



the LA group
Landscape Architecture
and Engineering, PC.

40 Long Alley
Saratoga Springs
New York 12866

P 518/587-8100
F 518/587-0180
www.thelagroup.com

Stormwater Pollution Prevention Plan

Prepared in accordance with NYS DEC General Permit GP-0-10-001

for:

Hudson Valley Community College Science Building

Owner/Operator(s):

Hudson Valley Community College
Attention: Mr. Steve Cowan
80 Vandenburg Avenue
Troy, NY 12180
518-629-7356

SWPPP Contact(s):

The LA Group, PC
Attention: Mr. Dan Desjardins
40 Long Alley
Saratoga Springs, NY 12866
1-518-587-8100
1-518-587-0180

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Appendices

- A Notice of Intent (NOI)**
- B Stormwater Management Report and Hydro CAD**
- C Map Set** – Location Map, Construction Drawing, Phasing Plan, Grading Plan, and Erosion and Sediment Control Plan Map
- D SWPPP Inspection Forms** –SWPPP Inspection Report
- E Other SWPPP Forms** – Construction Sequence, SWPPP Plan Changes, Spill Response Form
- F SPDES General Permit GP-0-10-001**
- G Contech Maintenance Guidelines for Hydrodynamic Separator**

1.0 PERMIT OVERVIEW AND REQUIREMENTS

1.1 Permit Overview

This Stormwater Pollution Prevention Plan (SWPPP) is prepared to inform the landowner and construction personnel of the measures to be implemented for controlling runoff and pollutants from the site during and after construction activities. The objective of this plan is to comply with the New York Department of Environmental Conservation (NYSDEC) State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activities, Permit No. GP-0-10-001 requirements. Any material conflicts between this plan and the site plans, specification or instructions, must be brought to the attention of the design professional. The project may have other permits and it is the responsibility of the owner and contractor to know and understand all permits.

The operator will be issued a bill from New York State for a one hundred dollar (\$100.00) annual fee for the open GP-0-10-001 permit. The operator will also be billed by New York State for a one time one hundred dollar (\$100.00) per acre fee for the proposed disturbed soil area listed in the NOI, and finally a one time six hundred (\$600.00) per acre fee for the proposed increased impervious area listed in the NOI.

The operator is responsible to maintain onsite in a secure location that is accessible during normal working hours to an individual performing a compliance inspection, the following information:

- ✓ the Notice of Intent (NOI),
- ✓ the NYS Department of Environmental Conservation NOI Acknowledgement Letter,
- ✓ the SWPPP,
- ✓ General Permit (included in the SWPPP),
- ✓ MS4 SWPPP Acceptance Form (where applicable), and
- ✓ All inspection reports.

Technical standards are detailed in the “New York State Standards and Specifications for Sediment and Erosion and Sediment Control (August 2005)”, as well as illustrated on the Erosion and Sediment Control Plan Map included in **Appendix C**. The design of post-construction stormwater control practices follow the guidance provided by “New York State Stormwater Management Design Manual.”

2.0 SWPPP REVIEW, UPDATE

2.1 SWPPP Review

Applicable Federal, State, and local regulatory agencies that have jurisdiction may elect to review this SWPPP and notify the permittee in writing that the SWPPP does not meet the requirements of their regulations. If the SWPPP needs to be revised, the permittee

and the site contractor will make the required modifications within seven days of such notification and submit written certification to the notifying agency that the changes have been implemented. A copy of the SWPPP will be kept available on site for review by regulatory agencies, engineers, and subcontractors.

The Town of North Greenbush is an MS4 Community, however the Hudson Valley Community College is a publicly funded school and not subject to MS4 review.

2.2 SWPPP Update

The permittee identified in this SWPPP shall amend the SWPPP when there is a change in one or more of the following project components which has an effect on the potential for discharge of pollutants from stormwater runoff associated with construction activities:

- ✓ Design
- ✓ Construction
- ✓ Operation
- ✓ Maintenance

The SWPPP shall also be updated or amended under the following conditions:

- ✓ If measures identified in the SWPPP become ineffective in eliminating or minimizing pollutants from sources identified, or in achieving the general objectives of controlling stormwater pollution from permitted construction activity.
- ✓ To identify a new subcontractor that will implement any part of the SWPPP.

3.0 SITE ASSESSMENT, EVALUATION AND PLANNING

3.1 Project Location

This site is located on the existing Hudson Valley Community College campus. Specifically, the project area is bound to the north by Holiday Drive, bound to the west by NYS Route 4 (Vandenburg Road) and bound to the south by South Road.

See **Appendix C** for a general site location map.

3.2 Pre-Development Conditions

Currently, the site is predominantly parking areas, sidewalk and lawn area that serve the existing college campus. There are 3.26 acres of impervious surface within the 4.7 acre work area.

3.3 Project Type

This Project is redevelopment of a portion of the existing campus from parking, sidewalks and lawn to a new science building. The redevelopment conditions meet the criteria in Section 9.3.1 in order to utilize alternative sizing and selection of stormwater management controls defined in Chapter 9. The construction of this building will result in a reduction of impervious surface.

3.4 Project Scope

This Project is for the construction of one 35,000 square foot building, reconfiguration and reconstruction of the existing parking lot and access roads, construction of new sidewalks and landscaping and installation of new utilities to serve the building.

3.5 Historic Preservation Determination

A Negative Declaration was made during the SEQR evaluation and this portion of the campus is already developed, therefore this project will have no effect on any historical or archeological resources.

3.6 Receiving Waters

The closest receiving waters for the Project Site are an unnamed tributary to the Hudson River located off of the property.

3.7 Soils

The USDA/NRCS soil survey for Rensselaer county shows the soils in the Project Site are of the Hudson series. The Hudson soils are very deep, moderately well drained soils formed from clayey and silty lacustrine sediments. These soils are of the Hydraulic Soil Group C.

4.0 EROSION AND SEDIMENT CONTROL

4.1 Erosion and Sediment Control Practices

If any elements of the design are not in conformance with the technical standard, identify them and include the reason for the deviation and provide information, which demonstrates that it is equivalent to the technical standards.

Temporary Structural Practices

- ✓ Dust Control
- ✓ Silt Fence
- ✓ Stabilized Construction Entrance

Permanent Structural Controls

- ✓ Land Grading



Temporary Stabilization Practices (including vegetative practices)

- ✓ Seed and mulch bare soil areas within 14 days of disturbance unless construction will resume in that area within 21 days.

Permanent Stabilization Practices (including vegetative practices)

- ✓ Seed and mulch all disturbed areas. Slopes that are 3:1 or steeper should receive a Rolled Erosion Control Product (RECP), sodding, and or hydro-seeding a homogenous mixture of wood fiber mulch with tackifying agent.

Refer to Construction Drawings attached in **Appendix C** for detailed information on each practice.

4.2 Erosion and Sediment Control Drawings

Erosion and Sediment Control drawings are included in **Appendix C**.

Erosion and Sediment Control drawings must include the following:

- ✓ Total site area
- ✓ All improvements
- ✓ Areas of disturbance
- ✓ Areas that will not be disturbed
- ✓ Existing vegetation
- ✓ On-site and adjacent off-site surface waters
- ✓ Wetlands and drainage patterns affected by construction
- ✓ Existing and final slopes
- ✓ Locations of soil types and boundaries
- ✓ Material, waste, borrow or equipment storage areas located on adjacent properties
- ✓ Location of stormwater discharges
- ✓ Specific locations, sizes, and lengths of each erosion and sediment control practice
- ✓ Details of erosion and sediment control practices shall include dimensions, material specifications, installation details, operation and maintenance requirements. Include location and sizing of any temporary sediment basins and structural practices used to divert flows.

4.3 Construction Phasing Plan and Sequence of Operations

The Construction Phasing Plan is included in **Appendix C**.

- ✓ Temporary structural erosion controls will be installed prior to earthwork as per the attached plans.
- ✓ Areas to be undisturbed for more than 14 days will be temporarily stabilized by seeding.

- ✓ Disturbed areas will be reseeded and mulched immediately after final contours are re-established and no more than 14 days after the completion of construction at that site.
- ✓ Temporary erosion control devices will not be removed until the area served is stabilized by the growth of vegetation and the area is certified as being stabilized by the Erosion Control Superintendent.

Construction Activities	Reference Sheet Number	Start → Stop
Sequence must include major items such as, but not limited to, clearing and grubbing, excavation and grading, utility and infrastructure installation and any other activity resulting in soil disturbance. Include installation of erosion and sediment control practices and timing of installation.		
Install erosion and sediment controls, staging area and construction fencing.		1 Week
Remove existing asphalt, curbs, signs, trees and relocate utilities.		3 Weeks
Excavate for building and perform site earthwork		3-4 Weeks
Building construction		18 months
Complete utility and stormwater installation		2 weeks
Install pavement, curbing and site utilities		2 weeks
Stabilize site, complete final punch list		2 weeks

4.4 Erosion and Sediment Control Practice Inspection Schedule

- ✓ Silt fence – maintenance shall be performed as needed and material removed when “bulges” develop in the silt fence.

- ✓ Check dams – should be inspected after each rain event. Correct all damage immediately. If significant erosion has occurred between structures, a liner of stone or other suitable material should be installed. Remove sediment accumulated behind the dam as needed to allow channel to drain through the check dam and prevent large flows over the dam.
- ✓ Storm drain inlet protection (not including silt sacks) – inspect after each storm event. Remove sediment when 50 percent of the storage volume is achieved.
- ✓ Sediment trap – sediment shall be removed and the trap restored to the original dimensions when the sediment has accumulated to ½ of the design depth.
- ✓ Stabilized construction entrance – entrance shall be maintained in a condition which shall prevent tracking. This may require periodic top dressing with additional aggregate. All sediment tracked onto or spilled on public rights of way shall be removed immediately. When necessary, wheels must be cleaned to remove sediment prior to entrance on public rights of way. When washing is required, it shall be done in an area stabilized with aggregate.
- ✓ Rock outlet protection – once a riprap outlet has been installed, the maintenance needs are very low. It should be inspected after high flows for evidence of scour beneath the riprap. Repair should be immediate.

4.5 Contractor Sequence Form

The operator shall prepare a summary of construction status using the Construction Sequence Form (included in **Appendix E**) once every month. Significant deviations to the sequence and reasons for those deviations (i.e. weather, subcontractor availability, etc.), shall be noted by the contractor. The schedule shall be used to record the dates for initiation of construction, implementation of erosion control measures, stabilization, etc. A copy of this table will be maintained at the construction site and updated.

5.0 POST CONSTRUCTION STORMWATER MANAGEMENT PRACTICES

5.1 Stormwater Management Controls

If any elements of the design are not in conformance with the technical standard, identify them and include the reason for the deviation and provide information, which demonstrates that it is equivalent to the technical standards.

- ✓ Contech or Similar Hydrodynamic Separator

5.2 Post Construction Stormwater Management Drawings

Post construction stormwater management drawings are included in **Appendix C**.

- Post construction stormwater management drawings must include the following:
- ✓ Specific locations, sizes, and lengths of each post construction stormwater management practice
 - ✓ Details of post construction stormwater management practices shall include dimensions, material specifications, installation details, operation and maintenance requirements.

5.3 Hydraulic and Hydrologic Analysis

The program utilized for quantifying stormwater runoff rates and volumes was **HydroCAD** software, produced by Applied Microcomputer Systems of Chocorua, NH. The SCS 24-hour Type II design storms for 1, 10, and 100-year frequency rainfall were analyzed.

- ✓ Hydrologic/hydraulic analysis for all structural components of the stormwater control system for the applicable design storms (see **Appendix B**).
- ✓ Comparison of post-development stormwater runoff conditions with pre-development conditions (see **Appendix B**).
- ✓ Dimensions, material specifications and installation details for each post-construction stormwater control practice (see **Appendix B and C**).

5.4 Comparison of Pre and Post Construction Stormwater Runoff

Stormwater Quantity. These calculations are based on the HydroCAD analysis.

	Required	Provided
1 year, 24 hour storm (CPv)	N/A	N/A
	Pre Development	Post Development
10 year, 24 hour storm (Qp)	32.38 CFS	31.82 CFS
100 year, 24 hour storm (Qf)	46.86 CFS	46.2.7 CFS

Water Quality Volume Calculations

The following was utilized to determine water quality volume:

$$WQ_v = \frac{(P)(R_v)(A)}{12}$$

Where:

WQ_v = Water Quality Volume (acre/feet)

P = 90% Rainfall Event (1.0 inches for this area)

R_v = 0.05 + 0.009(I) where I is impervious cover in percent

A = Subcatchment area in acres

	Required	Provided
Water Quality Volume (WQv)	0.036 AC FT	0.036 AC FT

6.0 CONSTRUCTION WASTE

Waste Materials: All waste materials generated during construction will be disposed at a suitable landfill, or transfer station.

Hazardous Waste: The project will not be a generator of hazardous waste and it is not anticipated that any hazardous waste will be generated during construction. If there are any materials generated, a licensed hazardous waste carrier will be contracted to dispose the hazardous material at a suitable disposal site. If hazardous materials are discovered during construction, the work will be stopped until the issue is resolved.

Waste: Portable sanitary facilities will be made available to construction personnel and will be serviced regularly.

7.0 OFFSITE VEHICLE TRACKING

Excavation equipment involved with the construction will remain on the project site and will not regularly egress or ingress the site. Any trucks used to bring in materials or remove materials via municipal paved roads will do so over a stabilized construction entrance. If any off-site vehicle tracking occurs, the contractor will be directed to initiate, street sweeping program in the immediate vicinity of the site.

8.0 EROSION AND SEDIMENT CONTROL INSPECTION

These are the inspection items that will be used to maintain erosion and sediment controls. The practices listed herein shall be implemented in accordance with the attached maintenance schedule.

A maintenance inspection report will be made after each inspection. The report form to be completed by the inspector is attached in **Appendix D**. Reports should be compiled and maintained on-site. All inspection materials are included in Appendix D of the onsite 3-ring binder.

- It is recommended that a rain gage be installed at the site.
- A qualified professional shall 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 the SWPPP and required by GP-0-10-001 have been adequately installed to ensure overall preparedness of the site for commencement of construction.
- ***Structural erosion controls and non-stabilized areas shall be inspected at least once every seven (7) days.*** The Inspection Form

is located at the end of this report and shall be completed in full for every inspection performed.

- The day-to-day erosion control activities on the site will be monitored by the construction manager. The qualified inspector (as defined by the NYS DEC SPDES regulations) and his crews will make **at least one inspection every seven (7) days** of erosion control devices.
- All measures will be maintained in good working order; if repair is necessary, it will be initiated within 24 hours of report.
- Silt fence will be inspected for depth of sediment, ripped fabric, to see if the fabric is securely attached to the fence posts, and to see that the fence posts are firmly in ground.
- All temporary sediment basins should be inspected for stability and integrity **at least once every seven (7) days**. Any structural failure in sediment basins or trenches that serve them will be repaired within 24 hours after detection. All temporary sediment basins or trenches shall be cleaned out when one foot of sediment or half the design depth of the trap has accumulated. All spoils shall be removed to a stabilized upland area.
- Seeded and planted areas will be inspected for bare spots, washouts, and healthy growth. If necessary, spot reseeding or sodding will be implemented.
- Trained Contractor will be responsible for the implementation of the SWPPP. This person will be onsite when any soil disturbing activities are being conducted. This trained contractor cannot conduct the regular SWPPP compliance inspections. This trained contractor must have received 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 4 hours of training every 3 years. It can also mean an employee from the contracting (construction) company, 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 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).

9.0 TEMPORARY STABILIZATION FOR FROZEN CONDITIONS

The following temporary stabilization measures **MUST** be performed when construction is occurring during winter/frozen ground conditions. The following requirements do not supercede any other requirements of this SWPPP as they apply to non-frozen ground conditions.

- Perimeter erosion control **MUST** still be installed prior to earthwork disturbance as per this SWPPP.
- Any areas that cannot be seeded to turf by October 1 or earlier will receive a temporary seeding. The temporary seeding will consist of winter rye seeded at the rate of 120 pounds per acre (2.5 pounds per 1,000 square feet) or stabilized as per the temporary stabilization for winter construction/frozen conditions.
- Any area of disturbance that will remain inactive for a period of 14 consecutive days **MUST** be mulched. This includes any previously disturbed areas that are covered with snow.
- Mulch **MUST** consist of loose straw applied at the rate of 2 to 3 bales (90 to 100 pounds) per thousand square feet.
- Mulch **MUST** be applied uniformly over the area of bare soil or bare soil that is covered with snow. For the latter condition, mulch **MUST** be applied on top of snow.
- Using a tracked vehicle, mulch **MUST** be crimped into the bare soil/snow. The tracked vehicle **MUST** be driven across the mulched areas in at least two directions to maximize crimping of mulch into the soil/snow.
- If mulch gets blown off an area to a significant degree, the site inspector **WILL** require that an area be re-mulched in accordance with Items 2 through 5 above, and this area **WILL** be included on the inspection checklist for the next inspection.
- If a particular area repeatedly experiences loss of mulch due to wind, then the inspector **WILL** require that an alternative method be used to secure the mulch in place. Such alternatives may include the use of netting, tackifier or other methods deemed appropriate by the inspector.
- During periods when snow is melting and/or surface soils are thawing during daytime hours, mulched areas **MUST** be re-tracked (crimped) as per Item 5 above at least once every seven days, more frequently if directed by the inspector. Additional mulch may be required to obtain

complete coverage of an area. Biodegradable erosion control matting may be required on steeper slopes.

- Additional stabilization measures for non-frozen ground conditions described in this SWPPP **WILL** be implemented at the time deemed appropriate by the inspector.

During the winter season, if a site has been stabilized and soil disturbing activities have been suspended for the winter, weekly inspections can be suspended. However, monthly inspections must still be conducted. All normal weekly inspections must resume when soil disturbing activities resume.

10.0 STORMWATER MAINTENANCE PROCEDURES

Temporary erosion and sediment controls and practices will need to be maintained frequently. It is the responsibility of the operator to inspect, and maintain the temporary controls so that they are working efficiently. The operator needs to pay close attention to SWPPP Inspection Reports that will advise of needed maintenance. Captured sediment will have to be removed periodically from each practice in order for the control to function properly. It is likely that if temporary controls are not maintained properly, controls will fail creating a mass discharge of sedimentation to the water body previously protected. Periodically remove sediment from silt fences, check dams, silt sacks, inlet protections, and sediment traps. Replace top-soil, mulch and seed where seeding has been disturbed.

Post-construction maintenance for this project will consist of annual inspections of permanent stormwater management facilities and steep slopes. The following procedures must be performed twice annually on the appropriate structural stormwater management practice. These maintenance procedures are essential to assure continual performance of the stormwater management practices on your site.

Catch Basins and Drywells

- Sediment removal with a vacuum truck should be done at least once a year, preferably after spring runoff and then in early fall, or when they are at 50% capacity, whichever comes first.
- Any mechanical valves should be operated for inspection every two months.

Vortex/Hydrodynamic Separators

- Must cleanout floatables and sediment on a regular basis. See Contech maintenance guidelines for specifications Attached in Appendix G

11.0 SPILL PREVENTION PRACTICES

Good Housekeeping and Material Management Practices

The following good housekeeping and material management practices will be followed on site during the construction project to reduce the risk of spills or other accidental exposure of materials and substances to stormwater runoff.

- Materials will be brought on site in the minimum quantities required.
- 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.
- Products will be kept in their original containers with the original manufacturer's label.
- Substances will not be mixed with one another unless recommended by the manufacturer.
- Whenever possible, all of a product will be used up before disposal.
- Manufacturer's recommendations for proper use and disposal will be followed.
- The construction manager or his designee will inspect regularly to ensure proper use and disposal of materials on site.
- The contractor shall prohibit washing of tools, equipment, and machinery in or within 100 feet of any watercourse or wetland.
- All above grade storage tanks are to be protected from vehicle damage by temporary barriers.

Inventory for Pollution Prevention Plan

The materials and substances listed below are expected to be on-site during construction.

- Petroleum for fueling vehicles will be stored in above ground storage tanks. Tanks will either be steel with an enclosure capable of holding 110% of the storage tank volume or of a Con-Store, concrete encased type typically employed by NYSDOT. Hydraulic oil and other oils will be stored in their original containers. Concrete and asphalt will be stored in the original delivery trucks.

- Fertilizer may be stored on site in its original container for a short period of time prior to seeding. Original containers will be safely piled on pallets or similar devices to protect from moisture.
- Paints and other similar materials will be stored in their original containers and all empty containers will be disposed of in accordance with label directions.
- Portable sanitary facilities, which contain chemical disinfectants (deodorants) will be located on-site, with the disinfectants held in the tank of the toilet.

Hazardous Products

These practices are used to reduce the risks associated with hazardous materials.

- Products will be kept in original containers unless they are not re-sealable.
- Original labels and material safety data sheets will be retained; they contain important product information.
- If surplus product must be disposed of, manufacturers' or local and State recommended methods for proper disposal will be followed.

Spill Prevention

The following product specific practices will be followed on site.

Petroleum Products:

- Construction personnel should be made aware that emergency telephone numbers are located in this SWPPP.
- The contractor shall immediately contact NYSDEC in the event of a spill, and shall take all appropriate steps to contain the spill, including construction of a dike around the spill and placing absorbent material over this spill.
- The contractor shall instruct personnel that spillage of fuels, oils, and similar chemicals must be avoided and will have arranged with a qualified spill remediation company to serve the site.
- Fuels, oils, and chemicals will be stored in appropriate and tightly capped containers. Containers shall not be disposed of on the project site.

- Fuels, oils, chemicals, material, equipment, and sanitary facilities will be stored/located away from trees and at least 100 feet from streams, wells, wet areas, and other environmentally sensitive sites.
- Dispose of chemical containers and surplus chemicals off the project site in accordance with label directions.
- Use tight connections and hoses with appropriate nozzles in all operations involving fuels, lubricating materials or chemicals.
- Use funnels when pouring fuels, lubricating materials or chemicals.
- Refueling and cleaning of construction equipment will take place in parking areas to provide rapid response to emergency situations.
- All on-site vehicles will be monitored for leaks and receive regular preventative maintenance to reduce the chance of leakage. Any vehicle leaking fuel or hydraulic fuel will be immediately scheduled for repairs and use will be discontinued until repairs are made.

Fertilizers:

- Fertilizer will be stored in its original containers on pallets with water resistant coverings.
- Proper delivery scheduling will minimize storage time.
- Any damaged containers will be repaired immediately upon discovery and any released fertilizer recovered to the fullest extent practicable.

Paints:

- All containers will be tightly sealed and stored when not required for use.
- Excess paint will not be discharged to the storm water system or wastewater system, but will be properly disposed of according to manufacturers' instructions or State and local regulations.

Concrete Trucks:

- Concrete trucks will be allowed to wash out or discharge surplus concrete or drum wash water only at designated locations on site.

Asphalt Trucks:

- Asphalt trucks shall not discharge surplus asphalt on the site.



Spill Control Practices

In addition to the good housekeeping and material management practices discussed in the previous sections of this plan, the following practices will be followed for spill prevention and cleanup. The construction manager responsible for the day-to-day site operations will be the spill prevention and cleanup coordinator. He will designate at least three 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 onsite construction office or trailer.

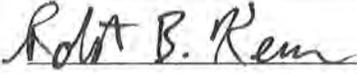
- Manufacturers' recommended methods for spill cleanup will be clearly posted and site personnel will be made aware of the procedures and the location of the information and cleanup supplies. Any spill in excess or suspected to be in excess of two gallons will be reported to the NYSDEC Regional Spill Response Unit. Notification to the NYSDEC (1-800-457-7362) must be completed within two hours of the discovery of the spill.
- Materials and equipment necessary for spill cleanup will be kept in the material storage area onsite. 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.
- All spills will be cleaned up immediately after discovery.
- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with spilled substance.
- Spills of toxic or hazardous material will be reported to the appropriate State or local government agency, regardless of the size



12.0 CERTIFICATIONS

Preparer Certification of Compliance with Federal, State, and Local Regulations

This Stormwater Pollution Prevention Plan was prepared in accordance with the New York State Department of Environmental Conservation SPDES General Permit for Stormwater Discharges from Construction Activities (Permit No. GP-0-10-001), pursuant to Article 17, Titles 7, 8 and Article 70 of the Environmental Conservation Law. This SPDES General Permit implements the Federal Clean Water Act pertaining to stormwater discharges.

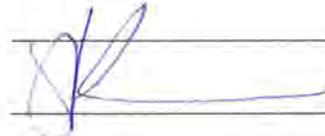
Name: Robert Kernan Title: Landscape Architect
Signature:  Date: 2/23/11
Company Name: The LA Group, PC

Owner Pollution Prevention Plan Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who are 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 210.45 of the Penal Law.

I understand that GP-0-10-001 requires site inspections be conducted by a qualified professional once every seven (7) days and when approved in writing by the NYSDEC, disturbances of greater than five (5) acres at one time require site inspections two (2) times every seven (7) days. These inspections shall be performed by a qualified professional as defined by the General Permit.

The Owner/Operator will be held financially responsible for any and all fines related to work tasks that are not specified by the Contractor(s)/Subcontractor(s) below.

Name:  Title: _____
Signature: _____ Date: 02-23-2011
Company Name: _____

Contractor and Subcontractor Certification

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 proceeding.

Name _____ Title _____

Signature _____ Date _____

Company Name _____

Address _____

City, State, Zip _____

Phone Number _____

SWPPP Components You
Are Responsible For

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

Name of Trained
Individual Responsible for
SWPPP Implementation _____ Title _____

Signature of Trained
Individual Responsible for
SWPPP Implementation _____ Date _____



Contractor and Subcontractor Certification

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 proceeding.

Name _____ Title _____

Signature _____ Date _____

Company Name _____

Address _____

City, State, Zip _____

Phone Number _____

SWPPP Components You
Are Responsible For

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

Name of Trained
Individual Responsible for
SWPPP Implementation _____ Title _____

Signature of Trained
Individual Responsible for
SWPPP Implementation _____ Date _____

Contractor and Subcontractor Certification

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 proceeding.

Name _____ Title _____

Signature _____ Date _____

Company Name _____

Address _____

City, State, Zip _____

Phone Number _____

SWPPP Components You
Are Responsible For

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

Name of Trained
Individual Responsible for
SWPPP Implementation _____ Title _____

Signature of Trained
Individual Responsible for
SWPPP Implementation _____ Date _____

Contractor and Subcontractor Certification

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 proceeding.

Name _____ Title _____

Signature _____ Date _____

Company Name _____

Address _____

City, State, Zip _____

Phone Number _____

SWPPP Components You
Are Responsible For

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

Name of Trained
Individual Responsible for
SWPPP Implementation _____ Title _____

Signature of Trained
Individual Responsible for
SWPPP Implementation _____ Date _____

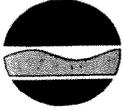
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Appendix A

**Notice of Intent
(NOI)**

NOTICE OF INTENT

New York State Department of Environmental Conservation



Division of Water

625 Broadway, 4th Floor

Albany, New York 12233-3505

NYR
(for DEC use only)

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)
Hudson Valley Community College

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

Owner/Operator Contact Person First Name
Steve

Owner/Operator Mailing Address
80 Vanderburg Avenue

City
Troy

State Zip
NY 12180 -

Phone (Owner/Operator) Fax (Owner/Operator)
518 - 629 - 7356 - - -

Email (Owner/Operator)

FED TAX ID
14 - 6009464 (not required for individuals)

Project Site Information

Project/Site Name

H V C C P r o p o s e d S c i e n c e B u i l d i n g

Street Address (NOT P.O. BOX)

S o u t h R o a d

Side of Street

North South East West

City/Town/Village (THAT ISSUES BUILDING PERMIT)

T r o y

State Zip

N Y 1 2 1 8 0 -

County

A l b a n y

DEC Region

4

Name of Nearest Cross Street

S o u t h R o a d a n d V a n d e r b u r g A v e n u e

Distance to Nearest Cross Street (Feet)

0

Project In Relation to Cross Street

North South East West

Tax Map Numbers
Section-Block-Parcel

1 1 2 . - 4 - 4 5 . 1

Tax Map Numbers

1 2 3 . - 2 - 3 . 1 1

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:

www.dec.ny.gov/imsmaps/stormwater/viewer.htm

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.

X Coordinates (Easting)

6 0 7 5 3 7

Y Coordinates (Northing)

4 7 2 7 8 2 3

2. What is the nature of this construction project?

- New Construction
- Redevelopment with increase in imperviousness
- Redevelopment with no increase in imperviousness

10. Is this a phased project?

Yes No

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

Start Date: 8 / 1 / 2011 - End Date: 6 / 1 / 2013

12. Identify the nearest, natural, surface waterbody(ies) to which construction site runoff will discharge.

Name

U n n a m e d T r i b u t a r y t o H u d s o n R i v e r

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)

[Empty grid for 12a answer]

[Empty grid for 12b answer]

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

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?

Yes No

If Yes, what is the acreage to be disturbed?

□□□□.□

17. Will the project disturb soils within a State regulated wetland or the protected 100 foot adjacent area?

Yes No

18. Does the site runoff enter a separate storm sewer system (including roadside drains, swales, ditches, culverts, etc)? (If No, skip question 19)

Yes No Unknown

19. What is the name of the municipality/entity that owns the separate storm sewer system?

C i t y o f T r o y

20. Does any runoff from the site enter a sewer classified as a Combined Sewer?

Yes No Unknown

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) ?

Yes No

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)

Yes No

23. Have the Water Quality and Quantity Control components of the SWPPP been developed in conformance with the current NYS Stormwater Management Design Manual ?

Yes No

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

Empty grid box for other details.

SWPPP Preparer

The LA Group, PC

Contact Name (Last, Space, First)

Desjardins, Daniel

Mailing Address

40 Long Alley

City

Saratoga Springs

State

NY

Zip

12866 -

Phone

518 - 587 - 8100

Fax

518 - 587 - 0180

Email

ddesjardins@thelagroup.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

P

Last Name

Desjardins

Signature

Handwritten signature of Daniel Desjardins

Date

02/23/2011

30. Provide the total water quality volume required and the total provided for the site.

WQv Required
 [] [] [] 0 . 0 3 6 acre-feet

WQv Provided
 [] [] [] 0 . 0 3 6 acre-feet

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

CPv Required
 [] [] [] . [] [] [] acre-feet

CPv Provided
 [] [] [] . [] [] [] acre-feet

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

Pre-Development
 [] [] 3 2 . 3 8 CFS

Post-development
 [] [] 3 1 . 8 2 CFS

Total Extreme Flood Control Criteria (Qf) - Peak discharge rate for the 100 year storm

Pre-Development
 [] [] 4 6 . 8 6 CFS

Post-development
 [] [] 4 6 . 2 7 CFS

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

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.

[] [] 2 7 %

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.

[] [] 1 8 %

34. Indicate the total number of post-construction stormwater management practices to be installed/constructed.

[] [] 1

35. Provide the total number of stormwater discharge points from the site. (include discharges to either surface waters or to separate storm sewer systems)

[] [] 1

Appendix B

**Stormwater Management Report
Hydro CAD**

STORMWATER MANAGEMENT REPORT

SCIENCE CENTER

For

**Hudson Valley Community College
80 Vanderburg Ave
Troy, NY 12180**

Owner/Operator(s):

**Hudson Valley Community College
Steve Cowan
80 Vanderburg Ave.
Troy, NY 12180**

Prepared by:

**The LA Group, PC
40 Long Alley
Saratoga Springs, NY 12866
518-587-8100
Project No. 201005**

February 22, 2011

<u>Table of Contents</u>	<u>Page</u>
I. Introduction	3
II. Methodology	3
III. Existing Site Conditions	4
IV. Proposed Site Conditions.....	5
V. Conclusions.....	6

List of Figures and Attachments

- Appendix A: Figure 1, Site Location Map

- Appendix B: W-1, Existing Subcatchment Map
 Fig. 4, Archive Watershed Map
 Existing Conditions HydroCAD Modeling Report

- Appendix C: W-2, Proposed Subcatchment Map
 Proposed Conditions HydroCAD Modeling Report

I. Introduction

This report addresses stormwater associated with the proposed construction of the new Science Center at Hudson Valley Community College. It covers stormwater in the south west portion of the campus, and is designed in accordance with Chapter 9 – Redevelopment of the New York State Stormwater Management Design Manual.

The Project consists of construction of a new science building, associated walks, alterations to the existing parking lot, and the installation of underground utilities. The study area is approximately 12.1± acres. The Project has been designed to minimize disturbance limits to the extents feasible, and will result in an approximately 20% reduction of impervious surface.

II. Methodology

Stormwater runoff calculations were prepared using the method prescribed in the USDA Soil Conservation Service Technical Release No. 20. The *HydroCAD* stormwater modeling system (version 9.10) produced by Applied Microcomputer Systems of Chocurua, New Hampshire was used.

Subcatchment boundaries for the Site were established from a topographic survey prepared by Thew Land Surveyors, dated July 17, 2010. The design storms evaluated as required by US Environmental Protection Agency Phase II requirements and the New York State Department of Environmental Conservation (NYSDEC) General Permit GP-0-10-001 (and the current applicable version of the NYSDEC Stormwater Management Design Manual) are the: 1, 10, and 100-year, 24 hour duration, SCS Type II events. The rainfall amounts for these storms are 2.40, 4.30, and 5.90 inches, respectively.

III. Existing Site Conditions

The Project area is a 4.7± acre portion of the campus. The Project area is encompassed by a 12.1± acre watershed (3.26 acres of which are impervious). This area is primarily composed of parking areas, associated walks, and lawn areas. Stormwater from the Project area discharges to a common point referred to as Design Point-2 (DP-2), as shown on “W-1 Existing Conditions Watershed Map.” The existing conditions were modeled in HydroCAD using data from an analysis completed by Clough Harbour & Associates in their 2009 Stormwater Management Report for the HVCC Parking Lot Expansion. Design Point-1 from the CHA analysis was not investigated with this project since changes to that watershed were minor and results in a decrease in runoff reaching DP-1. DP-2 (which is located near the intersection of Route 4 and South Drive entry) includes eight subcatchments. Areas, runoff curve numbers and time of concentration Surface runoff is collected in catch basins within the parking lot and either directed into an existing hydrodynamic separator and underground detention system, or it is piped and daylights to natural grade. Ultimately, both systems discharge off-site through a 36-inch culvert, under NYS Route 4. The slope of existing parking lot range from 1 to 4 percent while the lawn areas (within the Project Limits) range from 10 to 50 percent. Soils on the Project Site are identified as Hudson silt loam and having an HSG of C according to the USDA Soil Survey for Renssalaer County, New York.

The following curve numbers (CN) and/or land use coefficients were used in the stormwater modeling for the Project.

<u>CN</u>	<u>Description</u>	<u>HSG</u>
74	>75% Grass Cover, Good	C
98	Paved parking & roofs (impervious surfaces)	ALL

Additional soil information is attached.

IV. Proposed Site Conditions

The proposed Project includes construction of a new approximately 35,000 square foot science building, reconfiguration and reconstruction of the existing parking lot and access roads, construction of new site sidewalks and landscaping, and installation of underground utilities including water, sanitary sewer and drains. The existing stormwater management facilities will be used to the extent possible. After development of the Project, there will be 2.16 acres of impervious surface (reduction of 20%) within the limits of the Project's watershed. The hydrology of the Project Site has been conserved as much as possible, thereby reducing any detrimental downstream impacts.

Under Chapter 9 – Redevelopment, of the New York State Stormwater Management Design Manual, the requirements for the Channel Protection Volume (1-year storm), Overbank Flood Control (10-year storm), and Extreme Flood Control (100-year storm) may be waived if there is a decrease in impervious cover and no alterations to hydrology result in an increase in peak runoff rates. This is the case for the HVCC Science Building Project described herein. Water Quality Volume (WQv) requirements may be met by providing treatment for 25% of the theoretical Water Quality Volume for the existing impervious area plus 100% of the additional impervious area. When there is an increase in impervious surface, peak rate criteria for the 10- and 100-year design storms applies. Also, Chapter-9 requires a hydrologic analysis of the 1-year design storm to ensure there are no alterations to hydrology that would result in an increase in the peak discharge rate. These analyses were performed, and are attached to this report.

Water Quality requirements were considered during the design of site improvements. Calculations for the Water Quality Volume (WQv) have been completed for the Project based on the Chapter 9 – Redevelopment, requirements. The attached WQv computation sheet addresses the water quality volume requirements for the area tributary to the proposed subsurface detention facility only. A hydro-dynamic separator unit is proposed to meet the minimum required Water Quality Volume. The Project proposes a 20%

reduction in impervious cover and is utilizing an “alternative practice” for treatment of the Water Quality Volume; therefore, only 15% of the calculated WQv is required to receive treatment. Refer to Section 9.3.2.B.IV of the Design Manual for more information on WQv requirements for Redevelopment. The 90% rainfall event used for WQv calculations is 1 inch for the City of Troy. WQv treated in the hydro-dynamic separator is 0.036 acre-feet.

Peak discharge rates were estimated at Design Point #2, DP-2 (*HydroCAD* Reach 5R). Peak runoff from the courtyard area east of the new building (Subcatchment 12S) is proposed to be routed through the existing hydrodynamic separator and subsurface infiltration gallery with a modified controlled release outlet structure.

Refer to Section 9.3.2 of the Design Manual for more information on Redevelopment requirements.

The following table indicates the existing and proposed peak flows at Design Point #2 for the 1-year, 10-year, and 100-year storms.

Table 1 – Peak Discharge Rates (cfs)

Design Point	1-Year Storm (2.40")		10-Year Storm (4.30")		100-Year Storm (5.90")	
	Pre	Post	Pre	Post	Pre	Post
DP-2	15.67	15.16	32.38	31.82	46.86	46.27

V. Conclusions

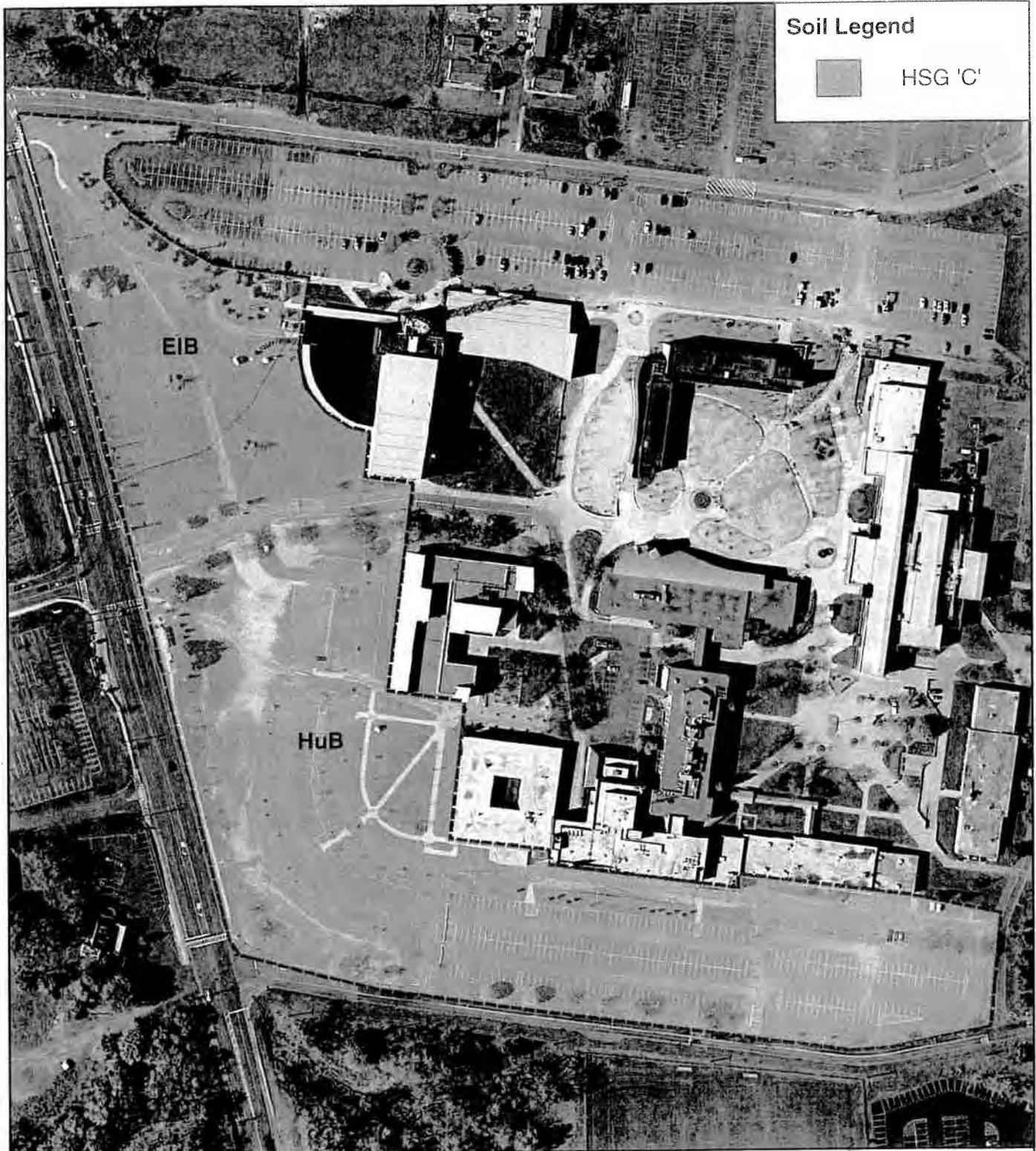
The proposed stormwater plan meets the requirements for the treatment and attenuation of runoff associated with the proposed project.

HydroCAD Computations are attached.

Submitted by:

Daniel P. Desjardins, P.E.
for
The LA Group, P.C.

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Soil Legend

■ HSG 'C'

EIB

HuB



CHA

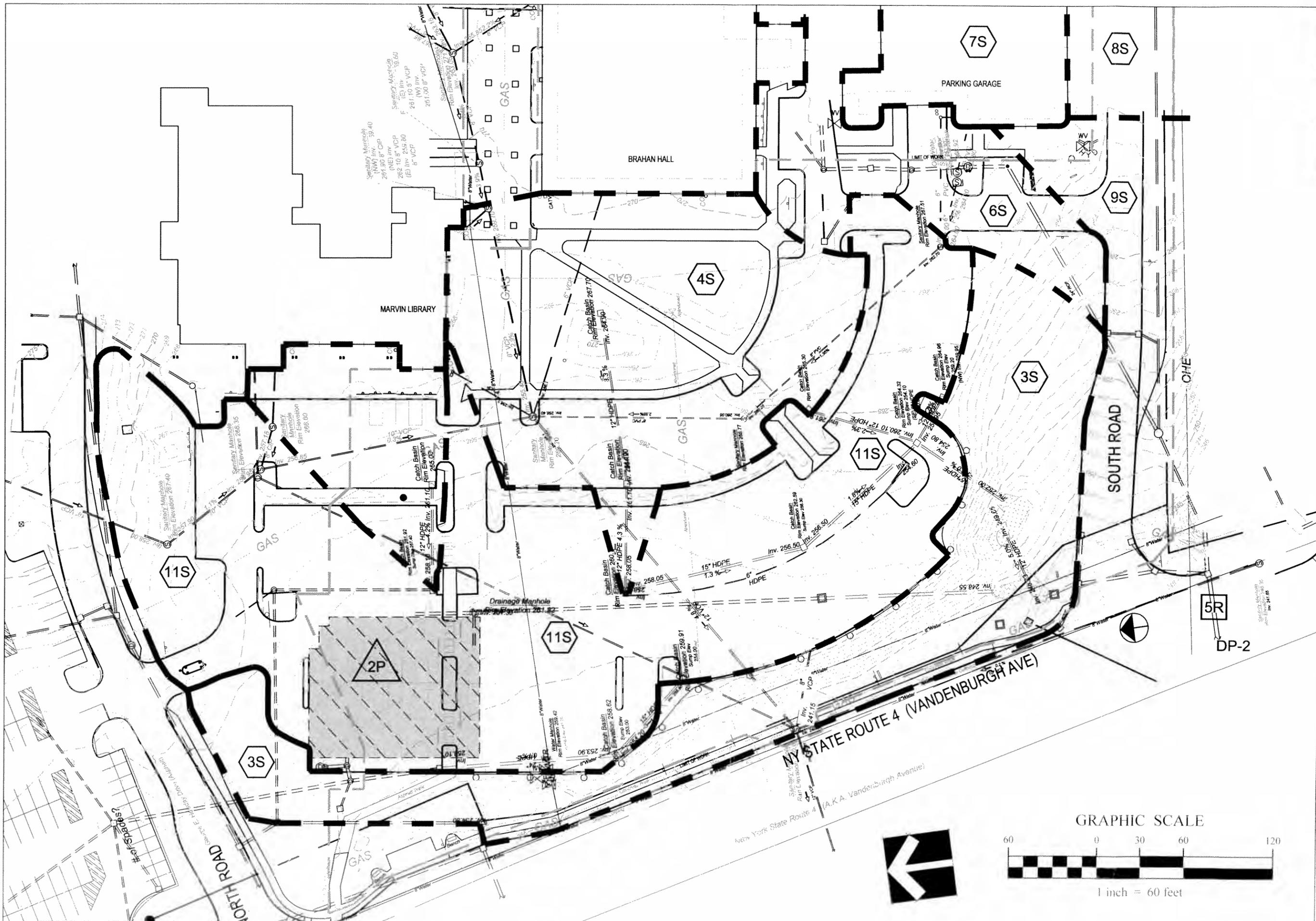
CLOUGH HARBOUR & ASSOCIATES LLP

Figure 2 - USDA Soils Classification Map

Scale 1" = 200'

CHA File No:
19518

Hudson Valley Community College
City of Troy and Town of N. Greenbush, Rensselaer Co., NY
Troy South USGS Quad



PAYETTE

Design Architect
 Payette Associates Inc.
 285 Summer Street
 Boston, MA 02210-1502
 Tel: 617-895-1000
 Fax: 617-895-1002



Architect of Record
 Mosaic Associates Architects
 73 Troy Road
 East Greenbush, NY 12061
 Tel: 518-479-4000
 Fax: 518-477-1356

Structural Engineer Ryan Bagg Associates 257 Waters Road Clifton Park, NY 12065 Tel: 518-406-5506 Fax: 518-406-5514	Civil Engineer The LA Group 40 Long Alley Saratoga Springs, NY 12866 Tel: 518-587-8100 Fax: 518-587-0180
---	--

MEP Engineer Vanderweil Engineers 274 Summer Street Boston, MA 02210 Tel: 617-423-7423 Fax: 617-423-7401	Landscape Payette Associates Inc. 285 Summer Street Boston, MA 02210-1502 Tel: 617-895-1000 Fax: 617-895-1002
--	---

Specialty Systems
 Integrated Building Systems
 73 Troy Road
 East Greenbush, NY 12061
 Tel: 518-477-6668
 Fax: 518-479-1931

25% CD SET

Number	Date	Description

HUDSON VALLEY COMMUNITY COLLEGE SCIENCE BUILDING

EXISTING SUBCATCHMENT MAP

Drawing Scale
 1"=60'
 Project Number
 222
 Date Issued
 2/2/01

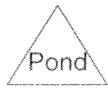
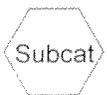
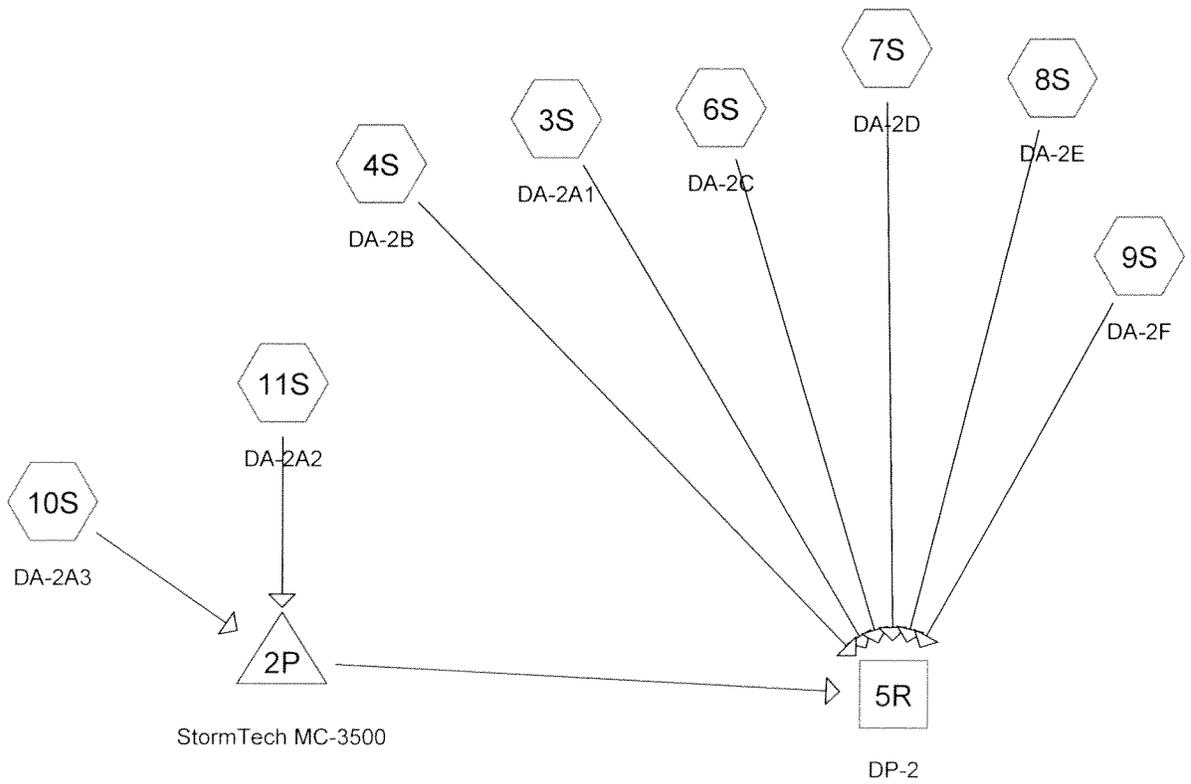
W-1

GRAPHIC SCALE



1 inch = 60 feet





201005 Existing

Prepared by The LA Group P.C.

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Page 2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.130	75	(3S)
0.900	83	(9S)
1.000	85	(6S)
1.170	88	(4S)
2.770	91	(10S)
1.400	92	(8S)
2.420	94	(11S)
1.320	98	(7S)

201005 Existing

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Page 3

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
12.110	Other	3S, 4S, 6S, 7S, 8S, 9S, 10S, 11S

201005 Existing

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Type II 24-hr 1-Year Rainfall=2.40"

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Page 4

Summary for Subcatchment 3S: DA-2A1

Runoff = 0.72 cfs @ 12.12 hrs, Volume= 0.055 af, Depth> 0.59"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.40"

Area (ac)	CN	Description
* 1.130	75	
1.130		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.4					Direct Entry,

Summary for Subcatchment 4S: DA-2B

Runoff = 2.15 cfs @ 12.04 hrs, Volume= 0.126 af, Depth> 1.29"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.40"

Area (ac)	CN	Description
* 1.170	88	
1.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					Direct Entry,

Summary for Subcatchment 6S: DA-2C

Runoff = 1.33 cfs @ 12.10 hrs, Volume= 0.091 af, Depth> 1.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.40"

Area (ac)	CN	Description
* 1.000	85	
1.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.8					Direct Entry,

201005 Existing

Prepared by The LA Group P.C.

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Type II 24-hr 1-Year Rainfall=2.40"

Printed 2/20/2011

Page 5

Summary for Subcatchment 7S: DA-2D

Runoff = 4.32 cfs @ 11.96 hrs, Volume= 0.239 af, Depth> 2.17"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.40"

Area (ac)	CN	Description
* 1.320	98	
1.320		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
5.0	0	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 8S: DA-2E

Runoff = 3.75 cfs @ 11.97 hrs, Volume= 0.187 af, Depth> 1.60"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.40"

Area (ac)	CN	Description
* 1.400	92	
1.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
5.0	0	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 9S: DA-2F

Runoff = 1.54 cfs @ 11.98 hrs, Volume= 0.073 af, Depth> 0.98"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.40"

Area (ac)	CN	Description
* 0.900	83	
0.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
5.0	0	Total, Increased to minimum Tc = 6.0 min			

201005 Existing

Type II 24-hr 1-Year Rainfall=2.40"

Prepared by The LA Group P.C.

Printed 2/20/2011

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Page 6

Summary for Subcatchment 10S: DA-2A3

Runoff = 5.18 cfs @ 12.08 hrs, Volume= 0.350 af, Depth> 1.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.40"

Area (ac)	CN	Description
* 2.770	91	
2.770		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2					Direct Entry,

Summary for Subcatchment 11S: DA-2A2

Runoff = 6.61 cfs @ 11.99 hrs, Volume= 0.357 af, Depth> 1.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.40"

Area (sf)	CN	Description
* 105,415	94	
105,415		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4					Direct Entry,

Summary for Reach 5R: DP-2

Inflow Area = 12.110 ac, 10.90% Impervious, Inflow Depth > 1.41" for 1-Year event

Inflow = 15.67 cfs @ 11.99 hrs, Volume= 1.418 af

Outflow = 15.57 cfs @ 12.00 hrs, Volume= 1.418 af, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Max. Velocity= 8.16 fps, Min. Travel Time= 0.2 min

Avg. Velocity = 2.59 fps, Avg. Travel Time= 0.6 min

Peak Storage= 192 cf @ 11.99 hrs

Average Depth at Peak Storage= 0.95'

Bank-Full Depth= 3.00', Capacity at Bank-Full= 72.26 cfs

36.0" Round Pipe

n= 0.012

Length= 100.0' Slope= 0.0100 '/'

Inlet Invert= 240.00', Outlet Invert= 239.00'

201005 Existing

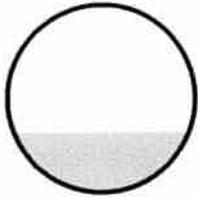
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Type II 24-hr 1-Year Rainfall=2.40"

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Summary for Pond 2P: StormTech MC-3500

Inflow Area = 5.190 ac, 0.00% Impervious, Inflow Depth > 1.63" for 1-Year event
 Inflow = 10.92 cfs @ 12.02 hrs, Volume= 0.707 af
 Outflow = 4.19 cfs @ 12.23 hrs, Volume= 0.647 af, Atten= 62%, Lag= 13.1 min
 Primary = 4.19 cfs @ 12.23 hrs, Volume= 0.647 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 254.63' @ 12.23 hrs Surf.Area= 0.242 ac Storage= 0.253 af

Plug-Flow detention time= 87.7 min calculated for 0.647 af (91% of inflow)
 Center-of-Mass det. time= 43.6 min (849.9 - 806.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	253.00'	0.246 af	102.75'W x 90.81'L x 5.00'H Field A 1.071 af Overall - 0.455 af Embedded = 0.616 af x 40.0% Voids
#2A	253.75'	0.455 af	StormTech MC-3500 x 180 Inside #1 Effective Size= 69.0"W x 45.0"H => 15.35 sf x 7.17'L = 110.1 cf Overall Size= 75.0"W x 45.0"H x 7.50'L with 0.33' Overlap
#3B	253.00'	0.019 af	8.25'W x 76.47'L x 5.00'H Field B 0.072 af Overall - 0.025 af Embedded = 0.047 af x 40.0% Voids
#4B	253.75'	0.025 af	StormTech MC-3500 x 10 Inside #3 Effective Size= 69.0"W x 45.0"H => 15.35 sf x 7.17'L = 110.1 cf Overall Size= 75.0"W x 45.0"H x 7.50'L with 0.33' Overlap
#5C	253.00'	0.017 af	8.25'W x 69.30'L x 5.00'H Field C 0.066 af Overall - 0.023 af Embedded = 0.043 af x 40.0% Voids
#6C	253.75'	0.023 af	StormTech MC-3500 x 9 Inside #5 Effective Size= 69.0"W x 45.0"H => 15.35 sf x 7.17'L = 110.1 cf Overall Size= 75.0"W x 45.0"H x 7.50'L with 0.33' Overlap
		0.785 af	Total Available Storage

Storage Group A created with Chamber Wizard
 Storage Group B created with Chamber Wizard
 Storage Group C created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	251.60'	24.0" Round Culvert L= 355.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 251.60' / 249.00' S= 0.0073 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	253.50'	6.0" Round Culvert X 6.00 L= 4.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 253.50' / 253.50' S= 0.0000 '/ Cc= 0.900 n= 0.012

201005 Existing

Type II 24-hr 1-Year Rainfall=2.40"

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#3 Device 1 255.25' **18.0" Round Culvert**
L= 4.0' CPP, projecting, no headwall, Ke= 0.900
Inlet / Outlet Invert= 255.25' / 255.25' S= 0.0000 '/' Cc= 0.900
n= 0.012

Primary OutFlow Max=4.18 cfs @ 12.23 hrs HW=254.62' (Free Discharge)

└─1=Culvert (Passes 4.18 cfs of 16.99 cfs potential flow)

└─┬─2=Culvert (Inlet Controls 4.18 cfs @ 3.55 fps)

└─┬─3=Culvert (Controls 0.00 cfs)

201005 Existing

Type II 24-hr 10-Year Rainfall=4.30"

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Summary for Subcatchment 3S: DA-2A1

Runoff = 2.54 cfs @ 12.10 hrs, Volume= 0.178 af, Depth> 1.89"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=4.30"

Area (ac)	CN	Description
* 1.130	75	
1.130		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.4					Direct Entry,

Summary for Subcatchment 4S: DA-2B

Runoff = 4.87 cfs @ 12.03 hrs, Volume= 0.293 af, Depth> 3.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=4.30"

Area (ac)	CN	Description
* 1.170	88	
1.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					Direct Entry,

Summary for Subcatchment 6S: DA-2C

Runoff = 3.30 cfs @ 12.09 hrs, Volume= 0.226 af, Depth> 2.72"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=4.30"

Area (ac)	CN	Description
* 1.000	85	
1.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.8					Direct Entry,

201005 Existing

Type II 24-hr 10-Year Rainfall=4.30"

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Summary for Subcatchment 7S: DA-2D

Runoff = 7.84 cfs @ 11.96 hrs, Volume= 0.447 af, Depth> 4.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=4.30"

Area (ac)	CN	Description
* 1.320	98	
1.320		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
5.0	0	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 8S: DA-2E

Runoff = 7.65 cfs @ 11.96 hrs, Volume= 0.397 af, Depth> 3.40"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=4.30"

Area (ac)	CN	Description
* 1.400	92	
1.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
5.0	0	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 9S: DA-2F

Runoff = 3.90 cfs @ 11.97 hrs, Volume= 0.191 af, Depth> 2.55"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=4.30"

Area (ac)	CN	Description
* 0.900	83	
0.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
5.0	0	Total, Increased to minimum Tc = 6.0 min			

201005 Existing

Type II 24-hr 10-Year Rainfall=4.30"

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Summary for Subcatchment 10S: DA-2A3

Runoff = 10.92 cfs @ 12.08 hrs, Volume= 0.761 af, Depth> 3.29"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=4.30"

Area (ac)	CN	Description
* 2.770	91	
2.770		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2					Direct Entry,

Summary for Subcatchment 11S: DA-2A2

Runoff = 12.90 cfs @ 11.99 hrs, Volume= 0.729 af, Depth> 3.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=4.30"

Area (sf)	CN	Description
* 105,415	94	
105,415		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4					Direct Entry,

Summary for Reach 5R: DP-2

Inflow Area = 12.110 ac, 10.90% Impervious, Inflow Depth > 3.13" for 10-Year event
 Inflow = 32.38 cfs @ 11.99 hrs, Volume= 3.156 af
 Outflow = 32.25 cfs @ 11.99 hrs, Volume= 3.156 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Max. Velocity= 9.94 fps, Min. Travel Time= 0.2 min
 Avg. Velocity = 3.30 fps, Avg. Travel Time= 0.5 min

Peak Storage= 326 cf @ 11.99 hrs
 Average Depth at Peak Storage= 1.41'
 Bank-Full Depth= 3.00', Capacity at Bank-Full= 72.26 cfs

36.0" Round Pipe
 n= 0.012
 Length= 100.0' Slope= 0.0100 '/'
 Inlet Invert= 240.00', Outlet Invert= 239.00'

201005 Existing

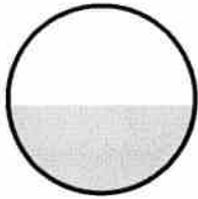
Type II 24-hr 10-Year Rainfall=4.30"

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Summary for Pond 2P: StormTech MC-3500

Inflow Area = 5.190 ac, 0.00% Impervious, Inflow Depth > 3.44" for 10-Year event
 Inflow = 22.18 cfs @ 12.02 hrs, Volume= 1.489 af
 Outflow = 7.92 cfs @ 12.25 hrs, Volume= 1.425 af, Atten= 64%, Lag= 14.0 min
 Primary = 7.92 cfs @ 12.25 hrs, Volume= 1.425 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 255.94' @ 12.25 hrs Surf.Area= 0.242 ac Storage= 0.507 af

Plug-Flow detention time= 68.9 min calculated for 1.425 af (96% of inflow)
 Center-of-Mass det. time= 43.7 min (829.9 - 786.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	253.00'	0.246 af	102.75'W x 90.81'L x 5.00'H Field A 1.071 af Overall - 0.455 af Embedded = 0.616 af x 40.0% Voids
#2A	253.75'	0.455 af	StormTech MC-3500 x 180 Inside #1 Effective Size= 69.0"W x 45.0"H => 15.35 sf x 7.17'L = 110.1 cf Overall Size= 75.0"W x 45.0"H x 7.50'L with 0.33' Overlap
#3B	253.00'	0.019 af	8.25'W x 76.47'L x 5.00'H Field B 0.072 af Overall - 0.025 af Embedded = 0.047 af x 40.0% Voids
#4B	253.75'	0.025 af	StormTech MC-3500 x 10 Inside #3 Effective Size= 69.0"W x 45.0"H => 15.35 sf x 7.17'L = 110.1 cf Overall Size= 75.0"W x 45.0"H x 7.50'L with 0.33' Overlap
#5C	253.00'	0.017 af	8.25'W x 69.30'L x 5.00'H Field C 0.066 af Overall - 0.023 af Embedded = 0.043 af x 40.0% Voids
#6C	253.75'	0.023 af	StormTech MC-3500 x 9 Inside #5 Effective Size= 69.0"W x 45.0"H => 15.35 sf x 7.17'L = 110.1 cf Overall Size= 75.0"W x 45.0"H x 7.50'L with 0.33' Overlap
		0.785 af	Total Available Storage

Storage Group A created with Chamber Wizard
 Storage Group B created with Chamber Wizard
 Storage Group C created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	251.60'	24.0" Round Culvert L= 355.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 251.60' / 249.00' S= 0.0073 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	253.50'	6.0" Round Culvert X 6.00 L= 4.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 253.50' / 253.50' S= 0.0000 '/ Cc= 0.900 n= 0.012

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Type II 24-hr 10-Year Rainfall=4.30"

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#3 Device 1 255.25' **18.0" Round Culvert**
L= 4.0' CPP, projecting, no headwall, Ke= 0.900
Inlet / Outlet Invert= 255.25' / 255.25' S= 0.0000 '/ Cc= 0.900
n= 0.012

Primary OutFlow Max=7.91 cfs @ 12.25 hrs HW=255.94' (Free Discharge)

↑ **1=Culvert** (Passes 7.91 cfs of 21.83 cfs potential flow)

↑ **2=Culvert** (Inlet Controls 6.63 cfs @ 5.63 fps)

↑ **3=Culvert** (Barrel Controls 1.28 cfs @ 2.37 fps)

201005 Existing

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Type II 24-hr 100-Year Rainfall=5.90"

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Summary for Subcatchment 3S: DA-2A1

Runoff = 4.32 cfs @ 12.10 hrs, Volume= 0.300 af, Depth> 3.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.90"

Area (ac)	CN	Description
* 1.130	75	
1.130		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.4					Direct Entry,

Summary for Subcatchment 4S: DA-2B

Runoff = 7.18 cfs @ 12.03 hrs, Volume= 0.441 af, Depth> 4.52"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.90"

Area (ac)	CN	Description
* 1.170	88	
1.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					Direct Entry,

Summary for Subcatchment 6S: DA-2C

Runoff = 5.01 cfs @ 12.09 hrs, Volume= 0.349 af, Depth> 4.19"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.90"

Area (ac)	CN	Description
* 1.000	85	
1.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.8					Direct Entry,

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Type II 24-hr 100-Year Rainfall=5.90"

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Summary for Subcatchment 7S: DA-2D

Runoff = 10.80 cfs @ 11.96 hrs, Volume= 0.622 af, Depth> 5.66"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.90"

Area (ac)	CN	Description
* 1.320	98	
1.320		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
5.0	0	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 8S: DA-2E

Runoff = 10.89 cfs @ 11.96 hrs, Volume= 0.579 af, Depth> 4.97"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.90"

Area (ac)	CN	Description
* 1.400	92	
1.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
5.0	0	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 9S: DA-2F

Runoff = 6.01 cfs @ 11.97 hrs, Volume= 0.300 af, Depth> 3.99"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.90"

Area (ac)	CN	Description
* 0.900	83	
0.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
5.0	0	Total, Increased to minimum Tc = 6.0 min			

201005 Existing

Type II 24-hr 100-Year Rainfall=5.90"

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Summary for Subcatchment 10S: DA-2A3

Runoff = 15.72 cfs @ 12.08 hrs, Volume= 1.118 af, Depth> 4.84"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.90"

Area (ac)	CN	Description
* 2.770	91	
2.770		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2					Direct Entry,

Summary for Subcatchment 11S: DA-2A2

Runoff = 18.12 cfs @ 11.99 hrs, Volume= 1.047 af, Depth> 5.19"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.90"

Area (sf)	CN	Description
* 105,415	94	
105,415		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4					Direct Entry,

Summary for Reach 5R: DP-2

Inflow Area = 12.110 ac, 10.90% Impervious, Inflow Depth > 4.65" for 100-Year event
 Inflow = 46.86 cfs @ 11.99 hrs, Volume= 4.689 af
 Outflow = 46.72 cfs @ 12.00 hrs, Volume= 4.688 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Max. Velocity= 10.88 fps, Min. Travel Time= 0.2 min
 Avg. Velocity = 3.75 fps, Avg. Travel Time= 0.4 min

Peak Storage= 431 cf @ 11.99 hrs
 Average Depth at Peak Storage= 1.76'
 Bank-Full Depth= 3.00', Capacity at Bank-Full= 72.26 cfs

36.0" Round Pipe
 n= 0.012
 Length= 100.0' Slope= 0.0100 '/'
 Inlet Invert= 240.00', Outlet Invert= 239.00'

201005 Existing

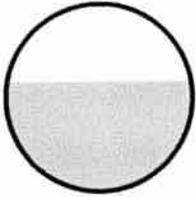
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Type II 24-hr 100-Year Rainfall=5.90"

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Summary for Pond 2P: StormTech MC-3500

Inflow Area = 5.190 ac, 0.00% Impervious, Inflow Depth > 5.01" for 100-Year event
 Inflow = 31.57 cfs @ 12.01 hrs, Volume= 2.165 af
 Outflow = 14.14 cfs @ 12.21 hrs, Volume= 2.098 af, Atten= 55%, Lag= 11.5 min
 Primary = 14.14 cfs @ 12.21 hrs, Volume= 2.098 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 256.97' @ 12.21 hrs Surf.Area= 0.242 ac Storage= 0.675 af

Plug-Flow detention time= 59.1 min calculated for 2.093 af (97% of inflow)
 Center-of-Mass det. time= 40.4 min (816.9 - 776.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	253.00'	0.246 af	102.75'W x 90.81'L x 5.00'H Field A 1.071 af Overall - 0.455 af Embedded = 0.616 af x 40.0% Voids
#2A	253.75'	0.455 af	StormTech MC-3500 x 180 Inside #1 Effective Size= 69.0"W x 45.0"H => 15.35 sf x 7.17'L = 110.1 cf Overall Size= 75.0"W x 45.0"H x 7.50'L with 0.33' Overlap
#3B	253.00'	0.019 af	8.25'W x 76.47'L x 5.00'H Field B 0.072 af Overall - 0.025 af Embedded = 0.047 af x 40.0% Voids
#4B	253.75'	0.025 af	StormTech MC-3500 x 10 Inside #3 Effective Size= 69.0"W x 45.0"H => 15.35 sf x 7.17'L = 110.1 cf Overall Size= 75.0"W x 45.0"H x 7.50'L with 0.33' Overlap
#5C	253.00'	0.017 af	8.25'W x 69.30'L x 5.00'H Field C 0.066 af Overall - 0.023 af Embedded = 0.043 af x 40.0% Voids
#6C	253.75'	0.023 af	StormTech MC-3500 x 9 Inside #5 Effective Size= 69.0"W x 45.0"H => 15.35 sf x 7.17'L = 110.1 cf Overall Size= 75.0"W x 45.0"H x 7.50'L with 0.33' Overlap
		0.785 af	Total Available Storage

Storage Group A created with Chamber Wizard
 Storage Group B created with Chamber Wizard
 Storage Group C created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	251.60'	24.0" Round Culvert L= 355.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 251.60' / 249.00' S= 0.0073 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	253.50'	6.0" Round Culvert X 6.00 L= 4.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 253.50' / 253.50' S= 0.0000 '/ Cc= 0.900 n= 0.012

201005 Existing

Type II 24-hr 100-Year Rainfall=5.90"

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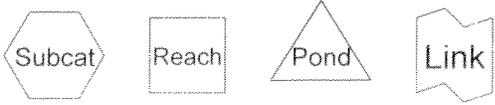
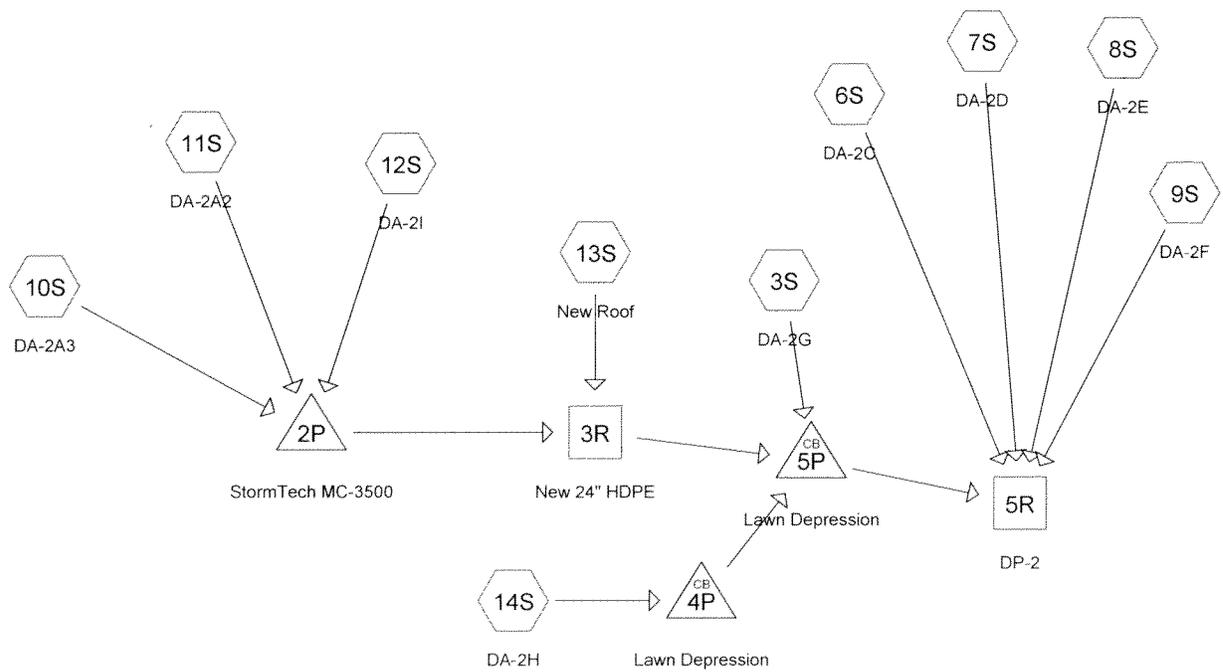
#3 Device 1 255.25' **18.0" Round Culvert**
L= 4.0' CPP, projecting, no headwall, Ke= 0.900
Inlet / Outlet Invert= 255.25' / 255.25' S= 0.0000 '/ Cc= 0.900
n= 0.012

Primary OutFlow Max=14.10 cfs @ 12.21 hrs HW=256.96' (Free Discharge)

↑ **1=Culvert** (Passes 14.10 cfs of 24.48 cfs potential flow)

↑ **2=Culvert** (Inlet Controls 8.03 cfs @ 6.82 fps)

↑ **3=Culvert** (Barrel Controls 6.07 cfs @ 3.76 fps)



Drainage Diagram for 201005 Proposed
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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
3.222	74	>75% Grass cover, Good, HSG C (3S, 11S, 12S, 14S)
0.900	83	(9S)
0.935	85	(6S)
2.770	91	(10S)
1.400	92	(8S)
1.320	98	(7S)
1.015	98	Paved parking, HSG C (11S, 12S, 14S)
0.771	98	Roofs, HSG C (13S)

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
5.008	HSG C	3S, 11S, 12S, 13S, 14S
0.000	HSG D	
7.325	Other	6S, 7S, 8S, 9S, 10S

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Type II 24-hr 1-Year Rainfall=2.40"

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Summary for Subcatchment 3S: DA-2G

Runoff = 0.58 cfs @ 12.06 hrs, Volume= 0.038 af, Depth> 0.55"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.40"

Area (sf)	CN	Description
36,002	74	>75% Grass cover, Good, HSG C
36,002		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	100	0.0300	0.18		Sheet Flow, Grass: Short n= 0.150 P2= 2.70"
3.3	280	0.0400	1.40		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
12.4	380	Total			

Summary for Subcatchment 6S: DA-2C

Runoff = 1.24 cfs @ 12.10 hrs, Volume= 0.085 af, Depth> 1.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.40"

Area (ac)	CN	Description
* 0.935	85	
0.935		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.8					Direct Entry,

Summary for Subcatchment 7S: DA-2D

Runoff = 4.32 cfs @ 11.96 hrs, Volume= 0.239 af, Depth> 2.17"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.40"

Area (ac)	CN	Description
* 1.320	98	
1.320		100.00% Impervious Area

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Type II 24-hr 1-Year Rainfall=2.40"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
5.0	0	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 8S: DA-2E

Runoff = 3.75 cfs @ 11.97 hrs, Volume= 0.187 af, Depth> 1.60"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.40"

Area (ac)	CN	Description
* 1.400	92	
1.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
5.0	0	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 9S: DA-2F

Runoff = 1.54 cfs @ 11.98 hrs, Volume= 0.073 af, Depth> 0.98"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.40"

Area (ac)	CN	Description
* 0.900	83	
0.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
5.0	0	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 10S: DA-2A3

Runoff = 5.18 cfs @ 12.08 hrs, Volume= 0.350 af, Depth> 1.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.40"

Area (ac)	CN	Description
* 2.770	91	
2.770		100.00% Pervious Area

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Type II 24-hr 1-Year Rainfall=2.40"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2					Direct Entry,

Summary for Subcatchment 11S: DA-2A2

Runoff = 2.27 cfs @ 11.98 hrs, Volume= 0.108 af, Depth> 1.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.40"

Area (sf)	CN	Description
32,714	74	>75% Grass cover, Good, HSG C
21,918	98	Paved parking, HSG C
54,632	84	Weighted Average
32,714		59.88% Pervious Area
21,918		40.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
5.0	0	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 12S: DA-2I

Runoff = 1.78 cfs @ 11.98 hrs, Volume= 0.085 af, Depth> 0.98"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.40"

Area (sf)	CN	Description
17,860	98	Paved parking, HSG C
27,616	74	>75% Grass cover, Good, HSG C
45,476	83	Weighted Average
27,616		60.73% Pervious Area
17,860		39.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
5.0	0	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 13S: New Roof

Runoff = 2.52 cfs @ 11.96 hrs, Volume= 0.139 af, Depth> 2.17"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.40"

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Type II 24-hr 1-Year Rainfall=2.40"

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Area (sf)	CN	Description
33,581	98	Roofs, HSG C
33,581		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
5.0	0	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 14S: DA-2H

Runoff = 0.91 cfs @ 12.06 hrs, Volume= 0.059 af, Depth> 0.63"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.40"

Area (sf)	CN	Description
4,450	98	Paved parking, HSG C
44,008	74	>75% Grass cover, Good, HSG C
48,458	76	Weighted Average
44,008		90.82% Pervious Area
4,450		9.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	100	0.0400	0.21		Sheet Flow, Grass: Short n= 0.150 P2= 2.70"
2.3	150	0.0250	1.11		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
2.5	350	0.0250	2.37		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
12.9	600	Total			

Summary for Reach 3R: New 24" HDPEInflow Area = 5.839 ac, 28.84% Impervious, Inflow Depth > 1.40" for 1-Year event
Inflow = 3.75 cfs @ 11.97 hrs, Volume= 0.681 af
Outflow = 3.73 cfs @ 11.98 hrs, Volume= 0.681 af, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Max. Velocity= 9.74 fps, Min. Travel Time= 0.3 min

Avg. Velocity = 3.97 fps, Avg. Travel Time= 0.7 min

Peak Storage= 65 cf @ 11.98 hrs

Average Depth at Peak Storage= 0.36'

Bank-Full Depth= 2.00', Capacity at Bank-Full= 53.34 cfs

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Type II 24-hr 1-Year Rainfall=2.40"

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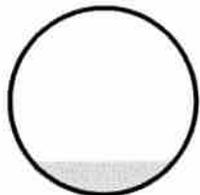
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24.0" Round Pipe

n= 0.013 Corrugated PE, smooth interior

Length= 170.0' Slope= 0.0556 '/'

Inlet Invert= 249.75', Outlet Invert= 240.30'

**Summary for Reach 5R: DP-2**

Inflow Area = 12.333 ac, 25.19% Impervious, Inflow Depth > 1.32" for 1-Year event
 Inflow = 15.16 cfs @ 11.98 hrs, Volume= 1.362 af
 Outflow = 15.16 cfs @ 11.98 hrs, Volume= 1.362 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond 2P: StormTech MC-3500

Inflow Area = 5.068 ac, 18.02% Impervious, Inflow Depth > 1.29" for 1-Year event
 Inflow = 8.12 cfs @ 12.01 hrs, Volume= 0.543 af
 Outflow = 1.61 cfs @ 12.44 hrs, Volume= 0.542 af, Atten= 80%, Lag= 26.0 min
 Primary = 1.61 cfs @ 12.44 hrs, Volume= 0.542 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
 Peak Elev= 254.30' @ 12.44 hrs Surf.Area= 0.242 ac Storage= 0.187 af

Plug-Flow detention time= 41.7 min calculated for 0.541 af (100% of inflow)

Center-of-Mass det. time= 40.3 min (866.5 - 826.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	253.00'	0.246 af	102.75'W x 90.81'L x 5.00'H Field A 1.071 af Overall - 0.455 af Embedded = 0.616 af x 40.0% Voids
#2A	253.75'	0.455 af	StormTech MC-3500 x 180 Inside #1 Effective Size= 69.0"W x 45.0"H => 15.35 sf x 7.17'L = 110.1 cf Overall Size= 75.0"W x 45.0"H x 7.50'L with 0.33' Overlap
#3B	253.00'	0.019 af	8.25'W x 76.47'L x 5.00'H Field B 0.072 af Overall - 0.025 af Embedded = 0.047 af x 40.0% Voids
#4B	253.75'	0.025 af	StormTech MC-3500 x 10 Inside #3 Effective Size= 69.0"W x 45.0"H => 15.35 sf x 7.17'L = 110.1 cf Overall Size= 75.0"W x 45.0"H x 7.50'L with 0.33' Overlap
#5C	253.00'	0.017 af	8.25'W x 69.30'L x 5.00'H Field C 0.066 af Overall - 0.023 af Embedded = 0.043 af x 40.0% Voids
#6C	253.75'	0.023 af	StormTech MC-3500 x 9 Inside #5 Effective Size= 69.0"W x 45.0"H => 15.35 sf x 7.17'L = 110.1 cf Overall Size= 75.0"W x 45.0"H x 7.50'L with 0.33' Overlap
		0.785 af	Total Available Storage

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Type II 24-hr 1-Year Rainfall=2.40"

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Storage Group A created with Chamber Wizard
 Storage Group B created with Chamber Wizard
 Storage Group C created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	251.26'	24.0" Round Culvert L= 212.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 251.26' / 249.78' S= 0.0070 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	255.50'	24.0" Round Culvert L= 2.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 255.50' / 255.48' S= 0.0100 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#3	Device 1	252.50'	8.0" Round Culvert L= 2.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 252.50' / 252.48' S= 0.0100 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=1.61 cfs @ 12.44 hrs HW=254.30' (Free Discharge)

↑1=Culvert (Passes 1.61 cfs of 17.06 cfs potential flow)

↑2=Culvert (Controls 0.00 cfs)

↑3=Culvert (Inlet Controls 1.61 cfs @ 4.61 fps)

Summary for Pond 4P: Lawn Depression

Inflow Area = 1.112 ac, 9.18% Impervious, Inflow Depth > 0.63" for 1-Year event
 Inflow = 0.91 cfs @ 12.06 hrs, Volume= 0.059 af
 Outflow = 0.91 cfs @ 12.06 hrs, Volume= 0.059 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.91 cfs @ 12.06 hrs, Volume= 0.059 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 243.23' @ 12.06 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	242.75'	18.0" Round Culvert L= 80.0' Ke= 0.900 Inlet / Outlet Invert= 242.75' / 240.34' S= 0.0301 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.89 cfs @ 12.06 hrs HW=243.22' (Free Discharge)

↑1=Culvert (Inlet Controls 0.89 cfs @ 1.85 fps)

Summary for Pond 5P: Lawn Depression

Inflow Area = 7.778 ac, 22.97% Impervious, Inflow Depth > 1.20" for 1-Year event
 Inflow = 4.90 cfs @ 12.00 hrs, Volume= 0.778 af
 Outflow = 4.90 cfs @ 12.00 hrs, Volume= 0.778 af, Atten= 0%, Lag= 0.0 min
 Primary = 4.90 cfs @ 12.00 hrs, Volume= 0.778 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

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Type II 24-hr 1-Year Rainfall=2.40"

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Peak Elev= 241.49' @ 12.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	240.34'	24.0" Round Culvert L= 20.0' Ke= 0.900 Inlet / Outlet Invert= 240.34' / 240.15' S= 0.0095 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=4.88 cfs @ 12.00 hrs HW=241.49' (Free Discharge)

↑**1=Culvert** (Barrel Controls 4.88 cfs @ 3.75 fps)

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Type II 24-hr 10-Year Rainfall=4.30"

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Summary for Subcatchment 3S: DA-2G

Runoff = 2.10 cfs @ 12.05 hrs, Volume= 0.125 af, Depth> 1.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=4.30"

Area (sf)	CN	Description
36,002	74	>75% Grass cover, Good, HSG C
36,002		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	100	0.0300	0.18		Sheet Flow, Grass: Short n= 0.150 P2= 2.70"
3.3	280	0.0400	1.40		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
12.4	380	Total			

Summary for Subcatchment 6S: DA-2C

Runoff = 3.08 cfs @ 12.09 hrs, Volume= 0.212 af, Depth> 2.72"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=4.30"

Area (ac)	CN	Description
* 0.935	85	
0.935		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.8					Direct Entry,

Summary for Subcatchment 7S: DA-2D

Runoff = 7.84 cfs @ 11.96 hrs, Volume= 0.447 af, Depth> 4.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=4.30"

Area (ac)	CN	Description
* 1.320	98	
1.320		100.00% Impervious Area

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Type II 24-hr 10-Year Rainfall=4.30"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
5.0	0	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 8S: DA-2E

Runoff = 7.65 cfs @ 11.96 hrs, Volume= 0.397 af, Depth> 3.40"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=4.30"

Area (ac)	CN	Description
* 1.400	92	
1.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
5.0	0	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 9S: DA-2F

Runoff = 3.90 cfs @ 11.97 hrs, Volume= 0.191 af, Depth> 2.55"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=4.30"

Area (ac)	CN	Description
* 0.900	83	
0.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
5.0	0	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 10S: DA-2A3

Runoff = 10.92 cfs @ 12.08 hrs, Volume= 0.761 af, Depth> 3.29"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=4.30"

Area (ac)	CN	Description
* 2.770	91	
2.770		100.00% Pervious Area

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Type II 24-hr 10-Year Rainfall=4.30"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2					Direct Entry,

Summary for Subcatchment 11S: DA-2A2

Runoff = 5.61 cfs @ 11.97 hrs, Volume= 0.275 af, Depth> 2.63"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=4.30"

Area (sf)	CN	Description
32,714	74	>75% Grass cover, Good, HSG C
21,918	98	Paved parking, HSG C
54,632	84	Weighted Average
32,714		59.88% Pervious Area
21,918		40.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
5.0	0	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 12S: DA-2I

Runoff = 4.53 cfs @ 11.97 hrs, Volume= 0.221 af, Depth> 2.55"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=4.30"

Area (sf)	CN	Description
17,860	98	Paved parking, HSG C
27,616	74	>75% Grass cover, Good, HSG C
45,476	83	Weighted Average
27,616		60.73% Pervious Area
17,860		39.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
5.0	0	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 13S: New Roof

Runoff = 4.58 cfs @ 11.96 hrs, Volume= 0.261 af, Depth> 4.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=4.30"

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Type II 24-hr 10-Year Rainfall=4.30"

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Area (sf)	CN	Description
33,581	98	Roofs, HSG C
33,581		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
5.0	0	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 14S: DA-2H

Runoff = 3.02 cfs @ 12.05 hrs, Volume= 0.182 af, Depth> 1.96"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=4.30"

Area (sf)	CN	Description
4,450	98	Paved parking, HSG C
44,008	74	>75% Grass cover, Good, HSG C
48,458	76	Weighted Average
44,008		90.82% Pervious Area
4,450		9.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	100	0.0400	0.21		Sheet Flow, Grass: Short n= 0.150 P2= 2.70"
2.3	150	0.0250	1.11		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
2.5	350	0.0250	2.37		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
12.9	600	Total			

Summary for Reach 3R: New 24" HDPE

Inflow Area = 5.839 ac, 28.84% Impervious, Inflow Depth > 3.12" for 10-Year event
Inflow = 6.26 cfs @ 11.97 hrs, Volume= 1.516 af
Outflow = 6.23 cfs @ 11.98 hrs, Volume= 1.516 af, Atten= 0%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 11.31 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 5.17 fps, Avg. Travel Time= 0.5 min

Peak Storage= 93 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.46'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 53.34 cfs

201005 Proposed

Type II 24-hr 10-Year Rainfall=4.30"

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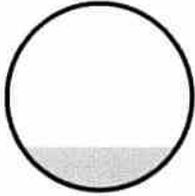
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24.0" Round Pipe

n= 0.013 Corrugated PE, smooth interior

Length= 170.0' Slope= 0.0556 '/'

Inlet Invert= 249.75', Outlet Invert= 240.30'

**Summary for Reach 5R: DP-2**

Inflow Area = 12.333 ac, 25.19% Impervious, Inflow Depth > 2.99" for 10-Year event
 Inflow = 31.82 cfs @ 11.98 hrs, Volume= 3.070 af
 Outflow = 31.82 cfs @ 11.98 hrs, Volume= 3.070 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond 2P: StormTech MC-3500

Inflow Area = 5.068 ac, 18.02% Impervious, Inflow Depth > 2.98" for 10-Year event
 Inflow = 18.75 cfs @ 12.00 hrs, Volume= 1.257 af
 Outflow = 3.12 cfs @ 12.47 hrs, Volume= 1.255 af, Atten= 83%, Lag= 28.1 min
 Primary = 3.12 cfs @ 12.47 hrs, Volume= 1.255 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
 Peak Elev= 255.96' @ 12.47 hrs Surf.Area= 0.242 ac Storage= 0.511 af

Plug-Flow detention time= 82.8 min calculated for 1.253 af (100% of inflow)
 Center-of-Mass det. time= 81.6 min (884.8 - 803.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	253.00'	0.246 af	102.75'W x 90.81'L x 5.00'H Field A
#2A	253.75'	0.455 af	1.071 af Overall - 0.455 af Embedded = 0.616 af x 40.0% Voids StormTech MC-3500 x 180 Inside #1 Effective Size= 69.0"W x 45.0"H => 15.35 sf x 7.17'L = 110.1 cf Overall Size= 75.0"W x 45.0"H x 7.50'L with 0.33' Overlap
#3B	253.00'	0.019 af	8.25'W x 76.47'L x 5.00'H Field B
#4B	253.75'	0.025 af	0.072 af Overall - 0.025 af Embedded = 0.047 af x 40.0% Voids StormTech MC-3500 x 10 Inside #3 Effective Size= 69.0"W x 45.0"H => 15.35 sf x 7.17'L = 110.1 cf Overall Size= 75.0"W x 45.0"H x 7.50'L with 0.33' Overlap
#5C	253.00'	0.017 af	8.25'W x 69.30'L x 5.00'H Field C
#6C	253.75'	0.023 af	0.066 af Overall - 0.023 af Embedded = 0.043 af x 40.0% Voids StormTech MC-3500 x 9 Inside #5 Effective Size= 69.0"W x 45.0"H => 15.35 sf x 7.17'L = 110.1 cf Overall Size= 75.0"W x 45.0"H x 7.50'L with 0.33' Overlap
		0.785 af	Total Available Storage

201005 Proposed

Type II 24-hr 10-Year Rainfall=4.30"

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Storage Group A created with Chamber Wizard
 Storage Group B created with Chamber Wizard
 Storage Group C created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	251.26'	24.0" Round Culvert L= 212.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 251.26' / 249.78' S= 0.0070 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	255.50'	24.0" Round Culvert L= 2.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 255.50' / 255.48' S= 0.0100 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#3	Device 1	252.50'	8.0" Round Culvert L= 2.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 252.50' / 252.48' S= 0.0100 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=3.11 cfs @ 12.47 hrs HW=255.96' (Free Discharge)

└─1=Culvert (Passes 3.11 cfs of 22.98 cfs potential flow)

└─┬─2=Culvert (Barrel Controls 0.77 cfs @ 2.10 fps)

└─┬─3=Culvert (Inlet Controls 2.35 cfs @ 6.72 fps)

Summary for Pond 4P: Lawn Depression

Inflow Area = 1.112 ac, 9.18% Impervious, Inflow Depth > 1.96" for 10-Year event
 Inflow = 3.02 cfs @ 12.05 hrs, Volume= 0.182 af
 Outflow = 3.02 cfs @ 12.05 hrs, Volume= 0.182 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.02 cfs @ 12.05 hrs, Volume= 0.182 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 243.69' @ 12.05 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	242.75'	18.0" Round Culvert L= 80.0' Ke= 0.900 Inlet / Outlet Invert= 242.75' / 240.34' S= 0.0301 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=3.01 cfs @ 12.05 hrs HW=243.68' (Free Discharge)

└─1=Culvert (Inlet Controls 3.01 cfs @ 2.60 fps)

Summary for Pond 5P: Lawn Depression

Inflow Area = 7.778 ac, 22.97% Impervious, Inflow Depth > 2.81" for 10-Year event
 Inflow = 10.68 cfs @ 12.01 hrs, Volume= 1.823 af
 Outflow = 10.68 cfs @ 12.01 hrs, Volume= 1.823 af, Atten= 0%, Lag= 0.0 min
 Primary = 10.68 cfs @ 12.01 hrs, Volume= 1.823 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

201005 Proposed

Type II 24-hr 10-Year Rainfall=4.30"

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Peak Elev= 242.22' @ 12.01 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	240.34'	24.0" Round Culvert L= 20.0' Ke= 0.900 Inlet / Outlet Invert= 240.34' / 240.15' S= 0.0095 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=10.57 cfs @ 12.01 hrs HW=242.21' (Free Discharge)

↑**1=Culvert** (Barrel Controls 10.57 cfs @ 4.49 fps)

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Type II 24-hr 100-Year Rainfall=5.90"

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Summary for Subcatchment 3S: DA-2G

Runoff = 3.59 cfs @ 12.04 hrs, Volume= 0.213 af, Depth> 3.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.90"

Area (sf)	CN	Description
36,002	74	>75% Grass cover, Good, HSG C
36,002		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	100	0.0300	0.18		Sheet Flow, Grass: Short n= 0.150 P2= 2.70"
3.3	280	0.0400	1.40		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
12.4	380	Total			

Summary for Subcatchment 6S: DA-2C

Runoff = 4.69 cfs @ 12.09 hrs, Volume= 0.327 af, Depth> 4.19"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.90"

Area (ac)	CN	Description
* 0.935	85	
0.935		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.8					Direct Entry,

Summary for Subcatchment 7S: DA-2D

Runoff = 10.80 cfs @ 11.96 hrs, Volume= 0.622 af, Depth> 5.66"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.90"

Area (ac)	CN	Description
* 1.320	98	
1.320		100.00% Impervious Area

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Type II 24-hr 100-Year Rainfall=5.90"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
5.0	0	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 8S: DA-2E

Runoff = 10.89 cfs @ 11.96 hrs, Volume= 0.579 af, Depth> 4.97"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.90"

Area (ac)	CN	Description
* 1.400	92	
1.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
5.0	0	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 9S: DA-2F

Runoff = 6.01 cfs @ 11.97 hrs, Volume= 0.300 af, Depth> 3.99"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.90"

Area (ac)	CN	Description
* 0.900	83	
0.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
5.0	0	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 10S: DA-2A3

Runoff = 15.72 cfs @ 12.08 hrs, Volume= 1.118 af, Depth> 4.84"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.90"

Area (ac)	CN	Description
* 2.770	91	
2.770		100.00% Pervious Area

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Type II 24-hr 100-Year Rainfall=5.90"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2					Direct Entry,

Summary for Subcatchment 11S: DA-2A2

Runoff = 8.55 cfs @ 11.97 hrs, Volume= 0.428 af, Depth> 4.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.90"

Area (sf)	CN	Description
32,714	74	>75% Grass cover, Good, HSG C
21,918	98	Paved parking, HSG C
54,632	84	Weighted Average
32,714		59.88% Pervious Area
21,918		40.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
5.0	0	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 12S: DA-2I

Runoff = 6.97 cfs @ 11.97 hrs, Volume= 0.348 af, Depth> 3.99"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.90"

Area (sf)	CN	Description
17,860	98	Paved parking, HSG C
27,616	74	>75% Grass cover, Good, HSG C
45,476	83	Weighted Average
27,616		60.73% Pervious Area
17,860		39.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
5.0	0	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 13S: New Roof

Runoff = 6.31 cfs @ 11.96 hrs, Volume= 0.363 af, Depth> 5.66"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.90"

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Type II 24-hr 100-Year Rainfall=5.90"

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Area (sf)	CN	Description
33,581	98	Roofs, HSG C
33,581		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
5.0	0	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 14S: DA-2H

Runoff = 5.04 cfs @ 12.05 hrs, Volume= 0.304 af, Depth> 3.28"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.90"

Area (sf)	CN	Description
4,450	98	Paved parking, HSG C
44,008	74	>75% Grass cover, Good, HSG C
48,458	76	Weighted Average
44,008		90.82% Pervious Area
4,450		9.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	100	0.0400	0.21		Sheet Flow, Grass: Short n= 0.150 P2= 2.70"
2.3	150	0.0250	1.11		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
2.5	350	0.0250	2.37		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
12.9	600	Total			

Summary for Reach 3R: New 24" HDPE

Inflow Area = 5.839 ac, 28.84% Impervious, Inflow Depth > 4.63" for 100-Year event
Inflow = 10.54 cfs @ 12.25 hrs, Volume= 2.255 af
Outflow = 10.52 cfs @ 12.26 hrs, Volume= 2.254 af, Atten= 0%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 13.21 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 5.82 fps, Avg. Travel Time= 0.5 min

Peak Storage= 136 cf @ 12.25 hrs
Average Depth at Peak Storage= 0.60'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 53.34 cfs

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Type II 24-hr 100-Year Rainfall=5.90"

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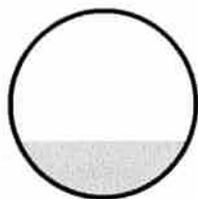
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24.0" Round Pipe

n= 0.013 Corrugated PE, smooth interior

Length= 170.0' Slope= 0.0556 '/'

Inlet Invert= 249.75', Outlet Invert= 240.30'

**Summary for Reach 5R: DP-2**

Inflow Area = 12.333 ac, 25.19% Impervious, Inflow Depth > 4.48" for 100-Year event
 Inflow = 46.27 cfs @ 11.98 hrs, Volume= 4.600 af
 Outflow = 46.27 cfs @ 11.98 hrs, Volume= 4.600 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond 2P: StormTech MC-3500

Inflow Area = 5.068 ac, 18.02% Impervious, Inflow Depth > 4.49" for 100-Year event
 Inflow = 27.88 cfs @ 12.00 hrs, Volume= 1.894 af
 Outflow = 9.78 cfs @ 12.26 hrs, Volume= 1.891 af, Atten= 65%, Lag= 15.8 min
 Primary = 9.78 cfs @ 12.26 hrs, Volume= 1.891 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
 Peak Elev= 257.06' @ 12.26 hrs Surf.Area= 0.242 ac Storage= 0.687 af

Plug-Flow detention time= 74.8 min calculated for 1.891 af (100% of inflow)
 Center-of-Mass det. time= 73.7 min (865.9 - 792.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	253.00'	0.246 af	102.75'W x 90.81'L x 5.00'H Field A 1.071 af Overall - 0.455 af Embedded = 0.616 af x 40.0% Voids
#2A	253.75'	0.455 af	StormTech MC-3500 x 180 Inside #1 Effective Size= 69.0"W x 45.0"H => 15.35 sf x 7.17'L = 110.1 cf Overall Size= 75.0"W x 45.0"H x 7.50'L with 0.33' Overlap
#3B	253.00'	0.019 af	8.25'W x 76.47'L x 5.00'H Field B 0.072 af Overall - 0.025 af Embedded = 0.047 af x 40.0% Voids
#4B	253.75'	0.025 af	StormTech MC-3500 x 10 Inside #3 Effective Size= 69.0"W x 45.0"H => 15.35 sf x 7.17'L = 110.1 cf Overall Size= 75.0"W x 45.0"H x 7.50'L with 0.33' Overlap
#5C	253.00'	0.017 af	8.25'W x 69.30'L x 5.00'H Field C 0.066 af Overall - 0.023 af Embedded = 0.043 af x 40.0% Voids
#6C	253.75'	0.023 af	StormTech MC-3500 x 9 Inside #5 Effective Size= 69.0"W x 45.0"H => 15.35 sf x 7.17'L = 110.1 cf Overall Size= 75.0"W x 45.0"H x 7.50'L with 0.33' Overlap
		0.785 af	Total Available Storage

201005 Proposed

Type II 24-hr 100-Year Rainfall=5.90"

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Storage Group A created with Chamber Wizard
 Storage Group B created with Chamber Wizard
 Storage Group C created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	251.26'	24.0" Round Culvert L= 212.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 251.26' / 249.78' S= 0.0070 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	255.50'	24.0" Round Culvert L= 2.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 255.50' / 255.48' S= 0.0100 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#3	Device 1	252.50'	8.0" Round Culvert L= 2.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 252.50' / 252.48' S= 0.0100 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=9.73 cfs @ 12.26 hrs HW=257.05' (Free Discharge)

↑ **1=Culvert** (Passes 9.73 cfs of 26.14 cfs potential flow)

↑ **2=Culvert** (Barrel Controls 7.01 cfs @ 3.70 fps)

↑ **3=Culvert** (Inlet Controls 2.73 cfs @ 7.81 fps)

Summary for Pond 4P: Lawn Depression

Inflow Area = 1.112 ac, 9.18% Impervious, Inflow Depth > 3.28" for 100-Year event
 Inflow = 5.04 cfs @ 12.05 hrs, Volume= 0.304 af
 Outflow = 5.04 cfs @ 12.05 hrs, Volume= 0.304 af, Atten= 0%, Lag= 0.0 min
 Primary = 5.04 cfs @ 12.05 hrs, Volume= 0.304 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 244.06' @ 12.05 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	242.75'	18.0" Round Culvert L= 80.0' Ke= 0.900 Inlet / Outlet Invert= 242.75' / 240.34' S= 0.0301 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=5.03 cfs @ 12.05 hrs HW=244.06' (Free Discharge)

↑ **1=Culvert** (Inlet Controls 5.03 cfs @ 3.07 fps)

Summary for Pond 5P: Lawn Depression

Inflow Area = 7.778 ac, 22.97% Impervious, Inflow Depth > 4.28" for 100-Year event
 Inflow = 16.08 cfs @ 12.03 hrs, Volume= 2.772 af
 Outflow = 16.08 cfs @ 12.03 hrs, Volume= 2.772 af, Atten= 0%, Lag= 0.0 min
 Primary = 16.08 cfs @ 12.03 hrs, Volume= 2.772 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

201005 Proposed

Type II 24-hr 100-Year Rainfall=5.90"

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Peak Elev= 243.15' @ 12.03 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	240.34'	24.0" Round Culvert L= 20.0' Ke= 0.900 Inlet / Outlet Invert= 240.34' / 240.15' S= 0.0095 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=16.00 cfs @ 12.03 hrs HW=243.13' (Free Discharge)

↳ **1=Culvert** (Inlet Controls 16.00 cfs @ 5.09 fps)

Water Quality Volume Calculation - 90% Rule

WQv = [(P)(Rv)(A)]/12 (Area tributary to existing 8' Downstream Defender)

Enter required values in yellow cells

Where:

$R_v = 0.05 + 0.009(I)$

I = impervious cover in percent

P = 90% rainfall (see Figure 4.1 in NYS Stormwater Management Design Manual)

A = site area in acres

% Impervious	57.5
Rv (Minimum 0.2)	0.5675
90% Rainfall	1.00
Site Area in Acres	5.10

WQv = **0.241** acre feet of storage = 10506 ft³

25% WQv = 0.060 ac-ft = 2627 ft³

75% WQv = 0.181 ac-ft = 7880 ft³

Job Name and # 201005 HVCC Science

Water Quality Volume Calculation - Redevelopment

Area to Device #1

Water Quality Volume - Storage Volume

(Area tributary to existing 8' Downstream Defender)

25% + (% IC Reduction + % WQv treated by Standard practices) x 3

+ (% WQv treated by Redevelopment Practices) = 100%

(Page 9-6, Chapter 9, NYS Stormwater Design Manual)

Enter required values in yellow cells

IC Reduction =	20 %
% WQv STD. =	0 %
% WQv ALT. =	15 %
Total (100%)	100 %

WQv = [(P)(Rv)(A)]/12

Where:

$R_v = 0.05 + 0.009(I)$

I = impervious cover in percent

P = 90% rainfall (see Figure 4.1 in NYS Stormwater Management Design Manual)

A = site impervious area only (in acres)

I (% Impervious)	57.5 %
Rv (Minimum 0.2)	0.5675
P (90% Rainfall)	1.00
A (Site Area)	5.10 acres

WQv	=	0.241 acre feet of storage	=	10506 ft ³
15% WQv	=	0.036 ac-ft	=	1576 ft ³
25% WQv	=	0.060 ac-ft	=	2627 ft ³
50% WQv	=	0.121 ac-ft	=	5253 ft ³
75% WQv	=	0.181 ac-ft	=	7880 ft ³

Water Quality Volume Calculation - Redevelopment

Water Quality Volume - Peak Discharge Rate (Area tributary to existing 8' Downstream Defender)

$$Q_p = (q_u)(A)(WQ_v)$$

Where:

q_u = unit peak discharge (cfs/sq mi/inch)

A = drainage area (sq mi)

$WQ_v = Q_d$ = water quality volume depth (watershed inches)

$$CN_a = 1000 / (10 + 5P + 10Q_d - 10(Q_d^2 + 1.25 Q_d P)^{0.5})$$

Where:

CN_a = adjusted curve number

P = 90% rainfall event (inches) =

Q_d = runoff volume depth (inches) = WQ_v (ac-ft) / A (ac)

= 0.036 / 5.10 * 12

Q_d = 0.09 inches

$CN_a = 80$

$t_c = 16.2 \text{ min} = 0.27 \text{ hr}$

$I_a = (200/CN_a) - 2$ (from Table 10.4 in Blue Book)

$I_a = 0.496$

$I_a/P = 0.496$

$q_u = 325$ From Exhibit 4-II in TR-55 (cfs/sq mi/inch)

$Q_p = 325 * 0.008 * 0.09$

$Q_p = 0.220 \text{ cfs}$

Channel Protection Volume Calculation**Step 1: Determine Qu**

P = 2.4 in. (1-yr. storm)

Area = 12.33 acres

CN = 80

Ia = 0.500

Ia/P = 0.21

Tc = 0.28 Hrs.

Using Figure 4-II, TR-55 and Tc, determine Qu (csm/in)

Qu = 650 csm/in

Step 2: Determine Qo/Qi

Using Figure B.1, DEC Manual Appendix B for T = 24 hrs. and Qu, determine Qo/Qi

Qo/Qi = 0.03

Step 3: Determine Vs/Vr $Vs/Vr = 0.682 - 1.43(Qo/Qi) + 1.64 (Qo/Qi)^2 - 0.804 (Qo/Qi)^3$

Vs/Vr = 0.641

Step 4: Determine Qd

Using Figure 2.1, TR-55 or SCS TR-16 and P, determine Qd (in of runoff)

Qd = 0.8 in

Step 5: Determine Cpv

Area = 12.33 acres

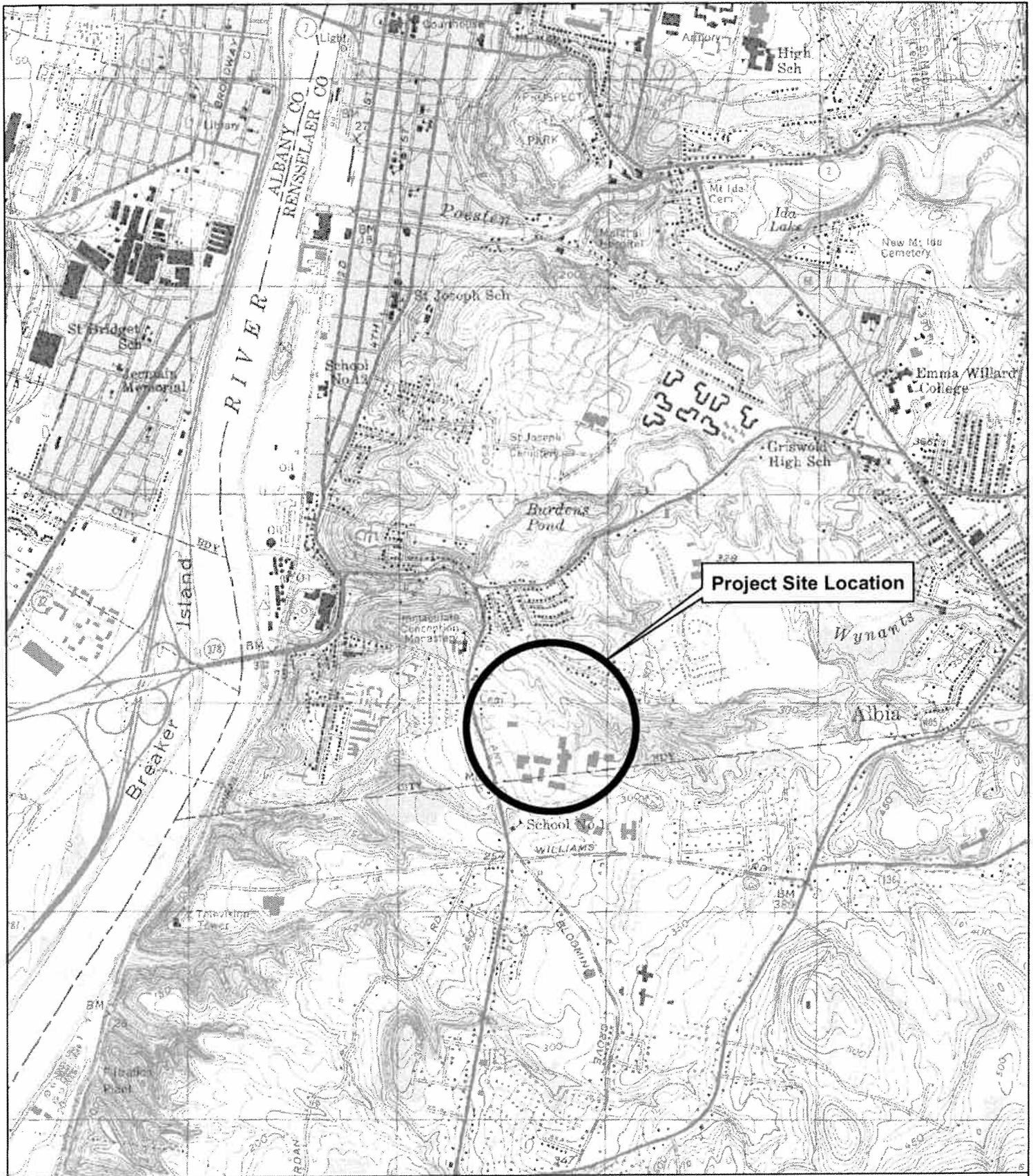
 $Cpv = Vs = (Vs/Vr) * Qd * A/12$

Cpv = 0.527 ac-ft

Cpv = 22936 ft³**Reference:** NYSDEC Stormwater Management Design Manual, August 2010

Appendix C

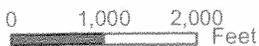
Map Set



Project Site Location



1:24,000



Hudson Valley Community College

City of Troy, Rensselaer County, New York

Title

USGS Site Location Map

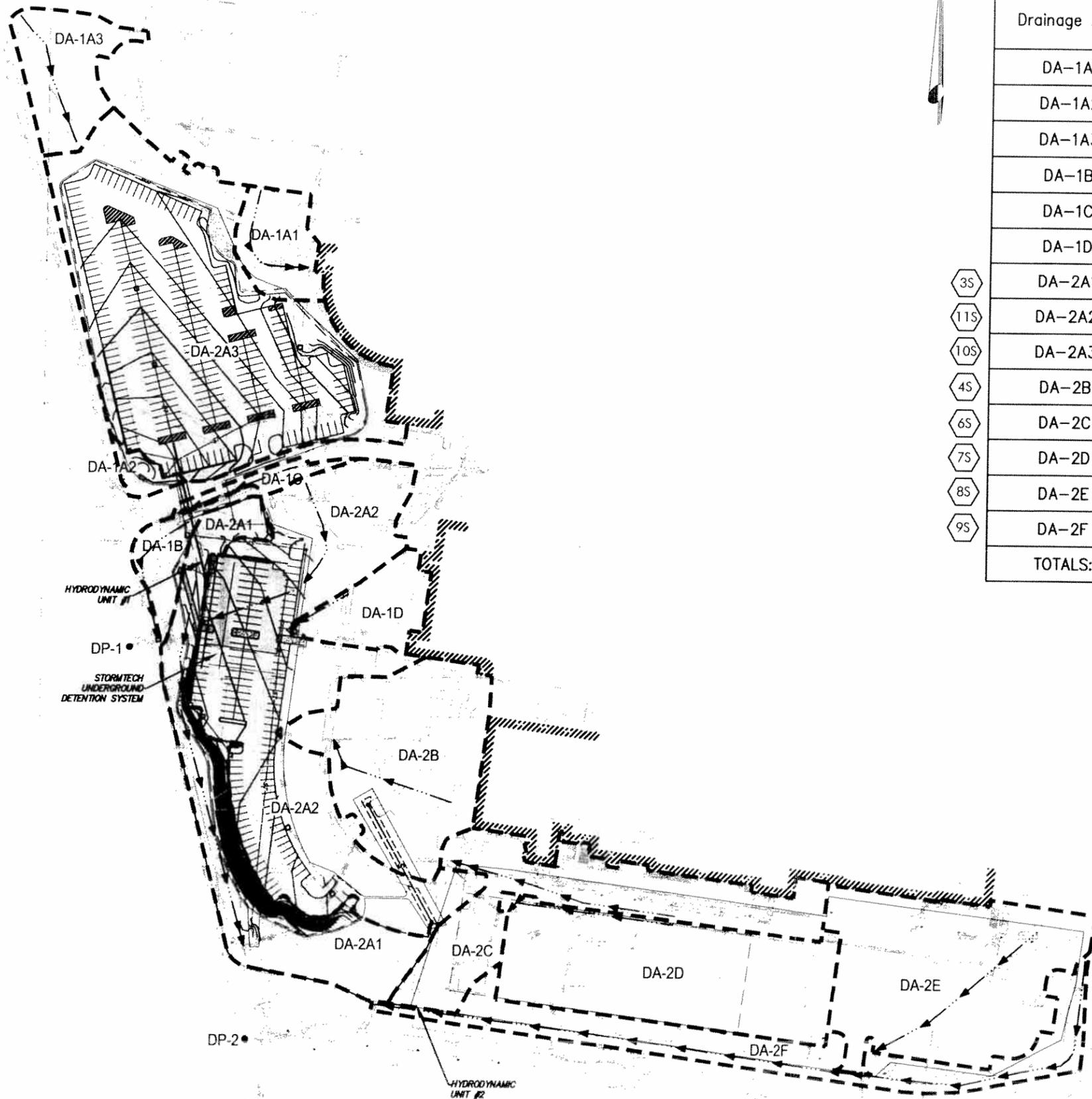
USGS 1:24,000 Quadrangle: Troy South



the LA group
Landscape Architecture
and Engineering, PC

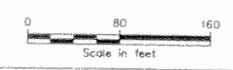
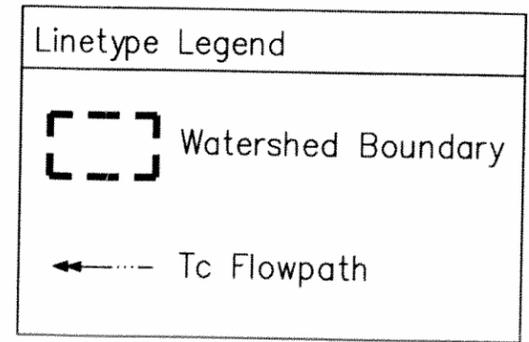
Project 201005

Date 2/23/2011

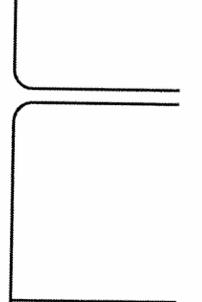
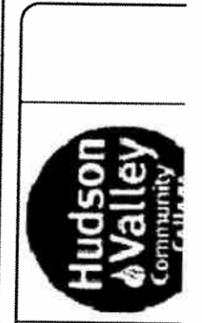


- 3S
- 11S
- 10S
- 4S
- 6S
- 7S
- 8S
- 9S

Drainage Areas			
Drainage Area	Area (acres)	Curve Number (CN)	Tc (hours)
DA-1A1	0.31	82	0.16
DA-1A2	0.07	74	0.09
DA-1A3	0.43	76	0.24
DA-1B	0.20	87	0.18
DA-1C	0.10	98	0.08
DA-1D	0.30	87	0.08
DA-2A1	1.13	75	0.29
DA-2A2	2.42	94	0.13
DA-2A3	2.77	91	0.27
DA-2B	1.17	88	0.20
DA-2C	1.00	85	0.28
DA-2D	1.32	98	0.08
DA-2E	1.40	92	0.08
DA-2F	0.90	83	0.08
TOTALS:	13.52	-	-



No.	Submitted / Revision	App'd By	Date



HUDSON VALLEY
COMMUNITY COLLEGE
PARKING LOT EXPANSION
Archive Watershed Map

Fig-4

Appendix D

SWPPP Inspection Form

**HVCC Science Building
WEEKLY SWPPP INSPECTION REPORT**

Inspector Name:	Date:
Signature (required):	Time:
Weather:	Inspection #:
Soil Conditions (dry, saturated, etc):	

Note: Digital photos, with date stamp required for all practices requiring corrective action, before and after, to be attached to the inspection report.

	YES	NO	N/A	
1.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Routine Inspection. Date of last inspection: _____
2.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Inspection following rain event. Date/time of storm ending: _____ Rainfall amount: _____ Recorded by: _____
3.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is this a final site inspection?
4.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Has site undergone final stabilization?
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If so, have all temporary erosion and sediment controls been removed?

Site Disturbance (Indicate Locations on Plan)

	YES	NO	N/A	
1.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Areas previously disturbed, but have not undergone active site work in the last 14 days?
2.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Areas disturbed within last 14 days?
3.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Areas expected to be disturbed in next 14 days?
4.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Do areas of steep slopes or complex stabilization issues exist? If "YES" explain:
5.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are there currently more than 5 acres of disturbed soil at the site? If so make sure there is an approval letter from NYS DEC.

Additional Comments: _____

Inspection of Erosion and Sediment Control Devices

	Type of Control Device	Accumulation (if any) in %	Repairs/Maintenance Needed
1.			
2.			
3.			
4.			
5.			
6.			

Stabilization/Runoff

	YES	NO	N/A	
1.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are all existing disturbed areas contained by control devices? Type of devices:
2.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are there areas that require stabilization within the next 14 days? Specify Area:
3.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Have stabilization measures been initiated in inactive areas?
4.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is there current snow cover or frozen ground conditions?
5.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Rills or gullies?
6.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Slumping/deposition?
7.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Loss of vegetation?
8.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Lack of germination?
9.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Loss of mulching?

Receiving Structures/Water Bodies (Indicate locations where runoff leaves the project site on the site plan)

YES NO N/A

1. Surface water swale or natural surface waterbody?
 If natural waterbody:
 Is waterbody located onsite, or adjacent to property boundary?
 Description of condition: _____
2. Municipal or community system?
 Inspect locations where runoff from project site enters the receiving waters and indicate if there is evidence of:
 - a. Rills or gullies?
 - b. Slumping/deposition?
 - c. Loss of vegetation?
 - d. Undermining of structures?
 - e. Was there a discharge into the receiving water on the day of inspection?
 - f. Is there evidence of turbidity, sedimentation, or oil in the receiving waters?

Additional Comments: _____

Inspection of Post-Construction Stormwater Management Control Devices

Type of Control Device	Phase of Construction	Repairs/Maintenance Needed
1.		
2.		
3.		
4.		

General Site Condition

YES NO N/A

1. Have action items from previous reports been addressed?
2. Does routine maintenance of protection components occur on a regular basis?
3. Does cleaning and/or sweeping affected roadways occur, at minimum, daily?
4. Is debris and litter removed on a monthly basis, or as necessary?
5. Is the site maintained in an orderly manner?

Contractors progress over last 7 days: _____

Anticipated work to be begun in the next 7 days: _____

Additional Comments: _____

Visual Observations

YES NO N/A

1. All erosion and sediment control measures have been installed/constructed?
2. All erosion and sediment control measures are being maintained properly?

SUMMARY OF ACTION ITEMS TO REPAIR/REPLACE/MAINTAIN/CORRECT DEFICIENCIES

Action Reported To (no signature required): _____

Company: _____

Appendix E

Other SWPPP Forms

The operator shall prepare a summary of construction status using the Construction Sequence Form below once every month. Significant deviations to the sequence and reasons for those deviations (i.e. weather, subcontractor availability, etc.), shall be noted by the contractor. The schedule shall be used to record the dates for initiation of construction, implementation of erosion control measures, stabilization, etc. A copy of this table will be maintained at the construction site and updated in addition to the individual Inspection Reports completed for each inspection.

Construction Sequence Form

Construction Activities (Identify name of planned practices)	Date Complete
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
11.	
12.	

**STORM WATER POLLUTION PREVENTION PLAN
PLAN CHANGES, AUTHORIZATION, AND CHANGE CERTIFICATION**

CHANGES REQUIRED TO THE POLLUTION PREVENTION PLAN:

REASONS FOR CHANGES:

REQUESTED BY: _____

DATE: _____

AUTHORIZED BY: _____

DATE: _____

CERTIFICATION OF CHANGES:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that false statements made herein are punishable as a Class A misdemeanor pursuant to Section 210.45 of the penal code.

SIGNATURE: _____

DATE: _____

SPILL RESPONSE REPORT

Within 1 hour of a spill discovery less than 2 gallons in volume the following must be notified:

Steve Cowan
518-629-7356

Within 1 hour of a spill discovery greater than 2 gallons the following must be notified:

Steve Cowan 518-629-7356
NYSDEC Spill Response Hotline 1-800-457-7362
Spill Response Contractor

Material Spilled: _____

Approximate Volume: _____

Location: _____

Distance to nearest down gradient drainage: _____

Distance to nearest down gradient open water: _____

Temporary control measures in place: _____

Appendix F

SPDES General Permit GP-0-10-0



NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SPDES GENERAL PERMIT
FOR STORMWATER DISCHARGES

from

CONSTRUCTION ACTIVITY

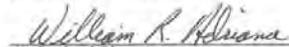
Permit No. GP-0-10-001

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


Authorized Signature

January 28, 2010
Date

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”.

(Part II. A)

3. 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).
4. 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.
5. 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;

(Part III. B. 1)

- 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;

(Part III. B. 1)

- 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)

- 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.
3. 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.

(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.

Environmental Conservation Law (ECL) - means chapter 43-B of the Consolidated Laws of the State of New York, entitled the Environmental Conservation Law.

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.

Note: 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.

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

<p>The following construction activities that involve soil disturbances of one (1) or more acres of land, but less than five (5) acres:</p> <ul style="list-style-type: none"> • Single family home <u>not</u> located in one of the watersheds listed in Appendix C and <u>not</u> directly discharging to one of the 303(d) segments listed in Appendix E • Single family residential subdivisions with 25% or less impervious cover at total site build-out and <u>not</u> located in one of the watersheds listed in Appendix C and <u>not</u> directly discharging to one of the 303(d) segments listed in Appendix E • Construction of a barn or other agricultural building, silo, stock yard or pen.
<p>The following construction activities that involve soil disturbances of one (1) or more acres of land:</p> <ul style="list-style-type: none"> • Installation of underground, linear utilities; such as gas lines, fiber-optic cable, cable TV, electric, telephone, sewer mains, and water mains • Environmental enhancement projects, stormwater retrofits and stream restoration projects • Bike paths and trails • Sidewalk construction projects that are not part of a road/ highway construction or reconstruction project • Slope stabilization projects • Slope flattening that changes the grade of the site, but does not significantly change the runoff characteristics • Spoil areas that will be covered with vegetation • Land clearing and grading for the purposes of creating vegetated open space (i.e. recreational parks, lawns, meadows, fields), excluding projects that <i>alter hydrology from pre to post development</i> conditions • Athletic fields (natural grass) that do not include the construction or reconstruction of <i>impervious area</i> <u>and</u> do not <i>alter hydrology from pre to post development</i> conditions • Demolition project where vegetation will be established and no redevelopment is planned • Overhead electric transmission line project that does not include the construction of permanent access roads or parking areas surfaced with <i>impervious cover</i> • 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 <i>impervious area</i>
<p>The following construction activities that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land:</p> <ul style="list-style-type: none"> • 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.

Table 2
CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A SWPPP
THAT INCLUDES POST-CONSTRUCTION STORMWATER MANAGEMENT PRACTICES

<p>The following construction activities that involve soil disturbances of one (1) or more acres of land:</p> <ul style="list-style-type: none"> • Single family home located in one of the watersheds listed in Appendix C or <i>directly discharging</i> to one of the 303(d) segments listed in Appendix E • Single family residential subdivisions located in one of the watersheds listed in Appendix C or <i>directly discharging</i> to one of the 303(d) segments listed in Appendix E • Single family residential subdivisions 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 • Single family residential subdivisions 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 • Multi-family residential developments; includes townhomes, condominiums, senior housing complexes, apartment complexes, and mobile home parks • Airports • Amusement parks • Campgrounds • Cemeteries that include the construction or reconstruction of impervious area (>5% of disturbed area) or <i>alter the hydrology from pre to post development</i> conditions • Commercial developments • Churches and other places of worship • 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 <i>impervious area</i>, excluding projects that involve soil disturbances of less than five acres. • Golf courses • Institutional, includes hospitals, prisons, schools and colleges • Industrial facilities, includes industrial parks • Landfills • Municipal facilities; includes highway garages, transfer stations, office buildings, POTW's and water treatment plants • Office complexes • Sports complexes • Racetracks, includes racetracks with earthen (dirt) surface • Road construction or reconstruction • Parking lot construction or reconstruction • Athletic fields (natural grass) that include the construction or reconstruction of impervious area (>5% of disturbed area) or <i>alter the hydrology from pre to post development</i> conditions • Athletic fields with artificial turf • Permanent access roads, parking areas, substations, compressor stations and well drilling pads, surfaced with <i>impervious cover</i>, 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 • All other construction activities that include the construction or reconstruction of <i>impervious area</i> <u>and</u> <i>alter the hydrology from pre to post development</i> conditions, <u>and</u> are not listed in Table 1
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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

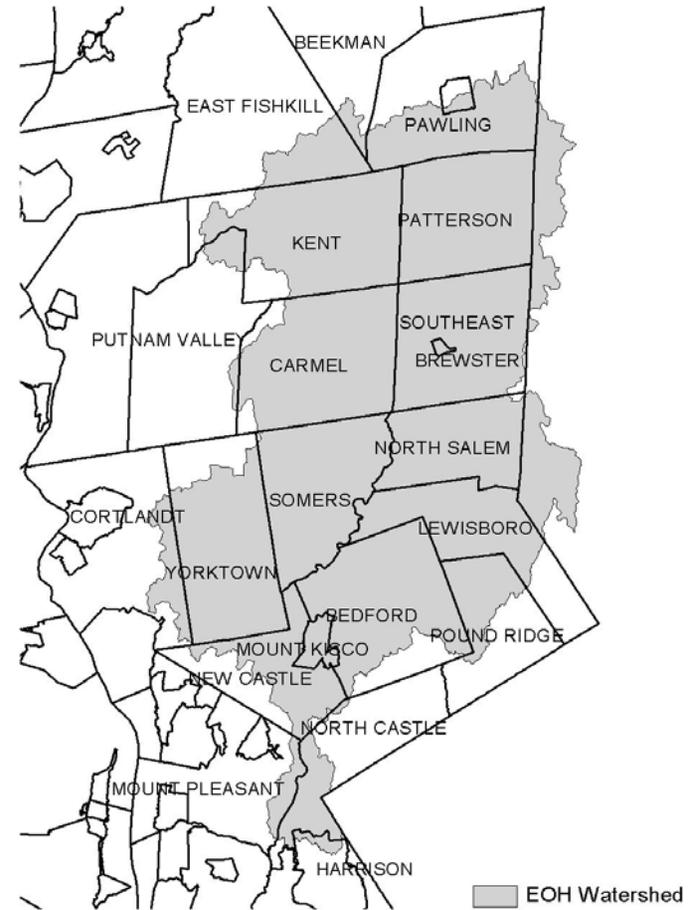


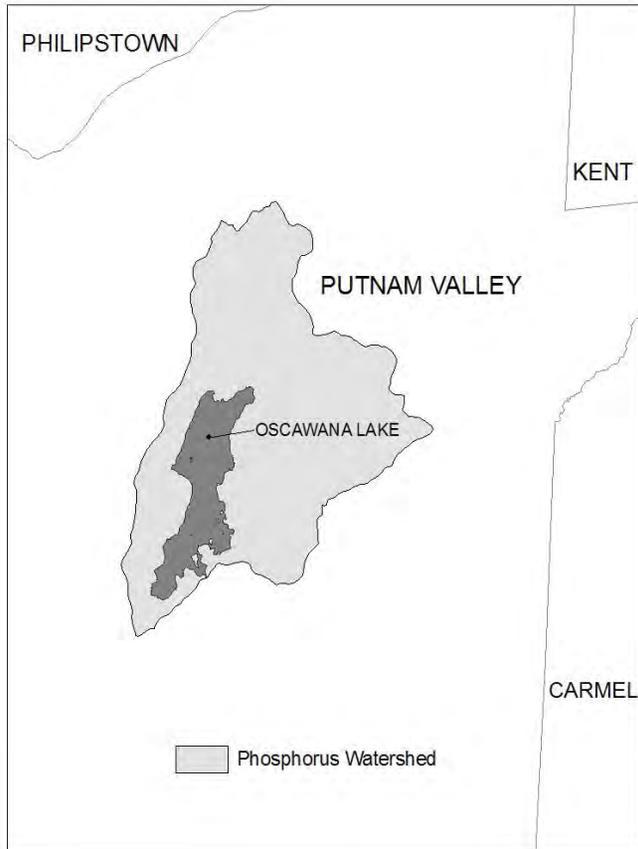
Figure 2 - Onondaga Lake Watershed



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”).

COUNTY	WATERBODY	COUNTY	WATERBODY
Albany	Ann Lee (Shakers) Pond, Stump Pond	Monroe	Genesee River, Lower, Main Stem
Albany	Basic Creek Reservoir	Monroe	Genesee River, Middle, Main Stem
Bronx	Van Cortlandt Lake	Monroe	Black Creek, Lower, and minor tribs
Broome	Whitney Point Lake/Reservoir	Monroe	Buck Pond
Broome	Beaver Lake	Monroe	Long Pond
Broome	White Birch Lake	Monroe	Cranberry Pond
Chautauqua	Chautauqua Lake, North	Monroe	Mill Creek and tribs
Chautauqua	Chautauqua Lake, South	Monroe	Shipbuilders Creek and tribs
Chautauqua	Bear Lake	Monroe	Minor tribs to Irondequoit Bay
Chautauqua	Chadakoin River and tribs	Monroe	Thomas Creek/White Brook and tribs
Chautauqua	Lower Cassadaga Lake	Nassau	Glen Cove Creek, Lower, and tribs
Chautauqua	Middle Cassadaga Lake	Nassau	LI Tribs (fresh) to East Bay
Chautauqua	Findley Lake	Nassau	East Meadow Brook, Upper, and tribs
Clinton	Great Chazy River, Lower, Main Stem	Nassau	Hempstead Bay
Columbia	Kinderhook Lake	Nassau	Hempstead Lake
Columbia	Robinson Pond	Nassau	Grant Park Pond
Dutchess	Hillside Lake	Nassau	Bergholtz Creek and tribs
Dutchess	Wappinger Lakes	Oneida	Ballou, Nail Creeks
Dutchess	Fall Kill and tribs	Onondaga	Ley Creek and tribs
Dutchess	Rudd Pond	Onondaga	Onondaga Creek, Lower and tribs
Erie	Rush Creek and tribs	Onondaga	Onondaga creek, Middle and tribs
Erie	Ellicott Creek, Lower, and tribs	Onondaga	Onondaga Creek, Upper, and minor tribs
Erie	Beeman Creek and tribs	Onondaga	Harbor Brook, Lower, and tribs
Erie	Murder Creek, Lower, and tribs	Onondaga	Ninemile Creek, Lower, and tribs
Erie	South Branch Smoke Cr, Lower, and tribs	Onondaga	Minor tribs to Onondaga Lake
Erie	Little Sister Creek, Lower, and tribs	Ontario	Honeoye Lake
Essex	Lake George (primary county listed as Warren)	Ontario	Hemlock Lake Outlet and minor tribs
Genesee	Black Creek, Upper, and minor tribs	Ontario	Great Brook and minor tribs
Genesee	Tonawanda Creek, Middle, Main Stem	Oswego	Lake Neatahwanta
Genesee	Tonawanda Creek, Upper, and minor tribs	Putnam	Oscawana Lake
Genesee	Little Tonawanda Creek, Lower, and tribs	Putnam	Lake Carmel
Genesee	Oak Orchard Creek, Upper, and tribs	Queens	Jamaica Bay, Eastern, and tribs (Queens)
Genesee	Bowen Brook and tribs	Queens	Bergen Basin
Genesee	Bigelow Creek and tribs	Queens	Shellbank Basin
Greene	Schoharie Reservoir	Rensselaer	Snyders Lake
Greene	Sleepy Hollow Lake	Richmond	Grasmere, Arbutus and Wolfes Lakes
Herkimer	Steele Creek tribs	Saratoga	Dwaas Kill and tribs
Kings	Hendrix Creek	Saratoga	Tribs to Lake Lonely
Lewis	Mill Creek/South Branch and tribs	Saratoga	Lake Lonely
Livingston	Conesus Lake	Saratoga	Schuyler Creek and tribs
Livingston	Jaycox Creek and tribs	Schenectady	Collins Lake
Livingston	Mill Creek and minor tribs		

APPENDIX E

List of 303(d) segments impaired by pollutants related to construction activity, cont’d.

COUNTY	WATERBODY	COUNTY	WATERBODY
Schoharie	Engleville Pond		
Schoharie	Summit Lake		
St. Lawrence	Black Lake Outlet/Black Lake		
Steuben	Lake Salubria		
Steuben	Smith Pond		
Suffolk	Millers Pond		
Suffolk	Mattituck (Marratooka) Pond		
Suffolk	Tidal tribs to West Moriches Bay		
Suffolk	Canaan Lake		
Suffolk	Lake Ronkonkoma		
Tompkins	Cayuga Lake, Southern End		
Tompkins	Owasco Inlet, Upper, and tribs		
Ulster	Ashokan Reservoir		
Ulster	Esopus Creek, Upper, and minor tribs		
Warren	Lake George		
Warren	Tribs to L.George, Village of L. George		
Warren	Huddle/Finkle Brooks and tribs		
Warren	Indian Brook and tribs		
Warren	Hague Brook and tribs		
Washington	Tribs to L.George, East Shore of Lake George		
Washington	Cossayuna Lake		
Wayne	Port Bay		
Wayne	Marbletown Creek and tribs		
Westchester	Peach Lake		
Westchester	Mamaroneck River, Lower		
Westchester	Mamaroneck River, Upper, and minor tribs		
Westchester	Sheldrake River and tribs		
Westchester	Blind Brook, Lower		
Westchester	Blind Brook, Upper, and tribs		
Westchester	Lake Lincolndale		
Westchester	Lake Meahaugh		
Wyoming	Java Lake		
Wyoming	Silver Lake		

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

Region	COVERING THE FOLLOWING COUNTIES:	DIVISION OF ENVIRONMENTAL PERMITS (DEP) PERMIT ADMINISTRATORS	DIVISION OF WATER (DOW) WATER (SPDES) PROGRAM
1	NASSAU AND SUFFOLK	50 CIRCLE ROAD STONY BROOK, NY 11790 TEL. (631) 444-0365	50 CIRCLE ROAD STONY BROOK, NY 11790-3409 TEL. (631) 444-0405
2	BRONX, KINGS, NEW YORK, QUEENS AND RICHMOND	1 HUNTERS POINT PLAZA, 47-40 21ST ST. LONG ISLAND CITY, NY 11101-5407 TEL. (718) 482-4997	1 HUNTERS POINT PLAZA, 47-40 21ST ST. LONG ISLAND CITY, NY 11101-5407 TEL. (718) 482-4933
3	DUTCHESS, ORANGE, PUTNAM, ROCKLAND, SULLIVAN, ULSTER AND WESTCHESTER	21 SOUTH PUTT CORNERS ROAD NEW PALTZ, NY 12561-1696 TEL. (845) 256-3059	100 HILLSIDE AVENUE, SUITE 1W WHITE PLAINS, NY 10603 TEL. (914) 428-2505
4	ALBANY, COLUMBIA, DELAWARE, GREENE, MONTGOMERY, OTSEGO, RENNELAER, SCHENECTADY AND SCHOHARIE	1150 NORTH WESTCOTT ROAD SCHENECTADY, NY 12306-2014 TEL. (518) 357-2069	1130 NORTH WESTCOTT ROAD SCHENECTADY, NY 12306-2014 TEL. (518) 357-2045
5	CLINTON, ESSEX, FRANKLIN, FULTON, HAMILTON, SARATOGA, WARREN AND WASHINGTON	1115 STATE ROUTE 86, PO BOX 296 RAY BROOK, NY 12977-0296 TEL. (518) 897-1234	232 GOLF COURSE ROAD, PO BOX 220 WARRENSBURG, NY 12885-0220 TEL. (518) 623-1200
6	HERKIMER, JEFFERSON, LEWIS, ONEIDA AND ST. LAWRENCE	STATE OFFICE BUILDING 317 WASHINGTON STREET WATERTOWN, NY 13601-3787 TEL. (315) 785-2245	STATE OFFICE BUILDING 207 GENESEE STREET UTICA, NY 13501-2885 TEL. (315) 793-2554
7	BROOME, CAYUGA, CHENANGO, CORTLAND, MADISON, ONONDAGA, OSWEGO, TIOGA AND TOMPKINS	615 ERIE BLVD. WEST SYRACUSE, NY 13204-2400 TEL. (315) 426-7438	615 ERIE BLVD. WEST SYRACUSE, NY 13204-2400 TEL. (315) 426-7500
8	CHEMUNG, GENESEE, LIVINGSTON, MONROE, ONTARIO, ORLEANS, SCHUYLER, SENECA, STEUBEN, WAYNE AND YATES	6274 EAST AVON-LIMA ROAD AVON, NY 14414-9519 TEL. (585) 226-2466	6274 EAST AVON-LIMA RD. AVON, NY 14414-9519 TEL. (585) 226-2466
9	ALLEGANY, CATTARAUGUS, CHAUTAQUA, ERIE, NIAGARA AND WYOMING	270 MICHIGAN AVENUE BUFFALO, NY 14203-2999 TEL. (716) 851-7165	270 MICHIGAN AVE. BUFFALO, NY 14203-2999 TEL. (716) 851-7070

Appendix G

Contech Maintenance Guidelines for Hydrodynamic Separator

CDS[®] Inspection and Maintenance Guide



Maintenance

The CDS 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. For example, unstable soils or heavy winter sanding will cause the grit chamber to fill more quickly but regular sweeping of paved surfaces will slow accumulation.

Inspection

Inspection is the key to effective maintenance and is easily performed. Pollutant transport and deposition may vary from year to year and regular inspections will help ensure that the system is cleaned out at the appropriate time. At a minimum, inspections should be performed twice per year (e.g. spring and fall) however more frequent inspections may be necessary in climates where winter sanding operations may lead to rapid accumulations, or in equipment washdown areas. Installations should also be inspected more frequently where excessive amounts of trash are expected.

The visual inspection should ascertain that the system components are in working order and that there are no blockages or obstructions in the inlet and separation screen. The inspection should also quantify the accumulation of hydrocarbons, trash, and sediment in the system. Measuring pollutant accumulation can be done with a calibrated dipstick, tape measure or other measuring instrument. If absorbent material is used for enhanced removal of hydrocarbons, the level of discoloration of the sorbent material should also be identified during inspection. It is useful and often required as part of an operating permit to keep a record of each inspection. A simple form for doing so is provided.

Access to the CDS unit is typically achieved through two manhole access covers. One opening allows for inspection and cleanout of the separation chamber (cylinder and screen) and isolated sump. The other allows for inspection and cleanout of sediment captured and retained outside the screen. For deep units, a single manhole access point would allow both sump cleanout and access outside the screen.

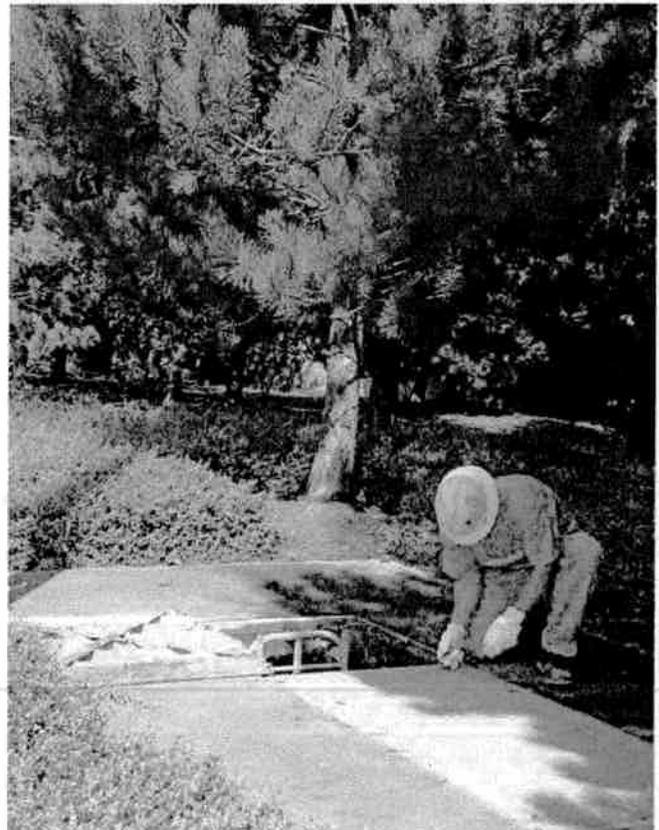
The CDS system should be cleaned when the level of sediment has reached 75% of capacity in the isolated sump or when an appreciable level of hydrocarbons and trash has accumulated. If absorbent material is used, it should be replaced when significant discoloration has occurred. Performance will not be impacted until 100% of the sump capacity is exceeded however it is recommended that the system be cleaned prior to that for easier removal of sediment. The level of sediment is easily determined by measuring from finished grade down to the top of the sediment pile. To avoid underestimating the level of sediment in the chamber, the measuring device must be lowered to the top of the sediment pile carefully. Particles at the top of the pile typically offer less resistance to the end of the rod than consolidated particles toward the bottom of the pile. Once this measurement is recorded, it should be compared to the as-built drawing for the unit to determine whether the height of the sediment pile off the bottom of the sump floor exceeds 75% of the total height of isolated sump.

Cleaning

Cleaning of a CDS system should be done during dry weather conditions when no flow is entering the system. The use of a vacuum truck is generally the most effective and convenient method of removing pollutants from the system. Simply remove the manhole covers and insert the vacuum hose into the sump. The system should be completely drained down and the sump fully evacuated of sediment. The area outside the screen should also be cleaned out if pollutant build-up exists in this area.

In installations where the risk of petroleum spills is small, liquid contaminants may not accumulate as quickly as sediment. However, the system should be cleaned out immediately in the event of 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 since they are usually less expensive to dispose than the oil/water emulsion that may be created by vacuuming the oily layer. Trash and debris can be netted out to separate it from the other pollutants. The screen should be power washed to ensure it is free of trash and debris.

Manhole covers should be securely seated following cleaning activities to prevent leakage of runoff into the system from above and also to ensure that proper safety precautions have been followed. Confined space entry procedures need to be followed if physical access is required. Disposal of all material removed from the CDS system should be done in accordance with local regulations. In many jurisdictions, disposal of the sediments may be handled in the same manner as the disposal of sediments removed from catch basins or deep sump manholes.



CDS Model	Diameter		Distance from Water Surface to Top of Sediment Pile		Sediment Storage Capacity	
	ft	m	ft	m	yd ³	m ³
CDS2015-4	4	1.2	3.0	0.9	0.5	0.4
CDS2015	5	1.5	3.0	0.9	1.3	1.0
CDS2020	5	1.5	3.5	1.1	1.3	1.0
CDS2025	5	1.5	4.0	1.2	1.3	1.0
CDS3020	6	1.8	4.0	1.2	2.1	1.6
CDS3030	6	1.8	4.6	1.4	2.1	1.6
CDS3035	6	1.8	5.0	1.5	2.1	1.6
CDS4030	8	2.4	4.6	1.4	5.6	4.3
CDS4040	8	2.4	5.7	1.7	5.6	4.3
CDS4045	8	2.4	6.2	1.9	5.6	4.3

Table 1: CDS Maintenance Indicators and Sediment Storage Capacities



Support

- Drawings and specifications are available at www.contechstormwater.com.
- Site-specific design support is available from our engineers.

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