1. Overseeing SWPPP materials inventory, identifying and recommending pollution prevention opportunities;
2. Identifying potential pollutant sources and recommending changes in operations, equipment, layout and materials, as necessary;
3. Coordinating Best Management Practices (BMPs), reviewing program effectiveness, and updating the program as needed; and
4. Reporting results and problems.

The names of the committee members shall be filed in the project field office with the permit and the soil erosion and controls log.
11.2 Emergency Contacts

Primary and secondary emergency contacts are listed herein. In the event of a site emergency, NYSDOT shall contact the persons listed below:

**Primary Emergency Contact:**

Name: 
Title: Resident Engineer
Office Phone: 
Home Phone: 
Cell Phone: 

**Secondary Emergency Contact:**

Name: 
Title: Assistant Resident Engineer
Office Phone: 
Home Phone: 
Cell Phone: 

**SWPPP Signatory Authority:**

Name: 
Title: 
Office Phone: 

**NYSDEC Regional Contact:**

Name: 
Title: 
Address: 
Office Phone:
11.3 Compliance Certifications

This section provides the terms by which this SWPPP shall be put into effect. It consists of the following certification forms, located within the front of the SWPPP and as contained in the latest NYSDOT Construction Inspection Manual:

- HC 209 Notice to Disturb Greater than 5 Acres of Soil
- HC 210 Notice to Reduce Frequency of Inspections
- MURK 6 SPDES Stormwater Inspection Report
- MURK 6-1 SPDES Stormwater Inspection Report - Continuation
- MURK 6-2 SPDES Stormwater Outlets to Waters of the US - Continuation
- CONR 5 Design-Builder/Subcontractor SPDES Permit Certification
- CONR 8 SPDES Stormwater Pollution Prevention Plan (SWPPP) Revision
The Manual for Uniform Recordkeeping (MURK) Part 1B Construction Inspection Manual (CIM) provides guidance to Department construction inspection staff for Standard Specification Sections 200 through 699. Specific procedures are provided that construction inspection staff can use to ensure that appropriate tests are performed; inspections are performed at the appropriate times; and only materials meeting the specifications are incorporated into the work. The primary sources of requirements for inspection are New York State Department of Transportation:

- Standard Specifications for Construction and Materials
- Standard Sheets
- Contract specific details and special specifications
- Independent Assurance Sampling and Testing Program

American Standards Testing and Materials (ASTM) and American Association of State Highway and Transportation Officials (AASHTO) materials and testing specifications play a major role in the standard specifications and in assuring conformance with both federal and industry standards.

Material certifications of approved materials, in accordance with §106-04 Material Certifications and Approved Lists, for standard specification in Section 700 are associated with many items inspected with CIM procedures. The certifications help ensure that appropriate quality materials are incorporated into the work.

Project schedules submitted consistent with the standard specification and CAM §108-01 Start and Progress of Work should be consulted to ensure that critical issues associated with each construction stage are addressed before work on that item begins.

Other MURK manuals for construction program activities are noted below:

MURK Part 1A the Contract Administration Manual (CAM) contains guidance for Standard Specifications, Section 100 General Provisions. Requirements or information that do not correspond to any specific subsection, or cover general requirements, are covered in Sections 90 through 99.

MURK Part 1C the Office of Construction Safety and Health Program Manual, contains guidance for safety and health requirements on Department contracts that apply to contractor's construction operations, to program staff, and to construction inspection consultants’ staff.

MURK Part 1D the Construction Consultant Manual is a comprehensive reference to all aspects of the administration of consultant contracts for construction activities, including consultant inspection and construction services.

MURK Part 2A the Materials Inspection Manual (MIM), is published by the Materials Bureau and contains guidance for materials testing and acceptance. The MIM corresponds to Standard Specifications Section 700 Materials and Manufacturing.
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I. GENERAL REQUIREMENTS

Soil Erosion and Sediment Control is an integral part of protecting water quality during construction. Smaller contracts that do not require environmental permits are still required to protect water quality. Erosion and sediment control is required on all construction contracts with soil disturbance, including temporary disturbances from staging areas, storage areas, etc.

A. Erosion & Sediment Control Plan. Erosion and Sediment Control (E&SC) requirements are frequently based on environmental permits from various agencies. The permits should be reviewed in detail, as requirements may be stated in the permits that are not shown in the contract documents. Water Quality Protection is a JOINT RESPONSIBILITY of the Contractor and the Department. If the Contractor intends to change the sequence of operations or the E&SC Plan presented in the contract documents, the Contractor must modify the E&SC Plan and schedules in accordance with the Contractor’s intended sequence of operations for all excavation, stripping, embankment, fill, grading and other operations that create soil disturbance(s) in accordance with §203-3.03 Scheduling of Work to Minimize Soil Erosion and Water Pollution, and submit the modified E&SC Plan, schedule and location(s) of staging areas, offsite spoil areas, etc., to the Engineer-in-Charge (EIC), in accordance with §107-12 Water Quality Protection. This is now the Contractor’s E&SC Plan. Clearing & grubbing, earthwork and other operations that create soil disturbances should not begin until the Contractor’s E&SC Plan and associated schedule are approved by the EIC. The Contractor’s plan should indicate approximately what area of earth is exposed at any one time. The Contractor’s approved progress schedule in accordance with §108-01 is a valuable tool in managing time related exposure risks, and is typically far more detailed than an intended sequence of operations created by the Designer and included in the contract documents. The Construction Environmental Coordinator (CEC) should be contacted if the EIC has any questions or needs technical assistance. Significant plan revisions after construction starts should be reviewed by the CEC, and the Designer, if necessary.

B. Protection Prior to Disturbances. Erosion and sediment control measures (primarily sediment control) must be installed prior to wide-spread grubbing, stripping or other operations that create soil disturbances. Only initial clearing (felling trees, etc) that would damage or destroy E&SC measures should be allowed prior to installation of those measures. E&SC measures around the perimeter of a large area to be logged/cleared may be required to protect water quality. Subsequent E&SC measures should then be installed prior to grubbing or stripping of specific areas. Disturbed areas may be protected by mulching slopes, temporary seeding, installing silt fences, straw bale dikes, erosion control blankets, etc. The Contractor should not be allowed to routinely clear, grub and strip the entire site, but rather should grub and strip only those areas required to progress construction operations, in order to minimize the area and time of disturbances.

C. Limiting Disturbance. The specification no longer limits the area that the Contractor can disturb (though the State Pollutant Discharge Elimination System (SPDES) General Permit GP-0-08-001 does), but the Contractor must have temporary seeding and mulching capability (mulcher or spreader) and materials (straw, rolled erosion control products, etc) on the site in sufficient quantity to treat the disturbed areas and should not rely solely on a subcontractor for erosion and sediment control, unless the subcontractor is available on a daily basis. Disturbances should be limited whenever and wherever possible, in both area and in time. Earth material exposed by any construction activity must not be left inactive for more than 7 days without the application of temporary or permanent erosion controls. Slopes should be rapidly brought to final grade, stabilized and seeded as soon as practicable, and should not wait until just before winter, or until the entire project is ready for seeding. The Contractor should be encouraged to mulch disturbed areas as soon as practicable and whenever the construction sequencing warrants it, but should not be allowed to repeatedly expose temporarily mulched slopes with limited work progressed solely for the purpose of increasing contract pay items quantities, and then expect to be paid to re-mulch those slopes.
SECTION 209 SOIL EROSION AND SEDIMENT CONTROL

D. Erosion Prevention. Emphasis must be placed on preventing erosion at the source, not on catching sediment at the bottom of the slope or in the channel. Slopes that are stabilized will reduce erosion significantly, and reduce the effort required for maintenance of control measures. Steep slopes require special attention. Steep slopes that cannot be stabilized quickly, due to weather or other constraints, may require the use of rolled erosion control products (e.g., mats/blankets). The use of RECPs not shown on the contract documents will be considered extra work. The EIC and Contractor should limit the surface area of earth exposed and provide immediate permanent or temporary erosion and sediment control measures to minimize damage to adjacent property and to minimize contamination of adjacent waterways. The EIC will issue a Stop Work Order pursuant to §105–01 Engineer’s Authority if a Contractor fails to comply with provisions of this section and a water quality standard is violated or the potential of water quality standard violations exist.

E. Erosion and Sediment Control Supervisor
An Erosion and Sediment Control Supervisor must be designated by the Contractor; the individual must be trained and authorized to enact changes as needed. The Contractor’s Erosion and Sediment Control Supervisor must meet the qualifications of the “Trained Individual”, even for projects that do not require coverage under the SPDES General Permit. One method to establish this individual’s qualifications is a certification from the Department that he/she has attended training. The individual should be knowledgeable in installation procedures, control measure application and general construction issues that affect erosion and sediment control.

F. Contractor Inspection and Maintenance
Erosion and sediment control measures require frequent inspection to ensure effective performance. All measures should be inspected at least once every 7 days and after all rainfall events of 1/2 in (12mm) or more within 24 hours. (Note: the Standard Specification predates the issuance of the permit, and defines a rainfall event over 12 hours while the permit identifies an event over 24 hours. For consistency, direct the contractor to perform rainfall event inspections using the 24 hour permit criteria). Inspections must be completed within one calendar day of the rainfall event. These inspections by the Contractor do not need to be conducted by a Trained Individual (unless projects are covered by the SPDES General Permit), do not fulfill the inspection requirements under the SPDES General Permit, and do not require written reports.

Temporary erosion and sediment control measures must be monitored and maintained by the Contractor, including winter shutdown. Maintenance must continue until permanent stabilization is completed and the temporary control measures are ordered to be removed. Measures must be repaired and accumulated sediments removed within three calendar days from the date of inspection. Accumulated sediment should be disposed of as unsuitable material.

G. Final Stabilization
Erosion and sediment control inspections and maintenance must be performed until the entire contract site has undergone final stabilization. Final stabilization means that all activities that create soil disturbances have been completed, and that a uniform perennial vegetative cover has been established with a density of 80% for all pervious, unpaved areas, or all exposed soil is covered with a permanent erosion control practice. Once the site has undergone final stabilization, the EIC should direct the Contractor to remove all temporary erosion and sediment control measures within the Right of Way and ensure the Contractor has removed all temporary erosion and sediment control measures from off-site waste areas, borrow areas, haul roads and equipment/material storage areas.

H. Temporary Stabilization
Temporary stabilization means that all exposed soil has been covered with material(s) as set forth in the technical standard, New York Standards and Specifications for Erosion and Sediment Control, to prevent the exposed soil from eroding. The materials can include, but are not limited to, mulch, seed and mulch, and erosion control mats.
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II.  EROSION AND SEDIMENT CONTROL MEASURES

A.  Area Measures

1.  Mulch
Mulch may be applied without seed, particularly if the area will be disturbed again prior to turf establishment. **Mulch application can reduce erosion by approximately 85% compared to a bare surface.** Straw mulch should be applied at approximately 2 tons/acre (0.8MT/Ha), which should be enough to cover the ground from view. Care should be taken to ensure that the use of mulch does not introduce invasive species onto the site.

Wood fiber mulch must be applied in accordance with the manufacturer's recommendations. When no manufacturer's recommendations are available, wood fiber mulch should be applied at approximately 1.5 tons/acre (0.6MT/Ha).

2.  Temporary Seed and Mulch
Areas where temporary seed is applied should also be mulched. Seed and mulch are paid for together, additional separate payment will not be made for mulch. If temporary seeding is not done within 24 hours of construction or disturbance, the soil must be scarified prior to seeding. Broadcasting, rolling with cultipack type seeder or hydroseeding are acceptable methods of temporary seeding. Proper soil to seed contact is an important factor in successful seeding. In order to reduce the need for “engineered” solutions, seeding should be done as soon as practicable rather than waiting to do larger areas all at once.

3.  Rolled Erosion Control Products
Rolled Erosion Control Products (RECPs) are commonly referred to as erosion control mats or blankets. They may be used to stabilize steep slopes and/or to provide immediate stabilization of sensitive areas. RECPs are available in three Classes: short-term, intermediate and permanent. §713-07 Rolled Erosion Control Products and Soil Stabilizers identifies the slopes for which different Classes and Types may be used, and what shear stresses they will withstand.

RECPs must be placed and firmly anchored as specified in the contract documents and/or according to manufacturer's recommendations on areas that have been shaped, graded and compacted to the lines and grades shown in the contract documents to ensure good surface contact. RECPs should not be placed on frozen ground. If weather conditions dictate, RECPs may be placed on frozen ground, and will provide some protection until the ground thaws and/or a more appropriate solution can be installed. RECPs placed on frozen ground will likely require additional work when the ground thaws and conditions allow. The Contractor is responsible for caring for the areas where RECPs have been placed until disturbed by subsequent work operation or phase, acceptance of the contract or acceptance of the turf, whichever is later.

When RECPs are delivered to the contract site, check the label on the container to verify that the material appears on the Approved List. If the RECP is not labeled, reject it. The EIC must remove a sample approximately 3 in x 5 in (75 mm x 125 mm) and submit the sample to the CEC. The CEC will physically and visually compare the sample to a reference sample to verify that the material provided is the material that was tested and approved. If there is a visual or physical discrepancy, the material is not to be accepted until the manufacturer can verify that the material is on the Approved List.

4.  Soil Stabilizers
Class IV products (soil stabilizers) do not require submission of samples or labels. Soil stabilizers are sprayed on products that bind soil particles together to prevent erosion, and should be applied in accordance with the manufacturer's recommendations.
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5. Turf Reinforcement Mats (TRMs)
A Turf Reinforcement Mat (TRM) is a long term, non-degradable RECP composed of Ultra-Violet stabilized non-degradable, synthetic fibers, nettings, and/or filaments processed into three dimensional reinforcement matrices.

TRMs are typically used in applications such as high flow ditches and channels, steep slopes, stream banks, and shorelines where erosive forces may exceed the limits of natural, unreinforced vegetation or in areas where limited vegetation establishment is anticipated. To establish vegetation, the prepared seedbed and TRM should be protected using practices to divert the runoff away from the TRM, such as a top of slope berm or pipe slope drain.

B. Linear Measures (Standard Sheet M209-1)
When used near the toe of slope, the preferred location for a linear measure is 10 ft (3 m) out from the toe of slope. This provides a flat area for sediment to accumulate and room for a machine (dozer, bucket loader, etc) to operate behind the feature to remove accumulated sediment. Linear measures are not intended to be filters, they are intended to trap sediment by impounding water against the measure and allowing sediment to settle out.

1. Silt Fence
Silt fence geotextiles and silt fence assemblies are listed on the Approved List separately. Silt fence assemblies are supplied pre-assembled, and have a variable post spacing that takes into account the fabric and mesh strength. Silt fences may also be constructed from approved fabric, stakes, mesh and wire. The bottom edge of a silt fence must be buried a minimum of 6 in (150 mm) in the ground, backfilled and compacted. An effective technique to properly install silt fence is to cut a narrow trench with a trenching machine, drive the stakes through the ditch, and then backfill the edge of the fabric. The stakes must be on the downstream side of the fabric to allow the fabric edge to be properly buried, and so that the stakes can support the silt fence when sediment or water push against the fence.

2. Strawbale Dike
Bales have an estimated design life of three months, and need to be systematically monitored, evaluated and replaced. Bales should be replaced through the life of the contract, or until the slopes are stabilized. Bales must be embedded in the soil a minimum of 4 in (100 mm), with the cut ends of the straw vertical, and be forced firmly together during placement.

3. Check Dams (Standard Sheet M209-2)
Check dams are placed in a channel to reduce the hydraulic gradient, and therefore the velocity of water flowing down the ditch; the purpose is not to filter sediments out of the water. It is imperative to the proper function of check dams that they be constructed so that water flows over the center of the dam, and not around the check dam, (i.e. the center of the check dam must be lower than the outside of the dam) thereby increasing erosion. The crest elevation of a check dam should be approximately equal to the elevation of the toe of the upstream check dam (If the slope is so steep that the check dams are too close together, then alternatives, such as stone-lined swales or pipe slope drains, should be considered). Repairs should be made immediately to any damaged sections and accumulated sediment should be removed if the depth is greater than 6 in (150 mm) or equal to one-half the height of the control measure. Sediment should be placed in designated disposal areas and not allowed to flow into streams or drainage ways during structure removal. Replace stone or fabric in check dams as needed to maintain the designed cross section.

Stone Check Dams are the most effective type, and are constructed of light and fine stone fill. Smaller stone is used to fill the voids in the larger stone. Stone check dams must have a lower section in the ditch center, with scour protection of geotextile or stone directly downstream to prevent localized erosion from water running over the check dam crest.
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Sand/Gravel Bag Check Dams are constructed of doubled sandbags filled with clean #1 stone or cushion sand, inversely inserted one into the second. Sand/Gravel bag check dams are effective where access by heavy equipment is not available. The bags can be placed by hand, and can be removed without causing further disturbance.

Prefabricated Check Dams can be used like other types of check dams, but, due to the light weight material, it can be used in remote or steep locations that are not accessible by construction equipment. Similar to other check dams, prefabricated check dams need to be properly installed, and can easily fail if water is allowed to run under or around the check dam.

Silt Fence Check Dams must have a low section in the ditch center, with scour protection of geotextile or stone directly downstream. This allows water to pond behind the check dam, then flow over the low section. The elevation of the low point must be lower than the elevation at the ends to prevent water from pooling behind the dam and flowing around the ends, which will cause erosion to the sides of and below the check dam. A silt fence check dam must be installed with the posts downstream, and the lower edge of the fabric buried and backfilled.

The pay item for silt fence check dams have been removed from Standard Specification 209, but still may be specified in existing construction projects. A silt fence check dam does not meet NYSDEC’s Technical Standards, so these practices should be replaced with another type of check dam.

Hay/Strawbale Check Dams are not effective and are not to be used.

C. Inlet Protection (Standard Sheet M209-03)
The primary purpose of inlet protection is to impound water around the inlet, allow sediment to fall out of suspension, and pass clean water into the inlet. The silt fence inlet protection must have a solid frame capable of holding water and sediment. The use of prefabricated silt fence assembly without additional wood framing, particularly around the top, will not be strong enough. Close attention should be given to the elevation of the top of the frame, as water will potentially pond to that elevation, and may flow over on to adjacent roadways or other areas.

D. Pipe Slope Drains (Standard Sheet M209-04)
The primary purpose of a pipe slope drain is to convey clean water from the top of a slope to the bottom without causing erosion. The pipes must be sufficiently water-tight to prevent leaking water from causing significant erosion, and must be stable enough to prevent the force of flowing water from displacing the pipe. The entrance may be constructed using a variety of methods; any method is suitable provided it channels water into the pipe without eroding the entrance or discharging water down the slope. The exit point of the pipe at the bottom must provide for discharge of flowing water without localized erosion.

E. Construction Entrances (Standard Sheet M209-05)
Construction entrances will typically be paid for if the entrances are shown in the contract documents. Construction entrances from Contractor staging areas and other locations selected by the Contractor or necessitated by operations at the Contractor's discretion should be constructed in the same manner, but no direct payment will be made for those installations.
F. Turbidity Curtains (Standard Sheet M209-06)
A turbidity curtain is generally used when construction activities occur within a waterbody or along its shoreline and is of short duration, generally less than one month. Turbidity curtains are not to be used across flowing watercourses, or on the edge of a rapidly flowing watercourse. A turbidity curtain should be inspected daily and repaired or replaced immediately when damaged or not functioning properly. If the curtain is oriented in a manner that faces the prevailing winds frequent checks of the anchorage should be made. A turbidity curtain should be used under constant head conditions (i.e. the water level must be the same on both sides of the curtain) and constant hydrostatic pressure conditions only. The use of turbidity curtain in tidal waters may require additional anchorage to prevent movement of the curtain with the tides.

G. Sediment Traps (Standard Sheet M209-07)
Periodic inspection and repair are required by the Contractor to correct damage. The Contractor is responsible for removal of accumulated sediment deposits. Repairs should be made immediately to any damaged sections and accumulated sediment should be removed if the depth is greater than or equal to \( \frac{2}{3} \) the height of the control measure.

III. SPDES REGULATORY BACKGROUND
In response to the 1987 amendments to the Clean Water Act, the US Environmental Protection Agency (EPA) promulgated rules for stormwater discharge from large construction sites (larger than 2 Ha [5 Ac]) under the National Pollutant Discharge Elimination System (NPDES) Phase I, issued in 1990. The Final Rule for NPDES Phase II, which addresses stormwater discharge from small construction sites (involving soil disturbances of 1 Ac (0.4 Ha) or more was issued in December 1999. The NPDES program is implemented in New York State by the NYS Department of Environmental Conservation (NYSDEC) under State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity, GP-0-08-001.

Coverage under the current SPDES permit is required for any construction contract that causes a soil disturbance of more than 1 Ac (0.4 Ha), or more than 5,000 sq ft (465 sq m) in the New York City East of Hudson Watershed. Milling or reconstruction of pavement is considered a disturbance if it reaches the bottom 6 in (150 mm) of granular base/subbase layer. The amount of disturbed area will be calculated during design and a Notice of Intent (NOI) will be submitted for coverage under a SPDES General Permit from the NYSDEC, if necessary. If contract modifications increase the soil disturbance to more than 1 Ac (0.4 Ha) within the right of way, the contract will require coverage under the SPDES General Permit, and operations that exceed the 1 Ac (0.4 Ha) limit should not begin until coverage is obtained. Because construction activities can often increase the amount of disturbance originally anticipated during design, the Department has the opportunity to gain coverage under the SPDES General Permit for projects with less than, but close to, the 1 Ac (0.4 Ha) threshold. In these cases, projects do not need to address the permanent stormwater management components of a Stormwater Pollution Prevention Plan (SWPPP). This allows construction staff the opportunity to have minor, temporary impacts that increase the total disturbance limit over 1 Ac (0.4 Ha) (because coverage under the SPDES General Permit has already been obtained a SWPPP has already been prepared) without changing the scope of the project.

A. SPDES GP-0-08-001 Definitions:
1. Owner or Operator. “The person, persons, or legal entity which owns or leases the property on which the construction activity is occurring; and/or an entity that has operational control over the construction plans and specifications, including the ability to make modifications to the plans and specifications.” This includes property within the contract limits, including that controlled by easement, occupancy and releases obtained by the Department to complete the contract work as designed in the contract documents. (Examples include permanent easements for drainage, temporary occupancies for grading at a toe of slope, and driveway/planting releases.)
2. Qualified Professional. “A person knowledgeable in the principles and practices of stormwater management and treatment, such as a licensed Professional Engineer, licensed Landscape Architect or other [NYSDEC] endorsed individual(s). Individuals preparing SWPPPs that require the post-construction stormwater management practice component must have an understanding of the principles of hydrology, water quality management practice design, water quantity control design, and, in many cases, the principle of hydraulics in order to prepare a SWPPP that conforms to the [NYSDEC]’s technical standard.”

3. Qualified Inspector. The Qualified Inspector is a person employed by the Department or a Consultant Inspector, and conducts site inspections for compliance with the SPDES General Permit. This is defined as a “person that is knowledgeable in the principles and practices of erosion and sediment control, such as a licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), licensed Landscape Architect, or other [NYSDEC] endorsed individual(s). It also means someone working under the direct supervision of the licensed Professional Engineer or licensed Landscape Architect, provided that person has training in the principles and practices of erosion and sediment control.” Inspectors (except for those persons who are a licensed Professional Engineer, licensed Landscape Architect, or CPESC) must have received 4 hours of training in proper erosion and sediment control principles no later than May 1, 2010, and must receive 4 hours of training every 3 years thereafter. Inspections of any post-construction stormwater management practice that include structural components must be performed by a licensed Professional Engineer. A Qualified Inspector can also be an EIC, CEC, or Environmental Specialist, provided they are a licensed Professional Engineer or licensed Landscape Architect, or under the supervision of a licensed Professional Engineer or licensed Landscape Architect.

4. Contractor/Subcontractor. The SPDES General Permit GP-0-08-001 is a generic statewide permit used by many parties, and encompassing many different circumstances. The permit does not recognize or address the legal differences and contractual relationships between the Department and Contractors, Subcontractors, Material Suppliers, Services, Utilities, etc.

5. Trained Individual. The Trained Individual conducts site inspections for maintenance of erosion and sediment control practices, in accordance with Section 209 of the Standard Specifications. This is defined as a “an employee from a contracting (construction) firm that has received 4 hours of training, which has been endorsed by the [NYSDEC], from a Soil and Water Conservation District, CPESC, Inc. or other [NYSDEC] endorsed entity, in proper erosion and sediment control principles no later than [May 1, 2010]. After receiving the initial training, the trained individual must receive 4 hours of training every 3 years.” This training requirement does not apply, to those persons who are a licensed Professional Engineer, licensed Landscape Architect, or CPESC. The Contractor is responsible to ensure that a Trained Individual be on site when soil disturbance activities occur.

6. Utilities. If a Utility is working within the contract limits before highway construction begins, SPDES permit coverage will need to be arranged, if required. If a Utility is working within the contract limits after a contract begins, the Utility will be considered a subcontractor by NYSDEC under the terms of the permit, and will be required to sign Form CONR 5 Contractor/Subcontractor SPDES Permit Certification (See Exhibit 209C). This does not, however, signify or enact any changes in the contractual relationships between the Department and third parties. If the utility refuses to sign the CONR 5, they should not be allowed to work within the right of way.
IV. CONTRACTS WITH SPDES Permit GP-0-08-001

A. Contractor/Subcontractor Certifications. In accordance with SPDES General Permit GP-0-08-001, the Owner (NYSDOT) “must identify the contractor(s) and subcontractor(s) that will be responsible for installing, constructing, repairing, inspecting and maintaining the erosion and sediment control practices included in the SWPPP; and the contractor(s) and subcontractor(s) that will be responsible for the construction of all post-construction stormwater management practices included in the SWPPP. The Owner or Operator must have each of these contractors and subcontractors identify at least one Trained Individual from their company that will be responsible for implementation of the SWPPP.” One Trained Individual must be on site on a daily basis when soil disturbing activities are being performed. Contract plans do not identify who will implement any given portion of the SWPPP, but that information is now included on Form CONR 5 Contractor/Subcontractor SPDES Permit Certification. The Contractor is responsible for completing the contract in accordance with the contract documents, including any work by a subcontractor. In order to comply with the conditions of the SPDES General Permit, the Contractor, as well as any subcontractor performing any activity that is a part of implementation of the SWPPP or any operation that causes a soil disturbance, must sign the CONR 5 prior to performing that activity.

B. Operations on Private Property. Contractor operations on private property, including spoil disposal areas, borrow areas, equipment staging areas and temporary batch plants are typically not included under the SPDES general permit coverage obtained by the Department prior to letting, because the Department does not meet the definition of “Owner or Operator” on these sites. Under the current definition of “Operator”, the Department may add coverage for areas abutting the right of way within the contract limits to the contract SPDES General Permit. For minor impacts (spoil areas, etc.) this should be considered.

For areas not abutting the right of way within the contract limits, or that have significant impacts, the Contractor must arrange for permit coverage for these areas through the landowner (the landowner must sign the Notice of Intent (NOI). If the impacts to the site are considered temporary, the required SWPPP will likely only include the Erosion and Sediment Control Plan for the site. The EIC should request a copy of the NOI submitted by the Contractor to NYSDEC, and any other permits required (Note that Contractors must comply with local land use regulations). The EIC need not receive nor review a copy of the SWPPP, and is not responsible to ensure periodic inspections have been performed. The EIC should receive a grading plan, if appropriate, and ensure that areas have been stabilized upon contract completion.

C. Borrow/Spoil/Staging Areas within the ROW. Areas within the right of way but outside the contract limits utilized for spoil areas will be included under the SPDES General Permit coverage obtained by the Department. If these areas are presented to NYSDEC during the permit review process as potential borrow/spoil/staging areas, with maximum limits, slopes, cover, etc. no further review by NYSDEC will be required. If these areas were not presented during the permit review, they may require notification and approval from NYSDEC. Contact the CEC for assistance with permit review/notification.

D. Disturbance Limits. The SPDES permit limits the amount of disturbance at any one time to 5 Ac (2 Ha) without notification of NYSDEC. When total disturbance exceeds 5 Ac (2 Ha) the Regional NYSDEC office must be notified, using Form HC 209 Notice to Disturb Greater Than 5 Ac of Soil (Exhibit 209F), and should include a sequencing plan that shows maximum amount of disturbance planned for each sequence and the locations of the planned cuts and fills. The SPDES General Permit defines both Temporary Stabilization and Final Stabilization.
E. Periodic Inspections. The Department must have inspections conducted by a Qualified Inspector at least once every 7 calendar days. When the amount of disturbance exceeds 2 Ha (5 Ac), the Qualified Inspector must inspect the project at least twice during a 7 calendar day period. If only two inspections are done in any one week, the inspections should be separated by a minimum of 2 full calendar days. Inspection reports are recorded on Form MURK 6 SPDES Stormwater Inspection Report (Exhibit 209A). It is also strongly suggested that inspections be conducted after rain events of ½ in (12 mm) or more in a 24 hour period. For these inspections done after rain events, it is not necessary that the Qualified Inspector complete the SPDES Stormwater Inspection Form unless there is a corrective action required by the Contractor. In this case, the form should be completed and transmitted to the Contractor for corrective action.

Although coverage under the SPDES General Permit is required for projects in the New York City East of Hudson Watershed with disturbances greater than 5000 sq ft (465 sq m), inspections by Qualified Inspectors are not required for projects that have a total disturbance of greater than 5000 sq ft (465 sq m) but less than 5 Ac (2 Ha).

The frequency of inspections can be reduced when soil disturbances have been temporarily suspended (e.g. winter shutdown) and existing disturbed areas have been temporarily stabilized. In this case, the NYSDEC must be notified using the Notice to Reduce Frequency of SPDES Site Inspections form (Exhibit 209F), and the Qualified Inspector must inspect the project site at least once every 30 calendar days.

F. Quality Assurance Inspections. When the Qualified Inspector is someone other than the CEC, it is recommended that the CEC or other knowledgeable staff periodically evaluate the quality of the inspections conducted by the Qualified Inspector to ensure that proper inspections are being conducted. These evaluations should occur one to three times per construction season; the frequency being dependant of the experience/training of the inspector and the complexity or sensitivity of the site.

G. Documentation ("Site Log Book"). Although not required by the SPDES General Permit, the Operator (Department) must maintain a “site log book” in the field office. The site log book must be a part of the Stormwater Pollution Prevention Plan (SWPPP), including Contractor/Subcontractor certifications, documented changes to the SWPPP approved by the Department, Engineer's Diary, Inspector's Daily Reports, periodic inspection reports, photographs, etc. as documentation of compliance with permit conditions. This documentation will be of particular importance if problems or water quality standard violations occur. This need not be a separate book, but rather may be a file of documentation already created. A list of pertinent documentation and where the information is contained may be helpful.

If NYSDEC requests a copy of the SWPPP, the Department must submit the SWPPP in both electronic (PDF format only) and paper format within 5 business days. The designer should provide the construction office with a PDF copy of the SWPPP, and if NYSDEC does make such a request, the construction office should make PDF copies of any subsequent additions or changes made to the SWPPP thereafter.

H. SWPPP Revisions. In order to stay in compliance with the SPDES General Permit, it is necessary to keep the SWPPP current. This is done by using the Form CONR 8 SPDES Stormwater Pollution Prevention Plan (SWPPP) Revision (Exhibit 209D).

There may be revisions to the SWPPP that will require that the Notice of Intent (NOI) be resubmitted to NYSDEC. Examples of such changes may include a significant increase in the amount of disturbed area or newly created impervious area, or a change in the type(s) or size(s) of post-construction stormwater management practices constructed.

If NYSDEC provides written notification to the Department that the SWPPP does not meet the minimum requirements of the SPDES General Permit, the Department has 14 days (or as indicated by NYSDEC) to make such changes and submit written notification that the requested changes have been made.
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I. Engineer's Field Office. Each field office should be equipped with a rain gauge. A copy of the SPDES General Permit, NOI (which was prepared and submitted to the NYSDEC prior to contract letting and revised during construction, as necessary), inspection reports, and an updated SWPPP must be kept at the Engineer's Field Office until the site has undergone final stabilization and the Notice of Termination (NOT) has been submitted to NYSDEC. These documents must be accessible during normal working hours to authorized persons conducting compliance inspections.

J. Terminating a SPDES Permit
After the Qualified Inspector has determined that the site has undergone final stabilization, all temporary erosion and sediment control structures have been removed, and all post-construction stormwater management practices have been constructed in conformance with the SWPPP, a NOT form must be submitted to the NYSDEC to cancel the SPDES permit coverage. The Qualified Inspector must sign the “Final Stabilization” and “Post-Construction Stormwater Management Practice(s)” certifications, and the EIC must sign the “Owner or Operator Certification”.

If the stormwater management practices were not constructed in accordance with the latest version of the SWPPP, the SWPP should be revised so that the SWPPP and the site conditions are consistent.

The NOT form, available from the NYSDEC web site, should be sent to the following address:

NYSDEC “Notice of Termination"
Bureau of Water Permits
625 Broadway
Albany, New York 12233-3505

V. INSPECTION/CERTIFICATION FORMS
A series of inspection/certification forms have been developed to facilitate permit compliance.

A. Form MURK 6 and MURK 6-1 SPDES Stormwater Inspection Report (Exhibits 209A)
This form is to be used when the Qualified Inspector evaluates the site, and compares the actual conditions to the SWPPP. The table is used to identify erosion and sediment control practices or stormwater management practices that require proper installation, maintenance, or replacement.

The lines on the reverse of this report form (“Describe Existing Deficiencies in the SWPPP“), are the place on the form to describe components of the SWPPP that might not be in compliance, in addition to the practices found on site.

The form must be signed and dated by the Qualified Inspector. The EIC may fill in the date when a copy is provided to the Contractor. The SPDES General Permit requires that the Contractor be notified of any corrective actions within one business day from the time of the inspection, and that the Contractor begin corrective actions within one business day of the notification.

The box(es) on the bottom of the form must be checked if continuation forms MURK 6-1 or MURK 6-2 are used.

B. Form MURK 6-1 SPDES Stormwater Inspection Report - Continuation (Exhibit 209B)
This form is to be used when the Qualified Inspector evaluates the site, and the table is not large enough to identify all the necessary erosion and sediment control practices or stormwater management practices that require proper installation, maintenance, or replacement.

The form must be initialed by the Qualified Inspector and attached to the Form MURK 6.

C. Form MURK 6-2 SPDES Stormwater Outlets to Waters of the US - Continuation (Exhibit 209C)
This form is to be used when the Qualified Inspector evaluates the site, and the table is not large enough to identify all the Outlets to Waters of the US, or additional space for narrative descriptions is needed.

The form must be initialed by the Qualified Inspector and attached to the Form MURK 6.
SECTION 209 SOIL EROSION AND SEDIMENT CONTROL

D. Form CONR 5 Contractor/Subcontractor SPDES Permit Certification (Exhibit 209D)
This form is used to record the required certification of the contractor and subcontractors that disturb soil or implement a component of the SWPPP. The certification is required by the permit, which is a part of the contract, and no subcontractor should be allowed to work until they have signed the certification.

E. Form CONR 8 SPDES Stormwater Pollution Prevention Plan (SWPPP) Revision (Exhibit 209E)
If significant revisions to the SWPPP are made during construction, whether at the request of the Contractor, Department personnel, or directed by NYSDEC, use Form CONR 8 to document who requested the revisions, the reasons the revisions were requested, what revisions were made, and by whom the revisions were made. Significant revisions include revisions that require a new or revised plan sheet, use of new or different control measures, or placement of control measures in new locations. Adjustment of control measure locations, addition of another check dam or extension of a line of silt fence are not significant revisions. A copy of this form should be filed in the Site Log Book. If the changes were directed in writing by NYSDEC, a copy should be sent to the local NYSDEC office that requested the changes.

F. Form HC 209 Notice To Disturb Greater Than 5 Acres of Soil (Exhibit 209F)
The SPDES General Permit requires written authorization from NYSDEC prior to disturbing more than 5 Ac (2 Ha) of soil. Because NYSDOT & NYSDEC have agreed that prior authorization is not required for NYSDOT projects, this notice must be sent to the appropriate NYSDEC regional office when it is known that construction activities will disturb greater than 5 Ac (2 Ha) of soil at any one time. Although this information may already be in the SWPPP and was specially noted when the NOI was transmitted to the NYSDEC Central Office, it is not likely that NYSDEC regional staff will have knowledge of this information.

G. Form HC 210 Notice To Reduce Frequency of SPDES Site Inspections (Exhibit 209G)
The SPDES General Permit allows the frequency of inspections to be reduced when soil disturbances have been temporarily suspended (e.g. winter shutdown) and existing disturbed areas have been temporarily stabilized. This form can be used to notify the NYSDEC that work on the project will be temporarily suspended and temporary stabilization measures have been applied to all disturbed areas.

The Qualified Inspector must conduct a site inspection at least once every 30 calendar days during this period. The standard site inspection frequency will resume when construction activities commence.

EXHIBITS
A Sample Form MURK 6 SPDES Stormwater Inspection Report
B Sample Form MURK 6-1 SPDES Stormwater Inspection Report - Continuation
C Sample Form MURK 6-2 SPDES Stormwater Outlets to Waters of the US - Continuation
D Sample Form CONR 5 Contractor/Subcontractor SPDES Permit Certification.
E Sample Form CONR 8 SPDES Stormwater Pollution Prevention Plan (SWPPP) Revision
F Sample Form HC 209 Notice to Disturb Greater than 5 Acres of Soil
G Sample Form HC 210 Notice to Reduce Frequency of SPDES Site Inspections
SECTION 610  TURF AND WILDFLOWER ESTABLISHMENT

I. GENERAL.
The inspections of plant materials should be coordinated with the Regional Landscape Architect (RLA). Testing is done by the Geotechnical Engineering Bureau (GEB) or an independent soils laboratory. Supplemental Landscape requirements may be specified in the contract proposal.

II. INSTALLATION.
If topsoil is acquired from approved sites that are designated in the contract documents, sampling and testing of the material is not required. Ensure that topsoil is not contaminated during stripping and other handling operations. If approved sites for topsoil are not included in the contract documents, the material proposed for use as topsoil must be stockpiled, sampled and tested prior to use.

Topsoil in-place that was previously tested and found to be deficient in organic content or pH only may be amended in place, without further testing, prior to the placement of turf or wildflowers. Topsoil that has been amended to correct organic or pH deficiencies prior to placement must be sampled. Testing of pH requirements will not produce valid results for many months, and therefore acceptance may be based on a certification or documentation from an applicator indicating application rate and amendments applied. One sample is required per acre (0.4 Ha) of placed topsoil, or part thereof. Each composite sample should represent full depth samples of placed topsoil from approximately ten (10) locations per acre (0.4 Ha).

Turf or wildflower establishment begins with fine grading of the surfaces and scarification, if necessary, to loosen and aerate the soil. The placement of additional topsoil is not required unless specified. When seeding lawn areas, the topsoil must have debris, stones, etc. larger than 2 inch (50 mm) removed. This may be accomplished by screening, mechanical raking, or hand raking. Without screening, topsoil may be difficult to rake.

Seed is accepted on the basis of the type of seed, purity, and germination, as verified by the label on the seed bag(s). Seed must be uniformly applied, with appropriate mechanical or hydraulic equipment. Fertilizer may be applied concurrently with the seed. Mulch must be applied after seeding to retain moisture, provide erosion control, and keep out birds and other animals.

Turf or wildflower establishment is measured in surface area that has been satisfactorily seeded and should be paid for after the seed has been applied. After a suitable period of time, a satisfactory growth of grass or wildflowers must develop prior to contract acceptance or the Contractor should be directed to reseed. If the seeding occurs near the completion of a contract, and sufficient time to establish a satisfactory growth of grass is not available, an Uncompleted Work Agreement should be considered.
SECTION 612 SODDING

I. GENERAL.
Sod is used to quickly establish turf and prevent soil erosion. Sod is much more expensive than seeding, and is frequently used when roadsides in urban/suburban areas are residential or commercial lawns, public spaces, etc. Supplemental landscape development requirements may be specified in the contract proposal.

II. INSTALLATION.
Sources of sod must be made known to the Engineer at least 5 days before cutting and are subject to inspection and approval by the Engineer before cutting. Shipments of sod that arriving at a contract site must be accompanied by a certificate indicating compliance with the regulations of the NYS Department of Agriculture and Markets. The Contractor must exercise care to retain the soil existing on the roots of the sod during transporting, handling and transplanting operations.

Sod should be a mixture of permanent grasses; such as blends of bluegrasses, perennial ryegrasses and fescues. Monocultures are not acceptable unless so specified.

Sod installation begins with fine grading of the surfaces and scarification, if necessary, to loosen and aerate the soil. A minimum of 2 inches (50 mm) of topsoil under all sod is required unless otherwise specified. Verify that the soil on which sod will be laid is moist to a depth of 2 - 3 inches (50 - 75 mm). If the soil is not moist, the soil must be watered prior to placing sod, which is included in the cost of the sod item. Fertilizer must be applied at the stated rate. Refer to the fertilizer labels for percentage of nitrogen or other elements in order to determine the amount of fertilizer that should be applied.

Ensure that the sod which is not immediately planted is tightly rolled, or stored roots-to-roots. All sod in stacks must be kept moist and protected from the sun and from freezing. The maximum period of time from harvesting to planting shall not exceed 48 hours. Sod that is stored prior to planting shall meet the moisture requirements of §713-14 at the time of planting. Sod must not be placed if the sod is frozen, or if the topsoil under it is frozen.

After placement, sod must be pressed into the soil to ensure firm contact with the topsoil and eliminate air pockets, typically performed with a roller weighted with water. Sod placed on steep slopes must be anchored, typically with metal or plastic stakes. Ensure that stakes are driven flush to prevent damage to mowing equipment.

Ensure that the sod is watered after planting and remains watered until it is well established. Watering rate may be verified by measuring the total amount of water applied to a given area, or if water is applied uniformly via a static application or sprinkler, by placing and anchoring a plastic cup or rain gauge in the center of an area and measuring the depth in the cup. Lawn areas typically need approximately 1 inch (25 mm) of water per week, preferably in a single application. Overwatering is unnecessary, and potentially expensive.

Watering weekly for a minimum of 4 weeks after installation is included in the sod item. When the contract quantity exceeds 500 sq yds (400 sq m) watering, other than at the initial installation, is paid for separately. If contract quantities do not include the watering item, or the quantities are insufficient, additional watering should be considered extra work, in order to prevent expensive sod from dying out and having to be replaced. Once sod has become well established, additional watering should be unnecessary.
SECTION 625 SURVEY OPERATIONS, ROW MARKERS AND PERMANENT SURVEY MARKERS

I. GENERAL
All work associated with establishing or setting horizontal or vertical survey control, collecting survey field data or staking out field positions of proposed construction work, and preserving or stake out of land boundary markers is included under Survey Operations.

All work associated with the various types of Right of Way (ROW) Markers and the Permanent Survey Markers (PSM) includes providing the markers as specified to the site, installation, and certification of the location(s).

In accordance with NYS State Education Law, all work associated with boundary determinations or boundary monumentation can only be performed by or under the direction of a Licensed Professional Land Surveyor. Therefore, all locations of ROW Markers or PSMs can only be certified by a Licensed Professional Land Surveyor. (Certifications can also be submitted by exempt Licensed Professional Engineers as permitted under Article 145 of the NYS Education Law, but there are very few Engineers who still qualify under this exemption.)

II. INSTALLATION/CERTIFICATION
1. The Contractor installs the ROW Markers as per the standard sheet and to the required accuracy. PSMs are installed in accordance with the standard sheet at a location specified in the contract documents and the Acquisition Maps.
2. Inspectors should visually check the relative locations of the markers to other topographic features to verify their relative locations, such as proximity to ROW fencing, other ROW Markers, drainage structures, roadway pavement or sidewalks, or to adjacent property lines. If there seems to be a discrepancy with the location, ask the Surveyor to verify the location.
3. Within 30 days of installation, the Contractor submits to the Engineer, the appropriate marker certification form (See Exhibits 625A and 625B) which has been signed and sealed by a NYS Licensed Land Surveyor. The Engineer must forward the forms to the Regional Land Surveyor for approval of appropriate information. The Regional Land Surveyor must initial the approved certification form and return a copy to the Engineer. Upon receipt of the approved certification form, the Contractor will then be eligible to receive final payment for the markers.
4. The Engineer is responsible for placing the survey marker locations on the as-built drawings.
5. The Contractor must submit survey notes and calculations to the Engineer, prior to contract acceptance. (Transmittal of the notes and calculations may be in an electronic format.)

EXHIBITS
A  Sample Form HC 125  Permanent Survey Marker - Surveyor’s Certification
B  Sample Form HC 126  Right Of Way Markers - Surveyor’s Certification
PERMANENT SURVEY MARKER - SURVEYOR’S CERTIFICATION

D123456  PIN z987.65.321
Rte 123 Over the Hudson River
Village of Sulzdeld
Albany County
I.M. BUILDER

LAND SURVEYOR or EXEMPT P.E. SEAL
LICENSE No. ___ 654321 ___

CERTIFICATION
I hereby certify that the Permanent Survey Marker listed herein was installed in accordance with and to the degree of accuracy required by Section 625 of the Standard Specifications.

Name: G. Washington  Signature: G. Washington  Date: 11/01/08

STATE HWY (SH) NO. 123  NYS ROUTE NO. 7  CITY/TOWN/VILLAGE: East Oshkosh  COUNTY: Albany

NYS PLANE COOR. SYS. ZONE: EAST  NAME OF STATION (PSM NO.) 671

N = 43604.978  E = 222511.345

HORIZ. DATUM: NAD 1983 / (CORS 96)  DISTANCES & DIRECTIONS TO

COMBINED FACTOR: 0.999961314046  PRECEDING AND SUCCEEDING MARKERS

PSM NUMBER  DISTANCE (meters)  GRID BEARING

ELEV. = 164.486 meters  DATUM: NAVD 1988
BL 7090  190.270  N 82° 18' 38" W

BASELINE STA./OFF: 14+758.005 - 5.153 R
PSM 670  193.014  N 81° 40' 10" W

CENTERLINE STA./OFF: 5+456.391 - 2.281 R
BL 7091  173.514  S 85° 33' 51" W

DESCRIPTION (TO FIND MARKER):
BEHIND GUIDE RAIL SOUTH OF ROUTE 7 ±1 METER OFF EDGE OF PAVEMENT.
APPROXIMATELY 14 METERS SOUTHEAST OF ENTRANCE TO GOLF COURSE.
APPROXIMATELY 55 METERS NORTHWEST OF MILE MARKER 7 1325 2047

SKETCH OF MARKER (INCLUDING TIES)

NOTES: 1) THE FORM WILL BE MARKED WITH THE JOB STAMP.
2) SHOW NORTH ARROW AND DISTANCE TO NEAREST MILEPOST REFERENCE MARKER.
3) COORDINATES, DISTANCES AND ELEVATIONS SHALL BE CALCULATED AND NOTED TO NEAREST MILLIMETER.
4) ALL TIES ARE TO BE MEASURED HORIZONTALLY WITH A STEEL TAPE, UNLESS OTHERWISE NOTED.
5) SUBMIT FORM MARKED WITH AN ORIGINAL SIGNATURE AND STAMP OF THE LAND SURVEYOR’S SEAL.

ORIGINAL ACCEPTED BY REGIONAL LAND SURVEYOR RLS INITIALED COPY RETURNED TO ENGINEER FJC

February 2009  New York State Department of Transportation  Construction Inspection Manual  Exhibit 625A
RIGHT OF WAY MARKERS - SURVEYOR’S CERTIFICATION

D123456  PIN z987.65.321
Rte 123 Over the Hudson River
Village of Sulzdorf
Albany County
I.M. BUILDER

CERTIFICATION
I hereby certify that the Right of Way Markers listed herein were installed in accordance with and to the degree of accuracy required by Section 625 of the Standard Specifications.

<table>
<thead>
<tr>
<th>STATE HWY (SH) NO.</th>
<th>NYS ROUTE NO.</th>
<th>CITY/TOWN/VILLAGE</th>
<th>COUNTY:</th>
</tr>
</thead>
<tbody>
<tr>
<td>123</td>
<td>321</td>
<td>East Oshkosh</td>
<td>Albany</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PROPOSED</th>
<th>ACTUAL (AS BUILT)</th>
</tr>
</thead>
<tbody>
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<td></td>
<td></td>
</tr>
<tr>
<td>MAP NO.</td>
<td>BASELINE STATION</td>
</tr>
<tr>
<td>123</td>
<td>345+678.901</td>
</tr>
</tbody>
</table>

NOTES: 1) THE FORM WILL BE MARKED WITH THE JOB STAMP.
2) AS BUILT STATIONS AND OFFSETS SHALL BE LOCATED AND DIMENSIONED TO NEAREST MILLIMETER.
3) USE SEPARATE CERTIFICATION FORM FOR EACH STATE HIGHWAY.
4) SUBMIT FORM MARKED WITH AN ORIGINAL SIGNATURE AND INK STAMP OF THE LAND SURVEYOR’S SEAL.

ORIGINAL ACCEPTED BY REGIONAL LAND SURVEYOR  RLS INITIALED COPY RETURNED TO ENGINEER  EFC

Name: G. Washington  Signature: G. Washington  Date: 11/01/08
I. GENERAL
Petroleum storage tank closure involves emptying, purging/inerting, cleaning, removal and disposal of petroleum storage tanks; potential removal of contaminated soil; endpoint sample collection and analysis (if determined to be necessary); proper documentation of the work; and the submission of a tank closure report to NYSDEC. Incomplete tank closure often results in additional work and expense, particularly when closure must be obtained well after construction has been complete.

If a previously-unreported petroleum spill is discovered during construction, the contractor shall call the NYSDEC Spills Hotline (1-800-457-7362) within two hours of discovery of the spill.

II. SAFETY AND HEALTH
29 CFR 1910.120, Hazardous Waste Operations and Emergency Response, (HAZWOPER) requires that all persons directly involved in tank closure activities have 40-hour HAZWOPER training, updated annually with an 8-hour refresher, and at least one person on site is required to have supervisor training as per 29 CFR 1910.120(E)(4). Tank closure activities require a Project Safety and Health Plan (PSHP) that complies with both §107-05B. and 29 CFR 1910.120(b)(4).

III. MONITORING:
All tank closures will involve tank atmosphere monitoring. The atmosphere in the tank must be continually monitored for levels of explosive gas and oxygen. If contaminated soil is present; there is a potential for nuisance petroleum odors; or if the work is being performed in close proximity to residences, schools, or other sensitive receptors the work requires field organic vapor monitoring in accordance with §205-3.03.

![Fire Triangle](image)

Figure 1 – Fire Triangle

IV. TANK PURGING/INERTING
The atmosphere within the tank must be made inert (incapable of supporting combustion); otherwise the possibility of a violent explosion exists. The tank may be made inert by removing the fuel and/or oxygen sides of the “fire triangle” (Fig. 1, above). The third side (ignition source) should be minimized to the greatest extent possible before tank removal work can begin. Fuel vapors and oxygen are to be purged out of the tank by using dry ice, carbon dioxide or nitrogen. Positive ventilation is another option available to the contractor, providing that the engineer has given prior written approval. The positive ventilation option can be dangerous if it is performed improperly, and is not suited for dense urban areas.

When purging/inerting the tank, it is imperative that the tank’s vents be positioned at the top of the tank (the “12 o’clock position”). If the vents are not located at the 12 o’clock position, the portion of the tank located above the vents may contain an explosive atmosphere, even after purging/inerting has been performed.
V. ENDPOINT SAMPLE COLLECTION/LABORATORY ANALYSIS

Endpoint samples from the sidewalls and base of the tank pit are generally necessary in order to confirm the presence or absence of contamination from the tank, to confirm that contaminated soils have been satisfactorily removed, or to document the level of contamination that was left in place (e.g., because contamination extended beyond the limits of State-owned ROW, beyond project limits, because of structural concerns, etc.) Samples should not be collected until the intended limits of excavation have been reached.

Safety is paramount in the collection of endpoint samples. Sample collectors must exercise caution when entering the tank pit (which requires the Engineer’s authorization) or when standing next to the tank pit to collect samples with a shovel. The preferred method for collecting Endpoint samples is to direct the backhoe/excavator operator to pull soil from the sample location, place the bucket so that it rests on the ground, and allow the collector to sample from soil within the bucket.

In order to select the appropriate laboratory analyses for endpoint samples, the current/former tank contents must be determined. To the extent practical, this determination should be made during design and the appropriate analyses should be specified in the contract documents. In instances when the appropriate analyses have not been determined during design, a determination can be made in the field, preferably through consultation with on-site NYSDEC personnel. If NYSDEC personnel are not present, the endpoint samples should be analyzed according to the #2 fuel oil/diesel tank parameters.

Samples should be collected into laboratory provided glassware using dedicated latex or nitrile gloves to prevent cross contamination. After the sample jars are sealed, they should be placed into re-sealable plastic bags, keeping samples exhibiting signs of obvious contamination in separate bags from those exhibiting no signs of contamination. The samples should then be stored in a cooler with ice and delivered to a NYSDOH Environmental Laboratory Approval Program (ELAP) certified laboratory in accordance with sample hold-times and laboratory chain of custody procedures. Obtain a copy of the completed chain-of-custody form before the samples are taken off-site for delivery to the laboratory.

VI. NOTIFICATION OF NYSDEC

NYSDEC field personnel are often able to provide advice as to whether or not endpoint samples are necessary, or when significantly contaminated soil has been satisfactorily removed; therefore, every reasonable effort should be made to encourage NYSDEC to be on-site during tank removal activities. Appropriate NYSDEC personnel should be notified at least thirty (30) days prior to tank closure activities. For instances where tanks that are not identified during the design process are discovered during construction, NYSDEC should be called as soon as possible after discovery of the tank(s).

VII. DOCUMENTATION

All tank closure activities must be documented in order to demonstrate that the tank closure was conducted properly, and that all essential components of tank closure were performed. Complete a Tank Closure Form for each tank that is encountered during construction, and photograph each stage of closure activities. For each tank that is closed, the Department will submit a completed tank closure form, photographs, copies of analytical results, and documentation detailing the disposition of any removed tanks and contaminated soil to NYSDEC in order to obtain “official closure.” Incomplete documentation may result in additional work being required to obtain official closure and cause significant construction delays.

VIII. BACKFILLING

A significant portion of documentation activities require the tank pit to be open, therefore it is critical that the Engineer authorizes backfilling of the tank pit only after those documentation activities have been completed.

EXHIBITS

A  Sample Tank Closure Form
TANK CLOSURE FORM

CONTRACT INFORMATION

D #: D123456 Contractor Name: I. M. Builder

Site Address: 798 Route 123

City/Town: Albany County: Albany

TANK INFORMATION

Tank #: 001

Depth to Top of Tank: 4.0 Feet

Depth to Invert (bottom) of tank: 10.0 Feet

Tank Capacity: 5,000 Gallons

Tank Type: Steel ☒ Fiberglass - Reinforced Plastic ☐ Other ☐

Product: ☐ Gasoline ☐ #2 Fuel Oil / Diesel ☐ Waste Oil ☒ Other ☐

Volume of Product Removed from Tank: 300 Gallons

Volume of Water Removed from Tank: 700 Gallons

Liquid Disposal Facility: Liquids R Us, Troy, NY

Condition of Tank: ☐ Sound ☐ Corroded / Damaged but Intact ☒ Not Intact

Method used to Inert Tank: ☒ Dry Ice ☐ CO₂ Gas ☐ N₂ Gas ☐ Positive Ventilation

Make / Model of Explosion Meter / CGI Used: Rae Systems QRae Plus Oxygen Meter/CGI

Make / Model of O₂ Meter Used: Rae Systems QRae Plus Oxygen Meter/CGI

Inspector's Signature: ________________________________ Date Prepared: December 08, 2008
TANK CLOSURE FORM

REMOVAL INFORMATION

Was there a Leak / Spill?  ☒ Yes  ☐ No

If Yes, Provide NYSDEC Spill #:  0812345

If Yes, How Much Soil was Removed?:  250  ☒ CY  ☐ Ton

Soil Disposal Facility:  The Dirt Merchant, Schenectady, NY

Was Groundwater (GW) Encountered?  ☒ Yes  ☐ No

If Yes, Provide Depth to GW:  7.0  Feet

If Yes, and There Was a Spill / Leak, Did Groundwater Appear Contaminated?:  ☒ Yes  ☐ No

Were NYSDEC Personnel On-Site During Tank Closure?:  ☒ Yes  ☐ No

Name(s) of NYSDEC Field Personnel:  Tom Conservation

Were Endpoint Samples Collected?:  ☒ Yes  ☐ No

Analytical Parameters Requested (Check All That Apply):

☒ VOCs (8021 STARS List)  ☐ VOCs (8260 Full List)  ☒ PAHs / BNs (8270)
☐ SVOCs / BNAs (8270)  ☐ RCRA Metals  ☐ PCBs (8082)
☐ Other

Laboratory:  Retriever Labs

ELAP Certification #:  12345

Was Tank Cleaned On Site Prior to Disposal?:  ☒ Yes  ☐ No

If No, Name of Permitted Hauler Transporting Tank:

Was Wastewater, Waste Solvent or Other Regulated Waste Generated During Cleaning?:  ☒ Yes  ☐ No

If Yes, Disposal Facility:  Liquids R Us, Troy, NY

Ultimate Disposition of Tank:  Bob's Scrap Yard, E. Greenbush, NY

(Name of Facility / Firm)
NOTICE TO DISTURB GREATER THAN 5 ACRES OF SOIL
SPDES GENERAL PERMIT GP-0-08-001

Part II.C.3 of the SPDES General Permit for Stormwater Discharges from Construction Activity, GP-0-10-001, requires written authorization from the New York State Department of Environmental Conservation (NYSDEC) prior to disturbing more than 5 AC of soil. Executive management at the New York State Department of Transportation (NYSDOT) and NYSDEC have mutually agreed that prior authorization is not required for NYSDOT contracts, provided adequate control measures are implemented and site inspections are conducted in accordance with the SPDES General Permit. The NYSDOT hereby notifies NYSDEC that more than 5 AC of soil will be disturbed at this site.

A Qualified Inspector will conduct at least 2 site inspections every 7 calendar days whenever more than 5 AC of soil has been disturbed. Inspections during this period will be separated by a minimum of 2 full calendar days.

This notification will be filed with the Stormwater Pollution Prevention Plan (SWPPP).

Contract No.: _______________  PIN: _______________

Description: __________________________________________

Town, Village, City: ______________________________________

County: _______________________________________________

Approximate date soil disturbance will exceed 5 AC: __________________________

Total soil disturbance: ______________________________________

Signature ___________________________________________________

Name: ____________________________________________________

Title: _____________________________________________________

Phone: ___________________________________________________

E-Mail: ___________________________________________________

Date Submitted to NYSDEC: _________________________________
NOTICE TO REDUCE FREQUENCY OF SPDES SITE INSPECTIONS
SPDES GENERAL PERMIT GP-0-10-001

In accordance with Part IV.C.2.c of the SPDES General Permit for Stormwater Discharges from Construction Activity, GP-0-10-001, the New York State Department of Transportation hereby notifies the New York State Department of Environmental Conservation that work on this contract will be temporarily suspended and temporary stabilization measures have been applied to all disturbed areas.

A Qualified Inspector will conduct a site inspection at least once every 30 calendar days during this period. The standard site inspection frequency will resume when construction activities recommence.

SPDES Permit Identification #NYR10 ______________________

Contract No.: ______________________  PIN: ______________________

Description: ______________________________________________________________

Town, Village, City: _________________________________________________________

County:  _________________________________________________________________

Reason for temporary suspension of work:
☐ Winter Shutdown
☐ Other _________________________________________________________________

Approximate date work will be suspended: ________________________________

Approximate date work will resume: ________________________________

Signature ________________________________

Name: __________________________________________

Title: __________________________________________

Phone: ________________________________________

E-mail: _______________________________________

Date Submitted to NYSDEC: ________________________________
This inspection and maintenance form is to be used on contracts covered by SPDES General Permit for Construction Activity (GP-08-001). The completed inspection form must be filed in the Engineer’s Field Office.

Reason for this Inspection:  
- Standard 7 calendar day inspection
- Subsequent inspection in 7 calendar day period due to soil disturbance exceeding 2 Ha
- Received 12mm or more of rain in a 24 hour period

Codes for erosion and sediment control measures to be inspected: [Use the following codes in the table below] (1) mulch, (2) seed and mulch, (3) check dams, (4) strawbales, (5) silt fence, (6) sediment trap, (7) turbidity curtains, (8) pipe slope drains, (9) drainage structure inlet protection, (10) rolled erosion control products, (11) soil stabilizers, (12) construction entrances, (13) pipe inlet/outlet protection, (14) water diversion structures, (15) sedimentation basins, (16) cofferdams, (17) Other

List ONLY those erosion & sediment control and/or stormwater management practices that require repair, maintenance, reinstallation or replacement.

<table>
<thead>
<tr>
<th>ID</th>
<th>Location of Practice (Use stations or descriptions)</th>
<th>Practice</th>
<th>Describe Specific Maintenance Required (Including sediment removal, replacement or installation of practice)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1-000 10m RT</td>
<td>T</td>
<td>Remove Sediment</td>
<td>Remarks go here</td>
</tr>
<tr>
<td>2</td>
<td>1-050 12m RT</td>
<td>T</td>
<td>Remove Sediment</td>
<td>Remarks go here</td>
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<td>10</td>
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<td></td>
</tr>
</tbody>
</table>

Weather | Rain | Clear |
---|------|-------|
AM | 10°C | 12°C  |
PM | Wet  |       |
Have areas been disturbed or stabilized since the last inspection? □ Yes □ No
If YES, attach a location map showing all disturbed areas and areas stabilized since the last inspection.

Identify outlet points of stormwater from the site to Waters of the US (e.g., streams, rivers, lakes, wetlands, etc.) and describe the condition of the stormwater. Add Form MURK 6-2 (SPDES Stormwater Outlets to Waters of the U.S. - Continuation) as necessary.

<table>
<thead>
<tr>
<th>Location of Outlet (STA / OFFSET)</th>
<th>Type of Outlet (e.g., pipe, ditch, overland flow, etc.)</th>
<th>Is Runoff from Site Outletting to Waters of the US?</th>
<th>Describe Runoff (if any) (e.g., clear, turbid)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 1+300 18m RT</td>
<td>Pipe</td>
<td>Yes</td>
<td>Clear</td>
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<td>3 If the table is filled</td>
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<td>Use MURK 6-2 for continuation</td>
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</tbody>
</table>

Are more than 2 Ha of soil disturbed at this site at any one time?  Yes
If YES, was a notification form sent to NYSDEC?  Yes

Description of required maintenance and any existing deficiencies in the SWPPP: Specify each location using row ID number, if applicable

Qualified Inspector Name/Title (w/ Firm Name, If Consultant)

Qualified Inspector Signature:

Reviewed By:

Speedy Inspector

Prepared: 12/01/08
Copy to Contractor: 12/02/08

Engineer-in-Charge Date Reviewed: 12/02/08
Resident Engineer
Area Supervisor

MURK 6-1 SPDES Stormwater Inspection Report - Continuation attached.
MURK 6-2 SPDES Stormwater Outlets to Waters of the U.S. - Continuation attached.
Codes for erosion and sediment control measures to be inspected: [Use the following codes in the table below] (1) mulch, (2) seed and mulch, (3) check dams, (4) strawbales, (5) silt fence, (6) sediment trap, (7) turbidity curtains, (8) pipe slope drains, (9) drainage structure inlet protection, (10) rolled erosion control products, (11) soil stabilizers, (12) construction entrances, (13) pipe inlet/outlet protection, (14) water diversion structures, (15) sedimentation basins, (16) cofferdams, (17) Other

List ONLY those erosion & sediment control and/or stormwater management practices that require repair, maintenance, reinstallation or replacement.

<table>
<thead>
<tr>
<th>ID</th>
<th>Location of Practice (Use stations or descriptions)</th>
<th>Practice</th>
<th>Describe Specific Maintenance Required (including sediment removal, replacement or installation of practice)</th>
<th>Remarks</th>
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<tbody>
<tr>
<td>16</td>
<td>3+000 18m LT</td>
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<td>Remove Sediment</td>
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<td>Location of Practice (Use stations or descriptions)</td>
<td>Practice Code</td>
<td>Temp or Perm? (T,P or NA)</td>
<td>Describe Specific Maintenance Required (Including sediment removal, replacement or installation of practice)</td>
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Qualified Inspector Initials: ________________
SPDES STORMWATER OUTLETS TO WATERS OF THE U.S. - CONTINUATION

Identify outlet points of stormwater from the project site to Waters of the US (e.g. streams, rivers, lakes, wetlands, etc.) and describe the condition of the stormwater.

<table>
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<tr>
<th>Location of Outlet (STA / OFFSET)</th>
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<th>Describe Runoff (if any) (e.g. clear, turbid)</th>
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<tr>
<td>1 2+000/24m RT</td>
<td>Pipe</td>
<td>Yes</td>
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</tbody>
</table>

Description of required maintenance and any existing deficiencies in the SWPPP. Specify each location using row ID number, if applicable.

Use this area for additional narrative as required.
CONTR 5 (6/08)

Contractor / Subcontractor SPDES Permit Certification

Contract No.: D123456 PIN: 1234.56.789

Description: Rte 123 over Hudson River

Town, Village, City: Albany

County: ALBANY

Check Applicable Box: [ ] Prime Contractor [ ] Subcontractor

Name of Contractor/ Subcontractor: IM Builder

Address: 456 Main St

City: Sulfield State: NY ZIP: 12345

Phone: 518-123-4567

Core Pay Item Groups for which the Contractor/Subcontractor will be responsible (e.g. 203, 207, 209, etc.): 209 603 604

Mandatory Certification: The SPDES General Permit for Stormwater Discharges from Construction Activities (Permit No. GP-0-08-001) requires the Prime Contractor (and subcontractors) to certify they understand the Stormwater Pollution Prevention Plan (SWPPP), the General Permit conditions, and their responsibilities for compliance. The certification must be signed prior to performing any contract work. The certification shall be signed by an Owner, Principal, President, Secretary or Treasurer of the firm in accordance with the signature requirements of 102-05 Proposal Submission of the Standard Specifications.

I hereby certify that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the qualified inspector during a site inspection. I also understand that the owner or operator must comply with the terms and conditions of the New York State Pollutant Discharge Elimination System (SPDES) general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

Signature: __________________________ Date: October 31, 2008

Name: I. B. Builder Title: President

Effective April 30, 2010, the SPDES General Permit also requires the Prime Contractor to identify at least one trained individual who will be responsible for implementing the SWPPP and who shall be on-site on a daily basis when soil disturbance activities are being performed. (Prior training is not required if the trained individual is a licensed Professional Engineer, licensed Landscape Architect, or CPESC.) Provide the name and title of the trained individual who will be on-site and responsible for SWPPP implementation on this Contract:

Name/Title of Trained Individual: Speedy Inspector

Name of Training Course: ESC 101

Training Provider: Don Lake

Date of Training: October 31, 2008
SPDES STORMWATER POLLUTION PREVENTION PLAN
(SWPPP) REVISION

Date: October 29, 2008
Day of Week: S M T X T F S
Sheet No. 1 of 1

This form is to be used when revisions to the current Stormwater Pollution Prevention Plan (SWPPP) are required by SPDES General Permit for Construction Activity, GP-0-08-001. The completed form must be filed in the Engineer's Field Office.

Reason for the Revision(s): Revision(s) were requested by NYSDEC. ☒ Yes ☐ No

Ditchline from STA 2+000 to 2+120 has no temporary check dams shown. Work to reshape ditch disturbed surface, rain expected. Need to reduce runoff velocity in the ditch until the grass already planted has established enough to prevent erosion.

Describe the Revision(s) to the SWPPP:
Additional check dams along ditchline from STA 2+000 to 2+120 +/- 10m RT

Engineer-in-Charge Signature: ________________________________

EIICs Name & Title: ________________________________ I.M. InCharge

Date Completed: 10/28/08

Copy to Contractor: 10/29/08

February 2009

New York State Department of Transportation
Construction Inspection Manual

Exhibit 209E
1. The water depth to sediment is determined by taking two measurements with a stadia rod: one measurement from the manhole opening to the top of the sediment pile and the other from the manhole opening to the water surface. If the difference between these measurements is less than eighteen inches the system should be cleaned out. Note: To avoid underestimating the volume of sediment in the chamber, the measuring device must be carefully lowered to the top of the sediment pile.

2. For optimum performance, the system should be cleaned out when the floating hydrocarbon layer accumulates to an appreciable thickness. In the event of an oil spill, the system should be cleaned immediately.

3. The baffle chamber should be drawn down to a depth of three feet prior to beginning clean-out of the swirl chamber.
APPENDIX A

Site Location Map & Construction Plans
PROJECT LOCATION MAP

REPLACEMENT OF KOSCIUSZKO BRIDGE
KINGS AND QUEENS, NEW YORK
PIN x729.77
NOT TO SCALE
Figure 1
Kosciuszko Bridge Project Location

Source: USGS Quad Name: Brooklyn NY

1 inch equals 3,000 feet
NOTE:
1. FOR TRAFFIC INFORMATION BINDINGS BUILDING TO BE DEMOLISHED SEE DEMOLITION PLANS

STAGE 1
- TENDER OF PARTIALLY DEMOLISHED BUILDING AS REQUIRED
- INSTALL CAP ON PARCELS 1A, 2 AND 5A IN GROUND

LEGEND:
- BOUNDARY DEMOLITION
- PARTIAL BUILDING DEMOLITION
- ASHALT CAP

SCALE 1:500

2012

KOSCIUSKO BRIDGE PROJECT
CONSTRUCTION STAGING PLAN
STAGE 1

NEW YORK STATE DEPARTMENT OF TRANSPORTATION REASON TO ACT: DOCUMENT N/A.
### Construction Staging

<table>
<thead>
<tr>
<th>Contract / Phase</th>
<th>Stage</th>
<th>Description of Work</th>
<th>Erosion and Sediment Control Devices</th>
</tr>
</thead>
</table>
| Phase 1         | Stage 1 | ▪ Demolish existing buildings within the Right of Way acquired by NYSDOT  
▪ Construct asphalt caps and site access  
▪ Construct eastbound main span and eastbound approaches parallel to and on the eastbound side of the existing bridge | ▪ The Design-Builder shall utilize silt fence, temporary chain link fence, inlet protection, dust control, turbidity curtains, stabilized construction entrances, and silt sacks where required. |
|                 | Stage 2 | ▪ Construct Brooklyn and Queens connectors and LIE Interchange ramps  
▪ Transfer all traffic to the new eastbound structure  
▪ Improve Sergeant William Dougherty Playground | ▪ The Design-Builder shall utilize silt fence, temporary chain link fence, inlet protection, and dust control where required. |
|                 | Stage 3 | ▪ Demolish existing bridge approaches and main span | ▪ The Design-Builder shall utilize silt fence, temporary |
| Phase 2         | Stage 4 | ▪ Construct westbound main span (within footprint of existing structure) and westbound approaches  
▪ Transfer all westbound traffic to the new westbound structure  
▪ Complete local park and streetscape improvements. | ▪ The Design-Builder shall utilize silt fence, temporary chain link fence, inlet protection, and dust control where required. |

### Water Quality - Area breakdown by stage

<table>
<thead>
<tr>
<th>Stage</th>
<th>Staging Plan</th>
<th>Area contributing to Water Quality (Acres)</th>
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</table>
HEAD WALL DETAILS

CONCRETE NOTES

1. CONCRETE CONSTRUCTIONS SHALL CONFORM TO ACI 300, 305, 308, 315, 316, AND
   OTHER RELEVANT STANDARDS.

2. ALL CONCRETE SHALL MEET A MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI AT 28
   DAYS, SIMILAR TO AB-F, A-15, AND SMALL SCALE A BRICKWORK STANDARDS.

3. JOINTS SHALL BE OF DIMENSIONAL STONE OR CEMENT SURFACE, WITH A MINIMUM
   SPACE OF 1" BETWEEN JOINTS.

4. JOINT SEALANT SHALL BE A ONE-COMPONENT POLYURETHANE 'SIKAFLEX-1A' BY
   SIKA CHEMICAL CORPORATION OR APPROVED EQUAL.

5. JOINT SEALANT SHALL BE PLACED IN ALL CONNECTIONS AND SUBDUES UNLESS
   OTHERWISE SPECIFIED.

GENERAL NOTES

1. THE CONTRACTOR SHALL NOT SCALE THE DRAWINGS TO EXTENSION DESIGNS. ALL
   CONSTRUCTION SHALL BE CHECKED PRIOR TO ASSEMBLY OR CONSTRUCTION OF THE
   STRUCTURE.

2. THE CONTRACTOR SHALL VERIFY THE DIMENSIONS, DETAILS, MATERIALS, AND OTHER
   REQUIREMENTS OF THE CONTRACT WITH THE ENGINEER PRIOR TO CONSTRUCTION, AND
   NOTIFY THE ENGINEER IF ANY CHANGES OR MODIFICATIONS ARE NEEDED.

3. NO CONSTRUCTION JOINT SHALL BE MADE UNLESS SHOWN ON DRAWINGS OR
   APPROVED IN WRITING BY THE ENGINEER.

4. CONCRETE PROTECTION FOR REINFORCING BARS (UNLESS OTHERWISE NOTED):
   POZZOLAN CONTENT SHALL NOT EXCEED 20% BY WEIGHT OF CEMENT.

5. CONCRETE CONSTRUCTIONS SHALL CONFORM TO ACI 301, 305, 308, 315, 316, AND
   OTHER RELEVANT STANDARDS.

6. FOUNDATIONS SHALL BE PLACED ON SUBGRADE SOILS OR COMPOST STRUCTURAL GRANULAR FILL.

7. FOOTING DESIGN IS BASED UPON A NET ALLOWABLE SOIL BEARING CAPACITY OF
   2,000 POUNDS PER SQUARE FOOT FOR FOOTINGS BEARING ON APPROVED NATIVE
   SOILS AND 3,000 POUNDS PER SQUARE FOOT FOR FOOTINGS BEARING ON APPROVED
   NATIVE SOILS.

8. CONTRACTOR SHALL VERIFY THE FOUNDATION DESIGN WITH MATERIALS CLEAR TO CONSTRUCTION,
   AND ACCURATELY SPECIFIED ALTERNATIVE MATERIALS

9. ALL JOINTS SHALL BE ENCLOSED BY A CONCRETE JOINT SEALANT.

10. JOINT SEALANT SHALL BE ONE-COMPONENT POLYURETHANE 'SIKAFLEX-1A' BY
    SIKA CHEMICAL CORPORATION OR APPROVED EQUAL.

11. JOINT SEALANT SHALL BE PLACED IN ALL CONNECTIONS AND SUBDUES UNLESS
    OTHERWISE SPECIFIED.

12. JOINT SEALANT SHALL BE ONE-COMPONENT POLYURETHANE 'SIKAFLEX-1A' BY
    SIKA CHEMICAL CORPORATION OR APPROVED EQUAL.

13. USE ALTERNATIVE MATERIALS. WHEN REQUESTING SUCH APPROVAL, THE CONTRACTOR
    SHALL PROVIDE ADEQUATE AND DETAILED MANUFACTURER'S LITERATURE AND
    TECHNICAL DATA FOR EACH MATERIAL PRIOR TO ITS POTENTIAL USE.

14. MATERIALS SPECIFIED ON THE DRAWINGS AND/OR IN THE SPECIFICATIONS SHALL BE
    USED UNLESS THE CONTRACTOR OBTAINS WRITTEN APPROVAL OF THE ENGINEER TO
    USE ALTERNATIVE MATERIALS.

15. MATERIALS SPECIFIED ON THE DRAWINGS AND/OR IN THE SPECIFICATIONS SHALL BE
    USED UNLESS THE CONTRACTOR OBTAINS WRITTEN APPROVAL OF THE ENGINEER TO
    USE ALTERNATIVE MATERIALS.

16. NO EXCAVATION WORK MAY BEGIN UNTIL ALL UNDERGROUND UTILITIES HAVE BEEN
    IDENTIFIED AND MARKED.

17. CONTRACTOR SHALL NOT DERIVE SUPPORTS FROM EXISTING STRUCTURE TO
    SUPPORT THE DEAD AND SUPERIMPOSED LOADS. THE CONTRACTOR SHALL TAKE ALL
    NECESSARY PRECAUTIONS TO AVOID OVERLOADS, AND MAINTAIN AND INSURE THE
    INTEGRITY OF THE STRUCTURE AT ALL STAGES OF CONSTRUCTION.

18. SITE AND LOCATION PLANS, MARKOUTS AND ENGINEERING DRAWINGS SHALL BE
    SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL. THE CONTRACTOR SHALL
    PROVIDE ADEQUATE AND DETAILED MANUFACTURER'S LITERATURE AND TECHNICAL
    DATA FOR EACH MATERIAL PRIOR TO ITS POTENTIAL USE.

19. ELECTRICAL CABLE AND GROUNDING SYSTEMS NOT IDENTIFIED ON THE DRAWINGS
    SHALL BE REMOVED BEFORE THE CONCRETE HAS GAINED SUFFICIENT STRENGTH TO SAFELY
    SUPPORT THE DEAD AND SUPERIMPOSED LOADS. THE CONTRACTOR SHALL TAKE ALL
    NECESSARY PRECAUTIONS TO AVOID OVERLOADS, AND MAINTAIN AND INSURE THE
    INTEGRITY OF THE STRUCTURE AT ALL STAGES OF CONSTRUCTION.

20. IT IS THE DUTY OF THE CONTRACTOR TO VERIFY THE STABILITY AND SAFETY OF THE
    CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IF ANY CHANGES OR
    MODIFICATIONS ARE NEEDED.

21. THE CONTRACTOR SHALL NOT SCALE THE DRAWINGS TO EXTENSION DESIGNS. ALL
    CONSTRUCTION SHALL BE CHECKED PRIOR TO ASSEMBLY OR CONSTRUCTION OF THE
    STRUCTURE.
APPENDIX B

Soil Erosion and Sediment Control Details
TEMPORARY MULCH, ITEM 209.100101

**SLOPE PROTECTION NOTES**

1. All slopes shall be treated to stabilized grade and formed as soon as possible.

2. Permanent erosion control measures of seeding and mulching must be started within 90 days of initial seed treatment.

3. Any erosion cannot be completed within 15 days.

4. For additional, temporary, and permanent erosion control, information refer to the erosion control plans and supplemental erosion development specifications.

**TEMPORARY SLOPE TREATMENT TABLE**

<table>
<thead>
<tr>
<th>SLOPE PROTECTION REQUIREMENTS</th>
<th>FLAT SLOPES</th>
<th>STEEP SLOPES</th>
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<tbody>
<tr>
<td><em>a</em> Prior to any anticipated precipitation</td>
<td>TEMPORARY MULCH, ITEM 209.100101</td>
<td>TEMPORARY MULCH, ITEM 209.100101</td>
</tr>
<tr>
<td><em>b</em> No work on slopes for up to 14 consecutive days</td>
<td>TEMPORARY SEED AND MULCH, ITEM 209.100103</td>
<td>TEMPORARY SEED AND MULCH, ITEM 209.100103</td>
</tr>
<tr>
<td><em>c</em> No work on slopes for over 14 days to 60 days</td>
<td>TEMPORARY SEED AND MULCH, ITEM 209.100103</td>
<td>TEMPORARY SEED AND MULCH, ITEM 209.100103</td>
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<tr>
<td><em>d</em> Over 60 days</td>
<td>TEMPORARY SEED AND MULCH, ITEM 209.100103</td>
<td>TEMPORARY SEED AND MULCH, ITEM 209.100103</td>
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<tr>
<th>MATERIAlS</th>
<th>DESCRIPTION</th>
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<tr>
<td>ROLLED EROSION CONTROL PRODUCT, CLASS III TYPE B OR ITEM 209.190301, CLASS II TYPE C</td>
<td>IN LIEU OF TEMPORARY MEASURES</td>
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</table>

**Maintenance of Slope Protection Notes**

1. Maintenance of erosion controls and sediment controls shall be performed as required in accordance with this specification. The work shall be performed by the contractor within the time periods specified in the contract.

2. The contractor shall be responsible for maintaining the erosion and sediment controls in a manner that will prevent erosion and sediment from entering the waterways.

3. The work shall be performed in accordance with the appropriate erosion and sediment control plans.

4. The contractor shall be responsible for the proper installation and maintenance of the erosion and sediment controls.

5. The contractor shall be responsible for any damage or loss of erosion and sediment controls caused by the contractor or its agents.

6. The contractor shall be responsible for the cost of any repairs or replacement of erosion and sediment controls caused by the contractor or its agents.

**Temporary Mulch**

1. The contractor shall ensure that all erosion and sediment controls are properly installed and maintained.

2. The contractor shall be responsible for the cost of any repairs or replacement of erosion and sediment controls caused by the contractor or its agents.

3. The contractor shall be responsible for the cost of any damage or loss of erosion and sediment controls caused by the contractor or its agents.

4. The contractor shall be responsible for the cost of any damage or loss of erosion and sediment controls caused by the contractor or its agents.

5. The contractor shall be responsible for the cost of any damage or loss of erosion and sediment controls caused by the contractor or its agents.

6. The contractor shall be responsible for the cost of any damage or loss of erosion and sediment controls caused by the contractor or its agents.

7. The contractor shall be responsible for the cost of any damage or loss of erosion and sediment controls caused by the contractor or its agents.

8. The contractor shall be responsible for the cost of any damage or loss of erosion and sediment controls caused by the contractor or its agents.

9. The contractor shall be responsible for the cost of any damage or loss of erosion and sediment controls caused by the contractor or its agents.

10. The contractor shall be responsible for the cost of any damage or loss of erosion and sediment controls caused by the contractor or its agents.

**Additional Information**

1. All work shall be performed in accordance with the specifications and plans.

2. The contractor shall be responsible for the cost of any damage or loss of erosion and sediment controls caused by the contractor or its agents.

3. The contractor shall be responsible for the cost of any damage or loss of erosion and sediment controls caused by the contractor or its agents.

4. The contractor shall be responsible for the cost of any damage or loss of erosion and sediment controls caused by the contractor or its agents.

5. The contractor shall be responsible for the cost of any damage or loss of erosion and sediment controls caused by the contractor or its agents.

6. The contractor shall be responsible for the cost of any damage or loss of erosion and sediment controls caused by the contractor or its agents.

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8. The contractor shall be responsible for the cost of any damage or loss of erosion and sediment controls caused by the contractor or its agents.

9. The contractor shall be responsible for the cost of any damage or loss of erosion and sediment controls caused by the contractor or its agents.

10. The contractor shall be responsible for the cost of any damage or loss of erosion and sediment controls caused by the contractor or its agents.
ITEM NOS. 209.11----11 (PROPOSED) AND 209.12----11 (EXISTING)

SILTSACK® DETAIL INLET
PROTECTION FOR INLETS
IN PAVED AREAS
NOT TO SCALE
APPLICATION NOTES

A. THE PRIMARY PURPOSE OF A SILT FENCE OR STRAWBALE DIKE IS TO REDUCE
   BUFFER VELOCITY AND TRAP SEDIMENT. SEDIMENT TRAPED IN SLOPES IS THE MEASURE
   AND SEDIMENT FALLS OUT OF SUSPENSION.

B. THE FENCE OR DIKE SHOULD BE INSTALLED ON A LINE OF SIGHT
   TO PROVIDE ADEQUATE AREA FOR SEDIMENT STORAGE AND FACILITATE MAINTENANCE.
   MEASURES SHALL BE STAKED AND BUTTED.

C. STRAWBALE DIKE OR SILT FENCE SHALL NOT BE USED IN OR ACROSS A PLAINING
   CONTAINMENT OF AREAS OF CONCENTRATED FLOW.

GENERAL NOTES

1. SILT FENCE OR STRAWBALE DIKE SHALL BE STAKED A MINIMUM OF 18" FROM
   THE TOE OF SLOPE TO PROVIDE ENOUGH SPACE FOR SEDIMENT STORAGE AND FACILITATE MAINTENANCE.

2. POSTS MAY BE 2" X 2" HWIN WOOD, 3/8" X 3" HWIN STEEL, OR 2" X 4" HWIN STEEL.
   STAKED FOR THE PROVIDED SILT FENCE SHALL BE AS DESIGNATED ON THE
   DEPARTMENT APPROVED LIST FOR SILT FENCE.

3. BALES FOR SLOPE SHOULD BE INSTALLED WITH POSTS DIRECTED AND BALES BURIED A
   MINIMUM OF 4".

4. THE BOTTOM EDGE OF SILT FENCE SHALL BE INSTALLED A MINIMUM OF 4" BELOW
   SLOPE, TO PROVIDE ADEQUATE AREA FOR SEDIMENT STORAGE AND FACILITATE MAINTENANCE.
   SEDIMENT SHALL BE DISPOSED OF AS UNSUITABLE MATERIAL.

5. SEDIMENT SHALL BE REMOVED WHEN ACCUMULATION REACHES ONE-HALF OF THE MEASURE
   HEIGHT. SEDIMENT SHALL BE REMOVED FROM SEDIMENT CONTAINMENT AREA.

6. STRAWBALE DIKE - TEMPORARY SECTION
   AND LIMIT MAXIMUM SLOPE LENGTH (SEE NOTE 8)
   ADDITIONAL BALES PLACED TO LIMIT DRAINAGE AREA (SEE NOTE 7)

7. SEDIMENT SHALL BE REMOVED WHEN ACCUMULATION REACHES ONE-HALF OF THE MEASURE
   HEIGHT. SEDIMENT SHALL BE REMOVED AS UNSUITABLE MATERIAL.

8. THE FOLLOWING ARE MAXIMUM SLOPE LENGTHS TO THESE MEASURES:
   MAXIMUM DRAINAGE AREA TRIBUTARY TO 100'-0" OF STRAWBALE DIKE SHALL BE ' ACRE.
   MAXIMUM DRAINAGE AREA TRIBUTARY TO 100'-0" OF SILT FENCE SHALL BE ' ACRE.

9. INSTALLATION, MAINTENANCE, INSPECTION, EXCAVATION, FABRIC, AND COMPOST OF STRAWBALE TIES
   AND SILT FENCE SHALL BE PERFORMED IN THE UNIT PRICE BID FOR ITEM.
THE TOP OF THE INLET PROTECTION SHALL BE SET AT THE MAXIMUM DESIRED DRAINAGE LEVEL BASED ON FIELD LOCATION AND CONDITION.

APPLICATION NOTES:

1. Approved silo fence geotextiles are listed on the department's approved list. All materials shall be approved by the department before use.
2. Silo fence geotextiles shall be securely fastened to posts and frame.
3. Gravel bags shall be filled with clean stone rather than sand to prevent sediment from entering a drainage system if bags are damaged during use.
4. Gravel bags are filled with clean stone rather than sand to prevent sediment from entering a drainage system if bags are damaged during use.
5. Silt fence geotextile shall be securely fastened to posts and frame.
6. Posts and frame shall be driven at least 18" into ground. Wire mesh may be required for high-traffic areas to prevent uplift.
7. Silt fence geotextile shall be covered with a minimum of 6" of gravel to prevent erosion.

NOTES:

CROSS SECTION

DRAINAGE STRUCTURE INLET PROTECTION - TEMPORARY (GRAVEL BAG)

SILT FENCE GEOTEXTILE ATTACHED TO 2X4 nominal surface post

12" Mineral surface post

18" Flow

FLOW

PLAN

DRAINAGE STRUCTURE INLET PROTECTION - TEMPORARY (SILT FENCE)

SILT FENCE GEOTEXTILE ATTACHED TO 2X4 nominal surface post

12" Mineral surface post

18" Flow

FLOW

PLAN

CROSS SECTION

SILT FENCE GEOTEXTILE ATTACHED TO 2X4 nominal surface post

12" Mineral surface post

18" Flow

FLOW

STATE OF NEW YORK

DEPARTMENT OF TRANSPORTATION

U.S. CUSTOMARY STANDARD SHEET

APPROVED FEBRUARY 09, 2010

ISSUED UNDER EB 09-036

U.S. CUSTOMARY STANDARD SHEET

DRAINAGE STRUCTURE INLET PROTECTION

(SET 1 OF 2)

EFFECTIVE DATE: 09/02/2010

PAYMENT QUANTITIES

 INLET PROTECTION

<table>
<thead>
<tr>
<th>Protection</th>
<th>Gravel Bag</th>
<th>Silt Fence Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>15'</td>
<td>15'</td>
</tr>
<tr>
<td>B</td>
<td>15'</td>
<td>15'</td>
</tr>
<tr>
<td>C</td>
<td>15'</td>
<td>15'</td>
</tr>
<tr>
<td>D</td>
<td>15'</td>
<td>15'</td>
</tr>
<tr>
<td>E</td>
<td>15'</td>
<td>15'</td>
</tr>
<tr>
<td>F</td>
<td>15'</td>
<td>15'</td>
</tr>
<tr>
<td>G</td>
<td>15'</td>
<td>15'</td>
</tr>
<tr>
<td>H</td>
<td>15'</td>
<td>15'</td>
</tr>
<tr>
<td>I</td>
<td>15'</td>
<td>15'</td>
</tr>
<tr>
<td>J</td>
<td>15'</td>
<td>15'</td>
</tr>
<tr>
<td>K</td>
<td>15'</td>
<td>15'</td>
</tr>
<tr>
<td>L</td>
<td>15'</td>
<td>15'</td>
</tr>
<tr>
<td>M</td>
<td>15'</td>
<td>15'</td>
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<tr>
<td>N</td>
<td>15'</td>
<td>15'</td>
</tr>
<tr>
<td>O</td>
<td>15'</td>
<td>15'</td>
</tr>
<tr>
<td>P</td>
<td>15'</td>
<td>15'</td>
</tr>
<tr>
<td>Q</td>
<td>15'</td>
<td>15'</td>
</tr>
<tr>
<td>R</td>
<td>15'</td>
<td>15'</td>
</tr>
<tr>
<td>S</td>
<td>15'</td>
<td>15'</td>
</tr>
<tr>
<td>T</td>
<td>15'</td>
<td>15'</td>
</tr>
<tr>
<td>U</td>
<td>15'</td>
<td>15'</td>
</tr>
</tbody>
</table>

* Based on placement at bottom of pit slab on structure.
THE PRIMARY PURPOSE OF DRAINAGE STRUCTURE INLET PROTECTION IS TO PREVENT DAMAGE FROM RUNOFF IN A DRAINAGE SYSTEM BY STOPPING SEDIMENT FROM ENTERING THE STRUCTURE.

THE TOP OF THE INLET PROTECTION SHALL BE SET AT THE PROPOSED GRADE WATER LEVEL BASED ON FIELD LOCATION AND CONDITIONS.

APPLICATION NOTES:

1. SECURE THE ENDS OF THE APRON FOR THE PREFABRICATED DRAINAGE STRUCTURE INLET PROTECTION WITH STAPLES AS DETAILED IN THE PLAN VIEW OR AS RECOMMENDED BY THE MANUFACTURER'S LITERATURE.

2. MEASURES SHALL BE TAKEN TO PREVENT SEDIMENT FROM ENTERING THE STRUCTURE BY STOPPING SEDIMENT AS SOON AS IT ENTERS THE STRUCTURE. CUSTOMER MAY DIRECT THE MANUFACTURER TO PROVIDE ADDITIONAL MEASURES AS REQUIRED.

3. SEEPAGE HOLES SHALL BE COVERED WITH SEDIMENT FILTER MATERIAL TO PREVENT SEDIMENT FROM ENTERING THE SEDIMENT TRENCH.

4. SEDIMENT HOLES SHALL BE COVERED WITH SEDIMENT FILTER MATERIAL TO PREVENT SEDIMENT FROM ENTERING THE SEDIMENT TRENCH.

5. THE FABRICATION OF CONCRETE BLOCKS, SEDIMENT HOLES, SHALL BE COVERED WITH SEDIMENT FILTER MATERIAL TO PREVENT SEDIMENT FROM ENTERING THE SEDIMENT TRENCH.

6. DRAINAGE STRUCTURE INLET PROTECTION ALONGSIDE THE EXCAVATION. THE MANUFACTURER'S LITERATURE.

7. DRAINAGE STRUCTURE INLET PROTECTION - CONCRETE BLOCK

RECOMMENDATION: DRAINAGE STRUCTURE INLET PROTECTION WITH STAPLES AS DETAILED IN THE PLAN VIEW OR AS RECOMMENDED BY THE MANUFACTURER'S LITERATURE.

FOR THE DEPUTY CHIEF ENGINEER

RICHARD W. LEE, P.E.
APPLICATION NOTES:

A. The purpose of a stabilized construction entrance is to reduce or eliminate the tracking of sediment onto public rights of way.

1. Modifications may be required to match field conditions.

2. A 24" wide area shall be provided. Additional staging may be required to accommodate material.

3. Proposed drainage pipes shall be sized with sufficient capacity to carry ditch flows up to 50 MPH. Alternative ways of transporting ditch drainage across construction entrances may be proposed by the contractor for approval by the engineer.

4. The contractor shall provide a 24" stone or gravel entrance material for placement up to the edge of the pavement.

5. The contractor shall provide a 24" pipe that is not behind a roadside barrier.

6. LAYOUT diagrams, sections, and elevations of layout for a minor commercial entrance shall be on standard sheets titled "Temporary Entrance Layout".

7. Table 1 in this manual contains the minimum depth classification of materials that are used for construction entrance material.

8. Periodic maintenance may be required and cost of this maintenance will be included in the job price.

TABLE 1

<table>
<thead>
<tr>
<th>X</th>
<th>ENTRANCE SPEED CONDITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>&lt; 50 MPH</td>
</tr>
<tr>
<td>2</td>
<td>50 MPH - 70 MPH</td>
</tr>
<tr>
<td>3</td>
<td>70 MPH - 90 MPH</td>
</tr>
<tr>
<td>4</td>
<td>&gt; 90 MPH</td>
</tr>
</tbody>
</table>

NOTES:

1. MODIFICATIONS MAY BE REQUIRED TO MATCH FIELD CONDITIONS.

2. A 24" WIDE AREA SHALL BE PROVIDED. ADDITIONAL STAGING MAY BE REQUIRED TO ACCOMMODATE MATERI.

3. PROPOSED DRAINAGE PIPES SHALL BE SIZED WITH SUFFICIENT CAPACITY TO CARRY DITCH FLOWS UP TO 50 MPH. ALTERNATIVE WAYS OF TRANSPORTING DITCH DRAINAGE ACROSS CONSTRUCTION ENTRANCES MAY BE PROPOSED BY THE CONTRACTOR FOR APPROVAL BY THE ENGINEER.

4. THE CONTRACTOR SHALL PROVIDE A 24" STONE OR GRAVEL ENTRANCE MATERIAL FOR PLACEMENT UP TO THE EDGE OF THE PAVEMENT.

5. THE CONTRACTOR SHALL PROVIDE A 24" PIPE THAT IS NOT BEHIND A ROADSIDE BARRIER.

6. LAYOUT DIAGRAMS, SECTIONS, AND ELEVATIONS OF LAYOUT FOR A MINOR COMMERCIAL ENTRANCE SHALL BE ON STANDARD SHEETS TITLED "TEMPORARY ENTRANCE LAYOUT".

7. TABLE 1 IN THIS MANUAL CONTAINS THE MINIMUM DEPTH CLASSIFICATION OF MATERIALS THAT ARE USED FOR CONSTRUCTION ENTRANCE MATERIAL.

8. PERIODIC MAINTENANCE MAY BE REQUIRED AND COST OF THIS MAINTENANCE WILL BE INCLUDED IN THE JOB PRICE.
EBB STAKE OR ANCHOR EVERY 100 FT. MAX.
BARRIER MOVEMENT DUE TO TIDAL CHANGE
ANCHOR POINTS EVERY 100 FT. MAX.
WORK AREA

APPLICATION NOTES:
A. THE PURPOSE OF A TURBIDITY CURTAIN IS TO SEPARATE WORK AREAS IN OR ADJACENT TO PONDS, LAKES AND STREAMS, TO PREVENT SEDIMENTS FROM ENTERING THE WATERWAY.
B. TURBIDITY CURTAIN SHALL NOT BE PLACED ACROSS A POND OR STREAM.
C. TURBIDITY CURTAIN SHALL NOT BE PLACED ACROSS A BRIDGE LOCATION.

GENERAL NOTES:
A. THE TURBIDITY CURTAIN MAY BE APPLIED AT TIDAL LOCATIONS.
B. TURBIDITY CURTAIN SHALL BE A MINIMUM OF 100 FT. LONG FOR EACH SECTION OF CURTAIN APPLIED TO THE BANKS OR SHORE, AND EACH SECTION SHALL TERMINATE AT THE LIMIT OF DISTURBANCE.
C. TURBIDITY CURTAIN SHALL BE PLACED AS CLOSE TO THE WORK AS POSSIBLE WITHOUT INTERFERING WITH CONSTRUCTION OPERATIONS.
D. THE CONTRACTOR SHALL CONTINUOUSLY MONITOR THE INSTALLATION, TAKING INTO ACCOUNT WEATHER PATTERNS AND PREVAILING WIND DIRECTIONS THAT MAY AFFECT WATER LEVELS.
E. THE TURBIDITY CURTAIN SHALL BE REMOVED BY PULLING TOWARDS THE SHORE TO MINIMIZE THE EFFECT OF SEDIMENTS INTO THE WATERWAY.
F. THE WEIGHTED ANCHORING SYSTEM SHALL BE A TYPE THAT ALLOWS THE CURTAIN TO CONFORM TO THE CONTOUR OF THE BOTTOM ON THE WATERWAY.
G. THE TURBIDITY CURTAIN SHALL NOT BE PLACED ACROSS A FLOWING WATERWAY.
H. THE TURBIDITY CURTAIN SHALL BE PLACED AS CLOSE TO THE WORK AS POSSIBLE WITHOUT INTERFERING WITH CONSTRUCTION OPERATIONS.

PLAN
TYPICAL TURBIDITY CURTAIN LAYOUTS

FLOW VELOCITY ≤ 5 FT/S

FLOOD WAVE
WEIGHTED ANCHORING SYSTEM - SEE NOTE 6
EXISTING GROUND / WATER BANK
TO UNDISTURBED BOTTOM

SCHEDULE FOR WORK AT A BRIDGE LOCATION, BUT TURBIDITY CURTAIN MAY BE APPLIED AT OTHER LOCATIONS.
TURBIDITY CURTAIN SHALL BE A MINIMUM OF 100 FT. LONG FOR EACH SECTION OF CURTAIN APPLIED TO THE BANKS OR SHORE, AND EACH SECTION SHALL TERMINATE AT THE LIMIT OF DISTURBANCE.
TURBIDITY CURTAIN SHALL BE PLACED AS CLOSE TO THE WORK AS POSSIBLE WITHOUT INTERFERING WITH CONSTRUCTION OPERATIONS.
THE CONTRACTOR SHALL CONTINUOUSLY MONITOR THE INSTALLATION, TAKING INTO ACCOUNT WEATHER PATTERNS AND PREVAILING WIND DIRECTIONS THAT MAY AFFECT WATER LEVELS.
THE TURBIDITY CURTAIN SHALL BE REMOVED BY PULLING TOWARDS THE SHORE TO MINIMIZE THE EFFECT OF SEDIMENTS INTO THE WATERWAY.
THE WEIGHTED ANCHORING SYSTEM SHALL BE A TYPE THAT ALLOWS THE CURTAIN TO CONFORM TO THE CONTOUR OF THE BOTTOM ON THE WATERWAY.
EXISTING GROUND / WATER BANK
TO UNDISTURBED BOTTOM

SCHEDULE FOR WORK AT A BRIDGE LOCATION, BUT TURBIDITY CURTAIN MAY BE APPLIED AT OTHER LOCATIONS.
TURBIDITY CURTAIN SHALL BE A MINIMUM OF 100 FT. LONG FOR EACH SECTION OF CURTAIN APPLIED TO THE BANKS OR SHORE, AND EACH SECTION SHALL TERMINATE AT THE LIMIT OF DISTURBANCE.
TURBIDITY CURTAIN SHALL BE PLACED AS CLOSE TO THE WORK AS POSSIBLE WITHOUT INTERFERING WITH CONSTRUCTION OPERATIONS.
THE CONTRACTOR SHALL CONTINUOUSLY MONITOR THE INSTALLATION, TAKING INTO ACCOUNT WEATHER PATTERNS AND PREVAILING WIND DIRECTIONS THAT MAY AFFECT WATER LEVELS.
THE TURBIDITY CURTAIN SHALL BE REMOVED BY PULLING TOWARDS THE SHORE TO MINIMIZE THE EFFECT OF SEDIMENTS INTO THE WATERWAY.
THE WEIGHTED ANCHORING SYSTEM SHALL BE A TYPE THAT ALLOWS THE CURTAIN TO CONFORM TO THE CONTOUR OF THE BOTTOM ON THE WATERWAY.
EXISTING GROUND / WATER BANK
TO UNDISTURBED BOTTOM
APPENDIX C

Drainage Design Report and Plans
APPENDIX D

Vortechs Calculations and Details
ENGINEERING REPORT

TO:        Contech Engineered Solutions LLC
            200 Enterprise Drive
            Scarborough, ME 04074

DATE:      May 17, 2013
NO:        15126-1-0313-05
            (Revision 1)

ATTN:      Mr. Joshua Stackhouse
            Design Engineer – Stormwater Products

Re:        Review of Hydraulic Calculations and Standard Detail Drawings for a Vortechs® Parallel VX1319 Offline and a Vortechs® VX1522 Offline Stormwater Treatment System; Kosciuszko Bridge, Newtown Creek, Brooklyn/Queens, New York; CBC Report No. 15126-1-0313-05 (Revision 1)

We are pleased to submit our report for the above referenced project. The purpose of this report is to provide an evaluation of the hydraulic flow and oil storage calculations and standard detail drawings for the proposed Vortechs® systems at the above referenced project. We have evaluated the hydraulic calculations and oil storage calculations, and agree they conform with accepted industry standards for this product type. We have also evaluated the standard detail drawings regarding the oil storage capacity of the Vortechs® Parallel VX1319 and the Vortechs® VX1522 for there agreement with the Vortechs® System oil storage calculations provided to us. We have not made a review of the data used to perform the hydraulic design calculations, and are assuming all initial assumptions and data are correct as presented to us. No structural design calculations or details have been reviewed in conjunction with this project and others than CBC are responsible for the structural design. We have accordingly signed and sealed this report containing the hydraulic calculations and standard detail drawings, and they are attached in Appendix A of this report.

If you have any questions, please contact us.

Respectfully submitted,

CBC Engineers & Associates, Ltd.

William L. Delfino, P.E.
Senior Engineer

Mitchell T. Harper, P.E.
Chief Engineer

WLJ/MTH
Client (e-mail only j.stackhouse@conteches.com)
Jim Noll (e-mail only jnoll@conteches.com)
1-File

Dayton, OH    Lexington, KY    Hazard, KY    Charleston, WV    Harrisburg, IL
125 Westpark Road / Centerville, Ohio 45459 / Phone: 937-428-6150 / Fax: 937-428-6154
Visit us at www.cbceng.com
APPENDIX A

HYDRAULIC CALCULATIONS & STANDARD DETAIL DRAWINGS
Sizing Estimate

Provided by Joshua Stackhouse on May 16, 2013

Kosciuszko Bridge
Brooklyn/Queens, NY
Information provided by Eddie Recio, Hardey & Hanover

Site information:

<table>
<thead>
<tr>
<th>System</th>
<th>Area</th>
<th>Percent Impervious</th>
<th>Tc (min)</th>
<th>WQF - 90% Average Runoff Flow (CFS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brooklyn</td>
<td>21.422</td>
<td>92.73%</td>
<td>12.42</td>
<td>23.09</td>
</tr>
</tbody>
</table>

Sizing Summary:

The CONTECH Stormwater Solutions Vortechs® stormwater treatment system is a hydrodynamic separator designed to enhance gravitational separation of floating and settleable materials from stormwater flows. Stormwater flows enter the unit tangentially to the grit chamber, which promotes a gentle swirling motion. As stormwater circles within the grit chamber, pollutants migrate toward the center of the unit where velocities are the lowest. The majority of settleable solids are left behind as stormwater exits the swirl chamber. Stormwater flows are directed below a floatables baffle wall, where buoyant debris and hydrocarbons are removed.

<table>
<thead>
<tr>
<th>System</th>
<th>Vortechs Model</th>
<th>NYSDEC Approved Flow Rates (cfs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brooklyn</td>
<td>Parallel VX1319 offline</td>
<td>11.85 Each – 23.7 Total</td>
</tr>
</tbody>
</table>

Maintenance:
Like any stormwater best management practice, the Vortechs system requires regular inspection and maintenance to ensure optimal performance. Maintenance frequency will be driven by site conditions. Quarterly visual inspections are recommended, at which time the accumulation of pollutants can be determined. On average, the Vortechs system requires annual removal of accumulated pollutants.
Project: Kosciuszko Bridge - Newtown Creek
Location: Brooklyn/Queens, NY
Prepared For: Hardesty & Hanover

Purpose: To calculate the first flush runoff flow rate (WQF) over a given site area. In this situation the WQF to be analyzed is the runoff produced by the first 1.3" of rainfall.


Given:

<table>
<thead>
<tr>
<th>Structure Name</th>
<th>A (acres)</th>
<th>A (miles²)</th>
<th>Runoff Coefficient</th>
<th>Percent Imp. (%)</th>
<th>t_c (min)</th>
<th>t_c (hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brooklyn</td>
<td>21.422</td>
<td>0.03347</td>
<td>0.856</td>
<td>92.73</td>
<td>12.42</td>
<td>0.207</td>
</tr>
</tbody>
</table>

* Assumes runoff coefficient of 0.3 for pervious areas and 0.9 for impervious areas.

Procedure:
The Water Quality Flow (WQF) is calculated using the Water Quality Volume (WQV). This WQV, converted to watershed inches, is substituted for the runoff depth (Q) in the Natural Resources Conservation Service (formerly Soil Conservation Service), TR-55 Graphical Peak Discharge Method.

1. Compute WQV in watershed inches using the following equation:

\[ WQV = P \times R \]

where:
- \( P \) = design precipitation (inches) = (1.3" for water quality storm)
- \( R \) = volumetric runoff coefficient = 0.05 + 0.009(l)
- \( l \) = percent impervious cover

<table>
<thead>
<tr>
<th>Structure Name</th>
<th>Percent Imp. (%)</th>
<th>R</th>
<th>P (in)</th>
<th>WQV (in)</th>
<th>WQV (acre-ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brooklyn</td>
<td>92.73</td>
<td>0.856</td>
<td>1.3</td>
<td>1.150</td>
<td>0.005</td>
</tr>
</tbody>
</table>

2. Compute the NRCS Runoff Curve Number (CN) using the following equation, or graphically using Figure 2-1 from TR-55 (USDA, 1986):

\[ CN = 1000 \div [10+5P+10Q-10(Q^2+1.25QP)^{1/2}] \]

where:
- \( CN \) = Runoff Curve Number
- \( P \) = design precipitation (inches) = (1.3" for water quality storm)
- \( Q \) = runoff depth (watershed inches)

<table>
<thead>
<tr>
<th>Structure Name</th>
<th>Q (in)</th>
<th>CN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brooklyn</td>
<td>1.150</td>
<td>98.66</td>
</tr>
</tbody>
</table>

3. Using computed CN, read initial abstraction (I_a) from Table 4-1 in Chapter 4 of TR-55; compute I_a/P, interpolating when appropriate.

<table>
<thead>
<tr>
<th>Structure Name</th>
<th>I_a (in)</th>
<th>I_a/P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brooklyn</td>
<td>0.041</td>
<td>0.031538462</td>
</tr>
</tbody>
</table>
4. Compute the time of concentration ($t_c$) in hours and the drainage area in square miles. A minimum $t_c$ of 0.1 hours (6 minutes) should be used.

<table>
<thead>
<tr>
<th>Structure Name</th>
<th>$t_c$ (hr)</th>
<th>$A$ (miles$^2$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brooklyn</td>
<td>0.207</td>
<td>0.03347</td>
</tr>
</tbody>
</table>

5. Read the unit peak discharge ($q_u$) from Exhibit 4-III in Chapter 4 of TR-55 for appropriate $t_c$ for type III rainfall distribution.

<table>
<thead>
<tr>
<th>Structure Name</th>
<th>$t_c$ (hr)</th>
<th>$t_{IP}$</th>
<th>$q_u$ (csm/in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brooklyn</td>
<td>0.207</td>
<td>0.031538462</td>
<td>600</td>
</tr>
</tbody>
</table>

6. Substituting WQV (watershed inches) for runoff depth ($Q$), compute the water quality flow (WQF) from the following equation:

$$WQF = (q_u)^*(A)^*(Q)$$

where:
- $WQF$ = water quality flow (cfs)
- $q_u$ = unit peak discharge (cfs/m$^2$/inch)
- $A$ = drainage area (m$^2$)
- $Q$ = runoff depth (watershed inches)

<table>
<thead>
<tr>
<th>Structure Name</th>
<th>$q_u$ (csm/in)</th>
<th>$A$ (miles$^2$)</th>
<th>$Q$ (in)</th>
<th>$WQF$ (cfs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brooklyn</td>
<td>600</td>
<td>0.03347</td>
<td>1.150</td>
<td>23.05</td>
</tr>
</tbody>
</table>
Vortechns System Specifications:

- Width of Tank, \( w_i \): 13.0 ft
- Inside Height of Tank, \( h_i \): 7.0 ft
- Grit Chamber Radius, \( r_{gc} \): 6.5 ft
- Distance from grit chamber to baffle wall, \( l_b \): 1.50 ft
- Height of lower aperture in grit chamber, \( h_a \): 0.33 ft
- Distance from bottom of baffle wall to pipe invert, \( h_o \): 1.75 ft

Notation:

- \( A_{gc} \): Area of Grit Chamber, sf
- \( V_{gc} \): Volume of Oil Storage in Grit Chamber, cf
- \( V_o \): Volume of Oil Storage outside of Grit Chamber, cf
- \( O_c \): Oil Storage Capacity, cf and gallons

Calculations:

\[
A_{gc} = \pi \cdot r_{gc}^2
\]

\[
A_{gc} = 3.142 \cdot (6.5 \text{ ft})^2
\]

\[
A_{gc} = 132.7 \text{ sf}
\]

\[
V_{gc} = A_{gc} \cdot h_a
\]

\[
V_{gc} = 132.7 \text{ sf} \cdot 0.33 \text{ ft}
\]

\[
V_{gc} = 43.8 \text{ cf}
\]

\[
V_o = \left( (w_i \cdot h_o) \cdot (r_{gc}+ l_b) \right) - A_{gc} \cdot \left( h_o/2 \right)
\]

\[
V_o = \left( 13 \text{ ft} \cdot 1.75 \text{ ft} \right) \cdot (6.5 \text{ ft} + 1.5 \text{ ft}) - (132.7 \text{ sf} \cdot (1.75 \text{ ft}/2))
\]

\[
V_o = 65.8 \text{ cf}
\]

\[
O_c = V_{gc} + V_o
\]

\[
O_c = 43.8 \text{ cf} + 65.8 \text{ cf}
\]

\[
O_c = 109.7 \text{ cf}
\]

\[
O_c = 109.7 \text{ cf} \cdot 7.48 \text{ gal/cf}
\]

\[
O_c = 820 \text{ gallons}
\]

Conclusion:

The Oil Storage Capacity of a single Vortechns Model 1319 is 820 gallons. For this Dual System application, the Oil Storage Capacity is doubled to 1640 gallons.
VORTECHS SYSTEM

BYPASS MANHOLE

JUNCTION MANHOLE

VORTECHS SYSTEM

ACTUAL ORIENTATION AND LAYOUT MAY VARY DUE TO SITE SPECIFIC CONSIDERATIONS

This CAD file is for the purpose of specifying stormwater treatment equipment to be furnished by CONTECH Stormwater Solutions and may only be transferred to other documents exactly as provided by CONTECH Stormwater Solutions. Title block information, excluding the CONTECH Stormwater Solutions logo and the Vortechs Stormwater Treatment System designation and patent number, may be deleted if necessary. Revisions to any part of this CAD file without prior coordination with CONTECH Stormwater Solutions shall be considered unauthorized use of proprietary information.
Sizing Estimate

Provided by Joshua Stackhouse on May 15, 2013

Kosciuszko Bridge
Brooklyn/Queens, NY
Information provided by Eddie Recio, Hardesty & Hanover

Site Information:

<table>
<thead>
<tr>
<th>System</th>
<th>Area</th>
<th>Percent Impervious</th>
<th>Tc (min)</th>
<th>WQF - 90% Average Runoff Flow (CFS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Queens</td>
<td>11.575</td>
<td>100%</td>
<td>10.04</td>
<td>15.19</td>
</tr>
</tbody>
</table>

Sizing Summary:

The CONTECH Stormwater Solutions Vortechs® stormwater treatment system is a hydrodynamic separator designed to enhance gravitational separation of floating and settleable materials from stormwater flows. Stormwater flows enter the unit tangentially to the grit chamber, which promotes a gentle swirling motion. As stormwater circles within the grit chamber, pollutants migrate toward the center of the unit where velocities are the lowest. The majority of settleable solids are left behind as stormwater exits the swirl chamber. Stormwater flows then are directed below a floatables baffle wall, where buoyant debris and hydrocarbons are removed.

<table>
<thead>
<tr>
<th>System</th>
<th>Vortechs Model</th>
<th>NYSDEC Approved Flow Rates (cfs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Queens</td>
<td>VX 1522 offline</td>
<td>15.77</td>
</tr>
</tbody>
</table>

Maintenance:
Like any stormwater best management practice, the Vortechs system requires regular inspection and maintenance to ensure optimal performance. Maintenance frequency will be driven by site conditions. Quarterly visual inspections are recommended, at which time the accumulation of pollutants can be determined. On average, the Vortechs system requires annual removal of accumulated pollutants.
Project: Kosciuszko Bridge - Newtown Creek
Location: Brooklyn/Queens, NY
Prepared For: Hardesty & Hanover

Purpose: To calculate the first flush runoff flow rate (WQF) over a given site area. In this situation the WQV to be analyzed is the runoff produced by the first 1.3" of rainfall.


<table>
<thead>
<tr>
<th>Structure Name</th>
<th>A (acres)</th>
<th>A (miles²)</th>
<th>Runoff Coefficient</th>
<th>Percent Imp. (%)</th>
<th>t_c (min)</th>
<th>t_c (hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Queens</td>
<td>11.575</td>
<td>0.01809</td>
<td>0.90</td>
<td>100.00</td>
<td>10.04</td>
<td>0.167</td>
</tr>
</tbody>
</table>

* Assumes runoff coefficient of 0.3 for pervious areas and 0.9 for impervious areas.

Procedure: The Water Quality Flow (WQF) is calculated using the Water Quality Volume (WQV). This WQV, converted to watershed inches, is substituted for the runoff depth (Q) in the Natural Resources Conservation Service (formerly Soil Conservation Service), TR-55 Graphical Peak Discharge Method.

1. Compute WQV in watershed inches using the following equation:

\[ WQV = P \times R \]

where:
- \( WQV \) = water quality volume (watershed inches)
- \( P \) = design precipitation (inches) = (1.3" for water quality storm)
- \( R \) = volumetric runoff coefficient = 0.05 + 0.009(I)
- \( I \) = percent impervious cover

2. Compute the NRCS Runoff Curve Number (CN) using the following equation, or graphically using Figure 2-1 from TR-55 (USDA, 1986):

\[ CN = 1000 / \left(10 + 5P + 10Q - 10(Q^2 + 1.25QP)^{1/2}\right) \]

where:
- \( CN \) = Runoff Curve Number
- \( P \) = design precipitation (inches) = (1.3" for water quality storm)
- \( Q \) = runoff depth (watershed inches)

<table>
<thead>
<tr>
<th>Structure Name</th>
<th>Q (in)</th>
<th>CN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Queens</td>
<td>1.235</td>
<td>96.44</td>
</tr>
</tbody>
</table>

3. Using computed CN, read initial abstraction (I) from Table 4-1 in Chapter 4 of TR-55; compute \( I/P \), interpolating when appropriate.

<table>
<thead>
<tr>
<th>Structure Name</th>
<th>I (in)</th>
<th>I/P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Queens</td>
<td>0.041</td>
<td>0.031538462</td>
</tr>
</tbody>
</table>
4. Compute the time of concentration ($t_c$) in hours and the drainage area in square miles. A minimum $t_c$ of 0.1 hours (6 minutes) should be used.

<table>
<thead>
<tr>
<th>Structure Name</th>
<th>$t_c$ (hr)</th>
<th>$A$ (miles$^2$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Queens</td>
<td>0.167</td>
<td>0.01809</td>
</tr>
</tbody>
</table>

5. Read the unit peak discharge ($q_u$) from Exhibit 4-III in Chapter 4 of TR-55 for appropriate $t_c$ for type III rainfall distribution.

<table>
<thead>
<tr>
<th>Structure Name</th>
<th>$t_c$ (hr)</th>
<th>$I/P$</th>
<th>$q_u$ (csm/in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Queens</td>
<td>0.167</td>
<td>0.031538462</td>
<td>680</td>
</tr>
</tbody>
</table>

6. Substituting WQV (watershed inches) for runoff depth ($Q$), compute the water quality flow (WQF) from the following equation:

$$WQF = (q_u)^*(A)^*(Q)$$

where:

- $WQF = $ water quality flow (cfs)
- $q_u = $ unit peak discharge (cfs/m$^2$/inch)
- $A = $ drainage area (m$^2$)
- $Q = $ runoff depth (watershed inches)

<table>
<thead>
<tr>
<th>Structure Name</th>
<th>$q_u$ (csm/in)</th>
<th>$A$ (miles$^2$)</th>
<th>$Q$ (in)</th>
<th>WQF (cfs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Queens</td>
<td>680</td>
<td>0.01809</td>
<td>1.235</td>
<td>13.55</td>
</tr>
</tbody>
</table>
## Vortechs System Specifications:

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width of Tank, $w_c$</td>
<td>15.0 ft</td>
</tr>
<tr>
<td>Inside Height of Tank, $h_c$</td>
<td>10.0 ft</td>
</tr>
<tr>
<td>Grit Chamber Radius, $r_{gc}$</td>
<td>7.5 ft</td>
</tr>
<tr>
<td>Distance from grit chamber to baffle wall, $l_o$</td>
<td>2.67 ft</td>
</tr>
<tr>
<td>Height of lower aperture in grit chamber, $h_o$</td>
<td>0.33 ft</td>
</tr>
<tr>
<td>Distance from bottom of baffle wall to pipe invert, $h_c$</td>
<td>2.00 ft</td>
</tr>
</tbody>
</table>

## Notation:

- $A_{gc}$ = Area of Grit Chamber, sf
- $V_{gc}$ = Volume of Oil Storage in Grit Chamber, cf
- $V_o$ = Volume of Oil Storage outside of Grit Chamber, cf
- $O_c$ = Oil Storage Capacity, cf and gallons

## Calculations:

1. $A_{gc} = \pi * r_{gc}^2$
   - Calculate area of grit chamber
   - $A_{gc} = 3.142 * (7.5 \text{ ft})^2$
   - $A_{gc} = 176.7 \text{ sf}$

2. $V_{gc} = A_{gc} * h_s$
   - Calculate volume of oil storage in grit chamber
   - $V_{gc} = 176.7 \text{ sf} \times 0.33 \text{ ft}$
   - $V_{gc} = 58.3 \text{ cf}$

3. $V_o = ((w_c * h_c) * (r_{gc} + l_o)) - (A_{gc} * (h_o / 2))$
   - Calculate volume of oil storage outside of grit chamber
   - $V_o = ((15 \text{ ft} \times 2 \text{ ft}) * (7.5 \text{ ft} + 2.67 \text{ ft})) - (176.7 \text{ sf} \times (2 \text{ ft} / 2))$
   - $V_o = 128.4 \text{ cf}$

4. $O_c = V_{gc} + V_o$
   - Calculate oil storage capacity
   - $O_c = 58.3 \text{ cf} + 128.4 \text{ cf}$
   - $O_c = 186.7 \text{ cf}$

5. $O_c = 186.7 \text{ cf} \times 7.48 \text{ gal/cf}$
   - Convert oil storage from cf to gallons
   - $O_c = 1396 \text{ gallons}$

## Conclusion:

The Oil Storage Capacity of the Vortechs Model 1522 is 1396 gallons.

OSC 9/4/12
5/16/13

Ronald T. Roman, PE
Hardesty & Hanover
1501 Broadway,
New York, NY 10036

Re: Kosciuszko Bridge Stormwater Project Vortechs Systems Flow Rates

Dear Mr. Roman,

As requested, Contech would like to clarify the Vortechs model sizing for this project by providing the below calculations. NYSDEC relies on the NJDEP approval decisions and verified flows for BMPs, and NJDEP uses surface area scaling which means maintaining a constant hydraulic loading rate per square foot of treatment surface area. For the Vortechs we are approved for 40gpm/ft² in NJ. Further clarification of this can be seen in the enclosed email from Dr. Richard McGee who is the technical director for NJCAT. NJCAT is responsible for all of the technical review and issuing of technical reports that result in approvals for NJDEP. The calculations below use 40gpm/ft² as the hydraulic loading rate to calculate the maximum allowable flow rate for the model size. Cast-in-place systems or any precast system larger than the model 16000 are still designed using the approved hydraulic loading rate, and are approved for use in NJ.

By following the above described scaling criteria, Contech has provided two model sizes that will meet NJDEP sizing standards and are therefore also in conformance for NYSDEC approval for projects in NY.

For site designation “Queens”, Vortechs model 1522.

<table>
<thead>
<tr>
<th>Vortechs System Model</th>
<th>Grit Chamber Radius (ft)</th>
<th>Grit Chamber Area (ft²)</th>
<th>Design Flow Rate (cfs)</th>
<th>Hydraulic loading rate (gpm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1522</td>
<td>7.5</td>
<td>176.715</td>
<td>15.74</td>
<td>40</td>
</tr>
</tbody>
</table>

Formula:
Hydraulic Loading Rate * Grit Chamber Area / 449 = Design Flow Rate

\[
\frac{(40 * 176.715)}{449} = 15.74
\]
For site designation “Brooklyn”, Vortechs model 1319 (2 in parallel layout)

<table>
<thead>
<tr>
<th>Vortechs System Model</th>
<th>Grit Chamber Radius (ft)</th>
<th>Grit Chamber Area (ft²)</th>
<th>Design Flow Rate (cfs)</th>
<th>Hydraulic loading rate (gpm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1319</td>
<td>6.5</td>
<td>132.732</td>
<td>11.82</td>
<td>40</td>
</tr>
</tbody>
</table>

Formula:
Hydraulic Loading Rate * Grit Chamber Area / 449 = Design Flow Rate

\[
\frac{(40 \times 132.732)}{449} = 11.82
\]

Regards,

Joshua Stackhouse
Stormwater Design Engineer
Contech Engineered solutions, LLC
200 Enterprise Dr.
Scarborough, ME 04074

Encl: Email History: Cast in Place Vortechs Systems (CIP)
Stackhouse, Joshua

From: Richard S. Magee <rsmagee@rcn.com>
Sent: Saturday, November 18, 2006 7:32 AM
To: Berg, Derek; rsmagee@erols.com
Cc: 'Rhea Weinberg Brekke'; Ravi.Patraju@dep.state.nj.us
Subject: RE: Cast in Place Vortechs Systems (CIP)

Derek,

Since the hydraulics remain the same for all your units, whether precast or cast in place I see no reason the cast in place units designed at 40 gpm/ft² should be treated any differently then precast units with the same hydraulics. BOTTOM LINE: The cast in place units are acceptable if designed to the 40 gpm/ft² verified loading rate.

Let me know if more is needed.

Dick

P.S. I was on travel this week and am just getting home.

From: Berg, Derek [mailto:bergdm@contech-cpi.com]
Sent: Wednesday, November 15, 2006 1:25 PM
To: rsmagee@erols.com
Cc: Rhea Weinberg Brekke; Ravi.Patraju@dep.state.nj.us
Subject: Cast in Place Vortechs Systems (CIP)

Dr. Magee,

As we discussed yesterday, occasionally we are specified on a project that requires a Vortechs system larger then our precast sizes, which are limited in size due to shipping restrictions. All materials, geometries, and sizing remain the same, but the concrete is cast onsite as opposed to at the precaster. As long as the cast in place units are designed in accordance with the interim certification so that they do not exceed 40gpm during the water quality flow is it permissible for us to offer them in New Jersey? Ravi, has requested a response as soon as possible so he can provide guidance to DEP staff. Please let me know if you need any additional information.

Thanks,

Derek

Derek Berg
Regional Regulatory Manager - Northeast
Contech Stormwater Solutions
200 Enterprise Drive
Scarborough, ME
T: 207.885.9830  F: 207.885.9825
bergdm@contech-cpi.com
www.contechstormwater.com

Please note new company name and email address. Be sure to update your records.

The information contained in this message may be privileged and confidential, and protected from disclosure. If the reader of this message is not the intended recipient, or an employee or agent responsible for delivering this message to the intended recipient, you are hereby notified that any dissemination, distribution or copying of this communication is strictly prohibited. If you have received this communication in error, please notify us immediately by replying to the message and deleting it from your computer. Thank you CONTECH Stormwater Solutions Inc.
Derek Berg  
Regulatory Manager - Stormwater  
Contech Construction Products  
200 Enterprise Drive  
Scarborough, ME 04074

Re: Final Certification  
Vortechs Stormwater Treatment System by CONTECH Construction Products, Inc.

Expiration Date: July 15, 2011  
TSS Removal Rate: 50%

Dear Mr. Berg:

The Stormwater Management rules under N.J.A.C. 7:8-5.5(b) and 5.7(c) allow the use of manufactured treatment devices (MTDs) for compliance with the design and performance standards at N.J.A.C. 7:8-5 if the pollutant removal rates have been verified by the New Jersey Corporation for Advanced Technology (NJCAT) and have been certified by the New Jersey Department of Environmental Protection (NJDEP). CONTECH Construction Products, Inc. has requested a Final Certification for the Vortechs Stormwater Treatment System.

The certification process has been revised. The revised process places MTDs into five categories. The Vortechs Stormwater Treatment System by Contech Construction Products, Inc. has been qualified for Category IV, MTDs within the Testing portion of the NJCAT Verification Process as of May 15, 2009.

The NJDEP received the submitted data demonstrating the above approved TSS Removal Rate, a maintenance plan required under Category IV, and a signed statement by the NJCAT Technical Director and the manufacturer listing the indicating that the requirements of the July, 2003 TARP Tier II Protocol for Stormwater Best Management Practice Demonstration, 2006 Amendments to TARP Tier II Protocols, and June 28, 2006 Particle Size Distribution Requirements have been met. This certification is based solely on the documentation submitted and the verification of such documentation by NJCAT.

The NJDEP certifies the use of the CONTECH Construction Products, Inc. Vortechs Stormwater Treatment System at a TSS removal rate of 50%, subject to the following conditions:
1. The various models and associated water quality flow capacities shall be sized for the peak flow of the New Jersey Water Quality Design Storm per N.J.A.C. 7:8-5, as shown in Table 1: Vortechs Systems Water Quality Flow Rates for New Jersey.

   Table 1: Vortechs System Water Quality Flow Rates for New Jersey

<table>
<thead>
<tr>
<th>Vortechs System Model</th>
<th>Grit Chamber Radius (ft)</th>
<th>Grit Chamber Area (ft²)</th>
<th>Maximum Flow Rate (100 gpm/ft²) (cfs)</th>
<th>Design Flow Rate (40 gpm/ft²) (cfs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000</td>
<td>1.5</td>
<td>7.1</td>
<td>1.6</td>
<td>0.63</td>
</tr>
<tr>
<td>2000</td>
<td>2.0</td>
<td>12.6</td>
<td>2.8</td>
<td>1.12</td>
</tr>
<tr>
<td>3000</td>
<td>2.5</td>
<td>19.8</td>
<td>4.4</td>
<td>1.76</td>
</tr>
<tr>
<td>4000</td>
<td>3.0</td>
<td>28.3</td>
<td>6.3</td>
<td>2.5</td>
</tr>
<tr>
<td>5000</td>
<td>3.5</td>
<td>38.5</td>
<td>8.6</td>
<td>3.4</td>
</tr>
<tr>
<td>7000</td>
<td>4.0</td>
<td>50.3</td>
<td>11.2</td>
<td>4.5</td>
</tr>
<tr>
<td>9000</td>
<td>4.5</td>
<td>63.8</td>
<td>14.2</td>
<td>5.7</td>
</tr>
<tr>
<td>11000</td>
<td>5.0</td>
<td>78.5</td>
<td>17.5</td>
<td>7.0</td>
</tr>
<tr>
<td>16000</td>
<td>6.0</td>
<td>113.1</td>
<td>25.2</td>
<td>10.1</td>
</tr>
</tbody>
</table>
   
   Note that larger cast-in-place systems are available and should be sized not to exceed 40gpm/ft² grit chamber area during the water quality flow.

2. The Vortechs Stormwater Treatment System is certified as an off-line system only. Any flow above the New Jersey water quality design storm must be bypassed around the system.

3. A hydrodynamic separator, such as the Vortechs Stormwater Treatment System, cannot be used in series with another hydrodynamic separator to achieve an enhanced removal rate for total suspended solids (TSS) removal under N.J.A.C. 7:8-5.5.

4. The maintenance plan for the sites using this device shall incorporate at a minimum, the maintenance requirements for the Vortechs Stormwater Treatment System shown attached.

In addition to the attached, the detailed maintenance plan must include all of the items identified in Chapter 8: Maintenance of the New Jersey Stormwater Best Management Manual. Such items include, but are not limited to, the list of inspection and maintenance equipment and tools, specific corrective and preventative maintenance tasks, indication of problems in the system, and training of maintenance personnel.
Additional information regarding the implementation of the Stormwater Management rules N.J.A.C. 7:8 are available at www.njstormwater.org. Please contact Sandra Blick of my office at (609) 633-7021 if you have any questions.

Sincerely,

[Signature]

Ed Frankel, P.P., Section Chief
Bureau of Nonpoint Pollution Control

C:  Chron File
    Richard Magee, NJCAT
    Mark Pedersen, DLUR
    Elizabeth Dragon, BNPC
Vortechs® Maintenance

The Vortechs system should be inspected at regular intervals and maintained when necessary to ensure optimum performance. The rate at which the system collects pollutants will depend more heavily on site activities than the size of the unit, e.g., unstable soils or heavy winter sanding will cause the swirl chamber to fill more quickly but regular sweeping will slow accumulation.

Inspection

Inspection is the key to effective maintenance and is easily performed. Pollutant deposition and transport may vary from year to year and regular inspections will help ensure that the system is cleaned out at the appropriate time. Inspections should be performed twice per year (i.e. spring and fall) however more frequent inspections may be necessary in equipment washdown areas and in climates where winter sanding operations may lead to rapid accumulations. It is useful and often required as part of a permit to keep a record of each inspection. A simple inspection and maintenance log form for doing so is provided on the following page, and is also available on contechstormwater.com.

The Vortechs system should be cleaned when inspection reveals that the sediment depth has accumulated to within 12 to 18 inches (300 to 450 mm) of the dry-weather water surface elevation. This determination can be made by taking two measurements with a stadia rod or similar measuring device; one measurement from the manhole opening to the top of the sediment pile and the other from the manhole opening to the water surface. Note: To avoid underestimating the volume of sediment in the chamber, the measuring device must be carefully lowered to the top of the sediment pile. Finer, lighter particles at the top of the pile typically offer less resistance to the end of the rod than larger particles toward the bottom of the pile.

Cleaning

Cleaning of the Vortechs system should be done during dry weather conditions when no flow is entering the system. Cleanout of the Vortechs system with a vacuum truck is generally the most effective and convenient method of evacuating pollutants from the system. If such a truck is not available, a "clamshell" grab may be used, but it is difficult to remove all accumulated pollutants using a "clamshell".

In installations where the risk of petroleum spills is small, liquid contaminants may not accumulate as quickly as sediment. However, an oil or gasoline spill should be cleaned out immediately. Motor oil and other hydrocarbons that accumulate on a more routine basis should be removed when an appreciable layer has been captured. To remove these pollutants, it may be preferable to use absorbent pads to solidify the oil since these pads are usually much easier to remove from the unit individually and less expensive to dispose of than the oil/water emulsion that may be created by vacuuming the oily layer. Floating trash can be netted out if you wish to separate it from the other pollutants.

Cleaning of a Vortechs system is typically done by inserting a vacuum hose into the swirl chamber and evacuating this chamber of water and pollutants. As water is evacuated, the water level outside of the swirl chamber will drop to a level roughly equal to the crest of the lower aperture of the swirl chamber. The water outside the swirl chamber should remain near this level throughout pumping as the bottom and sides of the swirl chamber are sealed to the tank floor and walls. This "water lock" feature prevents water from migrating into the swirl chamber, exposing the bottom of the baffle wall and creating excess pump-out volume. Floating pollutants will decant into the swirl chamber as the water level is drawn down. This allows most floating material to be withdrawn from the same access point above the swirl chamber. Floating material that does not decant into the swirl chamber during draw down should be skimmed from the baffle chamber. If maintenance is not performed as recommended, sediment may accumulate outside the swirl chamber. If this is the case, it may be necessary to pump out other chambers. It is advisable to check for sediment accumulation in all chambers during inspection and maintenance.

These maintenance recommendations apply to all Vortechs systems with the following exceptions:

1. It is strongly recommended that when cleaning systems larger than the Model 16000 the baffle chamber be drawn down to depth of three feet prior to beginning clean-out of the swirl chamber. Drawing down this chamber prior to the swirl chamber reduces adverse structural forces pushing upstream on the swirl chamber once that chamber is empty.

2. Entry into a Vortechs system is generally not required as cleaning can be done from the ground surface. However, if manned entry into a system is required the entire system should be evacuated of water prior to entry regardless of the system size. Manhole covers should be securely seated following cleaning activities to prevent leakage of runoff into the system from above and also to ensure proper safety precautions. If anyone physically enters the unit, Confined Space Entry procedures need to be followed.

Disposal of all material removed from the Vortechs system should be done in accordance with local regulations. In many locations, disposal of evacuated sediments may be handled in the same manner as disposal of sediments removed from catch basins or deep sump manholes. Check your local regulations for specific requirements on disposal.

For assistance with maintaining your Vortechs system, contact us regarding the CONTECH Maintenance Compliance Certification Program.

![Image of Vortechs system](image-url)
# Vortechs Inspection & Maintenance Log

**Vortech Model:** ____________________________  **Location:** ____________________________

<table>
<thead>
<tr>
<th>Date</th>
<th>Water depth to sediment</th>
<th>Floatable Layer Thickness</th>
<th>Describe Maintenance Performed</th>
<th>Maintenance Personnel</th>
<th>Comments</th>
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</table>

1. The water depth to sediment is determined by taking two measurements with a stadia rod: one measurement from the manhole opening to the top of the sediment pile and the other from the manhole opening to the water surface. If the difference between these measurements is less than eighteen inches the system should be cleaned out. **Note:** To avoid underestimating the volume of sediment in the chamber, the measuring device must be carefully lowered to the top of the sediment pile.

2. For optimum performance, the system should be cleaned out when the floating hydrocarbon layer accumulates to an appreciable thickness. In the event of an oil spill, the system should be cleaned immediately.
NJCAT TECHNOLOGY VERIFICATION
VORTECHNICS, INC.

MAY 4, 2004
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1. Introduction

1.1 New Jersey Corporation for Advanced Technology (NJCAT) Program

NJCAT is a not-for-profit corporation to promote in New Jersey the retention and growth of technology-based businesses in emerging fields such as environmental and energy technologies. NJCAT provides innovators with the regulatory, commercial, technological and financial assistance required to bring their ideas to market successfully. Specifically, NJCAT functions to:

- Advance policy strategies and regulatory mechanisms to promote technology commercialization;
- Identify, evaluate, and recommend specific technologies for which the regulatory and commercialization process should be facilitated;
- Facilitate funding and commercial relationships/alliances to bring new technologies to market and new business to the state; and
- Assist in the identification of markets and applications for commercialized technologies.

The technology verification program specifically encourages collaboration between vendors and users of technology. Through this program, teams of academic and business professionals are formed to implement a comprehensive evaluation of vendor-specific performance claims. Thus, suppliers have the competitive edge of an independent third party confirmation of claims.

Pursuant to N.J.S.A. 13:1D-134 et seq. (Energy and Environmental Technology Verification Program) the New Jersey Department of Environmental Protection (NJDEP) and NJCAT have established a Performance Partnership Agreement (PPA) whereby NJCAT performs the technology verification review and NJDEP certifies the net beneficial environmental effect of the technology. In addition, NJDEP/NJCAT work in conjunction to develop expedited or more efficient timeframes for review and decision-making of permits or approvals associated with the verified/certified technology.

The PPA also requires that:

- The NJDEP shall enter into reciprocal environmental technology agreements concerning the evaluation and verification protocols with the United States Environmental Protection Agency, other local required or national environmental agencies, entities or groups in other states and New Jersey for the purpose of encouraging and permitting the reciprocal acceptance of technology data and information concerning the evaluation and verification of energy and environmental technologies; and

- The NJDEP shall work closely with the State Treasurer to include in State bid specifications, as deemed appropriate by the State Treasurer, any technology verified under the energy and environment technology verification program.
1.2 Technology Verification Report

In November 2003, Vortecnics, Inc., 200 Enterprise Drive, Scarborough, ME, 04074 submitted a formal request for participation in the NJCAT Technology Verification Program. The technology proposed — The Vortechs® Stormwater Treatment System — is a patented hydrodynamic separator designed to enhance gravitational separation of floating and settling materials from stormwater flows. The system was developed in Scarborough, Maine in 1988, and is described in greater detail later in this report. Through research and field application, the technology has been refined to capture total suspended solids (TSS), sediments, oils and greases, and trash and debris (including floatables and negatively buoyant debris). The request (after pre-screening by NJCAT staff personnel in accordance with the technology assessment guidelines) was accepted into the verification program. This verification report covers the evaluation based upon the performance claims of the vendor, Vortecnics Inc. (see Section 4). The verification report differs from typical NJCAT verification reports in that final verification of the Vortechs® System (and subsequent NJDEP certification of the technology) awaits completed field testing that meets the full requirements of the Technology Acceptance and Reciprocity Partnership (TARP) — Stormwater Best Management Practice Tier II Protocol for Interstate Reciprocity for stormwater treatment technology. This verification report is intended to evaluate Vortecnics initial performance claim for the technology based primarily on carefully conducted laboratory studies. This claim is expected to be modified and expanded following completion of the TARP required field-testing.

A number of telephone discussions and email exchanges were conducted to solicit relevant materials and to refine specific claims from the vendor. This project included the evaluation of assembled reports, conference proceedings, company manuals, literature and a CD, and laboratory testing reports to verify that the Vortechs® System meets the performance claims of Vortecnics Inc.

1.3 Technology Description

1.3.1 Technology Status: general description including elements of innovation/uniqueness/competitive advantage.

In 1990 Congress established deadlines and priorities for EPA to require permits for discharges of stormwater that is not mixed or contaminated with household or industrial wastewater. Phase I regulations established that a NPDES (National Pollutant Discharge Elimination System) permit is required for stormwater discharge from municipalities with a separate storm sewer system that serves a population greater than 100,000 and certain defined industrial activities. To receive a NPDES permit, the municipality or specific industry has to develop a stormwater management plan and identify Best Management Practices for stormwater treatment and discharge. Best Management Practices (BMPs) are measures, systems, processes or controls that reduce pollutants at the source to prevent the pollution of stormwater runoff discharge from the site. Phase II stormwater discharges include all discharges composed entirely of stormwater, except those specifically classified as Phase I discharge.
The nature of pollutants emanating from differing land uses are very diverse. Vortechics has developed a technology for separating and retaining floating and sinking pollutants including sediment, hydrocarbons and debris under rapid flow conditions using a hydrodynamic separator. The system is designed with a circular grit chamber that promotes a gentle swirling motion to encourage settling pollutants to migrate to the center of the chamber where they are deposited. Floating pollutants are elevated above the bottom of the baffle wall where they collect over time. Between maintenance events, pollutants accumulate within the system and are therefore removed from the natural environment. These pollutants may otherwise become a human health hazard, an aesthetic issue or may be cycled within the food chain or water table even if trapped in a land based treatment system. Maintenance is performed from above by vacuum truck and without interference from internal components.

General

The Vortechs® Stormwater Treatment System is a hydrodynamic separator designed to enhance gravitational separation of floating and settling materials from stormwater flows. Stormwater flows enter the unit tangentially to the grit chamber, which promotes a gentle swirling motion. As stormwater circles the grit chamber, pollutants migrate toward the center of the unit where velocities are the lowest. The majority of settleable solids are left behind as stormwater exits the grit chamber via two apertures on the perimeter of the chamber. Next, buoyant debris, oil and grease are separated from water as it flows under the baffle wall. Stormwater then exits the system through the flow control wall and ultimately through the outlet pipe. At this point it is relatively free of floating and settling pollutants.

Over time a conical pile tends to accumulate in the center of the unit containing sediment and associated metals, nutrients, hydrocarbons and other pollutants. Floating debris, oil and grease form a floating layer trapped in front of the baffle wall. These accumulated pollutants can be easily accessed through manholes conveniently located over each chamber. Maintenance is typically performed through the manhole over the grit chamber.
1.3.2 Specific Applicability

The Vortechs® System is well suited to urban stormwater applications due to the following features:

- Independent studies have shown that the system is capable in some cases of reducing the net total suspended solids load exported from a site by 80 percent or more.
- Infrequent flow rates can be treated without bypassing the System due to high treatment capacities.
- Below grade installation allows multiple land uses.
- Each system is custom designed to meet hydraulic demands of the site.
- Spill storage and sediment storage volumes can be increased as necessary.
- Technical support is available at no cost before and after the sale.
- No expendable or moving parts and a low cleanout volume minimize operating costs.

The Vortechs® System is a compact, below grade system that is fabricated near the jobsite from concrete and marine grade aluminum. There are nine standard precast models available, treating flow rates up to 25 cfs (11,310 gpm). Larger models can be cast in place to provide treatment of higher flows. Standard sizes are listed in Table 1.

<table>
<thead>
<tr>
<th>Vortechs® Model</th>
<th>Grit Chamber Diam./Area (ft/ft²)</th>
<th>Peak Design Flow cfs (gpm)</th>
<th>Sediment Storage (yd)</th>
<th>Approx. Size L x W (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000</td>
<td>3/7</td>
<td>1.6 (724)</td>
<td>0.75</td>
<td>9 x 3</td>
</tr>
<tr>
<td>2000</td>
<td>4/13</td>
<td>2.8 (1,267)</td>
<td>1.25</td>
<td>10 x 4</td>
</tr>
<tr>
<td>3000</td>
<td>5/20</td>
<td>4.5 (2,036)</td>
<td>1.75</td>
<td>11 x 5</td>
</tr>
<tr>
<td>4000</td>
<td>6/28</td>
<td>6.0 (2,714)</td>
<td>2.5</td>
<td>12 x 6</td>
</tr>
<tr>
<td>5000</td>
<td>7/38</td>
<td>8.5 (3,845)</td>
<td>3.25</td>
<td>13 x 7</td>
</tr>
<tr>
<td>7000</td>
<td>8/50</td>
<td>11.0 (4,976)</td>
<td>4.0</td>
<td>14 x 8</td>
</tr>
<tr>
<td>9000</td>
<td>9/64</td>
<td>14.0 (6,334)</td>
<td>4.75</td>
<td>15 x 9</td>
</tr>
<tr>
<td>11000</td>
<td>10/79</td>
<td>17.5 (7,917)</td>
<td>5.5</td>
<td>16 x 10</td>
</tr>
<tr>
<td>16000</td>
<td>12/113</td>
<td>25.0 (11,310)</td>
<td>7.0</td>
<td>18 x 12</td>
</tr>
</tbody>
</table>

Table 1
1.3.3 Range of Contaminant Characteristics

Vortechs® Systems have been shown to capture a wide range of pollutants of concern. These include: trash and debris (including floatables and negatively buoyant debris); total suspended solids; sediments; and oil and grease.

1.3.4 Range of Site Characteristics

Routine operation

Runoff from low intensity precipitation makes up the vast majority of the total annual flow from all sites. The lower flow control, commonly referred to as the orifice, is designed to pass 20 percent of the system capacity with the water surface elevation at the crown of the inlet pipe. The effect of submerging the inlet pipe is to reduce inlet velocity and turbulence by increasing the cross sectional area of the flow path. Detention times during routine operation are typically longer than four minutes. Removal rates of sediment and floating pollutants are very high during this time since turbulence and internal velocities are very low. In off-line configurations, bypass is not allowed to begin at less than 20 percent of capacity.

Moderate intensity operation

As storm intensities and flow rates increase, the operating rate (gpm/ft²) in the Vortechs® System also increases proportionally. As the inflow rates exceed the capacity of the low flow orifice, water begins to spill over the high flow control weir. The rising water surface elevation within the tank carries floating contaminants such as trash, oil and grease away from the inlet pipe and above the bottom of the baffle wall. This effectively prevents re-entrainment by separating contaminants from the higher velocity zones within the system. At these operating rates, between 20 percent and 70 percent of capacity, coarser influent sediment is removed efficiently, and previously captured fine sediment remains trapped in the grit chamber. The swirling action increases, which promotes the migration of particles toward the center of the grit chamber where they then form a stable conical pile. During an event of this magnitude, it is important to limit the amount of flow that is bypassed since velocities through the collection system may scour
catch basins and other upstream areas where sediment has accumulated during routine flows. These larger materials are likely to be captured by the Vortechs® System.

*Full capacity*

At peak treatment capacity the water surface elevation within the Vortechs® System is at the crown of the high flow weir. These operating rates are seen very infrequently. Sediment and hydrocarbon removal rates are low, but previously captured materials remain trapped. This is accomplished by increasing the water surface elevation in the system to increase residence times and decrease turbulence. To accommodate large, infrequent storms, Vortechnics can assist with the design of a bypass to route peak-flows around the unit.

*Storm subsidence*

As a storm subsides, treated runoff is decanted out of the Vortechs® System through the flow controls, restoring the water level to a low dry-weather volume. Accumulated pollutants can easily be observed through the access manhole located above the grit chamber. The low resting water level reduces maintenance costs by reducing the overall pump-out volume.
1.3.5 Material Overview, Handling and Safety

To clean out the Vortechs® System, a vacuum truck is generally the most convenient and efficient method. Only the manhole cover above the grit chamber needs to be accessed to remove pollutants trapped there. The grit chamber is sealed around the bottom and sides, so when it is emptied, oily liquids and floatable debris within the oil chamber decant into the grit chamber and thus, can be removed along with accumulated sediment and debris. This water lock feature reduces pump out volumes and ensures that the bottom of the baffle wall always remains submerged, preventing the transfer of floatables to the outlet during cleaning or during the next storm.

Solids recovered from the Vortechs® System can typically be land filled or disposed of at a waste water treatment plant. It is possible that there may be some specific land use activities that create contaminated solids, which will be captured in the system. Such material would have to be handled and disposed of in accordance with hazardous waste management requirements.

1.4 Project Description

This project included the evaluation of assembled reports, conference proceedings, company manuals, literature and a CD, and laboratory testing reports to verify that Vortechs® Systems meet the performance claims of Vortechnics Inc.
1.5  Key Contacts

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2. Evaluation of the Applicant

2.1 Corporate History

Founded in 1988 and based in Scarborough, Maine, Vortechs has built its business on the development of stormwater treatment products, including its flagship product the Vortechs® System, an award-winning hydrodynamic separator for the treatment of contaminated stormwater flows. Thomas Adams, an engineer from Portland, Maine, launched the privately held company to market his two product inventions, the Vortechs® System and the hydro-brake. In 1993, Adams met David Miley, now CEO of Vortechs, and Francis Tighe, now Vice President of Business Development, and demonstrated the engineering behind his two products. Miley and Tighe, intrigued by the possibilities of the Vortechs® System in particular, proposed to Adams that they partner to bring the system to market. In exchange for equity in the company, Tighe and Miley provided unsalaried “sweat equity” for two years, working to bring the system to market.

Tighe and Miley, both of whom had backgrounds in construction, engineering and most importantly starting up businesses, worked with Adams to install the first Vortechs® Systems into projects in New England. The initial business concept was to license the Vortechs® technology to concrete precasters, who would sell the products to site and excavating contractors. Using this model, some of the first Vortechs® Systems were installed at the Cole Haan headquarters in Yarmouth and an L.L. Bean facility in Freeport.

Within a year, it was clear to Miley and Tighe that key to growing the business was cultivating relationships with specifying engineers and stormwater regulators. Concrete precasters did not have the relationships needed with these decision-makers. Miley and Tighe decided to build the team internally to generate and support sales. In early 1995, they began hiring engineers to drive sales and production and invest in the marketing of the business.

Meanwhile, the company was also building its first in-house lab, which allowed it to do full-scale testing of stormwater treatment systems. In a nascent industry, this type of commitment to research and development was unprecedented. In 1997, Vortechs won its first of three environmental technology awards, the New England Environmental Award, for significant contributions to the improvement of the quality of the environment. Vortechs expanded its lab to include three separate full-scale test facilities.

In 1998, the company saw its third straight year of 60% growth, and won two more honors, this time a finalist in the CERF Charles Pankow Award for Innovation and an EPA Environmental Technology Innovator Award both in recognition of the Vortechs® System’s contribution to protecting the nation’s water resources. By then the sales team had grown into five regional offices and Vortechs products were being installed around the country, with sales still largely driven by the flagship Vortechs® System. The company opened an office in Canada in 2000. The increasing rollout of NPDES into Phase II cities (those with less than 50,000 population), continued to drive sales to $10 million in 2001.
In January 2002, Vortechics signed a sales representative agreement with CONTECH, a national construction products sales organization with 150 sales engineers who market and sell Vortechics products across the country. With this exclusive relationship, Vortechics has been able to dramatically expand its sales and service capabilities throughout the United States. The company also added representatives in Canada, including Ontario and British Columbia.

In the summer of 2002, the company celebrated the grand opening of its new corporate headquarters to continue its commitment to lead the market through a program of rigorous product testing and aggressive product development. In addition to a state-of-the-art 3,500 square foot lab, the headquarters also features an outdoor testing facility that allows Vortechics to monitor the next generation of stormwater treatment systems in situ. This onsite testing and product development enables Vortechics to explore new ways to improve water quality to an even higher standard than currently required by stormwater regulations.

In the fall of 2003, Vortechics launched a new product, the VortSentry™, another hydrodynamic separator product with a compact design and backed by full laboratory testing. The company also ramped up its commitment to R&D and product development by expanding its staff and technology budgets.

Currently Vortechics has 44 employees, and experienced sales growth exceeding 50% in 2003. More than 3,500 Vortechs® Systems have been installed throughout the United States and Canada.

2.2 Organization and Management

The company is headquartered in Scarborough, Maine, with nine regional sales offices throughout the United States and Canada. David Miley, president and CEO, and Fran Tighe, Vice President of Business Development, are co-owners of this privately held company. The company promotes a flat management structure with six functional managers overseeing its primary business areas: R&D: Dan Cobb; Operations: Ted Jones; Marketing: Kim West; Sales: Tom Gorriivan; Information Technology: Mike Haskell; and Finance: Dave Pierce. The company has nine regional sales managers, who report to Tom Gorriivan and work out of the regional offices based in Maine, Virginia, Georgia, Texas, Ohio, California, Washington, and Nova Scotia.

2.3 Operating Experience with the Proposed Technology

Vortechics has more than 15 years of experience with the proposed technology, including more than 3,500 installations throughout the United States and Canada. Most importantly, the award-winning technology is backed by almost 10 years of full scale laboratory testing and rigorous field testing, including third party studies from several universities and organizations. The company has developed numerous case studies and technical papers on the installation, use and maintenance of its technology, all of which have been reviewed, published and accepted by the general stormwater business community.
2.4 Patents

On June 2, 1998, the Vortechnics technology was granted a United States patent (Patent Number: 5,759,415).

2.5 Technical Resources, Staff and Capital Equipment

Vortechnics completes all design work at the corporate headquarters in Scarborough, Maine. Once a System design is complete, shop drawings are issued to a precast concrete contractor local to the installation site. Representatives from each precast company complete a formal Vortechs® Construction Training Course where the details of construction are established. Different contractors may elect to cast the system differently depending on their equipment and construction capabilities. For example, a precaster would have input regarding the details of construction such as how many pieces per system. They may elect to cast the system in two bathtub halves or a bottom slab, two riser sections and a top slab. They would also determine how the joints are formed and what type of lifting equipment is cast in. Vortechs, Inc. ultimately reviews all construction and installation decisions made by the precaster.

The Vortechs® System is delivered to the site by the precaster on the day of installation. Vortechs® Models 1000 through 4000 arrive in one piece fully assembled. Larger models may arrive on site in two or more pieces and may require some assembly. The site contractor is responsible for making arrangements to have a crane on site, completing excavation prior to delivery and setting the system into the ground. The contractor is also responsible for grouting the inlet and outlet pipe into the System, backfilling around the System and bringing the manhole frames and covers up to grade. Any work required on components inside the System is the responsibility of the Vortechs precast contractor.

Installation requires a crane and can typically be completed in two to four hours. Heaviest pick weight will be confirmed by Vortechs staff and communicated to the contractor prior to delivery.

Vortechs makes an installation video available to the installation contractor.

Structural integrity of the system is checked by the precaster before shipment. A “Vortechs® System Assembly Checklist” is completed and sent to the Vortechs office at this time. When the system arrives on site, it is inspected by the contractor. Any damage due to shipping and handling up to that point must be corrected by the precaster. Once the contractor takes delivery of the unit, it is their responsibility to lift it from the truck, place it in the ground, connect the inlet and outlet pipes and backfill around it. The contractor will perform a final check against the Vortechs Specification and the site plan before backfilling is initiated. If there are any installation errors at that point, the contractor will fix them and the system will be back filled.

Whenever possible a Vortechs representative other than the pre-cast contractor will be on site to assure that the system arrives and is installed as designed.
Adjustments for buoyancy issues, calculation of pick weights, and other custom design items are confirmed before delivery. The inlet and outlet are clearly marked to avoid improper installation. It is especially important that the system be set in such a way that the inlet pipe is at a 90 degree angle to the side of the tank to encourage proper grit chamber flow dynamics. This orientation is checked prior to backfilling the unit since a significantly different influent pipe angle may increase inlet turbulence or cause short-circuiting of the grit chamber.

Vortechs® Systems are typically available within four to six weeks of shop drawing approval.

3. Treatment System Description

The Vortechs® Stormwater Treatment Systems are designed to remove gross pollutants, including sediments, from stormwater using a hydrodynamic separator technology. Each unit has three basic components: 1) a circular grit chamber that promotes a gentle swirling motion of the incoming stormwater, 2) an oil baffle wall, and 3) a flow control wall for controlling high and low flows.

Figure 1 displays a simple schematic of the Vortechs® System. Stormwater flows enter the unit tangentially to the grit chamber, which promotes a gentle swirling motion. As stormwater circles the grit chamber, pollutants migrate toward the center of the unit where velocities are the lowest. The majority of settleable solids are left behind as stormwater exits the grit chamber via two apertures on the perimeter of the chamber. Next, buoyant debris, oil and grease are separated from water as it flows under the baffle wall. As stormwater exits the system through the flow control wall and ultimately the outlet pipe, it is relatively free of floating and settling pollutants. Over time a conical pile tends to accumulate in the center of the unit containing sediment and associated metals, nutrients, hydrocarbons and other pollutants. Floating debris and oil and grease form a floating layer trapped in front of the baffle wall. Accumulation of these pollutants can easily be accessed through manholes located over each chamber. Maintenance is typically performed through the manhole over the grit chamber.

There are nine (9) precast Vortechs® System models available to meet the hydraulic and water quality needs of large and small projects. The Vortechs® Systems have the ability to treat a wide range of flows up to 25 cfs (11,310 gpm). Larger flow Systems can be cast-in-place to accommodate higher flow rates.

4. Technical Performance Claim

Claim - The Vortechs® System sized at a treatment operating rate of no more than 40 gpm/ft², with an average influent TSS concentration of 187 mg/L and zero initial sediment loading, has been shown to have a TSS removal efficiency of 64% (per NJDEP treatment efficiency calculation methodology) for coarse silt particles (ranging from 38-75 microns) in laboratory studies using simulated stormwater.
5. Technical System Performance

The Vortechs® System has been tested in a full-scale hydraulic laboratory. The laboratory tests were completed for three different particle size distributions (PSD) with gradations ranging from 38 to 500 microns. For each different PSD, tests were performed with TSS influent concentrations ranging from 100 to 300 mg/L at operating rates from 10 to 100 gpm/ft² at 10 gpm/ft² intervals. In addition to specific testing, Vortechnic has developed the Rational Rainfall Method™, a model that estimates long term field performance based on site information, local precipitation patterns and laboratory performance data. The Vortechs® System has been tested extensively in the field by Vortechnic staff as well as independent researchers.

5.1 Laboratory Studies

In 1996, the Vortechnic laboratory-testing program was designed to construct a facility with the capability to test a full scale Vortechs® Model 2000. The laboratory not only provided an opportunity to gather performance data on the Vortechs® System as required by the Rational Rainfall Method™, or as requested by various regulatory agencies, but it also provided opportunities for new product development. Over the past few years, hundreds of engineers and regulators have been able to view the system in operation and witness tests.

The Vortechs® System was initially designed to address rules requiring 80% TSS removal and high efficiency oil and grease removal. Removal efficiency investigations for these pollutants were conducted in the laboratory using a full scale Vortechs® System where a high level of precision could be attained. The laboratory setting also allows all testing programs to progress at an efficient pace, since the rate of testing is not linked to natural precipitation patterns.

Vortechnic moved into a new state of the art facility with a 3,500 square foot laboratory space in June, 2002. Currently there are two test systems installed, each having a flow capacity of 3 cfs. This new laboratory serves as a demonstration area for the Vortechs® System as well as a resource for product development.

Several gradations ranging from 38 to 500 microns were targeted by Vortechnic for testing based on a survey of street sweeping and stormwater runoff PSD information and the availability of source materials for the tests. Once a bulk sample of fine sand and silt was obtained, it was sieved down into various discreet size fractions. Laboratory tests were conducted in a full scale Vortechs® Model 2000 in the Vortechnic Laboratories according to the following protocol:

1. Prepare a 20 to 30 gallon slurry of tap water and a known gradation of sediment particles.
2. Turn on the slurry mixer.
3. Stabilize flow in the Vortechs® System at the target operating rate
4. Set the metering pump to produce an influent concentration between 100 and 300 mg/L and begin metering the slurry into the influent line.
5. At a period of time no less than five times the theoretical detention time of the system after the metering pump is turned on, take the first influent sample.
6. Take the first effluent sample one detention time after the influent sample is taken
7. Repeat steps 4 and 5 for a minimum of 3 sample pairs.
8. Analyze sample pairs according to EPA 160.2, a method for the measurement of total non-filterable solids.
9. Report removal efficiencies as the percent difference between influent and effluent concentrations:

\[
\text{Removal Efficiency} = \frac{(\text{Influent concentration} - \text{Effluent Concentration})}{\text{Influent Concentration}}
\]

This testing process was repeated for several particle size ranges at operating rates from 10 to 100 gpm/ft² at 10 gpm/ft² intervals. Removal efficiencies for three gradations are displayed in Figure 2.

The 50-micron curve in Figure 2 represents removal of particles passing through a 200-mesh sieve and retained on a 400-mesh sieve. This particle size was selected to represent coarse silt, which is typically present on sites as a result of atmospheric deposition, weathering of site materials, and breakdown of organic matter and vehicular components. The Rational Rainfall Method™ uses laboratory generated performance data for these particles to estimate system performance in the field unless site information warrants using a coarser gradation.

![Vortex Systems removal efficiencies for selected sediment gradations](image)

**Figure 2**

The 50-micron curve is based on the removal efficiency of particles ranging from 38 to 75 microns. Two separate gradations of naturally occurring sediment particles were tested, one ranging from 38 microns to 63 microns and the other between 63 and 75 microns. The results of these tests were plotted and a conservative trend line was fitted through the data to represent the removal efficiency of 50-micron particles.
The average influent concentration across all tests was 187 mg/L with a high concentration of 576 mg/L and a low influent concentration of 65.2 mg/L. The results of individual tests supporting the 50-micron removal efficiency curve and the curve itself are presented in Figure 3.

![50 micron sediment particle removal efficiency curve](image)

Figure 3

The 150-micron curve (Figure 4) demonstrates the results of tests using particles that passed through a 60-mesh sieve and were retained on a 100-mesh sieve. This particle size represents fine sand which is also present on many sites, especially where landscaping is unconsolidated, where winter sanding occurs or as a result of breakdown of asphalt surfaces. When sediment loads are expected to be relatively heavy and coarse, Vortechs® System design may be based on removal efficiencies for this gradation.

![150 micron sediment gradation removal efficiency curve](image)

Figure 4
The "typical gradation" has an average particle size (d50) of 80 microns, and contains particles ranging from 38–500 microns in diameter (Figure 5). This particle range includes medium and fine sands as well as coarse silt. Removal efficiencies of this gradation (Figure 6) are used as a basis for sizing Vortechs® Systems when the TSS load is expected to contain a moderate concentration of a wide range of particles.

Figure 5

Particle size gradation of sediments used by Vortechs, Inc. to represent suspended solids loading in typical urban stormwater runoff

Figure 6

Removal efficiency of a "typical gradation" of sediment particles

These performance curves are unique in that they disclose the performance of the system at all operating rates up to the point of washout. Figures 2-6 show that removal efficiencies decrease
with operating rate. This is due to reductions in detention time and increased turbulence at higher operating rates.

On two occasions, May 9, 2001 and May 1, 2002, Mr. Jeff Dennis from the Maine Department of Environmental Protection witnessed laboratory testing of the Vortechs® System. On May 9, 2001, the Vortechs® System was tested for a targeted flow rate of 1.17 cfs or 42 gpm/ft² using the F-95 sand slurry. The PSD of the F-95 unground silica is shown in Table 2. Influent TSS concentrations ranged from 378.8 to 453.9 mg/L. Effluent concentrations ranged from 57.4 mg/L to 74.0 mg/L. When adjusting for the recycled background concentrations, the removal efficiencies indicated by inflow/outflow pairs ranged from 82.8% up to 86.5%, with a mean of 85.0%.

<table>
<thead>
<tr>
<th>USA STD Sieve Size</th>
<th>Millimeters</th>
<th>% Retained</th>
<th>Cumulative Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>0.600</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>40</td>
<td>0.425</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>50</td>
<td>0.300</td>
<td>1.0</td>
<td>1.2</td>
</tr>
<tr>
<td>70</td>
<td>0.212</td>
<td>9.0</td>
<td>10.2</td>
</tr>
<tr>
<td>100</td>
<td>0.150</td>
<td>30.0</td>
<td>40.2</td>
</tr>
<tr>
<td>140</td>
<td>0.106</td>
<td>42.0</td>
<td>83.3</td>
</tr>
<tr>
<td>200</td>
<td>0.075</td>
<td>15.0</td>
<td>97.2</td>
</tr>
<tr>
<td>270</td>
<td>0.053</td>
<td>2.5</td>
<td>99.7</td>
</tr>
<tr>
<td>Pan</td>
<td></td>
<td>0.3</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 2

On May 1, 2002, the Vortechs® System was tested for a targeted flow rate of 1.04 cfs or 37 gpm/ft² using the OK-110 sand slurry. The PSD of the OK-110 unground silica is shown in Table 3. Influent TSS concentrations ranged from 169.2 mg/L to 220.8 mg/L. Effluent concentrations ranged from 38.5 mg/L to 51.9 mg/L. When adjusting for the recycled background concentrations, the removal efficiencies indicated by inflow/outflow pairs ranged from 76.8% up to 85.7%, with a mean of 81.5%.

<table>
<thead>
<tr>
<th>USA STD Sieve Size</th>
<th>Millimeters</th>
<th>% Retained</th>
<th>Cumulative Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>70</td>
<td>0.212</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>100</td>
<td>0.150</td>
<td>1.0</td>
<td>1.2</td>
</tr>
<tr>
<td>120</td>
<td>0.125</td>
<td>15.0</td>
<td>16.2</td>
</tr>
<tr>
<td>140</td>
<td>0.106</td>
<td>41.0</td>
<td>57.0</td>
</tr>
<tr>
<td>170</td>
<td>0.088</td>
<td>25.0</td>
<td>82.0</td>
</tr>
<tr>
<td>200</td>
<td>0.075</td>
<td>15.0</td>
<td>97.0</td>
</tr>
<tr>
<td>270</td>
<td>0.053</td>
<td>3.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Pan</td>
<td></td>
<td>0.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 3
5.2 Verification Procedures

All the data provided to NJCAT were reviewed to fully understand the capabilities of the Vortechs® System. To verify Vortechs claim, the Vortechs laboratory data were reviewed and compared to the draft NJDEP Laboratory Testing Protocol. Only the data that closely compared to the draft NJDEP Laboratory Testing Protocol was used to verify Vortechs claim.

Claim - The Vortechs® System sized at a treatment operating rate of no more than 40 gpm/ft², with an average influent TSS concentration of 187 mg/L and zero initial sediment loading, has been shown to have a TSS removal efficiency of 64% (per NJDEP treatment efficiency calculation methodology) for coarse silt particles (ranging from 38-75 microns) in laboratory studies using simulated stormwater.

5.2.1 NJDEP Recommended TSS Laboratory Testing Procedure

The NJDEP has prepared a draft Total Suspended Solids Laboratory Testing Procedure to help guide vendors as they prepare to test their stormwater treatment systems prior to applying for NJCAT verification. The Testing Procedure has three components:

1. Particle size distribution
2. Full scale laboratory testing requirements
3. Measuring treatment efficiency

1. Particle size distribution:

The following particle size distribution will be utilized to evaluate a manufactured treatment system (See Table 4). A natural/commercial soil representing U.S.D.A. definition of a sandy loam material. This hypothetical distribution was selected as it represents the various particles that would be associated with typical stormwater runoff from a post construction site.

Specifically, the following distribution can be utilized:

<table>
<thead>
<tr>
<th>Particle Size (microns)</th>
<th>Sandy loam (percent by mass)</th>
</tr>
</thead>
<tbody>
<tr>
<td>500-1000 (coarse sand)</td>
<td>5.0</td>
</tr>
<tr>
<td>250-500 (medium sand)</td>
<td>5.0</td>
</tr>
<tr>
<td>100-250 (fine sand)</td>
<td>30.0</td>
</tr>
<tr>
<td>50-100 (very fine sand)</td>
<td>15.0</td>
</tr>
<tr>
<td>2-50 (silt)</td>
<td>(8-50 um, 25%) (2-8 um, 15%)*</td>
</tr>
<tr>
<td>1-2 (clay)</td>
<td>5.0</td>
</tr>
</tbody>
</table>

Table 4

Notes:
1. Recommended density of particles ≤2.65 g/cm³
*The 8 um diameter is the boundary between very fine silt and fine silt according to the definition of American Geophysical Union. The reference for this division/classification is: Lane, E. W., et al. (1947). "Report of the Subcommittee on Sediment Terminology," Transactions of the American Geophysical Union, Vol. 28, No. 6, pp. 936-938.

2. Full Scale lab test requirements
   A. At a minimum, complete a total of 15 test runs including three (3) tests each at a constant flow rate of 25, 50, 75, 100, and 125 percent of the treatment flow rate. These tests should be operated with initial sediment loading of 50% of the unit’s capture capacity.
   B. The three tests for each treatment flow rate will be conducted for influent concentrations of 100, 200, and 300 mg/L.
   C. For an online system, complete two tests at the maximum hydraulic operating rate. Utilizing clean water, the tests will be operated with initial sediment loading at 50% and 100% of the unit’s capture capacity. These tests will be utilized to check the potential for TSS resuspension and washout.
   D. The test runs should be conducted at a temperature between 73-79 degrees Fahrenheit or colder.

3. Measuring treatment efficiency
   A. Calculate the individual removal efficiency for the 15 test runs.
   B. Average the three test runs for each operating rate.
   C. The average percent removal efficiency will then be multiplied by a specified weight factor (see Table 5) for that particular operating rate.
   D. The results of the 5 numbers will then be summed to obtain the theoretical annual TSS load removal efficiency of the system.

<table>
<thead>
<tr>
<th>Treatment operating rate</th>
<th>Weight factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>25%</td>
<td>.25</td>
</tr>
<tr>
<td>50%</td>
<td>.30</td>
</tr>
<tr>
<td>75%</td>
<td>.20</td>
</tr>
<tr>
<td>100%</td>
<td>.15</td>
</tr>
<tr>
<td>125%</td>
<td>.10</td>
</tr>
</tbody>
</table>

Table 5

Notes:

Weight factors were based upon the average annual distribution of runoff volumes in New Jersey and the assumed similarity with the distribution of runoff peaks. This runoff volume distribution was based upon accepted computation methods for small storm hydrology and a statistical analysis of 52 years of daily rainfall data at 92 rainfall gages.
5.2.2 Laboratory Testing

The removal efficiency of the Vortechs® System is a function of sediment particle size and influent flow rate to the system (See Figure 2). As the flow rate increases, detention times of the system decreases, thereby reducing the time for particles to settle out and lower the system’s removal efficiency. Detention times of the laboratory Vortechs® System 2000 were provided by Vortechs and ranged from 8.1 to 1.3 minutes for flow rates of 10 to 100 gpm/ft², respectively. Also, as the particle sizes get larger, the settling of the particles increases due to the increased weight of the particles.

Since Vortechs uses the 50 micron PSD in sizing their systems and the 50 micron distribution in the laboratory testing was the closest to the PSD provided in the NJDEP Laboratory Testing Protocol, the data for the 50 micron distribution were used to verify Vortechs claim. Using the data for the 50 micron distribution provided in Figure 2 and a design operating rate of 40 gpm/ft², removal rates were determined from Figure 2 and are shown in Table 6.

<table>
<thead>
<tr>
<th>Treatment operating rate</th>
<th>Operating Rate (gpm/ft²)</th>
<th>Weight factor</th>
<th>Removal Efficiency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25%</td>
<td>10</td>
<td>.25</td>
<td>85.5</td>
</tr>
<tr>
<td>50%</td>
<td>20</td>
<td>.30</td>
<td>69.5</td>
</tr>
<tr>
<td>75%</td>
<td>30</td>
<td>.20</td>
<td>57.0</td>
</tr>
<tr>
<td>100%</td>
<td>40</td>
<td>.15</td>
<td>46.0</td>
</tr>
<tr>
<td>125%</td>
<td>50</td>
<td>.10</td>
<td>33.4</td>
</tr>
</tbody>
</table>

Table 6

Based upon the data presented in Table 6, the removal efficiency of the system is 64%, thereby verifying the Vortechs Claim.

Although the laboratory experiments using the F-95 and OK-110 unground silica resulted in higher TSS removal rates, both of these distributions are outside of the range of PSD as specified in the NJDEP Laboratory Testing Protocol. The results for the 150 micron sediment gradation and the typical gradation also yielded higher removal efficiencies but these two gradations were also outside of the range of the PSD as specified in the NJDEP Laboratory Testing Protocol. Therefore, these data could not be used in verifying higher removal efficiencies for the Vortechs® System.

Data were not available on the potential of re-suspension and wash out of initial sediment contained in the Vortechs® System. In order for the particle to be re-entrained, the flow velocity over the surface of the particle must create enough suction to pick it up. This is complicated by arming (shielding of smaller particles by larger particles) or by the tendency of particles of various diameters to interlock in a matrix that provides some protection from scouring flows. Specific operating rates or velocities that will cause re-suspension of particles with various settling velocities have not been determined by Vortechs.
5.2.3 Field Performance Modeling

The Rational Rainfall Model™ model may prove to be useful in developing estimates of field performance provided additional field data can be collected to validate the model. The Rational Rainfall Model™ model combines site information (drainage area and runoff coefficient) with local precipitation and laboratory data for the 50 micron PSD to produce an estimate of field performance. Vortechs provides an example removal efficiency calculation for Springfield, New Jersey using the Rational Rainfall Model™ (see Table 7). If the Rational Rainfall Model™ model can be calibrated and verified for New Jersey conditions, the Springfield example suggests that the Vortechs® System can achieve higher TSS removal efficiencies in the field on an annual basis.

<table>
<thead>
<tr>
<th>VORTECHS SYSTEM NET ANNUAL TSS REMOVAL EFFICIENCY ESTIMATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical Vortechs System</td>
</tr>
<tr>
<td>Springfield, NJ</td>
</tr>
<tr>
<td>Model 4000</td>
</tr>
</tbody>
</table>

Design Ratio\(^1\) = \(\frac{(3 \text{ acres}) \times (0.8) \times (449 \text{ gpm/cfs})}{(28.3 \text{ sf})} = 38.1\)

<table>
<thead>
<tr>
<th>Rainfall Intensity */hr</th>
<th>Operating Rate (^2) gpm/sf</th>
<th>% Total Rainfall Volume (^3)</th>
<th>Removal Efficiency (^4) (%)</th>
<th>Relative Efficiency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.08</td>
<td>3.0</td>
<td>33.7%</td>
<td>95.6%</td>
<td>32.3%</td>
</tr>
<tr>
<td>0.16</td>
<td>6.1</td>
<td>19.6%</td>
<td>91.2%</td>
<td>18.0%</td>
</tr>
<tr>
<td>0.24</td>
<td>9.1</td>
<td>11.4%</td>
<td>87.1%</td>
<td>9.0%</td>
</tr>
<tr>
<td>0.32</td>
<td>12.2</td>
<td>7.2%</td>
<td>82.2%</td>
<td>5.5%</td>
</tr>
<tr>
<td>0.40</td>
<td>15.2</td>
<td>4.4%</td>
<td>77.4%</td>
<td>3.4%</td>
</tr>
<tr>
<td>0.48</td>
<td>18.3</td>
<td>3.4%</td>
<td>73.3%</td>
<td>2.5%</td>
</tr>
<tr>
<td>0.56</td>
<td>21.3</td>
<td>2.3%</td>
<td>66.1%</td>
<td>1.6%</td>
</tr>
<tr>
<td>0.64</td>
<td>24.4</td>
<td>1.9%</td>
<td>61.5%</td>
<td>1.2%</td>
</tr>
<tr>
<td>0.72</td>
<td>27.4</td>
<td>1.7%</td>
<td>60.4%</td>
<td>1.0%</td>
</tr>
<tr>
<td>0.80</td>
<td>30.5</td>
<td>1.7%</td>
<td>57.1%</td>
<td>1.0%</td>
</tr>
<tr>
<td>0.88</td>
<td>33.5</td>
<td>1.1%</td>
<td>53.9%</td>
<td>0.6%</td>
</tr>
<tr>
<td>0.96</td>
<td>36.6</td>
<td>0.9%</td>
<td>50.7%</td>
<td>0.4%</td>
</tr>
<tr>
<td>1.04</td>
<td>39.6</td>
<td>0.8%</td>
<td>47.1%</td>
<td>0.6%</td>
</tr>
<tr>
<td>1.12</td>
<td>42.7</td>
<td>0.8%</td>
<td>43.7%</td>
<td>0.3%</td>
</tr>
<tr>
<td>1.20</td>
<td>45.7</td>
<td>0.6%</td>
<td>39.6%</td>
<td>0.4%</td>
</tr>
<tr>
<td>1.28</td>
<td>48.8</td>
<td>0.6%</td>
<td>36.0%</td>
<td>0.2%</td>
</tr>
<tr>
<td>1.36</td>
<td>51.8</td>
<td>0.3%</td>
<td>32.1%</td>
<td>0.3%</td>
</tr>
<tr>
<td>1.44</td>
<td>54.9</td>
<td>1.1%</td>
<td>26.3%</td>
<td>0.3%</td>
</tr>
<tr>
<td>1.52</td>
<td>57.9</td>
<td>0.2%</td>
<td>24.4%</td>
<td>0.0%</td>
</tr>
<tr>
<td>1.60</td>
<td>61.0</td>
<td>0.2%</td>
<td>21.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>1.80</td>
<td>68.6</td>
<td>0.6%</td>
<td>13.6%</td>
<td>0.1%</td>
</tr>
<tr>
<td>2.00</td>
<td>76.2</td>
<td>1.1%</td>
<td>7.8%</td>
<td>0.1%</td>
</tr>
</tbody>
</table>

Total = 60%

% rain falling at >2'/hr = 2.6%

Assumed Removal Efficiency of remaining % = 0.0%

Net Annual TSS Removal Efficiency Estimate = 80%

1 - Design Ratio = (Total Drainage Area) x (Runoff Coefficient) x (cfs to gpm conversion) / Grit Chamber Area
2 - Operating Rate (gpm/sf) = intensity ("/hr) x Design Ratio
3 - Based on 10 years of 15-minute rainfall data from NCDC Station 8423 in Springfield, NJ
4 - Based on Vortechs laboratory verified removal of 50 micron particles (see Technical Bulletin #1).

Table 7

21
5.2.4 Field Studies

Although field testing is important to calibrate and verify models such as the Rational Rainfall Method\textsuperscript{TM}, it is difficult to obtain data that are representative of a wide range of operating conditions. A very limited number of data points collected in Vortechs field studies are suitable for verifying the Vortechs Claim. Many of the field data are collected at very low operating rates and TSS influent concentrations are typically outside the range of concentrations that are typically observed in New Jersey (i.e., 100 to 300 mg/L). Although the field data are limited, additional data will be collected by Vortechs as they move forward to complete the TARP required field testing. It is expected that the collection of additional field data to calibrate and verify the Rational Rainfall Method\textsuperscript{TM} model will result in modified and expanded claims from Vortechs on the removal efficiency of their system. Since the laboratory data are sufficient to verify the initial claim by Vortechs, a further examination of the field data will not be included in this verification report.

5.3 Inspection and Maintenance

The Vortechs\textsuperscript{R} System requires minimal routine maintenance. However, it is important that the system be inspected at regular intervals and cleaned when necessary to ensure optimum performance. The rate at which the system collects pollutants will depend more on site activities than the size of the unit, i.e., heavy winter sanding will cause the grit chamber to fill more quickly but regular sweeping will slow accumulation.

5.3.1 Inspection

Inspection is the key to effective maintenance and it is easily performed. Vortechs recommends ongoing quarterly inspections of accumulated pollutants. Sediment accumulation may be especially variable during the first year after installation as catch basin sumps are filled and as construction disturbances and landscaping stabilize. Quarterly inspections are typically sufficient to ensure that systems are cleaned out at the appropriate time. Inspections may need to be performed more often in the winter months in climates where sanding operations may lead to rapid accumulations, or in other areas with heavy sediment loading. It is very useful to keep a record of each inspection.

The Vortechs\textsuperscript{R} System should be cleaned when inspection reveals that the sediment depth has accumulated to within six inches of the dry-weather water level. This determination can be made by taking two measurements with a stadia rod or similar measuring device. One measurement should be taken from the manhole opening to the top of the sediment pile and the other from the manhole opening to the water surface. The system should be cleaned out if the difference between the two measurements is six inches or less.

Note: To avoid underestimating the volume of sediment in the chamber, the measuring device must be lowered to the top of the sediment pile carefully. Finer, silty particles at the top of the pile may offer less resistance to the end of the rod than larger particles toward the bottom of the pile.
5.3.2 Maintenance

Maintaining the Vortechs® System is easiest when there is no flow entering the system. For this reason it is a good idea to schedule the cleanout during dry weather. Cleanout of the Vortechs® System with a vacuum truck is generally the most effective and convenient method of excavating pollutants from the system. If such a truck is not available, a “clamshell” grab may be used, but it is difficult to remove all accumulated pollutants with these devices.

Accumulated sediment is typically evacuated through the manhole over the grit chamber. Simply remove the cover and insert the vacuum hose into the grit chamber. As water is evacuated, the water level outside of the grit chamber will drop to the same level as the crest of the lower aperture of the grit chamber. It will not drop below this level due to the fact that the bottom and sides of the grit chamber are sealed to the tank floor and walls. This unique “water lock” feature prevents water from migrating into the grit chamber, exposing the bottom of the baffle wall. Floating pollutants will decant into the grit chamber as the water level there is drawn down. This allows most floating material to be withdrawn from the same access point above the grit chamber.

Motor oil and other hydrocarbons that accumulate on a more routine basis should be removed when an appreciable layer has been captured. To remove these pollutants, it may be preferable to use adsorbent pads since they are usually cheaper to dispose of than the oil water emulsion that may be created by vacuuming the oily layer. In Vortechs® installations where there is little risk of petroleum spills, liquid contaminants may not accumulate as quickly as sediment. However, any oil or gasoline spill should be cleaned out immediately. Trash can be netted out if it needs to be separated from the other pollutants.

If maintenance is not performed as recommended, sediment may accumulate outside the grit chamber. If this is the case, it may be necessary to pump out all chambers. It is a good idea to check for accumulation in all chambers during each maintenance event to prevent sediment build up there. Typically, accumulation outside the grit chamber will be negligible compared to the volume of solids captured in the grit chamber. Since flow velocities are higher outside the grit chamber than inside it, any particles that leave the grit chamber are unlikely to be trapped in subsequent chambers.

Manhole covers should be securely seated following cleaning activities, to ensure that surface runoff does not leak into the unit from above. Typical maintenance volumes are listed in Table 8.
### Typical Maintenance Volumes

<table>
<thead>
<tr>
<th>Model Size</th>
<th>Maximum Treatment Capacity (cfs)</th>
<th>Grit Chamber Diameter (ft)</th>
<th>Footprint (LxW)</th>
<th>Depth below invert* (ft)</th>
<th>Maintenance &quot;Pump Out&quot; volume* (gal)</th>
<th>Sediment storage capacity* (yd³)</th>
<th>Floatable material storage capacity* (gal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000</td>
<td>1.6</td>
<td>3</td>
<td>10x4</td>
<td>3</td>
<td>185</td>
<td>0.7</td>
<td>114</td>
</tr>
<tr>
<td>2000</td>
<td>2.8</td>
<td>4</td>
<td>11x5</td>
<td>3</td>
<td>332</td>
<td>1.2</td>
<td>166</td>
</tr>
<tr>
<td>3000</td>
<td>4.4</td>
<td>5</td>
<td>12x6</td>
<td>3</td>
<td>506</td>
<td>1.8</td>
<td>225</td>
</tr>
<tr>
<td>4000</td>
<td>6.3</td>
<td>6</td>
<td>13x7</td>
<td>3</td>
<td>706</td>
<td>2.4</td>
<td>292</td>
</tr>
<tr>
<td>5000</td>
<td>8.6</td>
<td>7</td>
<td>14x8</td>
<td>3</td>
<td>952</td>
<td>3.2</td>
<td>365</td>
</tr>
<tr>
<td>7000</td>
<td>11.2</td>
<td>8</td>
<td>15x9</td>
<td>3</td>
<td>1244</td>
<td>4.0</td>
<td>446</td>
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<tr>
<td>9000</td>
<td>14.2</td>
<td>9</td>
<td>16x10</td>
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<td>1582</td>
<td>4.8</td>
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<td>11000</td>
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<td>10</td>
<td>17x11</td>
<td>3</td>
<td>1947</td>
<td>5.6</td>
<td>628</td>
</tr>
<tr>
<td>16000</td>
<td>25.2</td>
<td>12</td>
<td>19x13</td>
<td>3</td>
<td>2774</td>
<td>7.1</td>
<td>839</td>
</tr>
</tbody>
</table>

*These volumes can be increased or decreased to meet specific site needs at no additional cost.

Table 8

#### 5.3.3 Solids Disposal

Solids recovered from the Vortechs® System can typically be land filled or disposed of at a waste water treatment plant.

#### 5.3.4 Damage Due to Lack of Maintenance

It is unlikely that the Vortechs® System will become damaged due to lack of maintenance since there are no fragile internal parts. However, adhering to a regular maintenance plan ensures optimal performance of the system.

### 6. Technical Evaluation Analysis

#### 6.1 Verification of Performance Claims

Based on the evaluation of the results from laboratory studies, sufficient data is available to support the Vortechs Claim: The Vortechs® System sized at a treatment operating rate of no more than 40 gpm/ft², with an average influent TSS concentration of 187 mg/L and zero initial sediment loading, has been shown to have a TSS removal efficiency of 64% (per NJDEP treatment efficiency calculation methodology) for coarse silt particles (ranging from 38-75 microns) in laboratory studies using simulated stormwater.
6.2 Limitations

6.2.1 Factors Causing Under-Performance

If the Vortechs® System is designed and installed correctly, there is minimal possibility of failure. There are no moving parts to bind or break. Nor are there parts that are particularly susceptible to wear or corrosion. Lack of maintenance may cause the system to operate at a reduced efficiency, and it is possible that eventually the system will become totally filled with sediment.

6.2.2 Pollutant Transformation and Release

The Vortechs® System will not increase the net pollutant load to the downstream environment. However, pollutants may be transformed within the unit. For example, organic matter may decompose and release nitrogen in the form of nitrogen gas or nitrate. These processes are similar to those in wetlands but probably occur at slower rates in the Vortechs® System due to the absence of light and mixing by wind, thermal inputs and biological activity. Accumulated sediment will not be lost from the system under normal operating conditions.

6.2.3 Sensitivity to Heavy or Fine Sediment Loading

The Vortechs® System requires no pretreatment. Heavy loads of sediment will increase the needed maintenance frequency, but will not affect overall performance. Heavy loads of fine sediment will not affect system operation.

6.2.4 Bypass Flow

The Vortechs® System has been tested at operating rates up to 100 gpm/ft² of swirl chamber surface area, which corresponds to the peak treatment capacity for each model, and has been found to provide positive removal efficiencies of suspended solids throughout this range. Flow rates exceeding the treatment capacity of the system may cause re-suspension of previously captured material, therefore it may be necessary to route peak flow around treatment via an external bypass.

6.2.5 Mosquitoes

The Vortechs® System design incorporates standing water in the separation chamber and containment sump, which can be a breeding site for mosquitoes. To address this potential problem Vortechnics sells an optional manhole cover insert that allows outgassing, but will prevent mosquitoes from entering the system through the manhole covers. A flap valve can be installed at the terminal end of the outlet pipe to prevent mosquitoes from entering the unit from the downstream side.
7. **Net Environmental Benefit**

The New Jersey Department of Environmental Protection (NJDEP or Department) encourages the development of innovative environmental technologies (IET) and has established a performance partnership between their verification/certification process and NJCAT's third party independent technology verification program. The Department in the IET data and technology verification/certification process will work with any company that can demonstrate a net beneficial effect (NBE) irrespective of the operational status, class or stage of an IET. The NBE is calculated as a mass balance of the IET in terms of its inputs of raw materials, water and energy use and its outputs of air emissions, wastewater discharges, and solid waste residues. Overall the IET should demonstrate a significant reduction of the impacts to the environment when compared to baseline conditions for the same or equivalent inputs and outputs.

Once Vortechs® Systems have been recommended and verified for interim use within the State of New Jersey, Vortechs Inc. will then proceed to install and monitor systems in the field for the purpose of achieving goals set by the Tier II Protocol and final certification. At that time a net environmental benefit evaluation will be completed. However, it should be noted that the Vortechs technology requires no input of raw material, has no moving parts, and therefore, uses no water or energy.

8. **References**


APPENDIX E

Delegation of Authority Form
Delegation of Authority

I, _____________________________________ (name), hereby designate the person or specifically described position to be a duly authorized representative for the purpose of overseeing compliance with environmental requirements, including the Construction general Permit, at the ______________________________ construction site. The designee is authorized to sign any reports, stormwater pollution prevention plans and all other documents required by the permit.

____________________________________________________
(name of person or position)
____________________________________________________
(company)
____________________________________________________
(address)
____________________________________________________
(city, state, zip)
____________________________________________________
(phone)

By signing this authorization, I confirm that I meet the requirements to make such a designation as set forth in ______________________________ (Reference State Permit), and that the designee above meets the definition of a “duly authorized representative” as set forth in ______________________________ (Reference State Permit).

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 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 knowing violations.
APPENDIX F

Grading and Stabilization Activities Log
Grading and Stabilization Activities Log

Project Name:

SWPPP Contact:

<table>
<thead>
<tr>
<th>Date Grading Activity Initiated</th>
<th>Description of Grading Activity</th>
<th>Date Grading Activity Ceased</th>
<th>Temporary or Permanent</th>
<th>Date when Stabilization Measures Initiated</th>
<th>Description of Stabilization Measure and Location</th>
</tr>
</thead>
<tbody>
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</table>

Note: Temporary and/or permanent soil stabilization measures must be initiated as soon as practicable, but in no case more than 14 days after the construction activity has ceased.
APPENDIX G

SPDES Special Note
A Stormwater Pollution Prevention Plan (SWPPP) has been prepared for this project. The following plan sheets, specifications, state and federal permits/approvals and additional information are components of the Stormwater Pollution Prevention Plan:

**Plans:** Work Zone Traffic Control Plans, Erosion & Sediment Control Plans, Drainage Plans and Details (under separate cover)

**Specifications:**
- **NYSDOT Standard Specifications:**
  - 209 Soil Erosion And Sediment Control
  - 603 Culverts and Storm Drains
  - 604 Drainage Structures
  - 610 Turf And Wildflower Establishment
  - 612 Sodding
  - 625 Survey Operations, Row Markers & Permanent Survey Markers
  - 655 Frames, Grates and Covers

- **Special Specifications:**
  - 604.5102nn15 Stormwater Treatment System

**Permits/Approvals:** Permit Under GP-0-10-001- granted MON. DAY, YEAR ID #
STORMWATER POLLUTION PREVENTION PLAN (SWPPP)  
(Permit No. GP-0-10-001)

Additional Information:
- Soils Description
- Description of Pollution Prevention Measures
- Description of Temporary & Permanent E&SC & Stormwater Practices
- Hydrologic/Hydraulic Analyses (including comparison of pre-development vs. post-development runoff conditions)
- Construction Sequencing Plan
- Certification Form(s)
- Operations & Maintenance Requirements
- Inspection Requirements

Others:

Contractors’ Obligations under SPDES General Permit GP-0-10-001

Every Contractor and Subcontractor that performs an activity that disturbs or exposes soil or implements a portion of the Stormwater Pollution Prevention Plan is required, under the terms of the SPDES General Permit GP-0-10-001, to complete and sign the Contractor/Subcontractor SPDES Permit Certification (Form CONR 5). Contractors are responsible for securing applicable Subcontractor signatures and should consider obtaining certifications as part of the Subcontractor approval process.

A blank copy of the CONR 5 is included in this proposal and is also available in electronic format from the NYSDOT Construction Division website at https://www.nysdot.gov/portal/page/portal/main/business-center/contractors/construction-division/forms-manuals-computer-applications-general-information/environmental

The Contractor shall provide a signed certification for itself at the Preconstruction Meeting. The Contractor will not be allowed to begin work until the certification has been submitted to the Engineer. All subcontractors shall submit a signed copy of the CONR 5 with the subcontractor approval package. Subcontractors will not be approved without a signed certification.
APPENDIX H

Training Log
SWPPP Training Log

Project Name:
Project Location:
Instructor’s Name(s):
Instructor’s Title(s):

Course Location:________________________________________  Date:__________________
Course Length (hours):___________________________________

Stormwater Training Topic: (check as appropriate)

☐ Erosion control BMPs  ☐ Emergency Procedures
☐ Sediment Control BMPs  ☐ Good Housekeeping BMPs
☐ Non-Stormwater BMPs

Specific Training Objective:_______________________________________________________
______________________________________________________________________________

Attendee Roster: (attach additional pages as necessary)

<table>
<thead>
<tr>
<th>No.</th>
<th>Name of Attendee</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
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<tr>
<td>3</td>
<td></td>
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<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX I

Notice of Intent & Permit Authorization Letter
NOTICE OF INTENT

New York State Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

Stormwater Discharges Associated with Construction Activity Under State Pollutant Discharge Elimination System (SPDES) General Permit # GP-0-10-001

All sections must be completed unless otherwise noted. Failure to complete all items may result in this form being returned to you, thereby delaying your coverage under this General Permit. Applicants must read and understand the conditions of the permit and prepare a Stormwater Pollution Prevention Plan prior to submitting this NOI. Applicants are responsible for identifying and obtaining other DEC permits that may be required.

-IMPORTANT-
RETURN THIS FORM TO THE ADDRESS ABOVE

OWNER/OPERATOR MUST SIGN FORM

Owner/Operator Information

Owner/Operator (Company Name/Private Owner Name/Municipality Name)
New York State Dept. of Transportation

Owner/Operator Contact Person Last Name (NOT CONSULTANT)
Lau

Owner/Operator Contact Person First Name
Jim

Owner/Operator Mailing Address
47-40 21st Street

City
Long Island City

State Zip
NY 11101

Phone (Owner/Operator) Fax (Owner/Operator)
718-482-4639 718-482-6319

Email (Owner/Operator)
Jimmy.Lau@dot.ny.gov

FED TAX ID
14-740026K (not required for individuals)
1. Provide the Geographic Coordinates for the project site in NYTM Units. To do this you must go to the NYSDEC Stormwater Interactive Map on the DEC website at:


Zoom into your Project Location such that you can accurately click on the centroid of your site. Once you have located your project site, go to the tool boxes on the top and choose "i" (identify). Then click on the center of your site and a new window containing the X, Y coordinates in UTM will pop up. Transcribe these coordinates into the boxes below. For problems with the interactive map use the help function.

<table>
<thead>
<tr>
<th>X Coordinates (Easting)</th>
<th>Y Coordinates (Northing)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 9 0 4 2 8</td>
<td>4 5 0 9 0 9 4</td>
</tr>
</tbody>
</table>

2. What is the nature of this construction project?

- [ ] New Construction
- [ ] Redevelopment with increase in imperviousness
- [ ] Redevelopment with no increase in imperviousness
3. Select the predominant land use for both pre and post development conditions.

**SELECT ONLY ONE CHOICE FOR EACH**

**Pre-Development Existing Land Use**
- O FOREST
- O PASTURE/OPEN LAND
- O CULTIVATED LAND
- O SINGLE FAMILY HOME
- O SINGLE FAMILY SUBDIVISION
- O TOWN HOME RESIDENTIAL
- O MULTI-FAMILY RESIDENTIAL
- O INSTITUTIONAL/SCHOOL
- O INDUSTRIAL
- O COMMERCIAL
- O ROAD/HIGHWAY
- O RECREATIONAL/SPORTS FIELD
- O BIKE PATH/TRAIL
- O LINEAR UTILITY
- O PARKING LOT
- O OTHER

**Post-Development Future Land Use**
- O SINGLE FAMILY HOME
- O SINGLE FAMILY SUBDIVISION
- O TOWN HOME RESIDENTIAL
- O MULTI-FAMILY RESIDENTIAL
- O INSTITUTIONAL/SCHOOL
- O INDUSTRIAL
- O COMMERCIAL
- O ROAD/HIGHWAY
- O RECREATIONAL/SPORTS FIELD
- O BIKE PATH/TRAIL
- O LINEAR UTILITY (water, sewer, gas, etc.)
- O PARKING LOT
- O CLEARING/GRADING ONLY
- O DEMOLITION, NO REDEVELOPMENT
- O WELL DRILLING ACTIVITY *(Oil, Gas, etc.)*
- O OTHER

*note: for gas well drilling, non-high volume hydraulic fractured wells only*

4. Will future use of this site be an agricultural property as defined by the NYS Agriculture and Markets Law?  
- O Yes  O No

5. Is this a project which does not require coverage under the General Permit (e.g. Project done under an Individual SPDES Permit, or department approved remediation)?  
- O Yes  O No

6. Is this property owned by a state authority, state agency, federal government or local government?  
- O Yes  O No

7. In accordance with the larger common plan of development or sale, enter the total project site acreage, the acreage to be disturbed and the future impervious area (acreage)within the disturbed area. Round to the nearest tenth of an acre.

<table>
<thead>
<tr>
<th>Total Site Acreage</th>
<th>Acreage To Be Disturbed</th>
<th>Existing Impervious Area Within Disturbed</th>
<th>Future Impervious Area Within Disturbed</th>
</tr>
</thead>
<tbody>
<tr>
<td>45.2</td>
<td>34.5</td>
<td>32.3</td>
<td>31.1</td>
</tr>
</tbody>
</table>

8. Do you plan to disturb more than 5 acres of soil at any one time?  
- O Yes  O No

9. Indicate the percentage of each Hydrologic Soil Group (HSG) at the site.

- A 19%  
- B 6%  
- C 62%  
- D 13%
10. Is this a phased project?  

   Yes  ○ No

11. Enter the planned start and end dates of the disturbance.  

   Start Date  06/01/2013  End Date  12/31/2020

12. Identify the nearest, natural, surface waterbody(ies) to which construction site runoff will discharge.  

   Name:  Newtown Creek

12a. Type of waterbody identified in Question 12?  

   ● Wetland / State Jurisdiction On Site (Answer 12b)  
   ○ Wetland / State Jurisdiction Off Site  
   ● Wetland / Federal Jurisdiction On Site (Answer 12b)  
   ○ Wetland / Federal Jurisdiction Off Site  
   ● Stream / Creek On Site  
   ○ Stream / Creek Off Site  
   ○ River On Site  
   ○ River Off Site  
   ○ Lake On Site  
   ○ Lake Off Site  
   ○ Other Type On Site  
   ○ Other Type Off Site

12b. How was the wetland identified?  

   ● Regulatory Map  
   ○ Delineated by Consultant  
   ○ Delineated by Army Corps of Engineers  
   ○ Other (identify)

13. Has the surface waterbody(ies) in question 12 been identified as a 303(d) segment in Appendix E of GP-0-10-001?  

   ○ Yes  ● No

14. Is this project located in one of the Watersheds identified in Appendix C of GP-0-10-001?  

   ○ Yes  ● No

15. Is the project located in one of the watershed areas associated with AA and AA-S classified waters?  

   If no, skip question 16.  

   ○ Yes  ● No
<table>
<thead>
<tr>
<th>Question</th>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>16. Does this construction activity disturb land with no existing impervious cover and where the Soil Slope Phase is identified as an E or F on the USDA Soil Survey? If Yes, what is the acreage to be disturbed?</td>
<td>Yes/No/Unknown</td>
</tr>
<tr>
<td>17. Will the project disturb soils within a State regulated wetland or the protected 100 foot adjacent area?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>18. Does the site runoff enter a separate storm sewer system (including roadside drains, swales, ditches, culverts, etc)?</td>
<td>Yes/No/Unknown</td>
</tr>
<tr>
<td>19. What is the name of the municipality/entity that owns the separate storm sewer system?</td>
<td>NYC Dept. of Environmental Protection</td>
</tr>
<tr>
<td>20. Does any runoff from the site enter a sewer classified as a Combined Sewer?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>21. Has the required Erosion and Sediment Control component of the SWPPP been developed in conformance with the current NYS Standards and Specifications for Erosion and Sediment Control (aka Blue Book)?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>22. Does this construction activity require the development of a SWPPP that includes Water Quality and Quantity Control components (Post-Construction Stormwater Management Practices) (If No, skip questions 23 and 27-35)</td>
<td>Yes/No</td>
</tr>
<tr>
<td>23. Have the Water Quality and Quantity Control components of the SWPPP been developed in conformance with the current NYS Stormwater Management Design Manual?</td>
<td>Yes/No</td>
</tr>
</tbody>
</table>
24. The Stormwater Pollution Prevention Plan (SWPPP) was prepared by:

- Professional Engineer (P.E.)
- Soil and Water Conservation District (SWCD)
- Registered Landscape Architect (R.L.A)
- Certified Professional in Erosion and Sediment Control (CPESC)
- Owner/Operator
- Other

SWPPP Preparer
Hardesty & Hanover

Contact Name (Last, Space, First)
Wan, Daniel Y.

Mailing Address
1501 Broadway, Suite 310
City
New York
State
NY
Zip
10036
Phone
212-944-1150
Fax
212-391-0297
Email
dwan@hardesty-hanover.com

SWPPP Preparer Certification

I hereby certify that the Stormwater Pollution Prevention Plan (SWPPP) for this project has been prepared in accordance with the terms and conditions of the GP-0-10-001. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of this permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

First Name
Daniel
MI
Y
Last Name
Wan
Signature

Date
05/16/2013
25. Has a construction sequence schedule for the planned management practices been prepared?  

Yes  ☐  No  ☐

26. Select all of the erosion and sediment control practices that will be employed on the project site:

<table>
<thead>
<tr>
<th><strong>Temporary Structural</strong></th>
<th><strong>Vegetative Measures</strong></th>
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</thead>
<tbody>
<tr>
<td>☐ Check Dams</td>
<td>☐ Brush Matting</td>
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<tr>
<td>☐ Construction Road Stabilization</td>
<td>☐ Dune Stabilization</td>
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<tr>
<td>☐ Dust Control</td>
<td>☐ Grassed Waterway</td>
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<tr>
<td>☐ Earth Dike</td>
<td>☐ Mulching</td>
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<tr>
<td>☐ Level Spreader</td>
<td>☐ Protecting Vegetation</td>
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<tr>
<td>☐ Perimeter Dike/Swale</td>
<td>☐ Recreation Area Improvement</td>
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<tr>
<td>☐ Pipe Slope Drain</td>
<td>☐ Seeding</td>
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<tr>
<td>☐ Portable Sediment Tank</td>
<td>☐ Sodding</td>
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<tr>
<td>☐ Rock Dam</td>
<td>☐ Straw/Hay Bale Dike</td>
</tr>
<tr>
<td>☐ Sediment Basin</td>
<td>☐ Streambank Protection</td>
</tr>
<tr>
<td>☐ Sediment Traps</td>
<td>☐ Temporary Swale</td>
</tr>
<tr>
<td>☐ Silt Fence</td>
<td>☐ Topsoiling</td>
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<tr>
<td>☐ Stabilized Construction Entrance</td>
<td>☐ Vegetating Waterways</td>
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<tr>
<td>☐ Storm Drain Inlet Protection</td>
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<tr>
<td>☐ Straw/Hay Bale Dike</td>
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<tr>
<td>☐ Temporary Access Waterway Crossing</td>
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<td>☐ Temporary Stormdrain Diversion</td>
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<td>☐ Turbidity Curtain</td>
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</tr>
<tr>
<td>☐ Wattling</td>
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</table>

<table>
<thead>
<tr>
<th><strong>Other</strong></th>
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</thead>
<tbody>
<tr>
<td>Drainage</td>
</tr>
<tr>
<td></td>
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<tr>
<td></td>
</tr>
</tbody>
</table>
27. Indicate all Stormwater Management Practice(s) that will be installed/constructed on this site:

<table>
<thead>
<tr>
<th>Ponds</th>
<th>Wetlands</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micropool Extended Detention (P-1)</td>
<td>Shallow Wetland (W-1)</td>
</tr>
<tr>
<td>Wet Pond (P-2)</td>
<td>Extended Detention Wetland (W-2)</td>
</tr>
<tr>
<td>Wet Extended Detention (P-3)</td>
<td>Pond/Wetland System (W-3)</td>
</tr>
<tr>
<td>Multiple Pond System (P-4)</td>
<td>Pocket Wetland (W-4)</td>
</tr>
<tr>
<td>Pocket Pond (P-5)</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Filtering</th>
<th>Infiltration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Sand Filter (F-1)</td>
<td>Infiltration Trench (I-1)</td>
</tr>
<tr>
<td>Underground Sand Filter (F-2)</td>
<td>Infiltration Basin (I-2)</td>
</tr>
<tr>
<td>Perimeter Sand Filter (F-3)</td>
<td>Dry Well (I-3)</td>
</tr>
<tr>
<td>Organic Filter (F-4)</td>
<td>Underground Infiltration System</td>
</tr>
<tr>
<td>Bioretention (F-5)</td>
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<tr>
<td>Other</td>
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</table>

<table>
<thead>
<tr>
<th>Alternative Practice</th>
<th>Verified Proprietary Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rain Garden</td>
<td>Hydrodynamic</td>
</tr>
<tr>
<td>Cistern</td>
<td>Wet Vault</td>
</tr>
<tr>
<td>Green Roof</td>
<td>Media Filter</td>
</tr>
<tr>
<td>Stormwater Planters</td>
<td></td>
</tr>
<tr>
<td>Permeable Paving (Modular Block)</td>
<td></td>
</tr>
</tbody>
</table>

28. Describe other stormwater management practices not listed above or explain any deviations from the technical standards.

Type 2 catch basins with 4' sump will be added.

29. Has a long term Operation and Maintenance Plan for the post-construction stormwater management practice(s) been developed?  

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

If Yes, Identify the entity responsible for the long term Operation and Maintenance

| Vortech Chamber maintained by NYS DOT. | Catch basins maintained by NYCDEP. |
30. Provide the total water quality volume required and the total provided for the site.

<table>
<thead>
<tr>
<th>WQv Required</th>
<th>WQv Provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.244 acre-feet</td>
<td>3.342 acre-feet</td>
</tr>
</tbody>
</table>

31. Provide the following Unified Stormwater Sizing Criteria for the site.

**Total Channel Protection Storage Volume (CPv)** - Extended detention of post-developed 1 year, 24 hour storm event

<table>
<thead>
<tr>
<th>CPv Required</th>
<th>CPv Provided</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
</tr>
</tbody>
</table>

31a. The need to provide for channel protection has been waived because:
- Site discharges directly to fourth order stream or larger

**Total Overbank Flood Control Criteria (Qp)** - Peak discharge rate for the 10 year storm

<table>
<thead>
<tr>
<th>Pre-Development</th>
<th>Post-development</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

31b. The need to provide for flood control has been waived because:
- Site discharges directly to fourth order stream or larger
  - Downstream analysis reveals that flood control is not required

**Total Extreme Flood Control Criteria (Qf)** - Peak discharge rate for the 100 year storm

<table>
<thead>
<tr>
<th>Pre-Development</th>
<th>Post-development</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

31. Provide the following Unified Stormwater Sizing Criteria for the site.

IMPORTANT: For questions 31 and 32, impervious area should be calculated considering the project site and all offsite areas that drain to the post-construction stormwater management practice(s). (Total Drainage Area = Project Site + Offsite areas)

32. Pre-Construction Impervious Area - As a percent of the Total Drainage Area enter the percentage of the existing impervious areas before construction begins.

96%

33. Post-Construction Impervious Area - As a percent of the Total Drainage Area, enter the percentage of the future impervious areas that will be created/remain on the site after completion of construction.

93%

34. Indicate the total number of post-construction stormwater management practices to be installed/constructed.

2

35. Provide the total number of stormwater discharge points from the site. (include discharges to either surface waters or to separate storm sewer systems)

2
36. Identify other DEC permits that are required for this project.

**DEC Permits**
- Air Pollution Control
- Coastal Erosion
- Hazardous Waste
- Long Island Wells
- Mined Land Reclamation
- Other SPDES
- Solid Waste
- None
- **Other**

*NY-2C; DEC Exc Fill*  
*Nav Water*

37. Does this project require a US Army Corps of Engineers Wetland Permit?  
If Yes, Indicate Size of Impact. □□□□□□□□ □ 0.2

- Yes  
- No

38. Is this project subject to the requirements of a regulated, traditional land use control MS4?  
(If No, skip question 39)

- Yes  
- No

39. Has the "MS4 SWPPP Acceptance" form been signed by the principal executive officer or ranking elected official and submitted along with this NOI?  

- Yes  
- No

40. If this NOI is being submitted for the purpose of continuing coverage under a general permit for stormwater runoff from construction activities, please indicate the former SPDES number assigned.  

*N Y R*

---

**Owner/Operator Certification**

I have read or been advised of the permit conditions and believe that I understand them. I also understand that, under the terms of the permit, there may be reporting requirements. I hereby certify that this document and the corresponding documents were prepared under my direction or supervision. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further understand that coverage under the general permit will be identified in the acknowledgment that I will receive as a result of submitting this NOI and can be as long as sixty (60) business days as provided for in the general permit. I also understand that, by submitting this NOI, I am acknowledging that the SWPPP has been developed and will be implemented as the first element of construction, and agreeing to comply with all the terms and conditions of the general permit for which this NOI is being submitted.

**Print First Name**  
Jim

**Print Last Name**  
Lau

**Owner/Operator Signature**  

**Date**  
05/29/2013
APPENDIX J

Notice of Termination
# NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity

**Please indicate your permit identification number:** NYR ___ ___ ___ ___ ___ ___

## I. Owner or Operator Information

1. Owner/Operator Name: 
2. Street Address: 
3. City/State/Zip: 
4. Contact Person: 
4a. Telephone: 
5. Contact Person E-Mail: 

## II. Project Site Information

5. Project/Site Name: 
6. Street Address: 
7. City/Zip: 
8. County: 

## III. Reason for Termination

9a. ☐ All disturbed areas have achieved final stabilization in accordance with the general permit and SWPPP.  
   *Date final stabilization completed* (month/year): 

9b. ☐ Permit coverage has been transferred to new owner/operator. Indicate new owner/operator’s permit identification number: NYR ___ ___ ___ ___ ___ ___  
   (Note: Permit coverage can not be terminated by owner identified in I.1. above until new owner/operator obtains coverage under the general permit)

9c. ☐ Other (Explain on Page 2)

## IV. Final Site Information

10a. Did this construction activity require the development of a SWPPP that includes post-construction stormwater management practices? ☐ yes ☐ no  
    (If no, go to question 10f.)

10b. Have all post-construction stormwater management practices included in the final SWPPP been constructed?  
    ☐ yes ☐ no  
    (If no, explain on Page 2)

10c. Identify the entity responsible for long-term operation and maintenance of practice(s)?
10d. Has the entity responsible for long-term operation and maintenance been given a copy of the operation and maintenance plan required by the general permit?  □ yes  □ no

10e. Indicate the method used to ensure long-term operation and maintenance of the post-construction stormwater management practice(s):
- □ Post-construction stormwater management practice(s) and any right-of-way(s) needed to maintain practice(s) have been deeded to the municipality.
- □ Executed maintenance agreement is in place with the municipality that will maintain the post-construction stormwater management practice(s).
- □ For post-construction stormwater management practices that are privately owned, the deed of record has been modified to include a deed covenant that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan.
- □ For post-construction stormwater management practices that are owned by a public or private institution (e.g. school, college, university), or government agency or authority, policy and procedures are in place that ensures operation and maintenance of the practice(s) in accordance with the operation and maintenance plan.

10f. Provide the total area of impervious surface (i.e. roof, pavement, concrete, gravel, etc.) constructed within the disturbance area? __________________________ (acres)

11. Is this project subject to the requirements of a regulated, traditional land use control MS4?  □ yes  □ no
   (If Yes, complete section VI - “MS4 Acceptance” statement)

V. Additional Information/Explanation:
(Use this section to answer questions 9c. and 10b., if applicable)

VI. MS4 Acceptance - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative (Note: Not required when 9b. is checked - transfer of coverage)

I have determined that it is acceptable for the owner or operator of the construction project identified in question 5 to submit the Notice of Termination at this time.

Printed Name:

Title/Position:

Signature: Date:
VII. Qualified Inspector Certification - Final Stabilization:

I hereby certify that all disturbed areas have achieved final stabilization as defined in the current version of the general permit, and that all temporary, structural erosion and sediment control measures have been removed. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

| Printed Name: |  |
| Title/Position: |  |
| Signature: | Date: |

VIII. Qualified Inspector Certification - Post-construction Stormwater Management Practice(s):

I hereby certify that all post-construction stormwater management practices have been constructed in conformance with the SWPPP. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

| Printed Name: |  |
| Title/Position: |  |
| Signature: | Date: |

IX. Owner or Operator Certification

I hereby certify that this document was prepared by me or under my direction or supervision. My determination, based upon my inquiry of the person(s) who managed the construction activity, or those persons directly responsible for gathering the information, is that the information provided in this document is true, accurate and complete. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

| Printed Name: |  |
| Title/Position: |  |
| Signature: | Date: |
APPENDIX K

NYSHPO Correspondence/ Documentation
MEMORANDUM OF AGREEMENT
BETWEEN
THE FEDERAL HIGHWAY ADMINISTRATION,
THE NEW YORK STATE DEPARTMENT OF TRANSPORTATION,
AND
THE NEW YORK STATE HISTORIC PRESERVATION OFFICER
FOR
THE KOSCIUSZKO BRIDGE IMPROVEMENT PROJECT
KINGS AND QUEENS COUNTIES, NEW YORK

Pursuant to 36 CFR 800.6

WHEREAS, the Federal Highway Administration (FHWA), in coordination with the New York State Department of Transportation (NYSDOT), has determined that improvements are needed for the Kosciusko Bridge (PIN X729.77; BIN 1-07569-9), which crosses Newtown Creek between Brooklyn and Queens, to address transportation, safety and structural deficiencies currently affecting the bridge; and

WHEREAS, the FHWA, in cooperation with the NYSDOT, has prepared an Environmental Impact Statement (EIS) to study improvements to the Kosciusko Bridge and identified five alternatives for consideration including two alternatives for the rehabilitation of the existing bridge with construction of a parallel bridge, and three alternatives for replacement of the existing bridge in its entirety; and

WHEREAS, as stipulated in 36 CFR 800.8(a)(1), Section 106 can be coordinated with the requirements of the National Environmental Policy Act (NEPA) including using NEPA public participation, analysis, and review processes to meet the requirements of both statutes; and

WHEREAS, the NYSDOT in consultation with FHWA and the New York State Historic Preservation Office (SHPO) has defined the Area of Potential Effect (APE) to include:

1. For Archaeology (Attachment A):
   - Brooklyn, north of Brooklyn-Queens Expressway (BQE)
     - Between Monitor Street and Newtown Creek, the existing BQE right-of-way.
   - Brooklyn, south of BQE
     - Between Monitor Street and Morgan Avenue, Meeker Avenue right-of-way and sidewalks.
     - Between Morgan Avenue and Vandervoort Avenue, narrow portions of lots fronting on Meeker Avenue.
     - Between Vandervoort Avenue and Porter Avenue, the entire lot fronting on the BQE north of Anthony Street.
     - East of Porter Avenue, portions of lots fronting on the BQE between Porter Avenue and Newtown Creek.
   - Queens, west of BQE
     - Between Newtown Creek and 55th Avenue, existing BQE right-of-way.
     - Between 55th Avenue and 53rd Avenue, Laurel Hill Boulevard adjacent to the eastern portion of Old Calvary Cemetery.
   - Queens, east of BQE
     - Portions of blocks between the BQE and 43rd Street north to 54th Drive.
     - Between 54th Drive and 54th Avenue, entire lots fronting 43rd Street to BQE.
2. For Architecture (Attachment B):
   - **Brooklyn**, north of BQE
     - Between Monitor and Van Dam Streets, all lots fronting Meeker Avenue.
     - East of Van Dam Street, entire area between Meeker Avenue, the BQE, and Newtown Creek.
   - **Brooklyn**, south of BQE
     - Between Monitor Street and Morgan Avenue, the area between the BQE and Lombardy Street; also lots fronting on the north side of Lombardy Street.
     - East of Morgan Avenue, the area between the BQE and Anthony Street, plus lots fronting on the south side of Anthony Street, to Newtown Creek.
   - **Queens**, west of BQE
     - Eastern portion of Old Calvary Cemetery. Areas between Review Avenue and Newtown Creek for a distance of approximately 1,000 feet along Review Avenue; and between Laurel Hill Boulevard and Newtown Creek.
   - **Queens**, east of BQE
     - Blocks between the BQE and 43rd Street, plus lots fronting on west side of 43rd Street from 53rd Avenue to 56th Road.

**WHEREAS**, cultural resources investigations have been conducted to identify resources eligible for inclusion in the National Register of Historic Places (NRHP) and include the following studies:

1. Phase 1a study, *Cultural Resources Survey Report for the Kosciuszko Bridge Project* (Parsons 2006)
2. *Final Determination of Eligibility: Kosciuszko Bridge* (BIN 1075699), *Kings and Queens County, New York, New York* (Hughes et al. 2006); and

**WHEREAS**, two historic properties have been determined eligible for inclusion in the NRHP in consultation with the New York State Historic Preservation Office (NYSHPO) pursuant to 36 CFR 800.4 implementing regulations for Section 106 of the National Historic Preservation Act (NHPA)(16 U.S.C. 470l) and include:

1. The Kosciuszko Bridge
2. The Old Calvary Cemetery; and

**WHEREAS**, the NYSDOT and the FHWA have consulted with the NYSHPO in accordance with 36 CFR 800.5 and have determined that the bridge replacement project will have an adverse effect on the Kosciuszko Bridge; and

**WHEREAS**, FHWA in consultation with the NYSHPO has determined that the undertaking will not adversely affect the Old Calvary Cemetery but the Final EIS for the project identifies the potential for elements which contribute to its NRHP eligibility (such as stone mortuary art and sculpture, headstones, and mausoleums) to experience vibration impacts from closeby ground-disturbing activities associated with the permanent or temporary construction (such as pile driving, excavation, and demolition); and

**WHEREAS**, no archaeological resources have previously been identified in the APE and due to the developed nature of the APE, no archaeological testing has yet been conducted; and

**WHEREAS**, the Phase 1a study indicates the potential for intact archaeological sites to occur beneath existing paved areas and some of these resources may be considered NRHP-eligible and may be affected by the proposed project; and
WHEREAS, the FHWA and NYSDOT have identified that effects to potential archaeological resources as a result of activities related to the implementation of the Undertaking, including, but not limited to, bridge and approach construction, staging areas, and other ancillary activities can not be determined at this time; and

WHEREAS, a Draft Archaeological Work Plan (AWP) has been prepared based on information available at this time; and

WHEREAS, pursuant to Section 800.3, the FHWA and the NYSDOT have identified and contacted consulting parties including the New York City Landmarks Preservation Commission, that may have an interest in the effects of this project on historic properties; and

WHEREAS, the FHWA has provided the Advisory Council on Historic Preservation (Council) with all relevant materials and an opportunity to comment and the Council has declined to participate; and

NOW, THEREFORE, the FHWA, the NYSDOT, and the NYSHPO agree that the Undertaking shall be implemented in accordance with the following stipulations in order to take into account the effect of the Undertaking on historic properties.

STIPULATIONS

The FHWA and the NYSDOT, in coordination with the NYSHPO, will ensure that the following stipulations are implemented as part of the subsequent planning, design, and construction of the selected project alternative:

I. MITIGATION MEASURES FOR THE KOSCIUSZKO BRIDGE

A. Prior to demolition, the Kosciuszko Bridge will be documented according to Historic American Engineering Record (HAER) standards at a level to be determined by NYSDOT in consultation with the NYSHPO. The final report will be distributed to the NYSHPO, NYS Archives, NYC Landmarks, FHWA and local repository to be determined in consultation with the NYSHPO.

B. HAER documentation will be conducted by qualified professional architectural historians that meet, at a minimum, the National Park Service Standards (36 CFR Part 61).

C. Additional mitigation measures will be developed in consultation with NYSDOT and NYSHPO with input from Consulting Parties via meetings during the Final Design Phase, so that any such mitigation can be included in the bid package for construction.

II. PROTECTIVE MEASURES FOR OLD CALVARY CEMETERY

A. The FHWA and the NYSDOT, in consultation with the NYSHPO, will develop a Construction Protection Plan (CPP) to protect contributing elements of the Old Calvary Cemetery from vibration effects. The CPP will set forth measures for protection and avoidance of structural and architectural damage from construction activities, monitoring of construction activities, and repair in the event of any damage.
B. The CPP will be based on the requirements established in the New York City Department of Buildings Technical Policy and Procedure Notice (PPN) #10/88 regarding procedures for the avoidance of damage to historic structures resulting from adjacent construction. The PPN defines an adjacent historic structure as being contiguous to or within a lateral distance of 90 feet from a lot under development or alteration.

C. The FHWA and the NYSDOT will ensure all conditions of the CPP are carried out by or under the direct supervision of an architectural historian that meets, at a minimum, the NPS Standards (36 CFR Part 61), and that construction documents indicate he or she will work with the Engineer in Charge of the project with authorization to stop work to prevent any unanticipated damage.

III. ARCHAEOLOGICAL INVESTIGATIONS

A. The FHWA and the NYSDOT, in consultation with the NYSHPO, will reassess and refine the direct APE of the preferred alternative once the preferred alternative is selected and included in the Record of Decision (ROD).

B. A qualified professional archaeologist, (36 CFR Part 61), will modify and refine the attached Draft AWP, outlining procedures for the identification and evaluation of archaeological resources.

C. The revised AWP will be reviewed and approved by the FHWA, the NYSDOT, and the NYSHPO prior to implementation. This plan will include procedures for monitoring during construction to investigate potential archaeological resources in areas within the APE identified as sensitive, but which will not be accessible until construction begins, due to the need to remove buildings, pavements, foundations, etc.

D. The FHWA and the NYSDOT will ensure that all archaeological investigations within the APE of the preferred alternative will be conducted in a manner consistent with the standards and guidelines set forth in SED Scope and Secretary of the Interior’s Standards and Guidelines for Identification and Evaluation (48 FR 44720-23).

E. A qualified professional archaeologist, (36 CFR Part 61), will direct the archaeological investigations to identify intact deposits within the APE for the selected alternative during construction activities.

F. Per the approved AWP, there will be continued consultation with NYSDOT, FHWA, NYSHPO, per NYSDOT established Section 106 procedures, to identify, evaluate and determine appropriate treatments for archaeological resources.

IV. TIMETABLE FOR COMPLIANCE

A. The FHWA and the NYSDOT shall ensure that archaeological investigations commence during the final design phase and continue with archaeological monitoring during construction as needed.

B. For all plans, reports, and documents prepared in accordance with this MOA, unless otherwise stipulated and agreed to by all parties, specific protocol regarding time frames will be developed for review and approval by all parties and put in place prior to the project going to construction.
V. DISPUTE RESOLUTION

Should any signatory to this MOA object in writing within 30 days to any plans or actions provided for review pursuant to this MOA, the FHWA, and the NYSDOT will consult with the objecting party to resolve the objection. If the objection cannot be resolved through consultation, the FHWA and the NYSDOT shall forward all documentation relevant to the dispute to the Council with copies to the NYSHPO and objecting party in accordance with 36 CFR 800.2(b)(2).

A. Upon receipt of adequate documentation, the Council shall review and advise the FHWA and the NYSDOT on the resolution of the objection within 30 calendar days. Any comment provided by the Council and all comments from the parties to the MOA, will be taken into account by the FHWA and the NYSDOT in reaching a final decision regarding the dispute.

B. If the Council does not provide comments regarding the dispute within 30 calendar days after receipt of adequate documentation, the FHWA and the NYSDOT may render a decision regarding the dispute. In reaching its decision, the FHWA and the NYSDOT will take into account all comments regarding the dispute from the parties to the MOA.

C. FHWA and NYSDOT responsibilities to carry out all other actions subject to the terms of this MOA that are not the subject of the dispute remain unchanged. The FHWA and the NYSDOT will notify all parties of its decision in writing before implementing that portion of the undertaking subject to dispute under this stipulation. The FHWA and the NYSDOT decision will be final.

VI. TERMINATION

Any of the signatories to this MOA may request a reconsideration of its terms or revoke the relevant portions of this MOA upon written notification to the other signatories, by providing thirty (30) days notice to the other signatories, provided that these signatories will consult during the period prior to termination to seek agreement on amendments or other actions that would avoid termination. In the advent of termination, the FHWA and the NYSDOT will comply with 36 CFR Parts 800.3 through 800.7 with regard to the undertaking covered by this MOA.

VII. AMENDMENTS

If any signatories to this MOA believe that its terms cannot be carried out, or that an amendment to these terms must be made, that Signatory shall consult with the other Signatories to develop amendments in accordance with 36 CFR Part 800.14(b) and 36 CFR Part 800.6(c)(7), to consider such amendment.

VIII. EXECUTION AND IMPLEMENTATION

Execution and implementation of this MOA between the NYSDOT, SHPO and FHWA, and the implementation of these stipulations provide evidence that the FHWA has taken into account the effects of this undertaking on historic properties and afforded the Council an opportunity to comment.
IX. SIGNATORIES TO THIS AGREEMENT

FEDERAL HIGHWAY ADMINISTRATION
By  
Date 11/25/08

NEW YORK STATE DEPARTMENT OF TRANSPORTATION
By  
Date 10/14/08

NEW YORK STATE HISTORIC PRESERVATION OFFICER
By  
Date 10/22/08
APPENDIX L

SPDES General Permit (GP-0-10-001)
NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SPDES GENERAL PERMIT
FOR STORMWATER DISCHARGES

from

CONSTRUCTION ACTIVITY

Permit No. GP-0-10-001

Issued Pursuant to Article 17, Titles 7, 8 and Article 70
of the Environmental Conservation Law

Effective Date: January 29, 2010
Expiration Date: January 28, 2015

William R. Adriance
Chief Permit Administrator

[Signature]

Authorized Signature

January 28, 2010

Address:
NYS DEC
Div. Environmental Permits
625 Broadway, 4th Floor
Albany, N.Y. 12233-1750
PREFACE

Pursuant to Section 402 of the Clean Water Act (“CWA”), stormwater discharges from certain construction activities are unlawful unless they are authorized by a National Pollutant Discharge Elimination System (“NPDES”) permit or by a state permit program. New York’s State Pollutant Discharge Elimination System (“SPDES”) is a NPDES-approved program with permits issued in accordance with the Environmental Conservation Law (“ECL”).

This general permit (“permit”) is issued pursuant to Article 17, Titles 7, 8 and Article 70 of the ECL. An owner or operator may obtain coverage under this permit by submitting a Notice of Intent (“NOI”) to the Department. Copies of this permit and the NOI for New York are available by calling (518) 402-8109 or at any New York State Department of Environmental Conservation (“the Department”) regional office (see Appendix G). They are also available on the Department’s website at:

http://www.dec.ny.gov/

An owner or operator of a construction activity that is eligible for coverage under this permit must obtain coverage prior to the commencement of construction activity. Activities that fit the definition of “construction activity”, as defined under 40 CFR 122.26(b)(14)(x), (15)(i), and (15)(ii), constitute construction of a point source and therefore, pursuant to Article 17-0505 of the ECL, the owner or operator must have coverage under a SPDES permit prior to commencing construction activity. They cannot wait until there is an actual discharge from the construction site to obtain permit coverage.

*Note: The italicized words/phrases within this permit are defined in Appendix A.*
# NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
# SPDES GENERAL PERMIT FOR STORMWATER DISCHARGES

## FROM CONSTRUCTION ACTIVITIES

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Part I. PERMIT COVERAGE AND LIMITATIONS

A. Permit Application - This permit authorizes stormwater discharges to surface waters of the State from the following construction activities identified within 40 CFR Parts 122.26(b)(14)(x), 122.26(b)(15)(i) and 122.26(b)(15)(ii), provided all of the eligibility provisions of this permit are met:

1. Construction activities involving soil disturbances of one (1) or more acres; including disturbances of less than one acre that are part of a larger common plan of development or sale that will ultimately disturb one or more acres of land; excluding routine maintenance activity that is performed to maintain the original line and grade, hydraulic capacity or original purpose of a facility;

2. Construction activities involving soil disturbances of less than one (1) acre where the Department has determined that a SPDES permit is required for stormwater discharges based on the potential for contribution to a violation of a water quality standard or for significant contribution of pollutants to surface waters of the State.

3. Construction activities located in the watershed(s) identified in Appendix D that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land.

B. Maintaining Water Quality - It shall be a violation of this permit and the ECL for any discharge to either cause or contribute to a violation of water quality standards as contained in Parts 700 through 705 of Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York, such as:

1. There shall be no increase in turbidity that will cause a substantial visible contrast to natural conditions;

2. There shall be no increase in suspended, colloidal or settleable solids that will cause deposition or impair the waters for their best usages; and

3. There shall be no residue from oil and floating substances, nor visible oil film, nor globules of grease.

C. Eligibility Under This General Permit

1. This permit may authorize all discharges of stormwater from construction activity to surface waters of the State and groundwaters except for ineligible discharges identified under subparagraph D. of this Part.

2. Except for non-stormwater discharges explicitly listed in the next paragraph, this permit only authorizes stormwater discharges from construction activities.
(Part I. C)

3. Notwithstanding paragraphs C.1 and C.2 above, the following non-stormwater discharges may be authorized by this permit: discharges from fire fighting activities; fire hydrant flushings; waters to which cleansers or other components have not been added that are used to wash vehicles or control dust in accordance with the SWPPP, routine external building washdown which does not use detergents; pavement washwaters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used; air conditioning condensate; uncontaminated groundwater or spring water; uncontaminated discharges from construction site de-watering operations; and foundation or footing drains where flows are not contaminated with process materials such as solvents. For those entities required to obtain coverage under this permit, and who discharge as noted in this paragraph, and with the exception of flows from fire fighting activities, these discharges must be identified in the SWPPP. Under all circumstances, the owner or operator must still comply with water quality standards in Part I.B.

D. Activities Which Are Ineligible for Coverage Under This General Permit - All of the following are not authorized by this permit:

1. Discharges after construction activities have been completed and the site has undergone final stabilization;

2. Discharges that are mixed with sources of non-stormwater other than those expressly authorized under subsection C.3. of this Part and identified in the SWPPP required by this permit;

3. Discharges that are required to obtain an individual SPDES permit or another SPDES general permit pursuant to Part VII, subparagraph K of this permit;

4. Discharges from construction activities that adversely affect a listed, or proposed to be listed, endangered or threatened species, or its critical habitat;

5. Discharges which either cause or contribute to a violation of water quality standards adopted pursuant to the ECL and its accompanying regulations;

6. Construction activities for residential, commercial and institutional projects that:
   
   a. are tributary to waters of the state classified as AA or AA-s; and
(Part I. D. 6)

b. disturb one or more acres of land with no existing impervious cover and where the Soil Slope Phase is identified as an E or F on the USDA Soil Survey for the County in which the disturbance will occur.

7. *Construction activities* for linear transportation projects and linear utility projects that:
   a. are tributary to waters of the state classified as AA or AA-s; and
   
   b. disturb two or more acres of land with no existing impervious cover and where the Soil Slope Phase is identified as an E or F on the USDA Soil Survey for the County in which the disturbance will occur.

8. *Construction activities* that adversely affect a property that is listed or is eligible for listing on the State or National Register of Historic Places (Note: includes Archeological sites), unless there are written agreements in place with the NYS Office of Parks, Recreation and Historic Preservation (OPRHP) or other governmental agencies to mitigate the effects, or there are local land use approvals evidencing the same.

Part II. OBTAINING PERMIT COVERAGE

A. Notice of Intent (NOI) Submittal

1. An *owner or operator* of a *construction activity* that is not subject to the requirements of a *regulated, traditional land use control MS4* must first develop a SWPPP in accordance with all applicable requirements of this permit and then submit a completed NOI form to the address below in order to be authorized to *discharge* under this permit. The NOI form shall be one which is associated with this permit, signed in accordance with Part VII.H. of this permit.

   **NOTICE OF INTENT**
   NYS DEC, Bureau of Water Permits
   625 Broadway, 4th Floor
   Albany, New York 12233-3505

2. An *owner or operator* of a *construction activity* that is subject to the requirements of a *regulated, traditional land use control MS4* must first develop a SWPPP in accordance with all applicable requirements of this permit and then have its SWPPP reviewed and accepted by the MS4 prior to submitting the NOI to the Department. The *owner or operator* shall have the “MS4 SWPPP Acceptance” form signed by the principal executive officer or ranking elected official from the *regulated, traditional land use control MS4*, or by a duly authorized representative of that person, and then submit that form along with the NOI to the address referenced under “Notice of Intent (NOI) Submittal”.
This requirement does not apply to an owner or operator that is obtaining permit coverage in accordance with the requirements in Part II.E. (Change of Owner or Operator).

3. The owner or operator shall have the SWPPP preparer sign the “SWPPP Preparer Certification” statement on the NOI prior to submitting the form to the Department.

4. As of the date the NOI is submitted to the Department, the owner or operator shall make the NOI and SWPPP available for review and copying in accordance with the requirements in Part VII.F. of this permit.

B. Permit Authorization

1. An owner or operator shall not commence construction activity until their authorization to discharge under this permit goes into effect.

2. Authorization to discharge under this permit will be effective when the owner or operator has satisfied all of the following criteria:
   
   a. project review pursuant to the State Environmental Quality Review Act (SEQRA) have been satisfied, when SEQRA is applicable,

   b. where required, all necessary Department permits subject to the Uniform Procedures Act (UPA) (see 6 NYCRR Part 621) have been obtained, unless otherwise notified by the Department pursuant to 6 NYCRR 621.3(a)(4). Owners or operators of construction activities that are required to obtain UPA permits must submit a preliminary SWPPP to the appropriate DEC Regional Office in Appendix F at the time all other necessary UPA permit applications are submitted. The preliminary SWPPP must include sufficient information to demonstrate that the construction activity qualifies for authorization under this permit,

   c. the final SWPPP has been prepared, and

   d. an NOI has been submitted to the Department in accordance with the requirements of this permit.

3. An owner or operator that has satisfied the requirements of Part II.B.2 above will be authorized to discharge stormwater from their construction activity in accordance with the following schedule:
(Part II. B. 3)

a. For construction activities that are not subject to the requirements of a regulated, traditional land use control MS4:

i. Five (5) business days from the date the Department receives a complete NOI for construction activities with a SWPPP that has been prepared in conformance with the technical standards referenced in Parts III.B.1, 2 and/or 3, or

ii. Sixty (60) business days from the date the Department receives a complete NOI for construction activities with a SWPPP that has not been prepared in conformance with the technical standards referenced in Parts III.B.1, 2 or 3.

b. For construction activities that are subject to the requirements of a regulated, traditional land use control MS4:

i. Five (5) business days from the date the Department receives a complete NOI and signed “MS4 SWPPP Acceptance” form,

4. The Department may suspend or deny an owner’s or operator’s coverage under this permit if the Department determines that the SWPPP does not meet the permit requirements.

5. Coverage under this permit authorizes stormwater discharges from only those areas of disturbance that are identified in the NOI. If an owner or operator wishes to have stormwater discharges from future or additional areas of disturbance authorized, they must submit a new NOI that addresses that phase of the development, unless otherwise notified by the Department.

C. General Requirements For Owners or Operators With Permit Coverage

1. The owner or operator shall ensure that the provisions of the SWPPP are implemented from the commencement of construction activity until all areas of disturbance have achieved final stabilization and the Notice of Termination (NOT) has been submitted to the Department in accordance with Part V. of this permit. This includes any changes made to the SWPPP pursuant to Part III.A.4.

2. The owner or operator shall maintain a copy of the General Permit (GP-0-10-001), NOI, NOI Acknowledgment Letter, SWPPP, MS4 SWPPP Acceptance form and inspection reports at the construction site until all disturbed areas have achieved final stabilization and the NOT has been submitted to the Department.
(Part II. C. 2)

The documents must be maintained in a secure location, such as a job trailer, on-site construction office, or mailbox with lock. The secure location must be accessible during normal business hours to an individual performing a compliance inspection.

3. The owner or operator of a construction activity shall not disturb greater than five (5) acres of soil at any one time without prior written authorization from the Department or, in areas under the jurisdiction of a regulated, traditional land use control MS4, the MS4 (provided the MS4 is not the owner or operator of the construction activity). At a minimum, the owner or operator must comply with the following requirements in order to be authorized to disturb greater than five (5) acres of soil at any one time:

   a. The owner or operator shall have a qualified inspector conduct at least two (2) site inspections in accordance with Part IV.C. every seven (7) calendar days, for as long as greater than five (5) acres of soil remain disturbed. The two (2) inspections shall be separated by a minimum of two (2) full calendar days.

   b. In areas where soil disturbance activity has been temporarily or permanently ceased, temporary and/or permanent soil stabilization measures shall be installed and/or implemented within seven (7) days from the date the soil disturbance activity ceased. The soil stabilization measures selected shall be in conformance with the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control.

   c. The owner or operator shall prepare a phasing plan that defines maximum disturbed area per phase and shows required cuts and fills.

   d. The owner or operator shall install any additional site specific practices needed to protect water quality.

   e. The owner or operator shall include the requirements above in their SWPPP.

4. The Department may suspend or revoke an owner’s or operator’s coverage under this permit at any time if the Department determines that the SWPPP does not meet the permit requirements.
(Part II. C)

5. For construction activities that are subject to the requirements of a regulated, traditional land use control MS4, the owner or operator shall notify the MS4 in writing of any planned amendments or modifications to the post-construction stormwater management practice component of the SWPPP required by Part III.A. 4. and 5. of this permit. Unless otherwise notified by the MS4, the owner or operator shall have the SWPPP amendments or modifications reviewed and accepted by the MS4 prior to commencing construction of the post-construction stormwater management practice.

D. Permit Coverage for Discharges Authorized Under GP-0-08-001

1. Upon renewal of SPDES General Permit for Stormwater Discharges from Construction Activity (Permit No. GP-0-08-001), an owner or operator of construction activity with coverage under GP-0-08-001, as of the effective date of GP-0-10-001, shall be authorized to discharge in accordance with GP-0-10-001 unless otherwise notified by the Department.

E. Change of Owner or Operator

1. When property ownership changes or when there is a change in operational control over the construction plans and specifications, the original owner or operator must notify the new owner or operator, in writing, of the requirement to obtain permit coverage by submitting a NOI with the Department. Once the new owner or operator obtains permit coverage, the original owner or operator shall then submit a completed NOT with the name and permit identification number of the new owner or operator to the Department at the address in Part II.A.1.. If the original owner or operator maintains ownership of a portion of the construction activity and will disturb soil, they must maintain their coverage under the permit.

Permit coverage for the new owner or operator will be effective as of the date the Department receives a complete NOI, provided the original owner or operator was not subject to a sixty (60) business day authorization period that has not expired as of the date the Department receives the NOI from the new owner or operator.

Part III. STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

A. General SWPPP Requirements

1. The SWPPP shall be prepared prior to the submittal of the NOI. The NOI shall be submitted to the Department prior to the commencement of construction activity.
(Part III. A)

2. The SWPPP shall describe the erosion and sediment control practices and where required, post-construction stormwater management practices that will be used and/or constructed to reduce the pollutants in stormwater discharges and to assure compliance with the terms and conditions of this permit. In addition, the SWPPP shall identify potential sources of pollution which may reasonably be expected to affect the quality of stormwater discharges.

3. All SWPPPs that require the post-construction stormwater management practice component shall be prepared by a qualified professional that is knowledgeable in the principles and practices of stormwater management and treatment.

4. The owner or operator must keep the SWPPP current so that it at all times accurately documents the erosion and sediment controls practices that are being used or will be used during construction, and all post-construction stormwater management practices that will be constructed on the site. At a minimum, the owner or operator shall amend the SWPPP:

   a. whenever the current provisions prove to be ineffective in minimizing pollutants in stormwater discharges from the site;

   b. whenever there is a change in design, construction, or operation at the construction site that has or could have an effect on the discharge of pollutants; and

   c. to address issues or deficiencies identified during an inspection by the qualified inspector, the Department or other regulatory authority.

5. The Department may notify the owner or operator at any time that the SWPPP does not meet one or more of the minimum requirements of this permit. The notification shall be in writing and identify the provisions of the SWPPP that require modification. Within fourteen (14) calendar days of such notification, or as otherwise indicated by the Department, the owner or operator shall make the required changes to the SWPPP and submit written notification to the Department that the changes have been made. If the owner or operator does not respond to the Department’s comments in the specified time frame, the Department may suspend the owner’s or operator’s coverage under this permit.

6. Prior to the commencement of construction activity, the owner or operator must identify the contractor(s) and subcontractor(s) that will be responsible for installing, constructing, repairing, replacing, inspecting and maintaining the erosion and sediment control practices included in the SWPPP; and the contractor(s) and subcontractor(s) that will be responsible for constructing the post-construction stormwater management practices included in the SWPPP.
(Part III. A. 6)

The owner or operator shall have each of the contractors and subcontractors identify at least one person from their company that will be responsible for implementation of the SWPPP. This person shall be known as the trained contractor. The owner or operator shall ensure that at least one trained contractor is on site on a daily basis when soil disturbance activities are being performed.

The owner or operator shall have each of the contractors and subcontractors identified above sign a copy of the following certification statement below before they commence any construction activity:

"I hereby certify that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the qualified inspector during a site inspection. I also understand that the owner or operator must comply with the terms and conditions of the most current version of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings. "

In addition to providing the certification statement above, the certification page must also identify the specific elements of the SWPPP that each contractor and subcontractor will be responsible for and include the name and title of the person providing the signature; the name and title of the trained contractor responsible for SWPPP implementation; the name, address and telephone number of the contracting firm; the address (or other identifying description) of the site; and the date the certification statement is signed. The owner or operator shall attach the certification statement(s) to the copy of the SWPPP that is maintained at the construction site. If new or additional contractors are hired to implement measures identified in the SWPPP after construction has commenced, they must also sign the certification statement and provide the information listed above.

7. For projects where the Department requests a copy of the SWPPP or inspection reports, the owner or operator shall submit the documents in both electronic (PDF only) and paper format within five (5) business days, unless otherwise notified by the Department.

8. The SWPPP must include documentation supporting the determination of permit eligibility with regard to Part I.D.8. (Historic Places or Archeological Resource). At a minimum, the supporting documentation shall include the following:
(Part III. A. 8)

a. Information on whether the stormwater discharge or construction activities would have an effect on a property (historic or archeological resource) that is listed or eligible for listing on the State or National Register of Historic Places;

b. Results of historic resources screening determinations conducted. Information regarding the location of historic places listed, or eligible for listing, on the State or National Registers of Historic Places and areas of archeological sensitivity that may indicate the need for a survey can be obtained online by viewing the New York State Office of Parks, Recreation and Historic Places (OPRHP) online resources located on their web site at: http://nysparks.state.ny.us/shpo/online-tools/ (using The Geographic Information System for Archeology and National Register). OPRHP can also be contacted at: NYS OPRHP, State Historic Preservation Office, Peebles Island Resources Center, P.O. Box 189, Waterford, NY 12188-0189, phone: 518-237-8643;

c. A description of measures necessary to avoid or minimize adverse impacts on places listed, or eligible for listing, on the State or National Register of Historic Places. If the owner or operator fails to describe and implement such measures, the stormwater discharge is ineligible for coverage under this permit; and

d. Where adverse effects may occur, any written agreements in place with OPRHP or other governmental agency to mitigate those effects, or local land use approvals evidencing the same.

B. Required SWPPP Contents

1. Erosion and sediment control component - All SWPPPs prepared pursuant to this permit shall include erosion and sediment control practices designed in conformance with the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control. Where erosion and sediment control practices are not designed in conformance with this technical standard, the owner or operator must demonstrate equivalence to the technical standard. At a minimum, the erosion and sediment control component of the SWPPP shall include the following:

   a. Background information about the scope of the project, including the location, type and size of project;
b. A site map/construction drawing(s) for the project, including a general location map. At a minimum, the site map shall show the total site area; all improvements; areas of disturbance; areas that will not be disturbed; existing vegetation; on-site and adjacent off-site surface water(s), wetlands and drainage patterns that could be affected by the construction activity; existing and final slopes; locations of different soil types with boundaries; material, waste, borrow or equipment storage areas located on adjacent properties; and location(s) of the stormwater discharge(s);

c. A description of the soil(s) present at the site, including an identification of the Hydrologic Soil Group (HSG);

d. A construction phasing plan and sequence of operations describing the intended order of construction activities, including clearing and grubbing, excavation and grading, utility and infrastructure installation and any other activity at the site that results in soil disturbance;

e. A description of the minimum erosion and sediment control practices to be installed or implemented for each construction activity that will result in soil disturbance. Include a schedule that identifies the timing of initial placement or implementation of each erosion and sediment control practice and the minimum time frames that each practice should remain in place or be implemented;

f. A temporary and permanent soil stabilization plan that meets the requirements of the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, for each stage of the project, including initial land clearing and grubbing to project completion and achievement of final stabilization;

g. A site map/construction drawing(s) showing the specific location(s), size(s), and length(s) of each erosion and sediment control practice;

h. The dimensions, material specifications, installation details, and operation and maintenance requirements for all erosion and sediment control practices. Include the location and sizing of any temporary sediment basins and structural practices that will be used to divert flows from exposed soils;
i. A maintenance inspection schedule for the contractor(s) identified in Part III.A.6., to ensure continuous and effective operation of the erosion and sediment control practices. The maintenance inspection schedule shall be in accordance with the requirements in the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control;

j. A description of the pollution prevention measures that will be used to control litter, construction chemicals and construction debris from becoming a pollutant source in the stormwater discharges;

k. A description and location of any stormwater discharges associated with industrial activity other than construction at the site, including, but not limited to, stormwater discharges from asphalt plants and concrete plants located on the construction site; and

l. Identification of any elements of the design that are not in conformance with the requirements in the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control. Include the reason for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is equivalent to the technical standards.

2. Post-construction stormwater management practice component - All construction projects identified in Table 2 of Appendix B as needing post-construction stormwater management practices shall prepare a SWPPP that includes practices designed in conformance with the most current version of the technical standard, New York State Stormwater Management Design Manual (“Design Manual”). If the Design Manual is revised during the term of this permit, an owner or operator must begin using the revised version of the Design Manual to prepare their SWPPP six (6) months from the final revision date of the Design Manual.

Where post-construction stormwater management practices are not designed in conformance with this technical standard, the owner or operator must demonstrate equivalence to the technical standard.

At a minimum, the post-construction stormwater management practice component of the SWPPP shall include the following:

a. Identification of all post-construction stormwater management practices to be constructed as part of the project;
(Part III. B. 2)

1. Enhanced Phosphorus Removal Standards - All construction projects identified in Table 2 of Appendix B that are located in the watersheds identified in Appendix C shall prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the Enhanced Phosphorus Removal Standards included in the Design Manual. At a minimum, the post-construction stormwater management practice component of the SWPPP shall include items 2.a - 2.g. above.

2. Planning and Design Requirements for Post-Construction Stormwater Management Practices

   b. A site map/construction drawing(s) showing the specific location and size of each post-construction stormwater management practice;

   c. The dimensions, material specifications and installation details for each post-construction stormwater management practice;

   d. Identification of any elements of the design that are not in conformance with the Design Manual. Include the reason for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is equivalent to the technical standards;

   e. A hydrologic and hydraulic analysis for all structural components of the stormwater management control system;

   f. A detailed summary (including calculations) of the sizing criteria that was used to design all post-construction stormwater management practices. At a minimum, the summary shall address the required design criteria from the applicable chapter of the Design Manual; including the identification of and justification for any deviations from the Design Manual, and identification of any design criteria that are not required based on the design criteria or waiver criteria included in the Design Manual; and

   g. An operations and maintenance plan that includes inspection and maintenance schedules and actions to ensure continuous and effective operation of each post-construction stormwater management practice. The plan shall identify the entity that will be responsible for the long term operation and maintenance of each practice.
(Part III. C)  
C. Required SWPPP Components by Project Type - Unless otherwise notified by the Department, owners or operators of construction activities identified in Table 1 of Appendix B are required to prepare a SWPPP that only includes erosion and sediment control practices designed in conformance with Part III.B.1. Owners or operators of the construction activities identified in Table 2 of Appendix B shall prepare a SWPPP that also includes post-construction stormwater management practices designed in conformance with Part III.B.2 or 3.

Part IV. INSPECTION AND MAINTENANCE REQUIREMENTS

A. General Construction Site Inspection and Maintenance Requirements

1. The owner or operator must ensure that all erosion and sediment control practices and all post-construction stormwater management practices identified in the SWPPP are maintained in effective operating condition at all times.

2. The terms of this permit shall not be construed to prohibit the State of New York from exercising any authority pursuant to the ECL, common law or federal law, or prohibit New York State from taking any measures, whether civil or criminal, to prevent violations of the laws of the State of New York, or protect the public health and safety and/or the environment.

B. Owner or Operator Maintenance Inspection Requirements

1. The owner or operator shall inspect, in accordance with the requirements in the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, the erosion and sediment controls identified in the SWPPP to ensure that they are being maintained in effective operating condition at all times.

2. For construction sites where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and temporary stabilization measures have been applied to all disturbed areas, the owner or operator can stop conducting the maintenance inspections. The owner or operator shall begin conducting the maintenance inspections in accordance with Part IV.B.1. as soon as soil disturbance activities resume.

3. For construction sites where soil disturbance activities have been shut down with partial project completion, the owner or operator can stop conducting the maintenance inspections if all areas disturbed as of the project shutdown date have achieved final stabilization and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational.
(Part IV. C)

C. Qualified Inspector Inspection Requirements - The owner or operator shall have a qualified inspector conduct site inspections in conformance with the following requirements:

[Note: The trained contractor identified in Part III.A.6. cannot conduct the qualified inspector site inspections unless they meet the qualified inspector qualifications included in Appendix A. In order to perform these inspections, the trained contractor would have to be a:

- Licensed Professional Engineer,
- Certified Professional in Erosion and Sediment Control (CPESC),
- Registered Landscape Architect, or
- Someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided they have received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity].

1. A qualified inspector shall conduct site inspections for all construction activities identified in Tables 1 and 2 of Appendix B, with the exception of:

   a. the construction of a single family residential subdivision with 25% or less impervious cover at total site build-out that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres and is not located in one of the watersheds listed in Appendix C and not directly discharging to one of the 303(d) segments listed in Appendix E;

   b. the construction of a single family home that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres and is not located in one of the watersheds listed in Appendix C and not directly discharging to one of the 303(d) segments listed in Appendix E;

   c. construction on agricultural property that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres; and

   d. construction activities located in the watersheds identified in Appendix D that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land.

2. Unless otherwise notified by the Department, the qualified inspector shall conduct site inspections in accordance with the following timetable:

   a. For construction sites where soil disturbance activities are on-going, the qualified inspector shall conduct a site inspection at least once every seven (7) calendar days.
(Part IV. C. 2)

b. For construction sites where soil disturbance activities are on-going and the owner or operator has received authorization in accordance with Part II.C.3 to disturb greater than five (5) acres of soil at any one time, the qualified inspector shall conduct at least two (2) site inspections every seven (7) calendar days. The two (2) inspections shall be separated by a minimum of two (2) full calendar days.

c. For construction sites where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and temporary stabilization measures have been applied to all disturbed areas, the qualified inspector shall conduct a site inspection at least once every thirty (30) calendar days. The owner or operator shall notify the Regional Office stormwater contact person (see contact information in Appendix F) or, in areas under the jurisdiction of a regulated, traditional land use control MS4, the MS4 (provided the MS4 is not the owner or operator of the construction activity) in writing prior to reducing the frequency of inspections.

d. For construction sites where soil disturbance activities have been shut down with partial project completion, the qualified inspector can stop conducting inspections if all areas disturbed as of the project shutdown date have achieved final stabilization and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational. The owner or operator shall notify the Regional Office stormwater contact person (see contact information in Appendix F) or, in areas under the jurisdiction of a regulated, traditional land use control MS4, the MS4 (provided the MS4 is not the owner or operator of the construction activity) in writing prior to the shutdown. If soil disturbance activities are not resumed within 2 years from the date of shutdown, the owner or operator shall have the qualified inspector perform a final inspection and certify that all disturbed areas have achieved final stabilization, and all temporary, structural erosion and sediment control measures have been removed; and that all post-construction stormwater management practices have been constructed in conformance with the SWPPP by signing the “Final Stabilization” and “Post-Construction Stormwater Management Practice” certification statements on the NOT. The owner or operator shall then submit the completed NOT form to the address in Part II.A.1.
(Part IV. C. 3)

3. At a minimum, the qualified inspector shall inspect all erosion and sediment control practices to ensure integrity and effectiveness, all post-construction stormwater management practices under construction to ensure that they are constructed in conformance with the SWPPP, all areas of disturbance that have not achieved final stabilization, all points of discharge to natural surface waterbodies located within, or immediately adjacent to, the property boundaries of the construction site, and all points of discharge from the construction site.

4. The qualified inspector shall prepare an inspection report subsequent to each and every inspection. At a minimum, the inspection report shall include and/or address the following:

   a. Date and time of inspection;

   b. Name and title of person(s) performing inspection;

   c. A description of the weather and soil conditions (e.g. dry, wet, saturated) at the time of the inspection;

   d. A description of the condition of the runoff at all points of discharge from the construction site. This shall include identification of any discharges of sediment from the construction site. Include discharges from conveyance systems (i.e. pipes, culverts, ditches, etc.) and overland flow;

   e. A description of the condition of all natural surface waterbodies located within, or immediately adjacent to, the property boundaries of the construction site which receive runoff from disturbed areas. This shall include identification of any discharges of sediment to the surface waterbody;

   f. Identification of all erosion and sediment control practices that need repair or maintenance;

   g. Identification of all erosion and sediment control practices that were not installed properly or are not functioning as designed and need to be reinstalled or replaced;

   h. Description and sketch of areas that are disturbed at the time of the inspection and areas that have been stabilized (temporary and/or final) since the last inspection;
Part IV. C 4

i. Current phase of construction of all post-construction stormwater management practices and identification of all construction that is not in conformance with the SWPPP and technical standards;

j. Corrective action(s) that must be taken to install, repair, replace or maintain erosion and sediment control practices; and to correct deficiencies identified with the construction of the post-construction stormwater management practice(s); and

k. Digital photographs, with date stamp, that clearly show the condition of all practices that have been identified as needing corrective actions. The qualified inspector shall attach paper color copies of the digital photographs to the inspection report being maintained onsite within seven (7) calendar days of the date of the inspection. The qualified inspector shall also take digital photographs, with date stamp, that clearly show the condition of the practice(s) after the corrective action has been completed. The qualified inspector shall attach paper color copies of the digital photographs to the inspection report that documents the completion of the corrective action work within seven (7) calendar days of that inspection.

5. Within one business day of the completion of an inspection, the qualified inspector shall notify the owner or operator and appropriate contractor or subcontractor identified in Part III.A.6. of any corrective actions that need to be taken. The contractor or subcontractor shall begin implementing the corrective actions within one business day of this notification and shall complete the corrective actions in a reasonable time frame.

6. All inspection reports shall be signed by the qualified inspector. Pursuant to Part II.C.2., the inspection reports shall be maintained on site with the SWPPP.

Part V. TERMINATION OF PERMIT COVERAGE

A. Termination of Permit Coverage

1. An owner or operator that is eligible to terminate coverage under this permit must submit a completed NOT form to the address in Part II.A.1. The NOT form shall be one which is associated with this general permit, signed in accordance with Part VII.H.

2. An owner or operator may terminate coverage when one or more the following conditions have been met:
(Part V. A. 2)

a. Total project completion - All construction activity identified in the SWPPP has been completed; and all areas of disturbance have achieved final stabilization; and all temporary, structural erosion and sediment control measures have been removed; and all post-construction stormwater management practices have been constructed in conformance with the SWPPP and are operational;

b. Planned shutdown with partial project completion - All soil disturbance activities have ceased; and all areas disturbed as of the project shutdown date have achieved final stabilization; and all temporary, structural erosion and sediment control measures have been removed; and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational;

c. A new owner or operator has obtained coverage under this permit in accordance with Part II.E.

3. For construction activities meeting subdivision 2a. or 2b. of this Part, the owner or operator shall have the qualified inspector perform a final site inspection prior to submitting the NOT. The qualified inspector shall, by signing the “Final Stabilization” and “Post-Construction Stormwater Management Practice” certification statements on the NOT, certify that all disturbed areas have achieved final stabilization; and all temporary, structural erosion and sediment control measures have been removed; and that all post-construction stormwater management practices have been constructed in conformance with the SWPPP.

4. For construction activities that are subject to the requirements of a regulated, traditional land use control MS4 and meet subdivision 2a. or 2b. of this Part, the owner or operator shall also have the MS4 sign the “MS4 Acceptance” statement on the NOT. The owner or operator shall have the principal executive officer, ranking elected official, or duly authorized representative from the regulated, traditional land use control MS4, sign the “MS4 Acceptance” statement. The MS4 official, by signing this statement, has determined that it is acceptable for the owner or operator to submit the NOT in accordance with the requirements of this Part. The MS4 can make this determination by performing a final site inspection themselves or by accepting the qualified inspector’s final site inspection certification(s) required in Part V.3.

5. For construction activities that require post-construction stormwater management practices and meet subdivision 2a. of this Part, the owner or operator must, prior to submitting the NOT, ensure one of the following:
(Part V. A. 5)

a. the post-construction stormwater management practice(s) and any right-of-way(s) needed to maintain such practice(s) have been deeded to the municipality in which the practice(s) is located,

b. an executed maintenance agreement is in place with the municipality that will maintain the post-construction stormwater management practice(s),

c. for post-construction stormwater management practices that are privately owned, the owner or operator has modified their deed of record to include a deed covenant that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan,

d. for post-construction stormwater management practices that are owned by a public or private institution (e.g. school, college, university), or government agency or authority, the owner or operator has policy and procedures in place that ensures operation and maintenance of the practices in accordance with the operation and maintenance plan.

Part VI. REPORTING AND RETENTION OF RECORDS

A. Record Retention - The owner or operator shall retain a copy of the NOI, NOI Acknowledgment Letter, SWPPP, MS4 SWPPP Acceptance form and any inspection reports that were prepared in conjunction with this permit for a period of at least five (5) years from the date that the site achieves final stabilization. This period may be extended by the Department, in its sole discretion, at any time upon written notification.

B. Addresses - With the exception of the NOI, NOT, and MS4 SWPPP Acceptance form (which must be submitted to the address referenced in Part II.A.1), all written correspondence requested by the Department, including individual permit applications, shall be sent to the address of the appropriate Department Regional Office listed in Appendix F.

Part VII. STANDARD PERMIT CONDITIONS

A. Duty to Comply - The owner or operator must comply with all conditions of this permit. All contractors and subcontractors associated with the project must comply with the terms of the SWPPP. Any non-compliance with this permit constitutes a violation of the Clean Water Act (CWA) and the ECL and is grounds for an enforcement action against the owner or operator and/or the contractor/subcontractor; permit revocation, suspension or modification; or denial of a permit renewal application. Upon a finding of significant non-compliance with this permit or the applicable SWPPP, the Department may order an immediate stop to all construction activity at the site until the non-compliance is remedied.
(Part VII. A)

The stop work order shall be in writing, shall describe the non-compliance in detail, and shall be sent to the owner or operator.

**B. Continuation of the Expired General Permit** - This permit expires five (5) years from the effective date. However, coverage may be obtained under the expired general permit, which will continue in force and effect, until a new general permit is issued. Unless otherwise notified by the Department in writing, an owner or operator seeking authorization under the new general permit must submit a new NOI in accordance with the terms of such new general permit.

**C. Enforcement** - Failure of the owner or operator, its contractors, subcontractors, agents and/or assigns to strictly adhere to any of the permit requirements contained herein shall constitute a violation of this permit. There are substantial criminal, civil, and administrative penalties associated with violating the provisions of this permit. Fines of up to $37,500 per day for each violation and imprisonment for up to fifteen (15) years may be assessed depending upon the nature and degree of the offense.

**D. Need to Halt or Reduce Activity Not a Defense** - It shall not be a defense for an owner or operator in an enforcement action that it would have been necessary to halt or reduce the construction activity in order to maintain compliance with the conditions of this permit.

**E. Duty to Mitigate** - The owner or operator and its contractors and subcontractors shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

**F. Duty to Provide Information** - The owner or operator shall make available to the Department for review and copying or furnish to the Department within five (5) business days of receipt of a Department request for such information, any information requested for the purpose of determining compliance with this permit. This can include, but is not limited to, the NOI, NOI Acknowledgment Letter, SWPPP, MS4 SWPPP Acceptance form, executed maintenance agreement, and inspection reports. Failure to provide information requested by the Department within the request timeframe shall be a violation of this permit.

The NOI, SWPPP and inspection reports required by this permit are public documents that the owner or operator must make available for review and copying by any person within five (5) business days of the owner or operator receiving a written request by any such person to review the NOI, SWPPP or inspection reports. Copying of documents will be done at the requester’s expense.

**G. Other Information** - When the owner or operator becomes aware that they failed to submit any relevant facts, or submitted incorrect information in the NOI or in any other report, or have made substantive revisions to the SWPPP (e.g. the scope of the project changes significantly, the type of post-construction stormwater management practice(s)
(Part VII. G) changes, there is a reduction in the sizing of the post-construction stormwater management practice, or there is an increase in the disturbance area or impervious area), which were not reflected in the original NOI submitted to the Department, they shall promptly submit such facts or information to the Department. Failure of the owner or operator to correct or supplement any relevant facts within five (5) business days of becoming aware of the deficiency shall constitute a violation of this permit.

H. Signatory Requirements

1. All NOIs and NOTs shall be signed as follows:

   a. For a corporation these forms shall be signed by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:

      i. a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or

      ii. the manager of one or more manufacturing, production or operating facilities, provided the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

   b. For a partnership or sole proprietorship these forms shall be signed by a general partner or the proprietor, respectively; or

   c. For a municipality, State, Federal, or other public agency these forms shall be signed by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes:

      i. the chief executive officer of the agency, or
(Part VII. H. 1. c)

ii. a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of EPA).

2. The SWPPP and other information requested by the Department shall be signed by a person described in Part VII.H.1. or by a duly authorized representative of that person. A person is a duly authorized representative only if:

   a. The authorization is made in writing by a person described in Part VII.H.1.;

   b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position) and,

   c. The written authorization shall include the name, title and signature of the authorized representative and be attached to the SWPPP.

3. All inspection reports shall be signed by the qualified inspector that performs the inspection.

4. The MS4 SWPPP Acceptance form shall be signed by the principal executive officer or ranking elected official from the regulated, traditional land use control MS4, or by a duly authorized representative of that person.

   It shall constitute a permit violation if an incorrect and/or improper signatory authorizes any required forms, SWPPP and/or inspection reports.

I. Property Rights - The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges, nor does it authorize any injury to private property nor any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations. Owners or operators must obtain any applicable conveyances, easements, licenses and/or access to real property prior to commencing construction activity.

J. Severability - The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.
(Part VII. K)

K. Denial of Coverage Under This Permit

1. At its sole discretion, the Department may require any owner or operator authorized by this permit to apply for and/or obtain either an individual SPDES permit or another SPDES general permit. When the Department requires any discharger authorized by a general permit to apply for an individual SPDES permit, it shall notify the discharger in writing that a permit application is required. This notice shall include a brief statement of the reasons for this decision, an application form, a statement setting a time frame for the owner or operator to file the application for an individual SPDES permit, and a deadline, not sooner than 180 days from owner or operator receipt of the notification letter, whereby the authorization to discharge under this general permit shall be terminated. Applications must be submitted to the appropriate Regional Office. The Department may grant additional time upon demonstration, to the satisfaction of the Regional Water Engineer, that additional time to apply for an alternative authorization is necessary or where the Department has not provided a permit determination in accordance with Part 621 of this Title.

2. Any owner or operator authorized by this permit may request to be excluded from the coverage under this permit by applying for an individual permit or another general permit. In such cases, the owner or operator shall submit an individual application or an alternative general permit application in accordance with the requirements of this general permit, 40 CFR 122.26(c)(1)(ii) and 6 NYCRR Part 621, with reasons supporting the request, to the Department at the address for the appropriate Department Office (see addresses in Appendix F). The request may be granted by issuance of an individual permit or another general permit at the discretion of the Department.

3. When an individual SPDES permit is issued to a discharger authorized to discharge under a general SPDES permit for the same discharge(s), the general permit authorization for outfalls authorized under the individual SPDES permit is automatically terminated on the effective date of the individual permit unless termination is earlier in accordance with 6 NYCRR Part 750.

L. Proper Operation and Maintenance - The owner or operator shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the owner or operator to achieve compliance with the conditions of this permit and with the requirements of the SWPPP.

M. Inspection and Entry - The owner or operator shall allow the Department or an authorized representative of EPA, the State, or, in the case of a construction site which discharges through an MS4, an authorized representative of the MS4 receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to:
(Part VII. M)

1. Enter upon the owner’s or operator's premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of this permit;

2. Have access to and copy at reasonable times, any records that must be kept under the conditions of this permit; and

3. Inspect at reasonable times any facilities or equipment (including monitoring and control equipment).

N. Permit Actions - At the Department’s sole discretion, this permit may, at any time, be modified, suspended, revoked, or renewed. The filing of a request by the owner or operator for a permit modification, revocation and reissuance, termination, a notification of planned changes or anticipated noncompliance does not limit, diminish and/or stay compliance with any terms of this permit.

O. Definitions - Definitions of key terms are included in Appendix A of this permit.

P. Re-Opener Clause

1. If there is evidence indicating potential or realized impacts on water quality due to any stormwater discharge associated with construction activity covered by this permit, the owner or operator of such discharge may be required to obtain an individual permit or alternative general permit in accordance with Part VII.K. of this permit or the permit may be modified to include different limitations and/or requirements.

2. Permit modification, suspension or revocation will be conducted in accordance with 6 NYCRR Part 621, 6 NYCRR 750-1.18, and 6 NYCRR 750-1.20.

Q. Penalties for Falsification of Forms and Reports – Article 17 of the ECL provides for a civil penalty of $37,500 per day per violation of this permit. Articles 175 and 210 of the New York State Penal Law provide for a criminal penalty of a fine and/or imprisonment for falsifying forms and reports required by this permit.

R. Other Permits – Nothing in this permit relieves the owner or operator from a requirement to obtain any other permits required by law.
APPENDIX A

Definitions

Alter Hydrology from Pre to Post-Development Conditions - means the post-development peak flow rate(s) has increased by more than 5% of the pre-developed condition for the design storm of interest (e.g. 10 yr and 100 yr).

Combined Sewer - means a sewer that is designed to collect and convey both “sewage” and “stormwater”.

Commence (Commencement of) Construction Activities - means the initial disturbance of soils associated with clearing, grading or excavation activities; or other construction related activities that disturb or expose soils such as demolition, stockpiling of fill material, and the initial installation of erosion and sediment control practices required in the SWPPP. See definition for “Construction Activity(ies)” also.

Construction Activity(ies) - means any clearing, grading, excavation, filling, demolition or stockpiling activities that result in soil disturbance. Clearing activities can include, but are not limited to, logging equipment operation, the cutting and skidding of trees, stump removal and/or brush root removal. Construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility.

Direct Discharge (to a specific surface waterbody) - means that runoff flows from a construction site by overland flow and the first point of discharge is the specific surface waterbody, or runoff flows from a construction site to a separate storm sewer system and the first point of discharge from the separate storm sewer system is the specific surface waterbody.

Discharge(s) - means any addition of any pollutant to waters of the State through an outlet or point source.


Final Stabilization - means that all soil disturbance activities have ceased and a uniform, perennial vegetative cover with a density of eighty (80) percent over the entire pervious surface has been established; or other equivalent stabilization measures, such as permanent landscape mulches, rock rip-rap or washed/crushed stone have been applied on all disturbed areas that are not covered by permanent structures, concrete or pavement.

General SPDES permit - means a SPDES permit issued pursuant to 6 NYCRR Part 750-1.21 authorizing a category of discharges.

Groundwater - means waters in the saturated zone. The saturated zone is a subsurface zone in
which all the interstices are filled with water under pressure greater than that of the atmosphere. Although the zone may contain gas-filled interstices or interstices filled with fluids other than water, it is still considered saturated.

**Impervious Area (Cover)** - means all impermeable surfaces that cannot effectively infiltrate rainfall. This includes paved, concrete and gravel surfaces (i.e. parking lots, driveways, roads, runways and sidewalks); building rooftops and miscellaneous impermeable structures such as patios, pools, and sheds.

**Larger Common Plan of Development or Sale** - means a contiguous area where multiple separate and distinct construction activities are occurring, or will occur, under one plan. The term “plan” in “larger common plan of development or sale” is broadly defined as any announcement or piece of documentation (including a sign, public notice or hearing, marketing plan, advertisement, drawing, permit application, State Environmental Quality Review Act (SEQRA) application, zoning request, computer design, etc.) or physical demarcation (including boundary signs, lot stakes, surveyor markings, etc.) indicating that construction activities may occur on a specific plot.

For discrete construction projects that are located within a larger common plan of development or sale that are at least 1/4 mile apart, each project can be treated as a separate plan of development or sale provided any interconnecting road, pipeline or utility project that is part of the same “common plan” is not concurrently being disturbed.

**Municipal Separate Storm Sewer (MS4)** - a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

i. Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to surface waters of the State;

ii. Designed or used for collecting or conveying stormwater;

iii. Which is not a combined sewer; and

iv. Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

**National Pollutant Discharge Elimination System (NPDES)** - means the national system for the issuance of wastewater and stormwater permits under the Federal Water Pollution Control Act (Clean Water Act).

**NOI Acknowledgment Letter** - means the letter that the Department sends to an owner or operator to acknowledge the Department’s receipt and acceptance of a complete Notice of Intent. This letter documents the owner’s or operator’s authorization to discharge in accordance with the general permit for stormwater discharges from construction activity.
**Owner or Operator** - means the person, persons or legal entity which owns or leases the property on which the construction activity is occurring; and/or an entity that has operational control over the construction plans and specifications, including the ability to make modifications to the plans and specifications.

**Pollutant** - means dredged spoil, filter backwash, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand and industrial, municipal, agricultural waste and ballast discharged into water; which may cause or might reasonably be expected to cause pollution of the waters of the state in contravention of the standards or guidance values adopted as provided in Parts 700 et seq of this Title.

**Qualified Inspector** - means a person that is knowledgeable in the principles and practices of erosion and sediment control, such as a licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, or other Department endorsed individual(s).

It can also mean someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided that person has training in the principles and practices of erosion and sediment control. Training in the principles and practices of erosion and sediment control means that the individual working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect has received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity. After receiving the initial training, the individual working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect shall receive four (4) hours of training every three (3) years.

It can also mean a person that meets the **Qualified Professional** qualifications in addition to the **Qualified Inspector** qualifications.

**Qualified Professional** - means a person that is knowledgeable in the principles and practices of stormwater management and treatment, such as a licensed Professional Engineer, Registered Landscape Architect or other Department endorsed individual(s). Individuals preparing SWPPPs that require the post-construction stormwater management practice component must have an understanding of the principles of hydrology, water quality management practice design, water quantity control design, and, in many cases, the principles of hydraulics in order to prepare a SWPPP that conforms to the Department’s technical standard. All components of the SWPPP that involve the practice of engineering, as defined by the NYS Education Law (see Article 145), shall be prepared by, or under the direct supervision of, a professional engineer licensed to practice in the State of New York.
Regulated, Traditional Land Use Control MS4 - means a city, town or village with land use control authority that is required to gain coverage under New York State DEC’s SPDES General Permit For Stormwater Discharges from Municipal Separate Stormwater Sewer Systems (MS4s).

Routine Maintenance Activity - means construction activity that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility, including, but not limited to:

- Re-grading of gravel roads or parking lots,
- Stream bank restoration projects (does not include the placement of spoil material),
- Cleaning and shaping of existing roadside ditches and culverts that maintains the approximate original line and grade, and hydraulic capacity of the ditch,
- Cleaning and shaping of existing roadside ditches that does not maintain the approximate original grade, hydraulic capacity and purpose of the ditch if the changes to the line and grade, hydraulic capacity or purpose of the ditch are installed to improve water quality and quantity controls (e.g. installing grass lined ditch),
- Placement of aggregate shoulder backing that makes the transition between the road shoulder and the ditch or embankment,
- Full depth milling and filling of existing asphalt pavements, replacement of concrete pavement slabs, and similar work that does not expose soil or disturb the bottom six (6) inches of subbase material,
- Long-term use of equipment storage areas at or near highway maintenance facilities,
- Removal of sediment from the edge of the highway to restore a previously existing sheet-flow drainage connection from the highway surface to the highway ditch or embankment,
- Existing use of Canal Corp owned upland disposal sites for the canal, and
- Replacement of curbs, gutters, sidewalks and guide rail posts.

State Pollutant Discharge Elimination System (SPDES) - means the system established pursuant to Article 17 of the ECL and 6 NYCRR Part 750 for issuance of permits authorizing discharges to the waters of the state.

Surface Waters of the State - shall be construed to include lakes, bays, sounds, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Atlantic ocean within the territorial seas of the state of New York and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, public or private (except those private waters that do not combine or effect a junction with natural surface or underground waters), which are wholly or partially within or bordering the state or within its jurisdiction. Waters of the state are further defined in 6 NYCRR Parts 800 to 941.

Temporary Stabilization - means that exposed soil has been covered with material(s) as set forth in the technical standard, New York Standards and Specifications for Erosion and Sediment Control, to prevent the exposed soil from eroding. The materials can include, but are not limited to, mulch, seed and mulch, and erosion control mats (e.g. jute twisted yarn, excelsior wood fiber mats).
**Total Maximum Daily Loads (TMDLs)** - A TMDL is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources. It is a calculation of the maximum amount of a pollutant that a waterbody can receive on a daily basis and still meet water quality standards, and an allocation of that amount to the pollutant's sources. A TMDL stipulates wasteload allocations (WLAs) for point source discharges, load allocations (LAs) for nonpoint sources, and a margin of safety (MOS).

**Trained Contractor** - means an employee from the contracting (construction) company, identified in Part III.A.6., that has received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity. After receiving the initial training, the *trained contractor* shall receive four (4) hours of training every three (3) years.

It can also mean an employee from the contracting (construction) company, identified in Part III.A.6., that meets the *qualified inspector* qualifications (e.g. licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, or someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided they have received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity).

The *trained contractor* will be responsible for the day to day implementation of the SWPPP.

**Uniform Procedures Act (UPA) Permit** - means a permit required under 6 NYCRR Part 621 of the Environmental Conservation Law (ECL), Article 70.

**Water Quality Standard** - means such measures of purity or quality for any waters in relation to their reasonable and necessary use as promulgated in 6 NYCRR Part 700 et seq.
APPENDIX B

Required SWPPP Components by Project Type

Table 1

CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A SWPPP
THAT ONLY INCLUDES EROSION AND SEDIMENT CONTROLS

<table>
<thead>
<tr>
<th>The following construction activities that involve soil disturbances of one (1) or more acres of land, but less than five (5) acres:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Single family home not located in one of the watersheds listed in Appendix C and not directly discharging to one of the 303(d) segments listed in Appendix E</td>
</tr>
<tr>
<td>• Single family residential subdivisions with 25% or less impervious cover at total site build-out and not located in one of the watersheds listed in Appendix C and not directly discharging to one of the 303(d) segments listed in Appendix E</td>
</tr>
<tr>
<td>• Construction of a barn or other agricultural building, silo, stock yard or pen.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>The following construction activities that involve soil disturbances of one (1) or more acres of land:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Installation of underground, linear utilities; such as gas lines, fiber-optic cable, cable TV, electric, telephone, sewer mains, and water mains</td>
</tr>
<tr>
<td>• Environmental enhancement projects, such as wetland mitigation projects, stormwater retrofits and stream restoration projects</td>
</tr>
<tr>
<td>• Bike paths and trails</td>
</tr>
<tr>
<td>• Sidewalk construction projects that are not part of a road/highway construction or reconstruction project</td>
</tr>
<tr>
<td>• Slope stabilization projects</td>
</tr>
<tr>
<td>• Slope flattening that changes the grade of the site, but does not significantly change the runoff characteristics</td>
</tr>
<tr>
<td>• Spoil areas that will be covered with vegetation</td>
</tr>
<tr>
<td>• Land clearing and grading for the purposes of creating vegetated open space (i.e. recreational parks, lawns, meadows, fields), excluding projects that alter hydrology from pre to post development conditions</td>
</tr>
<tr>
<td>• Athletic fields (natural grass) that do not include the construction or reconstruction of impervious area and do not alter hydrology from pre to post development conditions</td>
</tr>
<tr>
<td>• Demolition project where vegetation will be established and no redevelopment is planned</td>
</tr>
<tr>
<td>• Overhead electric transmission line project that does not include the construction of permanent access roads or parking areas surfaced with impervious cover</td>
</tr>
<tr>
<td>• Structural practices as identified in Table II in the “Agricultural Management Practices Catalog for Nonpoint Source Pollution in New York State”, excluding projects that involve soil disturbances of less than five acres and construction activities that include the construction or reconstruction of impervious area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>The following construction activities that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• All construction activities located in the watersheds identified in Appendix D that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land.</td>
</tr>
</tbody>
</table>
**Table 2**

**CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A SWPPP THAT INCLUDES POST-CONSTRUCTION STORMWATER MANAGEMENT PRACTICES**

<table>
<thead>
<tr>
<th>Construction Activities</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single family home</td>
<td>Located in one of the watersheds listed in Appendix C or directly discharging to one of the 303(d) segments listed in Appendix E</td>
</tr>
<tr>
<td>Single family residential subdivisions</td>
<td>Located in one of the watersheds listed in Appendix C or directly discharging to one of the 303(d) segments listed in Appendix E</td>
</tr>
<tr>
<td>Single family residential subdivisions</td>
<td>That involve soil disturbances of between one (1) and five (5) acres of land with greater than 25% impervious cover at total site build-out</td>
</tr>
<tr>
<td>Single family residential subdivisions</td>
<td>That involve soil disturbances of five (5) or more acres of land, and single family residential subdivisions that involve soil disturbances of less than five (5) acres that are part of a larger common plan of development or sale that will ultimately disturb five or more acres of land</td>
</tr>
<tr>
<td>Multi-family residential developments</td>
<td>Includes townhomes, condominiums, senior housing complexes, apartment complexes, and mobile home parks</td>
</tr>
<tr>
<td>Airports</td>
<td></td>
</tr>
<tr>
<td>Amusement parks</td>
<td></td>
</tr>
<tr>
<td>Campgrounds</td>
<td></td>
</tr>
<tr>
<td>Cemeteries</td>
<td>That include the construction or reconstruction of impervious area (&gt;5% of disturbed area) or alter the hydrology from pre to post development conditions</td>
</tr>
<tr>
<td>Commercial developments</td>
<td></td>
</tr>
<tr>
<td>Churches and other places of worship</td>
<td></td>
</tr>
<tr>
<td>Construction of a barn or other agricultural building(e.g. silo) and structural practices as identified in Table II in the “Agricultural Management Practices Catalog for Nonpoint Source Pollution in New York State” that include the construction or reconstruction of impervious area, excluding projects that involve soil disturbances of less than five acres.</td>
<td></td>
</tr>
<tr>
<td>Golf courses</td>
<td></td>
</tr>
<tr>
<td>Institutional, includes hospitals, prisons, schools and colleges</td>
<td></td>
</tr>
<tr>
<td>Industrial facilities, includes industrial parks</td>
<td></td>
</tr>
<tr>
<td>Landfills</td>
<td></td>
</tr>
<tr>
<td>Municipal facilities; includes highway garages, transfer stations, office buildings, POTW’s and water treatment plants</td>
<td></td>
</tr>
<tr>
<td>Office complexes</td>
<td></td>
</tr>
<tr>
<td>Sports complexes</td>
<td></td>
</tr>
<tr>
<td>Racetracks, includes racetracks with earthen (dirt) surface</td>
<td></td>
</tr>
<tr>
<td>Road construction or reconstruction</td>
<td></td>
</tr>
<tr>
<td>Parking lot construction or reconstruction</td>
<td></td>
</tr>
<tr>
<td>Athletic fields (natural grass) that include the construction or reconstruction of impervious area (&gt;5% of disturbed area) or alter the hydrology from pre to post development conditions</td>
<td></td>
</tr>
<tr>
<td>Athletic fields with artificial turf</td>
<td></td>
</tr>
<tr>
<td>Permanent access roads, parking areas, substations, compressor stations and well drilling pads, surfaced with impervious cover, and constructed as part of an over-head electric transmission line project, wind-power project, cell tower project, oil or gas well drilling project or other linear utility project</td>
<td></td>
</tr>
<tr>
<td>All other construction activities that include the construction or reconstruction of impervious area and alter the hydrology from pre to post development conditions, and are not listed in Table 1</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX C

Watersheds Where Enhanced Phosphorus Removal Standards Are Required

Watersheds where owners or operators of construction activities identified in Table 2 of Appendix B must prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the Enhanced Phosphorus Removal Standards included in the technical standard, New York State Stormwater Management Design Manual (“Design Manual”).

- Entire New York City Watershed located east of the Hudson River - Figure 1
- Onondaga Lake Watershed - Figure 2
- Greenwood Lake Watershed - Figure 3
- Oscawana Lake Watershed – Figure 4
Figure 1 - New York City Watershed East of the Hudson
Figure 3 - Greenwood Lake Watershed
Figure 4 - Oscawana Lake Watershed
APPENDIX D

Watersheds where owners or operators of construction activities that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land must obtain coverage under this permit.

Entire New York City Watershed that is located east of the Hudson River - See Figure 1 in Appendix C
APPENDIX E

List of 303(d) segments impaired by pollutants related to construction activity (e.g. silt, sediment or nutrients). Owners or operators of single family home and single family residential subdivision construction activities that involve soil disturbances of one or more acres of land, but less than 5 acres, and directly discharge to one of the listed segments below shall prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the most current version of the technical standard, New York State Stormwater Management Design Manual (“Design Manual”).

<table>
<thead>
<tr>
<th>COUNTY</th>
<th>WATERBODY</th>
<th>COUNTY</th>
<th>WATERBODY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albany</td>
<td>Ann Lee (Shakers) Pond, Stump Pond</td>
<td>Monroe</td>
<td>Genesee River, Lower, Main Stem</td>
</tr>
<tr>
<td>Albany</td>
<td>Basic Creek Reservoir</td>
<td>Monroe</td>
<td>Genesee River, Middle, Main Stem</td>
</tr>
<tr>
<td>Bronx</td>
<td>Van Cortlandt Lake</td>
<td>Monroe</td>
<td>Black Creek, Lower, and minor tribs</td>
</tr>
<tr>
<td>Broome</td>
<td>Whitney Point Lake/Reservoir</td>
<td>Monroe</td>
<td>Buck Pond</td>
</tr>
<tr>
<td>Broome</td>
<td>Beaver Lake</td>
<td>Monroe</td>
<td>Long Pond</td>
</tr>
<tr>
<td>Broome</td>
<td>White Birch Lake</td>
<td>Monroe</td>
<td>Cranberry Pond</td>
</tr>
<tr>
<td>Chautauqua</td>
<td>Chautauqua Lake, North</td>
<td>Monroe</td>
<td>Mill Creek and tribs</td>
</tr>
<tr>
<td>Chautauqua</td>
<td>Chautauqua Lake, South</td>
<td>Monroe</td>
<td>Shipbuilders Creek and tribs</td>
</tr>
<tr>
<td>Chautauqua</td>
<td>Bear Lake</td>
<td>Monroe</td>
<td>Minor tribs to Irondequoit Bay</td>
</tr>
<tr>
<td>Chautauqua</td>
<td>Chadakoin River and tribs</td>
<td>Monroe</td>
<td>Thomas Creek/White Brook and tribs</td>
</tr>
<tr>
<td>Chautauqua</td>
<td>Lower Cassadaga Lake</td>
<td>Nassau</td>
<td>Glen Cove Creek, Lower, and tribs</td>
</tr>
<tr>
<td>Chautauqua</td>
<td>Middle Cassadaga Lake</td>
<td>Nassau</td>
<td>LI Tribs (fresh) to East Bay</td>
</tr>
<tr>
<td>Chautauqua</td>
<td>Findley Lake</td>
<td>Nassau</td>
<td>East Meadow Brook, Upper, and tribs</td>
</tr>
<tr>
<td>Clinton</td>
<td>Great Chazy River, Lower, Main Stem</td>
<td>Nassau</td>
<td>Hempstead Bay</td>
</tr>
<tr>
<td>Columbia</td>
<td>Kinderhook Lake</td>
<td>Nassau</td>
<td>Hempstead Lake</td>
</tr>
<tr>
<td>Columbia</td>
<td>Robinson Pond</td>
<td>Nassau</td>
<td>Grant Park Pond</td>
</tr>
<tr>
<td>Dutchess</td>
<td>Hillside Lake</td>
<td>Niagara</td>
<td>Bergholtz Creek and tribs</td>
</tr>
<tr>
<td>Dutchess</td>
<td>Wappinger Lakes</td>
<td>Oneida</td>
<td>Ballou, Nail Creeks</td>
</tr>
<tr>
<td>Dutchess</td>
<td>Fall Kill and tribs</td>
<td>Onondaga</td>
<td>Ley Creek and tribs</td>
</tr>
<tr>
<td>Dutchess</td>
<td>Rudd Pond</td>
<td>Onondaga</td>
<td>Onondaga Creek, Lower and tribs</td>
</tr>
<tr>
<td>Erie</td>
<td>Rush Creek and tribs</td>
<td>Onondaga</td>
<td>Onondaga creek, Middle and tribs</td>
</tr>
<tr>
<td>Erie</td>
<td>Ellicott Creek, Lower, and tribs</td>
<td>Onondaga</td>
<td>Onondaga Creek, Upper, and minor tribs</td>
</tr>
<tr>
<td>Erie</td>
<td>Beeman Creek and tribs</td>
<td>Onondaga</td>
<td>Harbor Brook, Lower, and tribs</td>
</tr>
<tr>
<td>Erie</td>
<td>Murder Creek, Lower, and tribs</td>
<td>Onondaga</td>
<td>Ninemile Creek, Lower, and tribs</td>
</tr>
<tr>
<td>Erie</td>
<td>South Branch Smoke Cr, Lower, and tribs</td>
<td>Onondaga</td>
<td>Minor tribs to Onondaga Lake</td>
</tr>
<tr>
<td>Erie</td>
<td>Little Sister Creek, Lower, and tribs</td>
<td>Ontario</td>
<td>Honeoye Lake</td>
</tr>
<tr>
<td>Essex</td>
<td>Lake George (primary county listed as Warren)</td>
<td>Ontario</td>
<td>Hemlock Lake Outlet and minor tribs</td>
</tr>
<tr>
<td>Genesee</td>
<td>Black Creek, Upper, and minor tribs</td>
<td>Ontario</td>
<td>Great Brook and minor tribs</td>
</tr>
<tr>
<td>Genesee</td>
<td>Tonawanda Creek, Middle, Main Stem</td>
<td>Oswego</td>
<td>Lake Neahawnta</td>
</tr>
<tr>
<td>Genesee</td>
<td>Tonawanda Creek, Upper, and minor tribs</td>
<td>Putnam</td>
<td>Oscawana Lake</td>
</tr>
<tr>
<td>Genesee</td>
<td>Little Tonawanda Creek, Lower, and tribs</td>
<td>Putnam</td>
<td>Lake Carmel</td>
</tr>
<tr>
<td>Genesee</td>
<td>Oak Orchard Creek, Upper, and tribs</td>
<td>Queens</td>
<td>Jamaica Bay, Eastern, and tribs (Queens)</td>
</tr>
<tr>
<td>Genesee</td>
<td>Bowen Brook and trib</td>
<td>Queens</td>
<td>Bergen Basin</td>
</tr>
<tr>
<td>Genesee</td>
<td>Bigelow Creek and trib</td>
<td>Queens</td>
<td>Shellbank Basin</td>
</tr>
<tr>
<td>Greene</td>
<td>Schoharie Reservoir</td>
<td>Rensselaer</td>
<td>Snyders Lake</td>
</tr>
<tr>
<td>Greene</td>
<td>Sleepy Hollow Lake</td>
<td>Richmond</td>
<td>Grasmere, Arbutus and Wolves Lakes</td>
</tr>
<tr>
<td>Herkimer</td>
<td>Steele Creek trib</td>
<td>Saratoga</td>
<td>Dwaas Kill and tribs</td>
</tr>
<tr>
<td>Kings</td>
<td>Hendrix Creek</td>
<td>Saratoga</td>
<td>Tribs to Lake Lonely</td>
</tr>
<tr>
<td>Lewis</td>
<td>Mill Creek/South Branch and trib</td>
<td>Saratoga</td>
<td>Lake Lonely</td>
</tr>
<tr>
<td>Livingston</td>
<td>Conesus Lake</td>
<td>Saratoga</td>
<td>Schuyler Creek and trib</td>
</tr>
<tr>
<td>Livingston</td>
<td>Jaycox Creek and trib</td>
<td>Schenectady</td>
<td>Collins Lake</td>
</tr>
<tr>
<td>Livingston</td>
<td>Mill Creek and minor trib</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

43
# APPENDIX E

List of 303(d) segments impaired by pollutants related to construction activity, cont’d.

<table>
<thead>
<tr>
<th>COUNTY</th>
<th>WATERBODY</th>
<th>COUNTY</th>
<th>WATERBODY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schoharie</td>
<td>Engleville Pond</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schoharie</td>
<td>Summit Lake</td>
<td></td>
<td></td>
</tr>
<tr>
<td>St. Lawrence</td>
<td>Black Lake Outlet/Black Lake</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Steuben</td>
<td>Lake Salubria</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Steuben</td>
<td>Smith Pond</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suffolk</td>
<td>Millers Pond</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suffolk</td>
<td>Mattituck (Marratooka) Pond</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suffolk</td>
<td>Tidal tribs to West Moriches Bay</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suffolk</td>
<td>Canaan Lake</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suffolk</td>
<td>Lake Ronkonkoma</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tompkins</td>
<td>Cayuga Lake, Southern End</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tompkins</td>
<td>Owasco Inlet, Upper, and tribs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ulster</td>
<td>Ashokan Reservoir</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ulster</td>
<td>Esopus Creek, Upper, and minor tribs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warren</td>
<td>Lake George</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warren</td>
<td>Tribs to L.George, Village of L George</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warren</td>
<td>Huddle/Finkle Brooks and tribs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warren</td>
<td>Indian Brook and tribs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warren</td>
<td>Hague Brook and tribs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Washington</td>
<td>Tribs to L.George, East Shore of Lake George</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Washington</td>
<td>Cossayuna Lake</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wayne</td>
<td>Port Bay</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wayne</td>
<td>Marbletown Creek and tribs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Westchester</td>
<td>Peach Lake</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Westchester</td>
<td>Mamaroneck River, Lower</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Westchester</td>
<td>Mamaroneck River, Upper, and minor tribs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Westchester</td>
<td>Sheldrake River and tribs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Westchester</td>
<td>Blind Brook, Lower</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Westchester</td>
<td>Blind Brook, Upper, and tribs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Westchester</td>
<td>Lake Lincolndale</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Westchester</td>
<td>Lake Meahaugh</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wyoming</td>
<td>Java Lake</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wyoming</td>
<td>Silver Lake</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: The list above identifies those waters from the final New York State “2008 Section 303(d) List of Impaired Waters Requiring a TMDL/Other Strategy”, dated May 26, 2008, that are impaired by silt, sediment or nutrients.
# APPENDIX F

## LIST OF NYS DEC REGIONAL OFFICES

<table>
<thead>
<tr>
<th>Region</th>
<th>COVERING THE FOLLOWING COUNTIES:</th>
<th>DIVISION OF ENVIRONMENTAL PERMITS (DEP) PERMIT ADMINISTRATORS</th>
<th>DIVISION OF WATER (SPDES) PROGRAM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Nassau and Suffolk</td>
<td>50 Circle Road&lt;br&gt;Stony Brook, NY 11790&lt;br&gt;Tel. (631) 444-0365</td>
<td>50 Circle Road&lt;br&gt;Stony Brook, NY 11790-3409&lt;br&gt;Tel. (631) 444-0405</td>
</tr>
<tr>
<td>2</td>
<td>Bronx, Kings, New York, Queens and Richmond</td>
<td>1 Hunters Point Plaza, 47-40 21st St.&lt;br&gt;Long Island City, NY 11790-5407&lt;br&gt;Tel. (718) 482-4997</td>
<td>1 Hunters Point Plaza, 47-40 21st St.&lt;br&gt;Long Island City, NY 11790-5407&lt;br&gt;Tel. (718) 482-4933</td>
</tr>
<tr>
<td>3</td>
<td>Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster and Westchester</td>
<td>21 South Putt Corners Road&lt;br&gt;New Paltz, NY 12561-1696&lt;br&gt;Tel. (845) 256-3059</td>
<td>100 Hillside Avenue, Suite 1W&lt;br&gt;White Plains, NY 10603&lt;br&gt;Tel. (914) 428-2505</td>
</tr>
<tr>
<td>4</td>
<td>Albany, Columbia, Delaware, Greene, Montgomery, Otsego, Rensselaer, Schenectady and Schoharie</td>
<td>1150 North Westcott Road&lt;br&gt;Schenectady, NY 12306-2014&lt;br&gt;Tel. (518) 357-2069</td>
<td>1130 North Westcott Road&lt;br&gt;Schenectady, NY 12306-2014&lt;br&gt;Tel. (518) 357-2045</td>
</tr>
<tr>
<td>5</td>
<td>Clinton, Essex, Franklin, Fulton, Hamilton, Saratoga, Warren and Washington</td>
<td>1115 State Route 86, PO Box 296&lt;br-Ray Brook, NY 12977-0296&lt;br&gt;Tel. (518) 897-1234</td>
<td>232 Golf Course Road, PO Box 220&lt;br&gt;Warrensburg, NY 12885-0220&lt;br&gt;Tel. (518) 623-1200</td>
</tr>
<tr>
<td>6</td>
<td>Herkimer, Jefferson, Lewis, Oneida and St. Lawrence</td>
<td>State Office Building&lt;br&gt;317 Washington Street&lt;br&gt;Watertown, NY 13601-3787&lt;br&gt;Tel. (315) 785-2245</td>
<td>State Office Building&lt;br&gt;207 Genesee Street&lt;br&gt;Utica, NY 13501-2885&lt;br&gt;Tel. (315) 793-2554</td>
</tr>
<tr>
<td>7</td>
<td>Broome, Cayuga, Chenango, Cortland, Madison, Onondaga, Oswego, Tioga and Tompkins</td>
<td>615 Erie Blvd. West&lt;br&gt;Syracuse, NY 13204-2400&lt;br&gt;Tel. (315) 426-7438</td>
<td>615 Erie Blvd. West&lt;br&gt;Syracuse, NY 13204-2400&lt;br&gt;Tel. (315) 426-7500</td>
</tr>
<tr>
<td>8</td>
<td>Chemung, Genesee, Livingston, Monroe, Ontario, Orleans, Schuyler, Seneca, Steuben, Wayne and Yates</td>
<td>6274 East Avon-Lima Road&lt;br&gt;Avon, NY 14414-9519&lt;br&gt;Tel. (585) 226-2466</td>
<td>6274 East Avon-Lima Rd.&lt;br&gt;Avon, NY 14414-9519&lt;br&gt;Tel. (585) 226-2466</td>
</tr>
<tr>
<td>9</td>
<td>Allegany, Cattaraugus, Chautauqua, Erie, Niagara and Wyoming</td>
<td>270 Michigan Avenue&lt;br&gt;Buffalo, NY 14203-2999&lt;br&gt;Tel. (716) 851-7165</td>
<td>270 Michigan Ave.&lt;br&gt;Buffalo, NY 14203-2999&lt;br&gt;Tel. (716) 851-7070</td>
</tr>
</tbody>
</table>
APPENDIX M

NYC DEP Existing Sewer Maps
<table>
<thead>
<tr>
<th>Sewer Shape</th>
<th>Sewer Material</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circular</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tile</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fiberglass</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unknown</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTES:**
- This map includes borough-wide properties, which are not shown on the map.
- The map is intended to be a graphic representation of the sewer system only.
- The map was updated on December 23, 2007 by DEP.
APPENDIX N

Wetlands Location Map
NYSDEC / USACE Joint Permit Application
NYSDOT Replacement of Kosciuszko Bridge (I-278) over Newtown Creek PIN X729.77

Figure 2a
NYSDEC Classified Streams
APPENDIX O

United States Department of Agriculture (USDA)
Natural Resource Conservation Services (NRCS)
Soil Boundary Map
DATE: October 31, 2012

SUBJECT: Soils Information, Kosciuszko Bridge [amended larger AOI]

TO: Daniela Bastos
Parsons Brinckerhoff
One Penn Plaza
New York, NY 10119

Ms. Bastos,

The Natural Resources Conservation Service, in partnership with the New York City Soil and Water Conservation district, is currently working toward the completion of the SSURGO soil survey for Kings and Queens Counties. All maps are still in draft, however the mapping for your area of interest (AOI) is not expected to change significantly from the draft copy I can provide you.

Per your request I am including an enlarged (1:7,500 scale) soil map of the above-referenced area of interest. Please take note that the scale used for mapping is at 1:12,000, and the minimum size delineation is 1.43 acres. **Soil survey maps are not intended for site specific assessments**, as the influence of human disturbance has resulted in the highly variable soil composition of the area. I encourage you to hire a consulting soil scientist if site specific information is needed.

In short, the areas immediately surrounding Kosciuszko bridge are mapped as Urban land, with various slope and substratum phases. In these most heavily urbanized areas (i.e. Urban land map units), we have not mapped specific soils because the pervious soil areas are so marginalized, fragmented, and/or absent. Some of the areas on the outer fringe of your AOI are Urban land complexes (e.g. UGA--Urban land-Greenbelt complex, 0 to 3 percent slopes), representing areas with significant area of soil intermixed with Urban land. The named soil component (e.g. Greenbelt series) may or may not represent the fill soils in your specific AOI. The soil survey maps provide a best effort to accurately correlate a series to these areas, however the variability of human transported and affected (fill) soils is often too great for an accurate representation at a 1:12,000 (order 2) scale. Again, these soil survey maps are not intended for site specific assessments. **Soil dependent site specific assessments should be made following a detailed (order 1) on-site investigation by a qualified private consulting soil scientist.**

Despite our lack of detailed information in the area, I have provided the draft copy of that AOI below.

The Urban land complexes (i.e. map units without a named soil series) consist of those areas in which 90% or more of the surface is covered by asphalt, concrete, buildings or other impervious materials. Substratum phases (e.g. till, tidal marsh, or reclaimed substratum) are added to provide additional information.

- The till substratum phase indicates a probability of unsorted and unstratified glacial till deposits below the fill overburden.
- The tidal marsh substratum phase indicates a probability of buried organic material below the fill overburden.
- The reclaimed substratum phase indicates that area was mapped as open water on historical surveys.

For any specific series information (e.g. Greenbelt, Centralpark) please query from and reference the following website: [https://soils.series.sc.egov.usda.gov/osdname.asp](https://soils.series.sc.egov.usda.gov/osdname.asp)
Soils Map: Kosciuszko bridge vicinity, Brooklyn and Queens, NY

[please see attached map]

The following is the legend for the above enlarged soil map:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Map Unit Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>GUA</td>
<td>Greenbelt-Urban land complex, 0 to 3 percent slopes</td>
</tr>
<tr>
<td>GUAd</td>
<td>Greenbelt-Urban land complex, deep water table, 0 to 3 percent slopes, cemetery</td>
</tr>
<tr>
<td>GUAw</td>
<td>Greenbelt-Urban land complex, very deep water table, 0 to 3 percent slopes, cemetery</td>
</tr>
<tr>
<td>GUBw</td>
<td>Greenbelt-Urban land complex, very deep water table, 3 to 8 percent slopes, cemetery</td>
</tr>
<tr>
<td>GUCw</td>
<td>Greenbelt-Urban land complex, very deep water table, 8 to 15 percent slope, cemetery</td>
</tr>
<tr>
<td>LaA</td>
<td>Laguardia artifactual coarse sandy loam, 0 to 3 percent slopes</td>
</tr>
<tr>
<td>LUB</td>
<td>Laguardia-Urban land complex, 3 to 8 percent slopes</td>
</tr>
<tr>
<td>UGA</td>
<td>Urban land-Greenbelt complex, 0 to 3 percent slopes</td>
</tr>
<tr>
<td>UGB</td>
<td>Urban land-Greenbelt complex, 3 to 8 percent slopes</td>
</tr>
<tr>
<td>UGBI</td>
<td>Urban land-Greenbelt complex, 3 to 8 percent slopes, low impervious surface</td>
</tr>
<tr>
<td>UGCI</td>
<td>Urban land-Greenbelt complex, 8 to 15 percent slopes, low impervious surface</td>
</tr>
<tr>
<td>UmA</td>
<td>Urban land, tidal marsh substratum, 0 to 3 percent slopes</td>
</tr>
<tr>
<td>UmB</td>
<td>Urban land, tidal marsh substratum, 3 to 8 percent slopes</td>
</tr>
<tr>
<td>UoA</td>
<td>Urban land, outwash substratum, 0 to 3 percent slopes</td>
</tr>
<tr>
<td>UrA</td>
<td>Urban land, reclaimed substratum, 0 to 3 percent slopes</td>
</tr>
<tr>
<td>UTA</td>
<td>Urban land, till substratum, 0 to 3 percent slopes</td>
</tr>
<tr>
<td>UTB</td>
<td>Urban land, till substratum, 3 to 8 percent slopes</td>
</tr>
<tr>
<td>w</td>
<td>Water</td>
</tr>
<tr>
<td></td>
<td>Sandy spot</td>
</tr>
<tr>
<td></td>
<td>Anthropogenic escarpment</td>
</tr>
<tr>
<td></td>
<td>Short steep slope</td>
</tr>
</tbody>
</table>
One of the historical surveys we draw heavily upon for the soil survey mapping is the Merrill surficial geology folio published in 1902\(^1\). Below is a screen shot of your AOI at \(\sim 1:20,000\):

\[\text{Stratified drift and till (undifferentiated)}\]

\[\text{Till (with occasional small rock exposures)}\]

Based on this document, one would expect a sandier substratum on the Brooklyn side, and a loamier substratum on the Queens side (beneath any fill overburden). Notice the "S-G" Sand and Gravel Mine spot symbols on the Brooklyn side. However, we did find some sandy substratum textures in the southern part of Calvary Cemetery, as indicated in the sandy spot symbol in the soils map in my report.

It also appears as if there are minimal reclaimed land areas (land created over previous open water) as the glacial deposits flank either side of the narrow waterway without extensive tidal marsh.

We have found the Merrill mapping to be pretty accurate, and this opinion is shared by some professional geologists we've consulted who work extensively within the NYC area.

The following are map unit descriptions generated from our soils database:

**GUA–Greenbelt-Urban land complex, 0 to 3 percent slopes**

**Map Unit Setting**
- Landscape: Lowlands, uplands
- Elevation: 0 to 520 feet
- Mean annual precipitation: 40 to 52 inches
- Mean annual air temperature: 47 to 62 degrees F
- Frost-free period: 216 to 234 days

**Map Unit Composition**
- Greenbelt and similar soils: 60 percent
- Urban land, till substratum: 25 percent
- Minor components: 15 percent

**Description of Greenbelt**

**Setting**
- Landform position (two-dimensional): Summit, backslope, footslope
- Landform position (three-dimensional): Crest, side slope, base slope, talus
- Anthropogenic features: Fills
- Down-slope shape: Linear, convex
- Across-slope shape: Linear, convex
- Parent material: Loamy human-transported material

**Properties and qualities**
- Slope: 0 to 3 percent
- Depth to restrictive feature: None within 60 inches
- Drainage class: Well drained
- Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.425 to 1.417 in/hr)
- Depth to water table: More than 6 feet
- Frequency of flooding: None
- Frequency of ponding: None
- Calcium carbonate maximum: 30 percent
- Available water capacity: High (about 10.7 inches)

**Interpretive Groups**
- Land capability (non irrigated): 1

**Typical Profile**

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\( ^A : 0 \text{ to } 5 \text{ inches: loam} \\
^Bw1 : 5 \text{ to } 16 \text{ inches: loam} \\
^Bw2 : 16 \text{ to } 30 \text{ inches: loam} \\
^C : 30 \text{ to } 79 \text{ inches: sandy loam} \)

**Description of Urban land, till substratum**

**Setting**
Landform position (two-dimensional): Summit  
Landform position (three-dimensional): Talf  
Anthropogenic features: Urban land  
Down-slope shape: Linear  
Across-slope shape: Linear  
Parent material: Asphalt over human-transported material

**Properties and qualities**
Slope: 0 to 3 percent  
Depth to restrictive feature: 0 to 0 inches to human-manufactured materials  
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.000 to 0.001 in/hr)  
Frequency of flooding: None  
Frequency of ponding: None  
Calcium carbonate maximum: 10 percent  
Available water capacity: Very low (about 0.0 inches)

**Interpretive Groups**
Land capability (non irrigated): 8s

**Typical Profile**
M : 0 to 15 inches: cemented material  
\( 2^C : 15 \text{ to } 79 \text{ inches: gravelly sandy loam} \)

**Minor Components**

**Ebbets soils**
Percent of map unit: 7 percent  
Landform position (two-dimensional): Summit, backslope, footslope  
Landform position (three-dimensional): Side slope, crest, base slope, talf  
Anthropogenic features: Fills  
Down-slope shape: Linear, convex  
Across-slope shape: Linear, convex

**Laguardia soils**
Percent of map unit: 7 percent  
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope  
Landform position (three-dimensional): Base slope, side slope, crest, rise, dip, talf  
Anthropogenic features: Fills  
Down-slope shape: Linear, convex, concave  
Across-slope shape: Linear, convex, concave

**North Meadow soils**
Percent of map unit: 1 percent  
Landform position (two-dimensional): Backslope, footslope, toeslope  
Landform position (three-dimensional): Base slope, side slope, talf  
Anthropogenic features: Fills  
Down-slope shape: Linear, concave  
Across-slope shape: Linear, concave
GUAd--Greenbelt-Urban land complex, deep water table, 0 to 3 percent slopes, cemetery

Map Unit Setting
Landscape: Uplands
Elevation: 0 to 520 feet
Mean annual precipitation: 40 to 52 inches
Mean annual air temperature: 47 to 62 degrees F
Frost-free period: 216 to 234 days

Map Unit Composition
Greenbelt, cemetery, deep water table phase, and similar soils: 53 percent
Urban land, till substratum, cemetery: 30
Minor components: 17 percent

Description of Greenbelt, cemetery, deep water table phase

Setting
Landform position (two-dimensional): Summit, shoulder, footslope, toeslope
Landform position (three-dimensional): Crest, side slope, base slope, talf
Anthropogenic features: Fills
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Loamy human-transported material

Properties and qualities
Slope: 0 to 3 percent
Surface area covered with stones and boulders: 7.0 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high or high (0.566 to 5,668 in/hr)
Depth to water table: About 37 to 60 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 2 percent
Available water capacity: High (about 9.6 inches)

Interpretive Groups
Land capability (non irrigated): 5s

Typical Profile
*A: 0 to 9 inches: loam
*Bw1: 9 to 24 inches: loam
*Bw2: 24 to 32 inches: sandy loam
2*C1: 32 to 37 inches: sand
3*C2: 37 to 72 inches: sandy loam

Description of Urban land, till substratum, cemetery

Setting
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Anthropogenic features: Urban land
Down-slope shape: Linear

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Across-slope shape: Linear
Parent material: Asphalt over human-transported material

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: 0 to 0 inches to human-manufactured materials
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.001 to 0.001 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 10 percent
Available water capacity: Very low (about 0.0 inches)

Interpretive Groups
Land capability (non irrigated): 8s

Typical Profile
M : 0 to 15 inches: cemented material
2°C : 15 to 79 inches: gravelly sandy loam

Minor Components

North Meadow soils
Percent of map unit: 8 percent
Landform position (two-dimensional): Backslope, footslope, toeslope
Landform position (three-dimensional): Base slope, side slope, talf
Anthropogenic features: Fills
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave

Aeric Endoaquepts, human transported material soils
Percent of map unit: 7 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave
Across-slope shape: Concave

Greenbelt, cemetery, very deep water table phase soils
Percent of map unit: 2 percent
Landform position (two-dimensional): Summit, shoulder, footslope, toeslope
Landform position (three-dimensional): Crest, side slope, base slope, talf
Anthropogenic features: Fills
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex

GUAw--Greenbelt-Urban land complex, very deep water table, 0 to 3 percent slopes, cemetery

Map Unit Setting

Landscape: Uplands
Elevation: 0 to 520 feet
Mean annual precipitation: 40 to 52 inches
Mean annual air temperature: 47 to 62 degrees F
Frost-free period: 216 to 234 days
Map Unit Composition
Greenbelt, cemetery, very deep water table phase, and similar soils: 60 percent
Urban land, till substratum, cemetery: 35
Minor components: 5 percent

Description of Greenbelt, cemetery, very deep water table phase

Setting
Landform position (two-dimensional): Summit, shoulder, footslope, toeslope
Landform position (three-dimensional): Crest, side slope, base slope, talf
Anthropogenic features: Fills
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Loamy human-transported material

Properties and qualities
Slope: 0 to 3 percent
Surface area covered with stones and boulders: 7.0 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high or high (0.568 to 5.668 in/hr)
Depth to water table: About 60 to 79 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 2 percent
Available water capacity: Moderate (about 7.5 inches)

Interpretive Groups
Land capability (non irrigated): 5s

Typical Profile
\( A \): 0 to 6 inches: loam
\( BA \): 6 to 14 inches: sandy loam
\( Bw1 \): 14 to 28 inches: sandy loam
\( Bw2 \): 28 to 35 inches: loam
\( C \): 35 to 50 inches: loam

Description of Urban land, till substratum, cemetery

Setting
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Anthropogenic features: Urban land
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Asphalt over human-transported material

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: 0 to 0 inches to human-manufactured materials
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.000 to 0.001 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 10 percent
Available water capacity: Very low (about 0.0 inches)
Interpretive Groups
Land capability (non irrigated): 8s

Typical Profile
M: 0 to 15 inches: cemented material
2°C: 15 to 79 inches: gravelly sandy loam

Minor Components
Charlton soils
Percent of map unit: 3 percent
Landform: Hills
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Head slope
Down-slope shape: Linear
Across-slope shape: Convex

Greenbelt, cemetery, deep water table phase soils
Percent of map unit: 2 percent
Landform position (two-dimensional): Summit, shoulder, footslope, toeslope
Landform position (three-dimensional): Crest, side slope, base slope, t alf
Anthropogenic features: Fills
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex

**GUBw--Greenbelt-Urban land complex, very deep water table, 3 to 8 percent slopes, cemetery**

**Map Unit Setting**
Landscape: Uplands
Elevation: 0 to 520 feet
Mean annual precipitation: 40 to 52 inches
Mean annual air temperature: 47 to 62 degrees F
Frost-free period: 216 to 234 days

**Map Unit Composition**
Greenbelt, cemetery, very deep water table phase, and similar soils: 70 percent
Urban land, till substratum, cemetery: 25
Minor components: 5 percent

**Description of Greenbelt,cemetery, very deep water table phase**

**Setting**
Landform position (two-dimensional): Shoulder, footslope, backslope
Landform position (three-dimensional): Crest, side slope, base slope
Anthropogenic features: Fills
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Loamy human-transported material

**Properties and qualities**
Slope: 3 to 8 percent
Surface area covered with stones and boulders: 7.0 percent
Depth to restrictive feature: None within 60 inches

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Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high or high (0.568 to 5.668 in/hr)
Depth to water table: About 60 to 79 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 2 percent
Available water capacity: Moderate (about 7.5 inches)

Interpretive Groups
Land capability (non irrigated): 6s

Typical Profile
^A: 0 to 6 inches: loam
^BA: 6 to 14 inches: sandy loam
^Bw1: 14 to 28 inches: sandy loam
^Bw2: 28 to 35 inches: loam
^C: 35 to 50 inches: loam

Description of Urban land, till substratum, cemetery

Setting
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Taf
Anthropogenic features: Urban land
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Asphalt over human-transported material

Properties and qualities
Slope: 3 to 8 percent
Depth to restrictive feature: 0 to 0 inches to human-manufactured materials
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.000 to 0.001 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 10 percent
Available water capacity: Very low (about 0.0 inches)

Interpretive Groups
Land capability (non irrigated): 8s

Typical Profile
M: 0 to 15 inches: cemented material
2^C: 15 to 79 inches: gravelly sandy loam

Minor Components

Charlton, cemetery soils
Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Head slope
Down-slope shape: Linear
Across-slope shape: Convex
GUCw--Greenbelt-Urban land complex, very deep water table, 8 to 15 percent slope, cemetery

Map Unit Setting
Landscape: Uplands
Elevation: 0 to 520 feet
Mean annual precipitation: 40 to 52 inches
Mean annual air temperature: 47 to 62 degrees F
Frost-free period: 216 to 234 days

Map Unit Composition
Greenbelt, cemetery, very deep water table phase, and similar soils: 61 percent
Urban land, till substratum, cemetery: 33
Minor components: 6 percent

Description of Greenbelt,cemetery, very deep water table phase

Setting
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Crest, side slope, base slope
Anthropogenic features: Fills
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Loamy human-transported material

Properties and qualities
Slope: 8 to 15 percent
Surface area covered with stones and boulders: 7.0 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high or high (0.568 to 5.668 in/hr)
Depth to water table: More than 6 feet
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 2 percent
Available water capacity: Moderate (about 7.5 inches)

Interpretive Groups
Land capability (non irrigated): 6s

Typical Profile
^A : 0 to 6 inches: loam
^BA : 6 to 14 inches: sandy loam
^Bw1 : 14 to 28 inches: sandy loam
^Bw2 : 28 to 35 inches: loam
^C : 35 to 50 inches: loam

Description of Urban land,till substratum, cemetery

Setting
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Talf
Anthropogenic features: Urban land
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Asphalt over human-transported material

Properties and qualities
Slope: 0 to 15 percent
Depth to restrictive feature: 0 to 0 inches to human-manufactured materials
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.000 to 0.001 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 10 percent
Available water capacity: Very low (about 0.0 inches)

Interpretive Groups
Land capability (non irrigated): 8s

Typical Profile
M : 0 to 15 inches: cemented material
2^c : 15 to 79 inches: gravelly sandy loam

Minor Components

Charlton, cemetery soils
Percent of map unit: 6 percent
Landform: Hills
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Head slope
Down-slope shape: Linear
Across-slope shape: Convex

LaA--Laguardia artifactual coarse sandy loam, 0 to 3 percent slopes

Map Unit Setting

Landscape: Lowlands, uplands
Elevation: 0 to 520 feet
Mean annual precipitation: 40 to 52 inches
Mean annual air temperature: 47 to 62 degrees F
Frost-free period: 216 to 234 days

Map Unit Composition
Laguardia and similar soils: 80 percent
Minor components: 20 percent

Description of Laguardia

Setting
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Base slope, side slope, crest, rise, dip, t alf
Anthropogenic features: Fills
Down-slope shape: Linear, convex, concave
Across-slope shape: Linear, convex, concave
Parent material: Loamy-skeletal human-transported material

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low or moderately high (0.014 to 1.417 in/hr)
Depth to water table: More than 6 feet
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 19 percent
Available water capacity: Moderate (about 7.4 inches)

Interpretive Groups
Land capability (non irrigated): 1

Typical Profile
^Au : 0 to 8 inches: artifactual coarse sandy loam
^BCu : 8 to 26 inches: very artifactual coarse sandy loam
^Cu : 26 to 79 inches: very artifactual coarse sandy loam

Minor Components

Ebbets soils
Percent of map unit: 6 percent
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Side slope, crest, base slope, talf
Anthropogenic features: Fills
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex

Centralpark soils
Percent of map unit: 5 percent
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Anthropogenic features: Fills
Down-slope shape: Convex
Across-slope shape: Convex

Greenbelt soils
Percent of map unit: 5 percent
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Crest, side slope, base slope, talf
Anthropogenic features: Fills
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex

Secaucus soils
Percent of map unit: 2 percent
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Dip, talf
Anthropogenic features: Fills
Down-slope shape: Linear
Across-slope shape: Concave

Fragmental, mixed, mesic Typic Udorthents soils
Percent of map unit: 2 percent
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Base slope, riser
Anthropogenic features: Fills
Down-slope shape: Convex
Across-slope shape: Convex

LUB--Laguardia-Urban land complex, 3 to 8 percent slopes

Map Unit Setting
Landscape: Lowlands, uplands
Elevation: 0 to 520 feet
Mean annual precipitation: 40 to 52 inches
Mean annual air temperature: 47 to 62 degrees F
Frost-free period: 216 to 234 days

Map Unit Composition
Laguardia and similar soils: 60 percent
Urban land, till substratum: 25
Minor components: 15 percent

Description of Laguardia

Setting
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Base slope, side slope, crest, rise, dip, t alf
Anthropogenic features: Fills
Down-slope shape: Linear, convex, concave
Across-slope shape: Linear, convex, concave
Parent material: Loamy-skeletal human-transported material

Properties and qualities
Slope: 3 to 8 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low or moderately high
(0.014 to 1.417 in/hr)
Depth to water table: More than 6 feet
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 19 percent
Available water capacity: Moderate (about 7.4 inches)

Interpretive Groups
Land capability (non irrigated): 2e

Typical Profile
Au: 0 to 8 inches: artifactual coarse sandy loam
BU: 8 to 26 inches: very artifactual coarse sandy loam
Cu: 26 to 79 inches: very artifactual coarse sandy loam

Description of Urban land,till substratum

Setting
Landform position (two-dimensional): Summit
Landform position (three-dimensional): T alf
Anthropogenic features: Urban land
Down-slope shape: Linear

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Across-slope shape: Linear  
Parent material: Asphalt over human-transported material  

Properties and qualities  
Slope: 0 to 8 percent  
Depth to restrictive feature: 0 to 0 inches to human-manufactured materials  
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.000 to 0.001 in/hr)  
Frequency of flooding: None  
Frequency of ponding: None  
Calcium carbonate maximum: 10 percent  
Available water capacity: Very low (about 0.0 inches)  

Interpretive Groups  
Land capability (non irrigated): 8s  

Typical Profile  
M : 0 to 15 inches: cemented material  
2^C : 15 to 79 inches: gravelly sandy loam  

Minor Components  

Ebbets soils  
Percent of map unit: 7 percent  
Landform position (two-dimensional): Summit, backslope, foottslope  
Landform position (three-dimensional): Side slope, crest, base slope, talf  
Anthropogenic features: Fills  
Down-slope shape: Linear, convex  
Across-slope shape: Linear, convex  

Greenbelt soils  
Percent of map unit: 7 percent  
Landform position (two-dimensional): Summit, backslope, foottslope  
Landform position (three-dimensional): Crest, side slope, base slope, talf  
Anthropogenic features: Fills  
Down-slope shape: Linear, convex  
Across-slope shape: Linear, convex  

Secaucus soils  
Percent of map unit: 1 percent  
Landform position (two-dimensional): Backslope  
Landform position (three-dimensional): Dip, talf  
Anthropogenic features: Fills  
Down-slope shape: Linear  
Across-slope shape: Concave  

UGA--Urban land-Greenbelt complex, 0 to 3 percent slopes  

Map Unit Setting  

Landscape: Uplands  
Elevation: 0 to 520 feet  
Mean annual precipitation: 40 to 52 inches  
Mean annual air temperature: 47 to 62 degrees F  
Frost-free period: 216 to 234 days  

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Map Unit Composition
Urban land, till substratum: 78 percent
Greenbelt and similar soils: 12 percent
Minor components: 10 percent

Description of Urban land, till substratum

Setting
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Anthropogenic features: Urban land
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Asphalt over human-transported material

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: 0 to 0 inches to human-manufactured materials
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.000 to 0.001 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 10 percent
Available water capacity: Very low (about 0.0 inches)

Interpretive Groups
Land capability (non irrigated): 8s

Typical Profile
M : 0 to 15 inches: cemented material
2^AC : 15 to 79 inches: gravelly sandy loam

Description of Greenbelt

Setting
Landform position (two-dimensional): Summit, backslope, fooslope
Landform position (three-dimensional): Crest, side slope, base slope, talf
Anthropogenic features: Fills
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Loamy human-transported material

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.425 to 1.417 in/hr)
Depth to water table: More than 6 feet
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 30 percent
Available water capacity: High (about 10.7 inches)

Interpretive Groups
Land capability (non irrigated): 1

Typical Profile
A: 0 to 5 inches: loam
Bw1: 5 to 16 inches: loam
Bw2: 16 to 30 inches: loam
C: 30 to 79 inches: sandy loam

Minor Components

Laguardia soils
Percent of map unit: 7 percent
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Base slope, side slope, crest, rise, dip, talf
Anthropogenic features: Fills
Down-slope shape: Linear, convex, concave
Across-slope shape: Linear, convex, concave

Central Park soils
Percent of map unit: 1 percent
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Anthropogenic features: Fills
Down-slope shape: Convex
Across-slope shape: Convex

Ebbets soils
Percent of map unit: 1 percent
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Side slope, crest, base slope, talf
Anthropogenic features: Fills
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex

North Meadow soils
Percent of map unit: 1 percent
Landform position (two-dimensional): Backslope, footslope, toeslope
Landform position (three-dimensional): Base slope, side slope, talf
Anthropogenic features: Fills
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave

UGB--Urban land-Greenbelt complex, 3 to 8 percent slopes

Map Unit Setting

Landscape: Uplands
Elevation: 0 to 520 feet
Mean annual precipitation: 40 to 52 inches
Mean annual air temperature: 47 to 62 degrees F
Frost-free period: 216 to 234 days

Map Unit Composition
Urban land, till substratum: 78 percent
Greenbelt and similar soils: 12 percent
Minor components: 10 percent

Description of Urban land, till substratum

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Setting
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Anthropogenic features: Urban land
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Asphalt over human-transported material

Properties and qualities
Slope: 0 to 8 percent
Depth to restrictive feature: 0 to 0 inches to human-manufactured materials
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.000 to 0.001 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 10 percent
Available water capacity: Very low (about 0.0 inches)

Interpretive Groups
Land capability (non irrigated): 8s

Typical Profile
M : 0 to 15 inches: cemented material
2°C : 15 to 79 inches: gravelly sandy loam

Description of Greenbelt

Setting
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Crest, side slope, base slope, talf
Anthropogenic features: Fills
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Loamy human-transported material

Properties and qualities
Slope: 3 to 8 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.425 to 1.417 in/hr)
Depth to water table: More than 6 feet
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 30 percent
Available water capacity: High (about 10.7 inches)

Interpretive Groups
Land capability (non irrigated): 2e

Typical Profile
A : 0 to 5 inches: loam
Bw1 : 5 to 16 inches: loam
Bw2 : 16 to 30 inches: loam
C : 30 to 79 inches: sandy loam

Minor Components

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Laguardia soils  
Percent of map unit: 7 percent  
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope  
Landform position (three-dimensional): Base slope, side slope, crest, rise, dip, talf  
Anthropogenic features: Fills  
Down-slope shape: Linear, convex, concave  
Across-slope shape: Linear, convex, concave

Centralpark soils  
Percent of map unit: 1 percent  
Landform position (two-dimensional): Summit  
Landform position (three-dimensional): Talf  
Anthropogenic features: Fills  
Down-slope shape: Convex  
Across-slope shape: Convex

Ebbets soils  
Percent of map unit: 1 percent  
Landform position (two-dimensional): Summit, backslope, footslope  
Landform position (three-dimensional): Side slope, crest, base slope, talf  
Anthropogenic features: Fills  
Down-slope shape: Linear, convex  
Across-slope shape: Linear, convex

North Meadow soils  
Percent of map unit: 1 percent  
Landform position (two-dimensional): Backslope, footslope, toeslope  
Landform position (three-dimensional): Base slope, side slope, talf  
Anthropogenic features: Fills  
Down-slope shape: Linear, concave  
Across-slope shape: Linear, concave

UGBI--Urban land-Greenbelt complex, 3 to 8 percent slopes, low impervious surface

Map Unit Setting  
Landscape: Uplands  
Elevation: 0 to 520 feet  
Mean annual precipitation: 40 to 52 inches  
Mean annual air temperature: 47 to 62 degrees F  
Frost-free period: 216 to 234 days

Map Unit Composition  
Urban land, till substratum: 60 percent  
Greenbelt and similar soils: 25 percent  
Minor components: 15 percent

Description of Urban land,till substratum  
Setting  
Landform position (two-dimensional): Summit  
Landform position (three-dimensional): Talf  
Anthropogenic features: Urban land  
Down-slope shape: Linear

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Across-slope shape: Linear
Parent material: Asphalt over human-transported material

Properties and qualities
Slope: 0 to 8 percent
Depth to restrictive feature: 0 to 0 inches to human-manufactured materials
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.000 to 0.001 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 10 percent
Available water capacity: Very low (about 0.0 inches)

Interpretive Groups
Land capability (non irrigated): 8s

Typical Profile
M: 0 to 15 inches: cemented material
2°C: 15 to 79 inches: gravelly sandy loam

Description of Greenbelt

Setting
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Crest, side slope, base slope, talf
Anthropogenic features: Fills
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Loamy human-transported material

Properties and qualities
Slope: 3 to 8 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.425 to 1.417 in/hr)
Depth to water table: More than 6 feet
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 30 percent
Available water capacity: High (about 10.7 inches)

Interpretive Groups
Land capability (non irrigated): 2e

Typical Profile
^A: 0 to 5 inches: loam
^Bw1: 5 to 16 inches: loam
^Bw2: 16 to 30 inches: loam
^C: 30 to 79 inches: sandy loam

Minor Components

Laguardia soils
Percent of map unit: 9 percent
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Base slope, side slope, crest, rise, dip, talf
Anthropogenic features: Fills
Down-slope shape: Linear, convex, concave
Across-slope shape: Linear, convex, concave

Ebbets soils
Percent of map unit: 3 percent
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Side slope, crest, base slope, talus
Anthropogenic features: Fills
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex

Central Park soils
Percent of map unit: 2 percent
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talus
Anthropogenic features: Fills
Down-slope shape: Convex
Across-slope shape: Convex

North Meadow soils
Percent of map unit: 1 percent
Landform position (two-dimensional): Backslope, footslope, toeslope
Landform position (three-dimensional): Base slope, side slope, talus
Anthropogenic features: Fills
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave

UGCI--Urban land-Greenbelt complex, 8 to 15 percent slopes, low impervious surface

Map Unit Setting

Landscape: Uplands
Elevation: 0 to 520 feet
Mean annual precipitation: 40 to 52 inches
Mean annual air temperature: 47 to 62 degrees F
Frost-free period: 216 to 234 days

Map Unit Composition
Urban land, till substratum: 60 percent
Greenbelt and similar soils: 25
Minor components: 15 percent

Description of Urban land, till substratum

Setting
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talus
Anthropogenic features: Urban land
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Asphalt over human-transported material

Properties and qualities
Slope: 0 to 15 percent
Depth to restrictive feature: 0 to 0 inches to human-manufactured materials
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.000 to 0.001 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 10 percent
Available water capacity: Very low (about 0.0 inches)

Interpretive Groups
Land capability (non irrigated): 8s

Typical Profile
M : 0 to 15 inches: cemented material
2^C : 15 to 79 inches: gravelly sandy loam

Description of Greenbelt

Setting
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Crest, side slope, base slope, talf
Anthropogenic features: Fills
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Loamy human-transported material

Properties and qualities
Slope: 8 to 15 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.425 to 1.417 in/hr)
Depth to water table: More than 6 feet
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 30 percent
Available water capacity: High (about 10.7 inches)

Interpretive Groups
Land capability (non irrigated): 3e

Typical Profile
^A : 0 to 5 inches: loam
^Bw1 : 5 to 16 inches: loam
^Bw2 : 16 to 30 inches: loam
^C : 30 to 79 inches: sandy loam

Minor Components

Laguardia soils
Percent of map unit: 9 percent
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Base slope, side slope, crest, rise, dip, talf
Anthropogenic features: Fills
Down-slope shape: Linear, convex, concave
Across-slope shape: Linear, convex, concave

Ebbets soils
Percent of map unit: 3 percent
Landform position (two-dimensional): Summit, backslope, footslope

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Landform position (three-dimensional): Side slope, crest, base slope, taf
Anthropogenic features: Fills
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex

Centralpark soils
Percent of map unit: 2 percent
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Nose slope
Anthropogenic features: Fills
Down-slope shape: Linear
Across-slope shape: Convex

North Meadow soils
Percent of map unit: 1 percent
Landform position (two-dimensional): Backslope, footslope, toeslope
Landform position (three-dimensional): Base slope, side slope, taf
Anthropogenic features: Fills
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave

**UmA--Urban land, tidal marsh substratum, 0 to 3 percent slopes**

**Map Unit Setting**

Landscape: Lowlands
Elevation: 0 to 520 feet
Mean annual precipitation: 40 to 52 inches
Mean annual air temperature: 47 to 62 degrees F
Frost-free period: 216 to 234 days

**Map Unit Composition**

Urban land, tidal marsh substratum: 92 percent
Minor components: 8 percent

**Description of Urban land, tidal marsh substratum**

**Setting**

Landform position (two-dimensional): Summit
Landform position (three-dimensional): Taf
Anthropogenic features: Urban land
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Asphalt over human-transported material

**Properties and qualities**

Slope: 0 to 3 percent
Depth to restrictive feature: 0 to 0 inches to human-manufactured materials
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.000 to 0.001 in/hr)
Depth to water table: About 20 to 20 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 10 percent
Available water capacity: Very low (about 0.0 inches)
Interpretive Groups
Land capability (non irrigated): 8s

Typical Profile
M1: 0 to 6 inches: cemented material
M2: 6 to 20 inches: cemented material
2°C: 20 to 79 inches: very gravelly sand

Minor Components

Laguardia soils
Percent of map unit: 5 percent
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Base slope, side slope, crest, rise, dip, tal"f
Anthropogenic features: Fills
Down-slope shape: Linear, convex, concave
Across-slope shape: Linear, convex, concave

Centralpark soils
Percent of map unit: 1 percent
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tal"f
Anthropogenic features: Fills
Down-slope shape: Convex
Across-slope shape: Convex

Ebbets soils
Percent of map unit: 1 percent
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Side slope, crest, base slope, tal"f
Anthropogenic features: Fills
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex

Greenbelt soils
Percent of map unit: 1 percent
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Crest, side slope, base slope, tal"f
Anthropogenic features: Fills
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex

UmB--Urban land, tidal marsh substratum, 3 to 8 percent slopes

Map Unit Setting

Landscape: Lowlands
Elevation: 0 to 520 feet
Mean annual precipitation: 40 to 52 inches
Mean annual air temperature: 47 to 62 degrees F
Frost-free period: 216 to 234 days

Map Unit Composition
Urban land, tidal marsh substratum: 92 percent
Minor components: 8 percent
Description of Urban land, tidal marsh substratum

Setting
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Anthropogenic features: Urban land
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Asphalt over human-transported material

Properties and qualities
Slope: 3 to 8 percent
Depth to restrictive feature: 0 to 0 inches to human-manufactured materials
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.000 to 0.001 in/hr)
Depth to water table: About 20 to 20 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 10 percent
Available water capacity: Very low (about 0.0 inches)

Interpretive Groups
Land capability (non irrigated): 8s

Typical Profile
M1: 0 to 6 inches: cemented material
M2: 6 to 20 inches: cemented material
2*C: 20 to 79 inches: very gravelly sand

Minor Components

Laguardia soils
Percent of map unit: 5 percent
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Base slope, side slope, crest, rise, dip, talf
Anthropogenic features: Fills
Down-slope shape: Linear, convex, concave
Across-slope shape: Linear, convex, concave

Centralpark soils
Percent of map unit: 1 percent
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Anthropogenic features: Fills
Down-slope shape: Convex
Across-slope shape: Convex

Ebbets soils
Percent of map unit: 1 percent
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Side slope, crest, base slope, talf
Anthropogenic features: Fills
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex

Greenbelt soils
Percent of map unit: 1 percent
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Crest, side slope, base slope, talf
Anthropogenic features: Fills
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex

UoA–Urban land, outwash substratum, 0 to 3 percent slopes

Map Unit Setting
Landscape: Uplands
Elevation: 0 to 520 feet
Mean annual precipitation: 40 to 52 inches
Mean annual air temperature: 47 to 62 degrees F
Frost-free period: 216 to 234 days

Map Unit Composition
Urban land, outwash substratum: 92 percent
Minor components: 8 percent

Description of Urban land, outwash substratum

Setting
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Anthropogenic features: Urban land
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Asphalt, over human-transported material

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: 0 to 0 inches to human-manufactured materials
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.000 to 0.001 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 10 percent
Available water capacity: Very low (about 0.0 inches)

Interpretive Groups
Land capability (non irrigated): 8s

Typical Profile
M1: 0 to 6 inches: cemented material
M2: 6 to 20 inches: cemented material
2°C: 20 to 72 inches: gravelly sand

Minor Components
Greenbelt soils
Percent of map unit: 3 percent
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Crest, side slope, base slope, talf
Anthropogenic features: Fills
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex

Flatbush soils
Percent of map unit: 2 percent
Landform position (two-dimensional): Summit, backslope, footslope, toeslope
Landform position (three-dimensional): Side slope, base slope, crest, talf, rise
Anthropogenic features: Fills
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex

Centralpark soils
Percent of map unit: 1 percent
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Anthropogenic features: Fills
Down-slope shape: Convex
Across-slope shape: Convex

Ebbets soils
Percent of map unit: 1 percent
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Side slope, crest, base slope, talf
Anthropogenic features: Fills
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex

Laguardia soils
Percent of map unit: 1 percent
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Base slope, side slope, crest, rise, dip, talf
Anthropogenic features: Fills
Down-slope shape: Linear, convex, concave
Across-slope shape: Linear, convex, concave

UrA—Urban land, reclaimed substratum, 0 to 3 percent slopes

Map Unit Setting

Landscape: Lowlands
Elevation: 0 to 520 feet
Mean annual precipitation: 40 to 52 inches
Mean annual air temperature: 47 to 62 degrees F
Frost-free period: 216 to 234 days

Map Unit Composition
Urban land, reclaimed substratum: 92 percent
Minor components: 8 percent

Description of Urban land, reclaimed substratum

Setting
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Anthropogenic features: Urban land
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Asphalt over human-transported material

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: 0 to 0 inches to human-manufactured materials
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.000 to 0.001 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 10 percent
Available water capacity: Very low (about 0.0 inches)

Interpretive Groups
Land capability (non irrigated): 8s

Typical Profile
M: 0 to 15 inches: cemented material
2'C: 15 to 79 inches: gravelly sandy loam

Minor Components

Laguardia soils
Percent of map unit: 5 percent
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Base slope, side slope, crest, rise, dip, talf
Anthropogenic features: Fills
Down-slope shape: Linear, convex, concave
Across-slope shape: Linear, convex, concave

Centralpark soils
Percent of map unit: 1 percent
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Anthropogenic features: Fills
Down-slope shape: Convex
Across-slope shape: Convex

Ebbets soils
Percent of map unit: 1 percent
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Side slope, crest, base slope, talf
Anthropogenic features: Fills
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex

Greenbelt soils
Percent of map unit: 1 percent
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Crest, side slope, base slope, talf
Anthropogenic features: Fills
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex

UtA--Urban land, till substratum, 0 to 3 percent slopes
Map Unit Setting

Landscape: Uplands
Elevation: 0 to 520 feet
Mean annual precipitation: 40 to 52 inches
Mean annual air temperature: 47 to 62 degrees F
Frost-free period: 216 to 234 days

Map Unit Composition
Urban land, till substratum: 92 percent
Minor components: 8 percent

Description of Urban land, till substratum

Setting
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Anthropogenic features: Urban land
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Asphalt over human-transported material

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: 0 to 0 inches to human-manufactured materials
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.000 to 0.001 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 10 percent
Available water capacity: Very low (about 0.0 inches)

Interpretive Groups
Land capability (non irrigated): 8s

Typical Profile
M: 0 to 15 inches: cemented material
2*C: 15 to 79 inches: gravelly sandy loam

Minor Components

Greenbelt soils
Percent of map unit: 3 percent
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Crest, side slope, base slope, talf
Anthropogenic features: Fills
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex

Ebbets soils
Percent of map unit: 2 percent
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Side slope, crest, base slope, talf
Anthropogenic features: Fills
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Laguardia soils
Percent of map unit: 2 percent
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Base slope, side slope, crest, rise, dip, talff
Anthropogenic features: Fills
Down-slope shape: Linear, convex, concave
Across-slope shape: Linear, convex, concave

Centralpark soils
Percent of map unit: 1 percent
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Anthropogenic features: Fills
Down-slope shape: Convex
Across-slope shape: Convex

UtB--Urban land, till substratum, 3 to 8 percent slopes

Map Unit Setting
Landscape: Uplands
Elevation: 0 to 520 feet
Mean annual precipitation: 40 to 52 inches
Mean annual air temperature: 47 to 62 degrees F
Frost-free period: 216 to 234 days

Map Unit Composition
Urban land, till substratum: 92 percent
Minor components: 8 percent

Description of Urban land, till substratum

Setting
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Anthropogenic features: Urban land
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Asphalt over human-transported material

Properties and qualities
Slope: 0 to 8 percent
Depth to restrictive feature: 0 to 0 inches to human-manufactured materials
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.000 to 0.001 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 10 percent
Available water capacity: Very low (about 0.0 inches)

Interpretive Groups
Land capability (non irrigated): 8s

Typical Profile
M : 0 to 15 inches: cemented material
2°C : 15 to 79 inches: gravelly sandy loam
Minor Components

Greenbelt soils
Percent of map unit: 3 percent
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Crest, side slope, base slope, talf
Anthropogenic features: Fills
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex

Ebbets soils
Percent of map unit: 2 percent
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Side slope, crest, base slope, talf
Anthropogenic features: Fills
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex

Laguardia soils
Percent of map unit: 2 percent
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Base slope, side slope, crest, rise, dip, talf
Anthropogenic features: Fills
Down-slope shape: Linear, convex, concave
Across-slope shape: Linear, convex, concave

Centralpark soils
Percent of map unit: 1 percent
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Anthropogenic features: Fills
Down-slope shape: Convex
Across-slope shape: Convex

Soils Information Available Online: NRCS Soils website (http://soils.usda.gov)
Under the Technical References link: books, manuals, guides, etc. for mapping, describing, analyzing, and investigating soils, under the Classification link: Official Series Descriptions, Keys to Soil Taxonomy
Under Soil Survey: national soil characterization (lab) data on selected series.
Under Soil Use: information on Hydric Soils and Soil Quality. The latter includes Soil Quality Assessment, and, under Land Management and Soil Quality, Urban Soil Quality Technical Notes on compaction, heavy metal contamination, and erosion and sedimentation from construction sites.

Please do not hesitate to contact me if you have any questions. (jacob.isleib@ct.usda.gov)

Jacob Isleib

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Chapter 7  Hydrologic Soil Groups
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Chapter 7 was originally prepared by Victor Mockus (retired) and reprinted with minor revisions in 1972. This version was prepared by the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) under guidance of Jon Werner (retired), NRCS; with assistance from Donald E. Woodward (retired), NRCS; Robert Nielsen (retired), NRCS; Robert Dobos, soil scientist, NRCS; and Allen Hjelmfelt (retired), Agricultural Research Service. It was finalized under the guidance of Claudia C. Hoeft, national hydraulic engineer.
Preface

This chapter of the National Engineering Handbook (NEH) Part 630, Hydrology, represents a multi-year collaboration between soil scientists at the National Soil Survey Center (NSSC) and engineers in the Conservation Engineering Division (CED) at National Headquarters to develop an agreed upon model for classifying hydrologic soil groups.

This chapter contains the official definitions of the various hydrologic soil groups. The National Soil Survey Handbook (NSSH) references and refers users to NEH630.07 as the official hydrologic soil group (HSG) reference. Updating the hydrologic soil groups was originally planned and developed based on this perspective.

Listing HSGs by soil map unit component and not by soil series is a new concept for the engineers. Past engineering references contained lists of HSGs by soil series. Soil series are continually being defined and re-defined, and the list of soil series names changes so frequently as to make the task of maintaining a single national list virtually impossible. Therefore, no such lists will be maintained. All such references are obsolete and their use should be discontinued.

Instructions for obtaining HSG information can be found in the introduction of this chapter.
Chapter 7  
Hydrologic Soil Groups

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Chapter 7

Hydrologic Soil Groups

630.0700 Introduction

This chapter defines four hydrologic soil groups, or HSGs, that, along with land use, management practices, and hydrologic conditions, determine a soil's associated runoff curve number (NEH630.09). Runoff curve numbers are used to estimate direct runoff from rainfall (NEH630.10).

A map unit is a collection of areas defined and named the same in terms of their soil components or miscellaneous areas or both (NSSH 627.03). Soil scientists assign map unit components to hydrologic soil groups. Map unit components assigned to a specific hydrologic soil group have similar physical and runoff characteristics. Soils in the United States, its territories, and Puerto Rico have been assigned to hydrologic soil groups. The assigned groups can be found by consulting the Natural Resources Conservation Service’s (NRCS) Field Office Technical Guide; published soil survey data bases; the NRCS Soil Data Mart Web site (http://soildatamart.nrcs.usda.gov/); and/or the Web Soil Survey Web site (http://websoilsurvey.nrcs.usda.gov/).

The state soil scientist should be contacted if a soil survey does not exist for a given area or where the soils within a watershed have not been assigned to hydrologic groups.

630.0701 Hydrologic soil groups

Soils were originally assigned to hydrologic soil groups based on measured rainfall, runoff, and infiltrometer data (Musgrave 1955). Since the initial work was done to establish these groupings, assignment of soils to hydrologic soil groups has been based on the judgment of soil scientists. Assignments are made based on comparison of the characteristics of unclassified soil profiles with profiles of soils already placed into hydrologic soil groups. Most of the groupings are based on the premise that soils found within a climatic region that are similar in depth to a restrictive layer or water table, transmission rate of water, texture, structure, and degree of swelling when saturated, will have similar runoff responses. The classes are based on the following factors:

- intake and transmission of water under the conditions of maximum yearly wetness (thoroughly wet)
- soil not frozen
- bare soil surface
- maximum swelling of expansive clays

The slope of the soil surface is not considered when assigning hydrologic soil groups.

In its simplest form, hydrologic soil group is determined by the water transmitting soil layer with the lowest saturated hydraulic conductivity and depth to any layer that is more or less water impermeable (such as a fragipan or duripan) or depth to a water table (if present). The least transmissive layer can be any soil horizon that transmits water at a slower rate relative to those horizons above or below it. For example, a layer having a saturated hydraulic conductivity of 9.0 micrometers per second (1.3 inches per hour) is the least transmissive layer in a soil if the layers above and below it have a saturated hydraulic conductivity of 23 micrometers per second (3.3 inches per hour).

Water impermeable soil layers are among those types of layers recorded in the component restriction table of the National Soil Information System (NASIS) database. The saturated hydraulic conductivity of an impermeable or nearly impermeable layer may range
from essentially 0 micrometers per second (0 inches per hour) to 0.9 micrometers per second (0.1 inches per hour). For simplicity, either case is considered impermeable for hydrologic soil group purposes. In some cases, saturated hydraulic conductivity (a quantitatively measured characteristic) data are not always readily available or obtainable. In these situations, other soil properties such as texture, compaction (bulk density), strength of soil structure, clay mineralogy, and organic matter are used to estimate water movement. Tables 7-1 and 7-2 relate saturated hydraulic conductivity to hydrologic soil group.

The four hydrologic soil groups (HSGs) are described as:

**Group A**—Soils in this group have low runoff potential when thoroughly wet. Water is transmitted freely through the soil. Group A soils typically have less than 10 percent clay and more than 90 percent sand or gravel and have gravel or sand textures. Some soils having loamy sand, sandy loam, loam or silt loam textures may be placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments.

The limits on the diagnostic physical characteristics of group A are as follows. The saturated hydraulic conductivity of all soil layers exceeds 40.0 micrometers per second (5.67 inches per hour). The depth to any water impermeable layer is greater than 50 centimeters [20 inches]. The depth to the water table is greater than 60 centimeters [24 inches]. Soils that are deeper than 100 centimeters [40 inches] to a water impermeable layer are in group A if the saturated hydraulic conductivity of all soil layers within 100 centimeters [40 inches] of the surface exceeds 10 micrometers per second (1.42 inches per hour).

**Group B**—Soils in this group have moderately low runoff potential when thoroughly wet. Water transmission through the soil is unimpeded. Group B soils typically have between 10 percent and 20 percent clay and 50 percent to 90 percent sand and have loamy sand or sandy loam textures. Some soils having loam, silt loam, silt, or sandy clay loam textures may be placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments. The limits on the diagnostic physical characteristics of group B are as follows. The saturated hydraulic conductivity in the least transmissive layer between the surface and 50 centimeters [20 inches] ranges from 10.0 micrometers per second (1.42 inches per hour) to 40.0 micrometers per second (5.67 inches per hour). The depth to any water impermeable layer is greater than 50 centimeters [20 inches]. The depth to the water table is greater than 60 centimeters [24 inches]. Soils that are deeper than 100 centimeters [40 inches] to a water impermeable layer or water table are in group B if the saturated hydraulic conductivity of all soil layers within 100 centimeters [40 inches] of the surface exceeds 4.0 micrometers per second (0.57 inches per hour) but is less than 10.0 micrometers per second (1.42 inches per hour).

**Group C**—Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted. Group C soils typically have between 20 percent and 40 percent clay and less than 50 percent sand and have loam, silt loam, sandy clay loam, clay loam, and silty clay loam textures. Some soils having clay, silty clay, or sandy clay textures may be placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments.

The limits on the diagnostic physical characteristics of group C are as follows. The saturated hydraulic conductivity in the least transmissive layer between the surface and 50 centimeters [20 inches] is between 1.0 micrometers per second (0.14 inches per hour) and 10.0 micrometers per second (1.42 inches per hour). The depth to any water impermeable layer is greater than 50 centimeters [20 inches]. The depth to the water table is greater than 60 centimeters [24 inches]. Soils that are deeper than 100 centimeters [40 inches] to a restriction or water table are in group C if the saturated hydraulic conductivity of all soil layers within 100 centimeters [40 inches] of the surface exceeds 0.40 micrometers per second (0.06 inches per hour) but is less than 4.0 micrometers per second (0.57 inches per hour).

**Group D**—Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted. Group D soils typically have greater than 40 percent clay, less than 50 percent sand, and have clayey textures. In some areas, they also have high shrink-swell potential. All soils with a depth to a water impermeable layer less than 50 centimeters [20 inches] and all soils with a water table
within 60 centimeters [24 inches] of the surface are in this group, although some may have a dual classification, as described in the next section, if they can be adequately drained.

The limits on the physical diagnostic characteristics of group D are as follows. For soils with a water impermeable layer at a depth between 50 centimeters and 100 centimeters [20 and 40 inches], the saturated hydraulic conductivity in the least transmissive soil layer is less than or equal to 1.0 micrometers per second (0.14 inches per hour). For soils that are deeper than 100 centimeters [40 inches] to a restriction or water table, the saturated hydraulic conductivity of all soil layers within 100 centimeters [40 inches] of the surface is less than or equal to 0.40 micrometers per second (0.06 inches per hour).

**Dual hydrologic soil groups**—Certain wet soils are placed in group D based solely on the presence of a water table within 60 centimeters [24 inches] of the surface even though the saturated hydraulic conductivity may be favorable for water transmission. If these soils can be adequately drained, then they are assigned to dual hydrologic soil groups (A/D, B/D, and C/D) based on their saturated hydraulic conductivity and the water table depth when drained. The first letter applies to the drained condition and the second to the undrained condition. For the purpose of hydrologic soil group, adequately drained means that the seasonal high water table is kept at least 60 centimeters [24 inches] below the surface in a soil where it would be higher in a natural state.

**Matrix of hydrologic soil group assignment criteria**—The decision matrix in tables 7–1 and 7–2 can be used to determine a soil's hydrologic soil group. Check both tables before making a final decision. If saturated hydraulic conductivity data are available and deemed to be reliable, then these data, along with water table depth information, should be used to place the soil into the appropriate hydrologic soil group. If these data are not available, the hydrologic soil group is determined by observing the properties of the soil in the field. Factors such as texture, compaction (bulk density), strength of soil structure, clay mineralogy, and organic matter are considered in estimating the hydraulic conductivity of each layer in the soil profile. The depth and hydraulic conductivity of any water impermeable layer and the depth to any high water table are used to determine correct hydrologic soil group.
### Table 7-1  Criteria for assignment of hydrologic soil groups when a water impermeable layer exists at a depth between 50 and 100 centimeters [20 and 40 inches]

<table>
<thead>
<tr>
<th>Soil property</th>
<th>Hydrologic soil group A</th>
<th>Hydrologic soil group B</th>
<th>Hydrologic soil group C</th>
<th>Hydrologic soil group D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturated hydraulic conductivity of the</td>
<td>&gt;40.0 µm/s (&lt;5.67 in/h)</td>
<td>≤40.0 to &gt;10.0 µm/s</td>
<td>≤10.0 to &gt;1.0 µm/s</td>
<td>≤1.0 µm/s (&lt;0.14 in/h)</td>
</tr>
<tr>
<td>least transmissive layer</td>
<td></td>
<td>(≤5.67 to &gt;1.42 in/h)</td>
<td>(≤1.42 to &gt;0.14 in/h)</td>
<td></td>
</tr>
<tr>
<td>and</td>
<td>and</td>
<td>and</td>
<td>and</td>
<td>and/or</td>
</tr>
<tr>
<td>Depth to water impermeable layer</td>
<td>50 to 100 cm [20 to 40 in]</td>
<td>50 to 100 cm [20 to 40 in]</td>
<td>50 to 100 cm [20 to 40 in]</td>
<td>&lt;50 cm [&lt;20 in]</td>
</tr>
<tr>
<td>and</td>
<td>and</td>
<td>and</td>
<td>and</td>
<td>and/or</td>
</tr>
<tr>
<td>Depth to high water table</td>
<td>60 to 100 cm [24 to 40 in]</td>
<td>60 to 100 cm [24 to 40 in]</td>
<td>60 to 100 cm [24 to 40 in]</td>
<td>&lt;80 cm [&lt;24 in]</td>
</tr>
</tbody>
</table>

### Table 7-2  Criteria for assignment of hydrologic soil groups when any water impermeable layer exists at a depth greater than 100 centimeters [40 inches]

<table>
<thead>
<tr>
<th>Soil property</th>
<th>Hydrologic soil group A</th>
<th>Hydrologic soil group B</th>
<th>Hydrologic soil group C</th>
<th>Hydrologic soil group D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturated hydraulic conductivity of the</td>
<td>&gt;10 µm/s (&gt;1.42 in/h)</td>
<td>≤10.0 to &gt;4.0 µm/s</td>
<td>≤4.0 to &gt;0.40 µm/s</td>
<td>≤0.40 µm/s (&lt;0.06 in/h)</td>
</tr>
<tr>
<td>least transmissive layer</td>
<td></td>
<td>(≤1.42 to &gt;0.57 in/h)</td>
<td>(≤0.57 to &gt;0.06 in/h)</td>
<td></td>
</tr>
<tr>
<td>and</td>
<td>and</td>
<td>and</td>
<td>and</td>
<td>and/or</td>
</tr>
<tr>
<td>Depth to water impermeable layer</td>
<td>&gt;100 cm (&gt;40 in)</td>
<td>&gt;100 cm (&gt;40 in)</td>
<td>&gt;100 cm (&gt;40 in)</td>
<td>&gt;100 cm (&gt;40 in)</td>
</tr>
<tr>
<td>and</td>
<td>and</td>
<td>and</td>
<td>and</td>
<td>and/or</td>
</tr>
<tr>
<td>Depth to high water table</td>
<td>&gt;100 cm (&gt;40 in)</td>
<td>&gt;100 cm (&gt;40 in)</td>
<td>&gt;100 cm (&gt;40 in)</td>
<td>&gt;100 cm (&gt;40 in)</td>
</tr>
</tbody>
</table>
630.0702 Disturbed soils

As a result of construction and other disturbances, the soil profile can be altered from its natural state and the listed group assignments generally no longer apply, nor can any supposition based on the natural soil be made that will accurately describe the hydrologic properties of the disturbed soil. In these circumstances, an onsite investigation should be made to determine the hydrologic soil group. A general set of guidelines for estimating saturated hydraulic conductivity from field observable characteristics is presented in the Soil Survey Manual (Soil Survey Staff 1993).

630.0703 References


APPENDIX P

Newtown Creek Group
February 15, 2013

Steven A. Watts  
New York State Department of Environmental Conservation  
47-40 21st Street  
Long Island City, NY 11101-5407

RE: Comments  
NYS DOT- KOSCIUSZKO BRIDGE

KOSCIUSZKO BRIDGE OVER NEWTOWN CREEK  
BROOKLYN/LIC, NY  
Application ID: 2-9902-00013

Dear Mr. Watts:

These comments are provided on behalf of the Newtown Creek Group (NCG) which consists of five companies, Phelps Dodge Refining Corporation, Texaco, Inc., BP Products North America Inc., The Brooklyn Union gas Company d/b/a National Grid NY, and ExxonMobil Oil Corporation. The NCG and the City of New York are under an Administrative Order on Consent (AOC) with the U.S. Environmental Protection Agency (EPA) to conduct a Remedial Investigation and Feasibility (RI/FS) in Newtown Creek. The New York State Department of Transportation (DOT) plans to replace the Kosciuszko Bridge (K-bridge) which spans a portion of the Newtown Creek Study Area, as defined in the AOC.

The NCG has reviewed the DOT application and has identified several components of the project that could have an impact on the conditions in Newtown Creek and the ongoing RI/FS in the Study Area. The NCG submits these comments and recommendations to the New York Department of Environmental Conservation (DEC) to consider in deciding on final approval of the application.

**K-bridge Replacement Components with Potential Impacts**

Certain components of the K-bridge replacement project will involve intrusive construction activities in and adjacent to Newtown Creek. These activities will occur during and after the ongoing RI/FS and have the potential to impact the current conditions within Newtown Creek.
These potential impacts arise primarily from the intrusive activities in and adjacent to the creek that can mobilize, and redistribute, near shore soil as well as surface and subsurface sediment that contains constituents of potential concern (COPCs). The project elements most likely to have these potential impacts on the RI/FS and exacerbate the potential for COPC migration involve:

1. Demolition of the existing main span, including the two steel towers that are currently supported by concrete foundation piers. These steel towers and concrete foundation piers are located at approximately creek mile 2.1 from the mouth of the East River at the edge of, and partially in, Newtown Creek.
2. Removal of the concrete foundation piers that currently support the main span to a depth of two feet below the mudline followed by contouring of the embankment and placement of rip-rap. These concrete foundations are located along the edge of the creek embankment and are exposed to creek surface waters.
3. Installation (and subsequent removal) of temporary platforms supported by 12-16 pilings per platform along both banks of Newtown Creek. Also, increased barge traffic to and from these platforms during the project that could lead to propeller scouring of the sediment bed.
4. Stormwater runoff during project construction and post construction due to the installation of additional stormwater discharges to Newtown Creek to accommodate drainage from the new main span and portions of the adjacent roadway.

The currently planned K-bridge replacement schedule of 2013 to 2017 will occur during the second phase of the RI/FS. In particular, subject to schedule modification, the Phase 2 RI field work will occur over a one year period, from March 2014 to February 2015. To properly characterize the nature and extent of environmental conditions within the study area certain investigative elements of the RI/FS are reproduced during the study to enable temporal comparisons of data sets. This type of investigative approach is important given the dynamic nature of the Newtown Creek Study Area.

The K-bridge replacement construction will include intrusive work that will have an impact on creek bed in the midst of the RI and complicate the characterization of the nature and extent of environmental impacts. Also, since sample collection from the study area will be underway during portions of the K-bridge construction, it is important that DOT and its selected contractor coordinate its in-creek activities with the RI/FS field work to ensure the safety of individuals working on the creek.
Monitoring & Mitigation Measures Recommendations

Newtown Creek has been subject to a number of environmental investigations leading up to its placement on the National Priority List (NPL) of Superfund sites. A number of environmental samples have been collected in the vicinity of the K-bridge. The sample results suggest the presence of, among other things, polycyclic aromatic hydrocarbons (PAHs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), metals and volatile organic compounds (VOCs i.e., collectively “COPCs”) in sediment. In fact the concentrations of these COPCs in deeper sediment tend to be the same or at higher levels as compared to surface sediments. Therefore, the intrusive work that takes place adjacent to or in the creek has the potential to mobilize sediment containing COPCs from both surface and subsurface areas where the intrusive work occurs. Moreover, the alteration of the creek shoreline and bottom may affect future sediment (and COPC) transport, particularly from up creek locations, by changing the pattern of sediment deposition in the immediate proximity of existing foundation piers and temporary platforms.

To reduce or eliminate the potential for the K-bridge replacement project to impact the study area, the NCG requests that DEC require the following monitoring and/or mitigation measures during the project.

Main Span Demolition

The DOT plan includes provisions to conduct bathymetry surveys in the creek area beneath the current and future K-bridge. The surveys are intended to provide a “before” and “after” look at the creek bottom to assess whether materials fall into the creek during demolition and construction. Additionally, DOT plans to require that netting be installed beneath the K-bridge span to capture materials before they fall into the creek. These are prudent survey and engineering controls to mitigate potential impacts to the creek.

In addition to these surveys and engineering controls, the NCG recommends DOT or its contractor:

- develop and implement a surface sediment sampling program at the conclusion of the main span demolition and replacement. The samples should cover the portion of the Newtown Creek were activities related to the construction occur. Such sampling should include suitable north/south and east west transects within the area of where demolition, construction and other in water activity occur.
The surface sediment sampling will provide data to ascertain whether surface sediment conditions in Newtown Creek were altered as a result of main span demolition and replacement.

Removal of Concrete Foundation Piers

There are two concrete foundation piers supporting the current steel structure of the K-bridge. These concrete foundations are in the creek, located along the north and south embankments. According to the current DOT plans, these concrete foundation piers will be removed to "two feet below mudline". At a November 2012 meeting with the DOT, the NCG learned that the plans would require sheet piling be installed around these concrete foundations prior to their removal.

The intrusive nature of removing these concrete foundation piers in close proximity to Newtown Creek area will result in a loss of soil and debris to the creek. Although the sheet piling will help limit the spread of any soil or debris loss, the activity will nonetheless alter this portion of the Newtown Creek Study Area. The NCG believes that it would be more protective to undertake the removal of these concrete foundation piers in as dry an environment as possible. Therefore, the NCG recommends DOT or its contractor:

- perform dewatering within either a cofferdam or sheet pile prior to removal;
- if sheet pile is used, ensure the enclosure is constructed of sealed sheets;
- remove any soil or debris that is released to the creek following foundation pier removal & bank restoration; and,
- develop and implement a surface sediment sampling program in the portion of the creek affected by the release of soil or debris following removal and bank restoration (may be included as part of the surface sediment sampling program mentioned above).

Temporary Platforms

The 40 percent design plan prepared by DOT provides for two temporary platforms to be installed in the creek to the east of the current K-bridge span. One temporary platform is planned for the north bank while the other will be positioned on the south bank of Newtown Creek. These temporary platforms are intended to serve as receiving and handling points for construction materials delivered by barge.

At the November 20, 2012 meeting, DOT indicated these temporary platforms will be installed at the start of the K-bridge replacement project and remain in place for its duration.
(estimated to be from 2013 through 2017). The platforms would require 12-16 pilings each driven to depths of 75 feet or more.

The NCG believes the installation of these temporary platforms will affect the portion of the Newtown Creek Study Area where they will be located. Additionally, the NCG believes the installation and removal of the pilings will suspend and mobilize surface and subsurface sediment. Since existing data has established the presence of COPCs in both surface and subsurface sediments in the location of these platforms, the disturbance caused by the installation and removal of the pilings and platforms is likely to release COPCs. Additionally, the duration of barge traffic that would deliver construction materials to these platforms will increase the potential for propeller scour in the area of the platforms.

Therefore, the NCG recommends DOT or its contractor:

- use silt curtains during installation and removal of pilings;
- evaluate the potential for propeller scour based on the size of vessels anticipated for use in delivering construction materials;
- use scour protection during the project duration if the above evaluation confirms the potential for propeller scour;
- install secure fencing (or equivalent) to prevent trespassers from gaining easy access to the Newtown Creek Study Area via the platforms while they are in place;
- extend the planned “before” and “after” bathymetry survey to the area of the platforms to assess whether construction materials fell into the creek and potential changes to the sediment bed; and,
- develop and implement surface sediment sampling in the portion of the creek affected by the platform installation removal and use during the course of project.

*Stormwater*

At the November 2012 meeting, the DOT indicated that a stormwater permit was pending for the project. Also, the DOT application indicates that the project will include three new stormwater discharges to Newtown Creek. Two of the new stormwater discharges will convey runoff from the new K-bridge deck for treatment in Vortech chambers and subsequent discharge through two separate 36 inch diameter pipes to Newtown Creek. A third stormwater discharge would be placed on the north side of Newtown Creek and function to drain overland stormwater runoff from a designated area.
The NCG recommends DOT or its selected contractor ensure proper stormwater management during and after K-bridge replacement and supply more information related to the new stormwater discharges for consideration in the RI/FS. Those would include:

- robust stormwater runoff controls in the areas adjacent to the creek that will be used or affected by K-bridge construction activities;
- periodic sampling of stormwater discharges from areas used or affected by K-bridge construction activities during the course of the project;
- provide engineering calculations pertaining to the volume of stormwater discharge from the new bridge span and approach roadways; and,
- provide engineering calculations pertaining to the volume of overland flow captured by the new stormwater system installed on the north side of Newtown Creek, the environmental condition of that area and provision for treatment (e.g., installation of a Vortech chamber) on this stormwater line (if not already included).

The additional volume of fresh water and suspended solids input into Newtown Creek will need to be factored into the hydrodynamic and sediment transport model that is currently being developed as part of the RI/FS for the Study Area.

The Newtown Creek Study Area is a dynamic environment that is subject to ongoing potential change from natural systems (e.g., tidal exchanges) and man-made activities (e.g., marine traffic and runoff from storm events). These potential changes were known and taken into consideration at the onset of the RI/FS. However, the Newtown Creek Study Area will also be subject to a number of projects during and after the RI/FS that could alter the study area in a way that might influence the findings of the RI and/or options considered in the FS. The K-bridge replacement is one such project.
The NCG acknowledges the importance of the K-bridge and other projects planned for Newtown Creek but believes it will be important to consider the impact of these projects on this NPL Superfund Site, ongoing RI/FS and any management decisions EPA recommends based on the RI/FS. Therefore, the NCG requests the DEC to consider these comments on the K-bridge replacement project and include them within any final permit.

Sincerely,

[Signature]

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Common Counsel
On behalf of the Newtown Creek Group

cc: Caroline Kwan (USEPA)
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