STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

Prepared for:

Newburgh Chicken, LLC

Proposed Popeyes Restaurant
Parcel 60-3-6.1
197 South Plank Road
Town of Newburgh
Orange County, NY

Prepared by:

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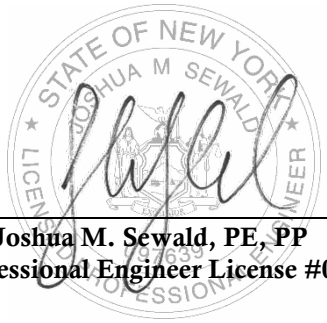

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APPENDIX

I. EXECUTIVE STATEMENT

This Stormwater Pollution Prevention Plan (SWPPP) has been prepared for the proposed Newburgh Chicken, LLC development located at 197 South Plank Road, in the Town of Newburgh in Orange County, New York. The objective of this document is to comply with the New York State Department of Environmental Conservation (NYSDEC) State Pollution Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activities, Permit No. GP-0-20-001 requirements.

Any material conflicts between this plan and the site plans, specifications, 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, and their applicable requirements.

The operator must maintain the following information on site in a secure location that is accessible during normal working hours to an individual performing the required compliance inspection:

- Notice of Intent (NOI)
- Compiled MS4 accepted SWPPP
- General Permit
- MS4 Acceptance Form
- All previous inspection reports

Technical standards are detailed in the "New York State Standards and Specifications for Sediment and Erosion and Sediment Control (November 2016)", as well as illustrated on the Erosion and Sediment Control Plan Map included in Appendix E. The design of post-construction stormwater control practices follows the guidance provided by "New York State Stormwater Management Design Manual", most recent revision.

The Contractor shall implement and maintain all temporary and permanent erosion control practices as identified in this SWPPP, the Construction Plans or as directed by the SWPPP inspector or municipality. The maximum soil exposure limit is 14 days without temporary or permanent surface treatment.

PROJECT OVERVIEW AND SUMMARY

The proposed lot has a total area of 42,212 SF (0.97 Ac) and currently consists of a one-story fast-food restaurant with drive thru, parking areas, shed, and driveways. The project site is bounded to the north by SH 52 as well as commercial and restaurant uses, to the south by commercial and retail uses, to the east by NYSH 300 commercial and retail uses, and to the west by commercial and industrial uses. The existing conditions of the tract have been verified by the ALTA/NSPS Land Title Survey, prepared by Gallas Surveying Group, dated October 7, 2022, last revised October 18, 2022.

The proposed project will include the construction of twenty-two (22) new parking spaces as well as other respective site improvements and stormwater management facilities. The site will be fully stabilized and restored upon completion. The land disturbance will be over one (1) acre and therefore required to comply with General Permit (GP-0-20- 001).

Per the General Permit, the project will be required to mitigate five unified stormwater sizing criteria:

1. Water Quality Volume (WQv) — 90% Percentile Rainfall Event
2. Runoff Reduction Volume (RRv) — Reduction of WQv utilizing runoff reduction techniques
3. Channel Protection Volume (CPv) — 1-Year Rainfall Event
4. Overbank Flood Volume (Qp) — 10-Year Rainfall Event
5. Extreme Storm Volume (Qf) — 100-Year Rainfall Event

The project utilized a NYSDEC SMP I-4 Underground Infiltration system designed and developed in conformance with the current New York State Stormwater Management Design Manual (NYS SWDM) to provide adequate mitigation measures to satisfy the requirements of each of the five unified stormwater sizing criteria outlined above.

The WQv storm event is 100% pre-treated via the utilization of one (1) Hydro International First Defense manufactured treatment device (MTD) which has been sized to treat the contributing discharge from the WQv storm event. The runoff is then routed through the underground infiltration system (36" perforated pipe) which has been sized to infiltrate the entire WQv before discharging excess stormwater through an outlet control structure. WQv and RRv are being satisfied by this infiltration technique. The outlet control structure has been designed to provide the required extended detention and outflow reduction as a result of the increase in impervious coverage for the 1, 10 and 100-year rainfall events. This satisfies the CPv, Qp and Qf unified stormwater sizing criteria outlined above.

WATER QUALITY (WQv) AND RUNOFF REDUCTION VOLUME (RRv)

Existing Impervious Coverage = 20,837 SF
Proposed Impervious Coverage = 25,649 SF
Total Site Area = 42,212 SF

WQv Required = 1,546 CF (refer to Section V for supporting calculations)
WQv Provided = 1,549 CF (Volume provided below lowest orifice of outlet structure) (refer to Appendix)

RRv Required	**= 294 CF** (refer to Section V for supporting calculations)
WQv Provided	= 1,549 CF (Volume provided below lowest orifice of outlet structure) (refer to Appendix)

A geotechnical investigation is in the process of being prepared and the results will be incorporated into the proposed stormwater management design once received. Conservative values were utilized in this preliminary design to demonstrate compliance with the Water Quality Volume and Runoff Reduction Volume requirements.

UNDERGROUND INFILTRATION BASIN DESIGN SUMMARY

3 Rows of 80 LF of 36" Ø Perforated HDPE Pipe (+ 6" stone base)

240 LF of 36" Ø Perforated HDPE Pipe Total

6" Stone Base	@ Elev. 357.25
Invert of Infiltration System	@ Elev. 358.00
Total Dead Storage Provided	1,549 CF (below elevation 359.35)
Total Storage Provided	3,387 CF

OUTLET CONTROL STRUCTURE

(1) 10" Ø Orifice	@ Elev. 359.35
(1) 6" Ø Orifice	@ Elev. 360.00
(1) 2' Weir	@ Elev. 361.50

Design infiltration rate utilizes 3.4 inches per hour (based on NRCS Hydraulic Conductivity Values for Orange County, NY)

The entire required WQv of 1,546 CF will be fully infiltrated through the bottom of the practice in approximately 7.5 hours which satisfies the 48-hour de-watering requirement.

PRE-TREATMENT DESIGN

The project has implemented one (1) Hydro International First Defense manufactured treatment device which has been designed to treat the discharge of the Water Quality storm and bypass higher design storms, including the 100-year storm event. The practice is being implemented as 100% pre-treatment that will capture the runoff from the new impervious surfaces. The Manufactured Treatment Device (MTD) is considered flow-through, and is sized based on flow rate as opposed to storage volume. Supporting information on the MTD (as well as in Section V) is as follows:

MTD – STORM STR. #5 - (4' Ø structure)

Contributing inflow area:	33,303 SF (0.765 AC.)
WQv inflow rate:	**1.46 CFS** (based on the 1 Year (CPv) Storm in the HydroCAD model - See Appendix)
Water quality treatment capacity:	**18 CFS** (based on manufacturer testing)

The pre-treatment device has been adequately sized to provide treatment for 100% of the WQv storm event.

INFILTRATION SYSTEM RESULTS:

STORM EVENT	ELEVATION (FEET)	STORAGE (CUBIC FEET)
WQv	359.34	1,546
1-YEAR (CPv)	359.94	2,117
10-YEAR (Qp)	360.32	2,465
100-YEAR (Qf)	361.33	3,145

PEAK FLOW ATTENUATION RESULTS:

Study Area S Plank Road			
Design Storm	**Existing Runnoff Rates (cfs)**	**Proposed Runoff Rates (cfs)**	**Difference (cfs)**
1-Year (CPv)	1.25	1.15	-0.10
10-Year (Qp)	2.48	2.41	-0.07
100-Year (Qf)	5.55	4.99	-0.56

II. INTRODUCTION

BACKGROUND

This SWPPP has been prepared in accordance with the guidelines and technical specifications required to obtain coverage under the New York State Department of Environmental Conservation (NYSDEC) SPDES General Permit for Stormwater Discharges from Construction Activity (GP-0-20-001 effective January 29, 2020).

In accordance with the permit requirements, an owner or operator of a construction activity that is eligible for coverage under the permit must obtain coverage prior to the commencement of construction activity. To obtain coverage under the permit, an owner or operator must first prepare a SWPPP in accordance with all applicable permit requirements. The owner or operator must then submit a completed Notice of Intent (NOI) to the NYSDEC at least five (5) business days prior to the start of construction activity. As defined within the permit, construction activity includes any clearing, grading, excavation, filling, demolition, or stockpiling activities that result in soil disturbance.

SWPPP REQUIREMENTS

The preparation and implementation of the SWPPP provides the framework for reducing soil erosion and minimizing pollutants in stormwater during construction of the project.

- Documents the selection, design, installation, implementation and maintenance of the control measures and practices that will be utilized to control erosion and the release of pollutants in storm water.
- Documents the selection, design, installation, and maintenance of the post-construction stormwater management practices that will be constructed to meet the pre-treatment, runoff reduction, water quality and peak discharge rate criteria of the permit.
- Describes the erosion and sediment control practices and post-construction stormwater management practices that will be used and/or constructed to reduce pollutants in stormwater discharges.
- Identifies potential sources of pollution which may reasonably be expected to affect the quality of stormwater discharges.
- Outlines the owner, operator and contractor's responsibility to maintain the erosion control measures and the post-construction stormwater management practices.

The proposed project implements the planning criteria as per Chapter 5: Green Infrastructure Practices of the New York State Stormwater Design Manual (NYS SMDM).

The subject site is currently developed as a one (1) story fast food restaurant with a stormwater conveyance system; and will be developed into a one story fast food restaurant with additional site features and stormwater management practices to offset the increase in impervious surfaces.

PROJECT CONTACTS

Owner/Operator:

Name: Newburgh Chicken, LLC

Address: 301 Route 17 North
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Rutherford, NJ 07070

Phone: (908) 531-8021

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Design Engineer:

Name: Joshua Sewald, P.E.
Dynamic Engineering Consultants, PC

Address: Dynamic Engineering Consultants, PC
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Lake Como, NJ 07719

Phone: (732) 974-0198

E-mail: jsewald@dynamicec.com

General Contractor:

Name: _____

Address: _____

_____

_____

Phone: _____

E-mail: _____

III. PROJECT DESCRIPTION

The project site is located at 197 South Plank Road, in the Town of Newburgh in Orange County, New York. The subject parcel is specifically identified as Parcel 60-3-6.1 on the Town of Newburgh Tax Maps.

EXISTING SITE CONDITIONS

The proposed lot has a total area of 42,212 SF (0.97 Ac) and currently consists of a one-story fast-food restaurant with drive-thru, parking area, shed, and driveways. The project site is bounded to the north by SH 52 as well as commercial and restaurant uses, to the south by commercial and retail uses, to the east by NYSH 300 and commercial and retail uses, and to the west by commercial and industrial uses. The existing conditions of the tract have been verified by the ALTA/NSPS Land Title Survey, prepared by Gallas Surveying Group, dated October 7, 2022, last revised October 18, 2022.

TOPOGRAPHY

The site generally slopes from a highpoint at the southwest corner of the property down to the intersection of South Plank Road (SH 52) and Union Avenue (NYSH 300) at the northeast corner of the site.

SOILS

Based upon USDA NRCS Soil Mapping, the soil type native to the study area includes:

SOIL TYPE (SYMBOL)	SOIL TYPE (NAME)	HYDROLOGIC SOIL GROUP
UH	Udorthents, smoothed	A

Dynamic Earth, LLC is in the process of conducting the necessary geotechnical investigation. Upon receipt, the results will be incorporated into the proposed stormwater design.

PROPOSED SITE CONDITIONS

The proposed development includes the construction of a one story fast food restaurant, with a drive-thru, as well as parking, lighting, landscaping, and other additional site improvements as shown on the accompanying Site Plans.

Project Summary

Description	Acres (SF)
Total Site Area	0.97 (42,212)
Existing Impervious Coverage Area	0.478 (20,837)
Proposed Impervious Coverage Area	0.589 (25,649)

The Proposed Project is depicted in detail on the Preliminary and Final Site Plan drawings, prepared by Dynamic Engineering Consultants, PC, dated 11/16/2023, last revised 1/17/2024.

IV. SOIL EROSION AND SEDIMENT CONTROLS

The Stormwater Pollution Prevention Plan (Sheet 13), within the Preliminary and Final Site Plan drawings, depicts the specific locations, sizes, and lengths of each erosion and sediment control practice, as detailed below. All contractors and sub-contractors will be required to understand the Stormwater Prevention Plan and sign the certification statement provided within the appendix of this report. The responsibility for the Stormwater Pollution Prevention Plan will be designated to the trained contractor. All erosion and sedimentation controls will be installed, monitored, repaired and replaced in accordance with the New York State Standards and Specifications for Erosion and Sediment Control.

Stabilized Construction Access

A stabilized construction access point will be utilized at the construction ingress/egress of the subject site. The construction access point will consist of a stabilized pad of aggregate underlain with geotextile located at any point where traffic will be entering or leaving the project site to or from a public right-of-way, street, alley, sidewalk, or parking area. The purpose of the stabilized construction access is to reduce or eliminate the tracking of sediment onto public right-of-ways or streets. The stabilized construction access points will be constructed in accordance with the New York State Standards and Specifications for Erosion and Sediment Control.

Temporary Stockpiles

Materials, such as topsoil, will be temporarily stockpiled as necessary on the project site during the construction process. Temporary stockpile areas will be located, as depicted on the Stormwater Pollution Prevention Plan, in an area away from storm drainage to the maximum extent practicable. The stockpile area will be surrounded with silt fencing to prevent sediment runoff from exiting this area. Soils will be stockpiled on, at minimum, double layers of 8-mil minimum sheeting, and will be kept covered when not in use with appropriately anchored plastic tarps. Broken or ripped tarps will be promptly replaced.

Silt Fence

Silt fencing will be installed, as depicted on the Stormwater Pollution Prevention Plan, and in accordance with the New York State Standards and Specifications for Erosion and Sediment Control. These barriers may extend into non-impact areas to provide adequate protection of adjacent lands. Silt fencing will serve to intercept sediment runoff from areas with disturbed soils, reduce the runoff velocity and initiate deposition of the transported sediment. Tall stakes will be used for the silt fencing to allow for visibility above potential snowpack.

Catch Basin Inlet Protection

Catch basins within and surrounding the project site with the potential to receive sediment runoff from the site will be protected by a filter fabric drop or manufactured insert inlet protection measure. The filter fabric barriers will be installed around inlets to detain water and thereby reducing the sediment content of sediment laden water by settling thus preventing heavily sedimented laden water from entering a storm drain system. The top of the barrier will be maintained to allow overflow to drop into the drop inlet and not bypass the inlet to unprotected lower areas. Support stakes for fabric will be installed in accordance with the New York State Standards and Specifications for Erosion and Sediment Control.

Dust Control

Dust control measures will be implemented throughout the project site. To the extent practical construction activities will be phased to minimize the amount of area disturbed at one time. For disturbed areas, not subject to traffic, vegetation will be utilized to stabilize the exposed surfaces. For disturbed areas subject to traffic dust control methods utilizing water or wind breakers will be used as necessary.

Winter Stabilization

Sediment and erosion controls will be modified as follows during winter months:

Snow Management

A snow management plan will be prepared allowing for adequate storage of mounded snow and control of the melt water, while not impacting ongoing construction activities. Stabilized construction access points will be widened as necessary to allow for snow management and stockpiling. Snow management activities (plowing) must not destroy or de-grade installed erosion and sediment control practices. A minimum 25-foot buffer will be maintained, to the extent practical, from all perimeter controls such as silt fencing. Drainage structures must be kept open and free of snow and ice dams. All debris, ice dams, or debris from plowing operations, that restrict the flow of runoff and meltwater, shall be removed.

Exposed Soil

Exposed soils will be protected by the use of established vegetation, anchored straw mulch, rolled stabilization matting, or other durable covering. In areas where soil disturbance activity has temporarily or permanently ceased, the application of soil stabilization measures as described above will be initiated. Disturbed areas remaining exposed for more than 14 days during construction operations will be stabilized temporarily. Straw or manufactured mulch will be applied at double the typical application rate when mulching alone is used for stabilization. Stone paths will be utilized when deemed necessary by the trained contractor or qualified inspector to stabilize access perimeters of buildings under construction and areas where construction vehicle traffic is anticipated.

SOIL EROSION AND SEDIMENT CONTROL INSPECTIONS

Inspections by Qualified Inspector

Inspections will be completed by a qualified inspector to fully document each inspection. Site inspection checklists and guidelines can be found in the appendix of this report.

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

- Start of construction;
- When soil disturbance activities are on-going, a qualified inspector will conduct a site inspection at least once every seven calendar days;
- When soil disturbance activities have been temporarily suspended and temporary stabilization measures have been applied to all disturbed areas, a qualified inspector will conduct a site inspection at least once every 30 calendar days. The applicant or operator will notify the NYSDEC Regional Office stormwater contact person in writing prior to reducing the frequency of inspections.

The qualified inspector will maintain a record of all inspection reports in a logbook, maintained onsite. Any changes to the proposed SWPPP will be documented. During each inspection, the following information will be recorded:

- Indicate on a site map all areas of the Project Site that have undergone temporary or permanent stabilization.
- Indicate all disturbed areas that have not undergone active work during the previous 14-day period. Inspect all sediment control practices and record the approximate degree of sediment accumulation as a percentage of the sediment storage volume.
- Inspect all erosion and sediment control practices and document all maintenance activities.
- Document any excessive deposition of sediment or ponding water along barrier or diversion systems.

At a minimum, the qualified inspector shall inspect:

- All erosion and sediment control practices and pollution prevention measures;
- All post-construction stormwater management practices under construction;
- 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.

Inspections by Trained Contractor

ESC inspections will be conducted daily by a trained contractor to determine when ESC measures need maintenance or repair. The trained contractor will inspect the erosion and sediment control practices and pollution prevention measures being implemented within the active work area daily. If deficiencies are identified, the trained contractor shall begin implementing corrective actions within one business day and will complete the corrective actions in a reasonable time frame.

If soil disturbance activities become temporarily suspended and temporary stabilization measures have been applied to all disturbed areas or if soil disturbance activities shut down with partial project completion, the daily inspections will also be suspended until soil disturbance activities resume.

Maintenance and inspection schedules for the contractor(s) have been provided in the appendix of this report.

Stabilized Construction Access Point

Periodic inspections and maintenance will be provided after each rainfall event and on an as needed basis at the discretion trained contractor and/or qualified inspector. The entrances will be maintained in a condition which will prevent tracking of sediment onto public rights-of-way.

Temporary Stockpiles

The stockpiles will be inspected to confirm the integrity of the surrounding silt fencing.

Silt Fence

Silt fencing will be monitored frequently for degradation and blockage. Maintenance will be performed as needed and material removed when bulges develop in the fencing.

Catch Basin Inlet Protection

The fabric barrier will be inspected after each rainfall event and removal of sediment and/or repairs will be performed as needed.

Dust Control

Dust control measures will be maintained through dry weather periods until all disturbed areas are stabilized.

Winter Stabilization

The site will be inspected frequently to ensure that the erosion and sediment control plan is functioning as intended.

Compliance inspections must be performed and reports filed properly in accordance with this SWPPP during a winter shutdown as described above.

Stormwater Pollution Prevention Plan

Temporary Soil Stabilization

Disturbed areas will be stabilized as soon as possible after construction is completed. Temporary seeding or mulching will be used on areas which will be exposed for more than 14 days and maintenance will be performed as necessary to ensure continued stabilization.

Permanent Soil Stabilization

Permanent stabilization will be performed as soon as possible after the completion of final grading and utility installation. Permanent seeding will be used on unpaved areas.

Inspections

Implementation of the Soil Stabilization Plan will be inspected at the same frequency at erosion and sediment controls. Site inspection checklists and guidelines can be found in appendix of this report.

Good Housekeeping and Pollution Prevention Measures

Vehicle and Construction Equipment Staging and Maintenance

Vehicle and construction equipment staging and maintenance areas will be located away from all drainage ways. Equipment cleaning, maintenance and repair will be conducted in designated areas with the perimeter of the area protected by silt fencing.

Construction Materials and Debris

The Project Site will be inspected at the end of each work day for building materials, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials that may be exposed to precipitation and stormwater. Materials identified as having the potential to discharge pollutants will be protected from precipitation and stormwater. Solid wastes will be disposed of in accordance with local, state and federal laws

Spill and Leak Prevention Plan

The spill prevention and control plan, detailed below, will be implemented by the trained contractor, as necessary, in accordance with the NYSDEC Spill Guidance Manual.

Spill Prevention

Refueling equipment shall be located at least 100 feet from all wetlands, streams and other surface waters.

All construction vehicles will be inspected daily for visible leaks of automotive fluid. If a leak is identified, immediate actions, as detailed in the spill prevention and control plan, will be taken to contain and clean up spilled fluids.

The trained contractor is responsible for maintaining all necessary Material Safety Data Sheets (MSDS) for all materials to be stored on-site. All state and federal regulations shall be followed for the storage, handling, application, usage, and disposal of pesticides, fertilizers, and petroleum products. All workers on-site will be required to be trained on safe handling and spill prevention procedures for all materials used during construction. Informational material regarding proper handling, spill response, spill kit location, and emergency actions to be taken, will be posted and available to all construction personnel.

Spill Reporting and Initial Notification Requirements

20- gallon spill kits for fast response for emergency oil, water-based and chemical liquid spills will be distributed around active construction areas. Spill kits, will include:

- 15" x 19" Pads
- 3" x 12' Sorbent Socks
- 18" x 18" Pillows
- Nitrile Gloves
- Emergency Handbook
- Goggles
- Disposal Bags

Under New York State law, all petroleum and most hazardous material spills must be reported to DEC Hotline (1-800-457-7362). If a spill is discovered and the responsible party cannot be located, the person who discovers the spill shall report the spill. Parties responsible for spills will be informed of their responsibilities by the trained contractor. In the event additional on-scene assistance is required, local authorities shall be contacted.

Petroleum spills must be reported to DEC unless they meet all of the following criteria:

- The spill is known to be less than 5 gallons;
- The spill is contained and under the control of the spiller;
- The spill has not and will not reach any State's water or land; and
- The spill is cleaned up within 2 hours of discovery.

For spills not deemed reportable, it is strongly recommended that the facts concerning the incident be documented by the spiller and a record maintained for one year.

Steps Following an Accidental Spill

- No party shall place themselves in a hazardous situation;
- Stay upwind and upgrade of the accident site;
- Do not walk in or near the spill, leak, or fire until this can be done safely;
- Treat any unknown substance as a hazardous material until the identity of the substance becomes known;
- Defer to the authority of the response agencies who have the responsibility and resources for taking actions at the emergency scene;

Sanitary facilities

Sanitary facilities will be provided for onsite personnel by the Contractor and must be utilized by all construction personnel.

Prohibited Discharges

The following discharges are prohibited:

- Wastewater from washout of concrete;
- Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;
- Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance;
- Soaps or solvents used in vehicle and equipment washing; and
- Toxic or hazardous substances from a spill or other release.

Inspections

Pollution prevention measure inspections within the active work area will be conducted by a qualified professional and trained contractor as described above. If deficiencies are identified, the qualified inspector shall begin implementing corrective actions within one business day and will complete the corrective actions in a reasonable timeframe.

V. STORMWATER MANAGEMENT CONTROLS

EXISTING DRAINAGE CONDITIONS

Pre-Construction Stormwater

The site has been evaluated using the TR-55 'Urban Hydrology for Small Watersheds' standards with the existing drainage sub-watershed area as depicted on the Existing Drainage Area Map which can also be found in the appendix of this report.

Study Area S Plank Road: This area encompasses then entire subject site, which is made up of an existing one-story structure, impervious, and open space areas. Under existing conditions, stormwater runoff

generated by this area flows via overland flow from the southwest corner to the northeast corner, ultimately tributary to the existing conveyance system within South Plank Road (SH 52).

PROPOSED DRAINAGE CONDITIONS

Post-Construction Stormwater

The proposed development includes the construction of a one story restaurant with associated parking and site improvements as shown on the accompanying Site Plans. One (1) underground infiltration facility has been designed to mitigate the increased stormwater runoff resulting from the additional impervious area. The infiltration facility has been designed to satisfy the channel protection, overbank flood, and extreme storm requirements set forth by the New York State Stormwater Design Manual. The site has been evaluated using the TR-55 'Urban Hydrology for Small Watersheds' standards and with the following proposed drainage sub-watershed areas as depicted on the Proposed Drainage Area Map which can also be found in the appendix of this report.

Study Area S Plank Road (Detained): This area includes the majority of the subject site, which consists of open space and impervious areas, including vehicular traveled impervious areas and roof runoff. Stormwater runoff generated from this area is collected by various on-site proposed inlets, which is then conveyed to the proposed underground infiltration facility. Stormwater is then infiltrated and released at a controlled rate through an outlet control structure which discharges to the existing stormwater conveyance system within South Plank Road (SH 52).

Study Area S Plank Road (Undetained): This area consists of on-site impervious and pervious areas that are not detained via the proposed inlet conveyance system. Stormwater runoff generated from this area is tributary to the existing stormwater conveyance system within South Plank Road (SH 52).

STORMWATER MANAGEMENT SYSTEM DESIGN

The stormwater management system has been designed to provide water quality and quantity controls as required by the NYSDEC SPDES General Permit for Stormwater Discharges from Construction. The design incorporates sizing for Water Quality Volume Control (WQv), Runoff Reduction Volume (RRv), Channel Protection Storage Volume (CPv), Overbank Flood Control (Qp) and Extreme Storm Flood Control (Qf). These five components of the water quality sizing criteria are further described as follows:

- The Water Quality Volume (WQv) is designed to improve water quality by capturing and treating 90% of the average annual stormwater runoff volume. The WQv is directly related to the amount of impervious cover on a project site. For this project the water quality volume will be treated by the use of storage and infiltration into the native soils.
- The Runoff Reduction Volume (RRv) is designed to control post-development water quality volumes to replicate pre-development hydrology by maintaining pre-construction infiltration, peak

runoff flow, and discharge volume, as well as minimizing concentrated flow. Runoff Reduction is promoted by use of infiltration, groundwater recharge, reuse and recycling by incorporating green infrastructure techniques and standard stormwater management practices with runoff reducing capacity. The projectis designed to allow for 100% recharge of the required runoff for WQv, which implicitly satisfies the Runoff Reduction criteria.

- The Channel Protection Storage Volume (Cpv) is designed to protect stream channels from erosion. The CPv is accomplished by providing 24 hour extended detention of the one-year, 24-hour storm event.
- The purpose of Overbank Flood Control (Qp) is to prevent an increase in the frequency and magnitude of out-of-bank flooding generated by urban development. Overbank Flood Control is accomplished by attenuating the post development 10-year, 24-hour peak discharge rate from the site to the pre-development rate.
- The purpose of Extreme Flood Control (Qf) is to prevent an increased risk of flood damage from large storm events, to maintain the boundaries of the pre-development 100-year floodplain, and to protect the physical integrity of stormwater management practices. Extreme Flood Control is accomplished by attenuating the post development 100-year, 24-hour peak discharge rate from the site to the pre- development rate.

The stormwater management system has been designed to provide water quality treatment, infiltration and storage and to provide zero net increase in peak discharges to the point of interest for design storms ranging from the 1-year to 100-year frequency.

WATER QUANTITY (PEAK FLOW ATTENUATION)

Water quantity control practices for the Channel Protection Volume (CPv), Overbank Flood Control (Qp) and Extreme Flood Control (Qf) mitigation has been provided and both pre- and post-construction models are detailed below:

STUDY AREA S PLANK ROAD (CFS)			
Design Storm	**Existing Runoff Rates (cfs)**	**Proposed Runoff Rates (cfs)**	**Difference (cfs)**
1-Year (CPv)	1.25	1.15	-0.10
10-Year (Qp)	2.48	2.41	-0.07
100-Year (Qf)	5.55	4.99	-0.56

Pre-development and post-development analyses share the same points of interest, so direct comparisons between the hydrologic models can be made.

WATER QUALITY

Post-construction stormwater quality was evaluated in accordance with the New York State Stormwater Management Design Manual (NYS SWDM). The WQv is intended to improve water quality by capturing and treating runoff from small, frequent storm events that tend to contain higher pollutant levels. The Water Quality Volume (WQv) was determined and incorporated into the project's overall design. See below.

The required WQv for the project is 1,546 CF calculated as follows:

Total Site Area = 42,212 SF
Existing Impervious Surfaces = 20,837 SF
New Impervious Surfaces = 25,649 SF
Increase in Impervious: = 4,812 SF

100% WQv Treatment Required for 25% of Existing Disturbed Impervious Area (9.2.1.A.II)

Compute 25% of Existing Impervious Cover
Existing Impervious Cover (I) = (20,837 * (.25)) / 42,212 = 12.3%

Compute Runoff Coefficient
Rv = 0.05 + (I) (0.009) = 0.05 + (12.3) (0.009) = 0.161

Compute Water Quality Volume (WQv)
From Figure 4.1 of Stormwater Management Design Manual, 90% Rainfall = 1.4"
WQv = [(P)(Rv)(A)] / 12 = [(1.4") (0.161) (42,212)] / 12 = **794 CF**

100% WQv Treatment Required for 100% of Increased Impervious Cover (9.2.1.A.II)

Compute Increase in Impervious Cover
Existing Impervious Surfaces = 20,837 SF
New Impervious Surfaces = 25,649 SF
Increase in Impervious: **= 4,812 SF**
Proposed Impervious Cover (I) = 4,812 / 42,212 = 11.4%

Compute Runoff Coefficient
Rv = 0.05 + (I) (0.009) = 0.05 + (11.4) (0.009) = 0.153

Compute Water Quality Volume (WQv)
From Figure 4.1 of Stormwater Management Design Manual, 90% Rainfall = 1.4"
WQv = [(P)(Rv)(A)] / 12 = [(1.4") (0.153) (42,212)] / 12 = **752 CF**

Combined WQv for 25% of Existing Disturbed Imperious Area and 100% of Increased Impervious Cover = 1,546 CFS

Based on the output from the HydroCAD model of the proposed stormwater management system, the volume provided below the outlet (elevation 359.35) is 1,549 CF.

Please refer to the summary below:

Water Quality Volume (WQv) Summary

Required Water Quality Volume	1,546 CF
Proposed Water Quality Treatment Volume	1,549 CF

The provided Water Quality Treatment Volume is greater than the Required Water Quality Volume satisfying the Water Quality requirement.

PRE-TREATMENT

The project has implemented one (1) Hydro International First Defense manufactured treatment device which has been designed to treat the discharge of the Water Quality storm (1.5") and bypass higher design storms, including the 100-year storm event. The practice is being implemented as 100% pre-treatment that will capture the runoff from the new impervious surfaces. The Manufactured Treatment Device (MTD) is considered flow-through, and is sized based on flow rate as opposed to storage volume. Supporting information on the MTD (as well as in Section V) is as follows:

MTD – STORM STR. #5 - (4' Ø structure)

Contributing inflow area:	33,303 SF (0.765 AC.)
WQv inflow rate:	**1.46 CFS** (based on the 1 Year (CPv) Storm in the HydroCAD model - See Appendix)
Water quality treatment capacity:	**18 CFS** (based on manufacturer testing)

The pre-treatment device has been adequately sized to provide treatment for 100% of the contributing, respective, WQv storm event.

RUNOFF REDUCTION VOLUME

Runoff Reduction Volume (RRv) is a reduction of the total Water Quality Volume (WQv) by application of green infrastructure techniques and Standard Stormwater Management Practices (SMPs) to replicate pre-development hydrology. It is intended to improve the mitigation of the negative effects of stormwater runoff from development by incorporating the design and layout of stormwater management features into the site planning process.

The RRv requirement can be accomplished by application of on-site green infrastructure techniques, standard stormwater management practices with runoff reduction capacity, and good operation and maintenance. The process is an iterative five-step approach that combines site planning with the use of green infrastructure techniques and standard stormwater management practices until the RRv requirement is met.

The five-step process is as follows:

1. Site planning to preserve natural features and reduce impervious cover;
2. Calculation of the water quality volume for the site;
3. Incorporation of green infrastructure techniques and standard SMPs with RRv capacity;
4. Use of standard SMPs, where applicable; and
5. Design of volume and peak rate control practices where required.

If by using these techniques the calculated RRv is greater than the required WQv, the RRv requirement is met.

The runoff reduction technique selected for this project is infiltration. Infiltration was determined to be suitable for the proposed project in consideration of factors including site topography, slopes, soil properties, project layout, and maintenance requirements.

As indicated in the water quality drainage calculations on the previous page, the proposed infiltration basin provides a total dead storage area of 1,549 CF below the low flow orifice. This volume exceeds the required water quality volume (WQv) of 1,546 CF. Therefore, the required runoff reduction volume goals are met on this project.

Soil Data

Soil Group	Area (SF)	HSG Specific Reduction Factor (S)
A	42,212	55%
B	0	40%
C	0	30%
D	0	20%
TOTAL	**42,212**	**55%**

Runoff Reduction Volume (RRv) Summary

Required Runoff Reduction Volume (RRv)	294 CF
Provided Water Quality Treatment Volume	1,549 CF

* Required RRv = (P) * (Rv) * (Aic) * (S) / 12 = (1.4") * (0.95) * (4,812 SF) * (0.55) / 12 = 294 CF

COLD CLIMATE CONSIDERATIONS

Impacts to infiltration area will be evaluated during required post construction annual inspections. Any deficiencies should be addressed pursuant to that inspection report.

OPERATIONS AND MAINTENANCE

The responsibility for implementation of long-term operation and maintenance of a post-construction stormwater management practice is the responsibility of the private property owner. This responsibility will be ensured by the execution of a Stormwater Maintenance Agreement between the owner of the project and the Town of Newburgh. The Stormwater Maintenance Agreement will be referenced in notes on the site plan and it will be filed in the Office of the Orange County Clerk which will make it a legally binding maintenance agreement.

The property owner shall maintain, clean, repair, and/or replace the stormwater management system components as necessary to ensure their optimum performance as designed. The stormwater system maintenance responsibilities shall apply to all stormwater system components on the property, including but not necessarily limited to, the following: catch basins, manholes, piping, outlet structures, pre-treatment and infiltration practices. The system will be maintained in accordance with the procedures and guidelines contained in the latest edition of the New York State Stormwater Management Design Manual. Refer to Section IV for maintenance requirements during construction and Section VI for post construction maintenance requirements. Inspection form documentation and the maintenance agree are included in the Appendix of this SWPPP.

VI. POST CONSTRUCTION CONTROLS

The permanent stormwater management and collection systems shall be maintained in perpetuity for full function and operation. The long-term maintenance of the on-site stormwater management systems is the self- responsibility of the property owner, and a legally binding maintenance agreement will be filed in the Office of the Orange County Clerk. This mechanism will protect the practices from neglect, adverse alteration and/or unauthorized removal. The Operation and Maintenance (O&M) plan for the post-construction stormwater management practices shall include the following:

1. The owner(s) of the stormwater management systems shall erect or post, in the immediate vicinity of the facility, a conspicuous and legible sign of not less than 18 inches by 24 inches bearing the following information:

   STORMWATER MANAGEMENT PRACTICE
   (INFILTRATION SYSTEM)
   Project Identification - ***(SPDES Construction Permit #)***
   This facility must be maintained in accordance with O&M Plan
   DO NOT REMOVE OR ALTER

2. The owners of the property shall be responsible for the implementation of long-term operation and maintenance of the post-construction stormwater management practices. As of the date of the preparation of this SWPPP, the owner is identified as:

   Newburgh Chicken, LLC
   301 Route 17 North
   Suite 802
   Rutherford, NJ 07070

3. The long-term operation and maintenance of the stormwater management practices shall be ensured by a legally binding maintenance agreement that is to be filed in the Office of the Orange County Clerk. The maintenance agreement shall include provisions for any necessary easements.

4. A Stormwater Pollution Prevention Plan is part of the Site Plan Set prepared by Dynamic Engineering Consultants, PC. The Site Plan Set is considered a part of this SWPPP, and includes schematics, measurements and specifications for the stormwater management practices on the site.

5. Underground Infiltration Basin maintenance measures shall include the following:
   - Condition of inlet pipes to be inspected annually. Clogs or damaged components must be remedied to ensure proper function.
   - All structural components must be inspected annually for cracking, subsidence, spalling, erosion and deterioration. Damaged components must be replaced.
   - Inspect all drainage structures annually for accumulation of debris and sediment.
   - Remove accumulated trash and debris from inside the outlet control structure.
   - Disposal of debris, trash and other waste material must be done at suitable disposal and recycling sites, and in compliance with all applicable local, state and federal regulations.
   - If evidence persists that the infiltration basin is not functioning properly, the owner shall make necessary repairs as soon as reasonably possible to restore proper function of the system.

6. Catch basin maintenance measures shall include the following:
   - Catch basins shall be visually inspected annually at the start of spring (or prior to significant snow melt or rain conditions).
   - The inspection should include documentation of debris build up in each structure, as well as noting any structural defects that have surfaced, including defects to castings, frames, covers, grates and concrete cracking or spalling.
   - Catch basins shall be cleaned of all debris at a frequency of no less than one fiscal year or in the event that sediment buildup exceeds six inches.
   - Trash and debris shall be removed regardless of buildup depth.
   - Debris or sediment removal shall be done as soon as reasonably possible to avoid impacts to receiving system, and no later than one month after the inspection report.
   - Disposal of debris, trash and other waste material must be done at suitable disposal and recycling sites, and in compliance with all applicable local, state and federal regulations.
   - Cosmetic deficiencies shall be corrected based on the severity of the deficiency. Any deficiency that notes structural imperfections that may cause potential failure shall be corrected immediately and without delay.

7. Hydro International First Defense maintenance measures shall include the following:
   - The First Defense unit shall be inspected 6-12 months after installation to monitor sediment levels and floatable accumulation and a maintenance interval should be determined by the end user based on that inspection.
   - The First Defense unit shall be cleaned out every 18 months depending on the accumulation.
   - Cleanout and maintenance can be performed from the surface.
   - Floatables can be removed from the upstream side of the internals manually or with a vac hose,

and a vac hose can be used to remove the standing water and sediment at the bottom of the sump, accessed through the center shaft.

POST CONSTRUCTION CONTROLS REPORTING

The maintenance and inspection records for each fiscal year shall be dutifully retained by the owner as well as submitted to the Town of Newburgh, which is the acting enforcement agent for the MS4 program.

The report shall be entitled:

"Newburgh Chicken, LLC Town of Newburgh, Orange County, New York Annual Maintenance and Inspection Report"

The report cover shall also include the following information:

i. Name of company who prepared or assisted in compiling information and inspections
ii. Date
iii. Name, address and phone number of current owner(s)

The required inspections and reports are to be performed by a New York State licensed Professional Engineer. The reports shall include photographs of each structure and additional photos of any corrective work that is undergone for that fiscal year. If corrective work is conducted, work logs and inventory of materials shall be documented and included within the report.

VII. CONCLUSION

The proposed development has been designed with provisions for the safe and efficient control of stormwater runoff in a manner that will not adversely impact the existing drainage patterns, adjacent roadways, or adjacent parcels.

The stormwater management design reduces peak flow rates for the proposed development area for the 1, 10 and 100-year storm events. The pre-treatment, water quality, runoff reduction and channel protective requirements set forth in the New York State Stormwater Management Design Manual have been satisfied through the implementation of the pre-treatment flow through device and an underground infiltration basin that will infiltrate the entire water quality volume.

Therefore, the project has satisfied all applicable requirements set forth by the New York State Stormwater Design Manual.

APPENDIX

GENERAL PERMIT (GP-0-20-001)

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SPDES GENERAL PERMIT
FOR STORMWATER DISCHARGES

From

CONSTRUCTION ACTIVITY

Permit No. GP- 0-20-001

Issued Pursuant to Article 17, Titles 7, 8 and Article 70

of the Environmental Conservation Law

Effective Date: January 29, 2020 Expiration Date: January 28, 2025

John J. Ferguson

Chief Permit Administrator

1-23-20

Authorized Signature Date

Address: NYS DEC
Division of 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 administers the approved State Pollutant Discharge Elimination System (SPDES) program with permits issued in accordance with the New York State Environmental Conservation Law (ECL) Article 17, Titles 7, 8 and Article 70.

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 ECL section 17-0505 and 17-0701, the *owner or operator* must have coverage under a SPDES permit prior to *commencing construction activity*. The *owner or operator* 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

Table of Contents

Part 1. 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 (5,000) square feet and one (1) acre of land.

B. Effluent Limitations Applicable to Discharges from Construction Activities

*Discharge*s authorized by this permit must achieve, at a minimum, the effluent limitations in Part I.B.1. (a) – (f) of this permit. These limitations represent the degree of effluent reduction attainable by the application of best practicable technology currently available.

1. Erosion and Sediment Control Requirements - The *owner or operator* must select, design, install, implement and maintain control measures to *minimize* the *discharge* of *pollutants* and prevent a violation of the *water quality standards*. The selection, design, installation, implementation, and maintenance of these control measures must meet the non-numeric effluent limitations in Part I.B.1.(a) – (f) of this permit and be in accordance with the New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016, using sound engineering judgment. Where control measures are not designed in conformance with the design criteria included in the technical standard, the *owner or operator* must include in the *Stormwater Pollution Prevention Plan* ("SWPPP") the reason(s) for the

deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

a. **Erosion and Sediment Controls.** Design, install and maintain effective erosion and sediment controls to *minimize* the *discharge* of *pollutants* and prevent a violation of the *water quality standards*. At a minimum, such controls must be designed, installed and maintained to:

   (i) *Minimize* soil erosion through application of runoff control and soil stabilization control measure to *minimize pollutant discharge*s;

   (ii) Control stormwater *discharge*s, including both peak flowrates and total stormwater volume, to *minimize* channel and *streambank* erosion and scour in the immediate vicinity of the *discharge* points;

   (iii) *Minimize* the amount of soil exposed during *construction activity*;

   (iv) *Minimize* the disturbance of *steep slopes*;

   (v) *Minimize* sediment *discharge*s from the site;

   (vi) Provide and maintain *natural buffer*s around surface waters, direct stormwater to vegetated areas and maximize stormwater infiltration to reduce *pollutant discharge*s, unless *infeasible*;

   (vii) *Minimize* soil compaction. Minimizing soil compaction is not required where the intended function of a specific area of the site dictates that it be compacted;

   (viii) Unless *infeasible*, preserve a sufficient amount of topsoil to complete soil restoration and establish a uniform, dense vegetative cover; and

   (ix) *Minimize* dust. On areas of exposed soil, *minimize* dust through the appropriate application of water or other dust suppression techniques to control the generation of pollutants that could be discharged from the site.

b. **Soil Stabilization**. In areas where soil disturbance activity has temporarily or permanently ceased, the application of soil stabilization measures must be initiated by the end of the next business day and completed within fourteen (14) days from the date the current soil disturbance activity ceased. For construction sites that *directly discharge* to one of the 303(d) segments

listed in Appendix E or is located in one of the watersheds listed in Appendix C, the application of soil stabilization measures must be initiated by the end of the next business day and completed within seven (7) days from the date the current soil disturbance activity ceased. See Appendix A for definition of *Temporarily Ceased*.

c. **Dewatering.** *Discharge*s from *dewatering* activities, including *discharge*s from *dewatering* of trenches and excavations, must be managed by appropriate control measures.

d. **Pollution Prevention Measures.** Design, install, implement, and maintain effective pollution prevention measures to *minimize* the *discharge* of *pollutants* and prevent a violation of the *water quality standards*. At a minimum, such measures must be designed, installed, implemented and maintained to:

(i) *Minimize* the *discharge* of *pollutants* from equipment and vehicle washing, wheel wash water, and other wash waters. This applies to washing operations that use clean water only. Soaps, detergents and solvents cannot be used;

(ii) *Minimize* the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste, hazardous and toxic waste, and other materials present on the site to precipitation and to stormwater. Minimization of exposure is not required in cases where the exposure to precipitation and to stormwater will not result in a *discharge* of *pollutants*, or where exposure of a specific material or product poses little risk of stormwater contamination (such as final products and materials intended for outdoor use) ; and

(iii) Prevent the *discharge* of *pollutants* from spills and leaks and implement chemical spill and leak prevention and response procedures.

e. **Prohibited *Discharge*s.** The following *discharge*s are prohibited:

(i) Wastewater from washout of concrete;

(ii) Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;

(iii) Fuels, oils, or other *pollutants* used in vehicle and equipment operation and maintenance;

(iv) Soaps or solvents used in vehicle and equipment washing; and

(v) Toxic or hazardous substances from a spill or other release.

f. Surface Outlets. When discharging from basins and impoundments, the outlets shall be designed, constructed and maintained in such a manner that sediment does not leave the basin or impoundment and that erosion at or below the outlet does not occur.

C. Post-construction Stormwater Management Practice Requirements

1. The *owner or operator* of a *construction activity* that requires post-construction stormwater management practices pursuant to Part III.C. of this permit must select, design, install, and maintain the practices to meet the *performance criteria* in the New York State Stormwater Management Design Manual ("Design Manual"), dated January 2015, using sound engineering judgment. Where post-construction stormwater management practices ("SMPs") are not designed in conformance with the *performance criteria* in the Design Manual, the *owner or operator* must include in the SWPPP the reason(s) for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

2. The *owner or operator* of a *construction activity* that requires post-construction stormwater management practices pursuant to Part III.C. of this permit must design the practices to meet the applicable *sizing criteria* in Part I.C.2.a., b., c. or d. of this permit.

a. Sizing Criteria for New Development

(i) Runoff Reduction Volume ("RRv"): Reduce the total Water Quality Volume ("WQv") by application of RR techniques and standard SMPs with RRv capacity. The total WQv shall be calculated in accordance with the criteria in Section 4.2 of the Design Manual.

(ii) Minimum RRv and Treatment of Remaining Total WQv: Construction activities that cannot meet the criteria in Part I.C.2.a.(i) of this permit due to site limitations shall direct runoff from all newly constructed impervious areas to a RR technique or standard SMP with RRv capacity unless infeasible. The specific site limitations that prevent the reduction of 100% of the WQv shall be documented in the SWPPP.

For each impervious area that is not directed to a RR technique or standard SMP with RRv capacity, the SWPPP must include documentation which demonstrates that all options were considered and for each option explains why it is considered infeasible.

In no case shall the runoff reduction achieved from the newly constructed impervious areas be less than the Minimum RRv as calculated using the criteria in Section 4.3 of the Design Manual. The remaining portion of the total WQv that cannot be reduced shall be treated by application of standard SMPs.

(iii) Channel Protection Volume ("Cpv"): Provide 24 hour extended detention of the post-developed 1-year, 24-hour storm event; remaining after runoff reduction. The Cpv requirement does not apply when:
(1) Reduction of the entire Cpv is achieved by application of runoff reduction techniques or infiltration systems, or
(2) The site discharges directly to tidal waters, or fifth order or larger streams.

(iv) *Overbank* Flood Control Criteria ("Qp"): Requires storage to attenuate the post-development 10-year, 24-hour peak discharge rate (Qp) to predevelopment rates. The Qp requirement does not apply when:
(1) the site discharges directly to tidal waters or fifth order or larger streams, or
(2) A downstream analysis reveals that *overbank* control is not required.

(v) Extreme Flood Control Criteria ("Qf"): Requires storage to attenuate the post-development 100-year, 24-hour peak discharge rate (Qf) to predevelopment rates. The Qf requirement does not apply when:
(1) the site discharges directly to tidal waters or fifth order or larger streams, or
(2) A downstream analysis reveals that *overbank* control is not required.

b. *Sizing Criteria* for *New Development* in Enhanced Phosphorus Removal Watershed

(i) Runoff Reduction Volume (RRv): Reduce the total Water Quality Volume (WQv) by application of RR techniques and standard SMPs with RRv capacity. The total WQv is the runoff volume from the 1-year, 24 hour design storm over the post-developed watershed and shall be

calculated in accordance with the criteria in Section 10.3 of the Design Manual.

(ii) Minimum RRv and Treatment of Remaining Total WQv: *Construction activities* that cannot meet the criteria in Part I.C.2.b.(i) of this permit due to *site limitations* shall direct runoff from all newly constructed *impervious areas* to a RR technique or standard SMP with RRv capacity unless *infeasible*. The specific *site limitations* that prevent the reduction of 100% of the WQv shall be documented in the SWPPP. For each *impervious area* that is not directed to a RR technique or standard SMP with RRv capacity, the SWPPP must include documentation which demonstrates that all options were considered and for each option explains why it is considered *infeasible.*

In no case shall the runoff reduction achieved from the newly constructed *impervious areas* be less than the Minimum RRv as calculated using the criteria in Section 10.3 of the Design Manual. The remaining portion of the total WQv that cannot be reduced shall be treated by application of standard SMPs.

(iii) Channel Protection Volume (Cpv): Provide 24 hour extended detention of the post-developed 1-year, 24-hour storm event; remaining after runoff reduction. The Cpv requirement does not apply when:
(1) Reduction of the entire Cpv is achieved by application of runoff reduction techniques or infiltration systems, or
(2) The site *discharge*s directly to tidal waters, or fifth order or larger streams.

(iv) *Overbank* Flood Control Criteria (Qp): Requires storage to attenuate the post-development 10-year, 24-hour peak *discharge* rate (Qp) to predevelopment rates. The Qp requirement does not apply when:
(1) the site *discharge*s directly to tidal waters or fifth order or larger streams, or
(2) A downstream analysis reveals that *overbank* control is not required.

(v) Extreme Flood Control Criteria (Qf): Requires storage to attenuate the post-development 100-year, 24-hour peak *discharge* rate (Qf) to predevelopment rates. The Qf requirement does not apply when:
(1) the site *discharge*s directly to tidal waters or fifth order or larger streams, or
(2) A downstream analysis reveals that *overbank* control is not required.

c. Sizing Criteria for Redevelopment Activity

(i) Water Quality Volume (WQv): The WQv treatment objective for *redevelopment activity* shall be addressed by one of the following options. *Redevelopment activities* located in an Enhanced Phosphorus Removal Watershed (see Part III.B.3. and Appendix C of this permit) shall calculate the WQv in accordance with Section 10.3 of the Design Manual. All other *redevelopment activities* shall calculate the WQv in accordance with Section 4.2 of the Design Manual.

(1) Reduce the existing *impervious cover* by a minimum of 25% of the total disturbed, *impervious area*. The Soil Restoration criteria in Section 5.1.6 of the Design Manual must be applied to all newly created pervious areas, or

(2) Capture and treat a minimum of 25% of the WQv from the disturbed, *impervious area* by the application of standard SMPs; or reduce 25% of the WQv from the disturbed, *impervious area* by the application of RR techniques or standard SMPs with RRv capacity., or

(3) Capture and treat a minimum of 75% of the WQv from the disturbed, *impervious area* as well as any additional runoff from tributary areas by application of the alternative practices discussed in Sections 9.3 and 9.4 of the Design Manual., or

(4) Application of a combination of 1, 2 and 3 above that provide a weighted average of at least two of the above methods. Application of this method shall be in accordance with the criteria in Section 9.2.1(B) (IV) of the Design Manual.

If there is an existing post-construction stormwater management practice located on the site that captures and treats runoff from the *impervious area* that is being disturbed, the WQv treatment option selected must, at a minimum, provide treatment equal to the treatment that was being provided by the existing practice(s) if that treatment is greater than the treatment required by options 1 – 4 above.

(ii) Channel Protection Volume (Cpv): Not required if there are no changes to hydrology that increase the *discharge* rate from the project site.

(iii) *Overbank* Flood Control Criteria (Qp): Not required if there are no changes to hydrology that increase the *discharge* rate from the project site.

(iv) Extreme Flood Control Criteria (Qf): Not required if there are no changes to hydrology that increase the *discharge* rate from the project site

d. Sizing Criteria for Combination of Redevelopment Activity and New Development

Construction projects that include both New Development and Redevelopment Activity shall provide post-construction stormwater management controls that meet the sizing criteria calculated as an aggregate of the Sizing Criteria in Part I.C.2.a. or b. of this permit for the New Development portion of the project and Part I.C.2.c of this permit for Redevelopment Activity portion of the project.

D. Maintaining Water Quality

The Department expects that compliance with the conditions of this permit will control *discharge*s necessary to meet applicable *water quality standards*. It shall be a violation of 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.

If there is evidence indicating that the stormwater *discharge*s authorized by this permit are causing, have the reasonable potential to cause, or are contributing to a violation of the *water quality standards*; the *owner or operator* must take appropriate corrective action in accordance with Part IV.C.5. of this general permit and document in accordance with Part IV.C.4. of this general permit. To address the *water quality standard* violation the *owner or operator* may need to provide additional information, include and implement appropriate controls in the SWPPP to correct the problem, or obtain an individual SPDES permit.

If there is evidence indicating that despite compliance with the terms and conditions of this general permit it is demonstrated that the stormwater *discharge*s authorized by this permit are causing or contributing to a violation of *water quality standards*, or if the Department determines that a modification of the permit is necessary to prevent a violation of *water quality standards*, the authorized *discharge*s will no longer be eligible for coverage under this permit. The Department may require the *owner or operator* to obtain an individual SPDES permit to continue discharging.

E. 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 F. of this Part.

2. Except for non-stormwater *discharges* explicitly listed in the next paragraph, this permit only authorizes stormwater *discharge*s; including stormwater runoff, snowmelt runoff, and surface runoff and drainage, from *construction activities*.

3. Notwithstanding paragraphs E.1 and E.2 above, the following non-stormwater discharges are authorized by this permit: those listed in 6 NYCRR 750-1.2(a)(29)(vi), with the following exception: "Discharges from firefighting activities are authorized only when the firefighting activities are emergencies/unplanned"; waters to which other components have not been added that are used to control dust in accordance with the SWPPP; and uncontaminated *discharge*s from *construction site* de-watering operations. All non-stormwater discharges must be identified in the SWPPP. Under all circumstances, the *owner or operator* must still comply with *water quality standards* in Part I.D of this permit.

4. The *owner or operator* must maintain permit eligibility to *discharge* under this permit. Any *discharges* that are not compliant with the eligibility conditions of this permit are not authorized by the permit and the *owner or operator* must either apply for a separate permit to cover those ineligible *discharges* or take steps necessary to make the *discharge* eligible for coverage.

F. Activities Which Are Ineligible for Coverage Under This General Permit

All of the following are **not** authorized by this permit:

1. *Discharge*s after *construction activities* have been completed and the site has undergone *final stabilization*;

2. *Discharge*s that are mixed with sources of non-stormwater other than those expressly authorized under subsection E.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.K. of this permit;

4. *Construction activities* or *discharges* from *construction activities* that may adversely affect an *endangered or threatened species* unless the *owner or*

operator has obtained a permit issued pursuant to 6 NYCRR Part 182 for the project or the Department has issued a letter of non-jurisdiction for the project. All documentation necessary to demonstrate eligibility shall be maintained on site in accordance with Part II.D.2 of this permit;

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:

   a. Where the *discharge*s from the *construction activities* are tributary to waters of the state classified as AA or AA-s; and

   b. Which are undertaken on land with no existing *impervious cover*; and

   c. Which disturb one (1) or more acres of land designated on the current United States Department of Agriculture ("USDA") Soil Survey as Soil Slope Phase "D", (provided the map unit name is inclusive of slopes greater than 25%), or Soil Slope Phase "E" or "F" (regardless of the map unit name), or a combination of the three designations.

7. *Construction activities* for linear transportation projects and linear utility projects:

   a. Where the *discharge*s from the *construction activities* are tributary to waters of the state classified as AA or AA-s; and

   b. Which are undertaken on land with no existing *impervious cover*; and

   c. Which disturb two (2) or more acres of land designated on the current USDA Soil Survey as Soil Slope Phase "D" (provided the map unit name is inclusive of slopes greater than 25%), or Soil Slope Phase "E" or "F" (regardless of the map unit name), or a combination of the three designations.

8. *Construction activities* that have the potential to affect an *historic property*, unless there is documentation that such impacts have been resolved. The following documentation necessary to demonstrate eligibility with this requirement shall be maintained on site in accordance with Part II.D.2 of this permit and made available to the Department in accordance with Part VII.F of this permit:

   a. Documentation that the *construction activity* is not within an archeologically sensitive area indicated on the sensitivity map, and that the *construction activity* is not located on or immediately adjacent to a property listed or determined to be eligible for listing on the National or State Registers of Historic Places, and that there is no new permanent building on the *construction site* within the following distances from a building, structure, or object that is more than 50 years old, or if there is such a new permanent building on the *construction site* within those parameters that NYS Office of Parks, Recreation and Historic Preservation (OPRHP), a Historic Preservation Commission of a Certified Local Government, or a qualified preservation professional has determined that the building, structure, or object more than 50 years old is not historically/archeologically significant.

      - 1-5 acres of disturbance - 20 feet
      - 5-20 acres of disturbance - 50 feet
      - 20+ acres of disturbance - 100 feet, or

   b. DEC consultation form sent to OPRHP, and copied to the NYS DEC Agency Historic Preservation Officer (APO), and
      (i) the State Environmental Quality Review (SEQR) Environmental Assessment Form (EAF) with a negative declaration or the Findings Statement, with documentation of OPRHP's agreement with the resolution; or
      (ii) documentation from OPRHP that the *construction activity* will result in No Impact; or
      (iii) documentation from OPRHP providing a determination of No Adverse Impact; or
      (iv) a Letter of Resolution signed by the owner/operator, OPRHP and the DEC APO which allows for this *construction activity* to be eligible for coverage under the general permit in terms of the State Historic Preservation Act (SHPA); or

   c. Documentation of satisfactory compliance with Section 106 of the National Historic Preservation Act for a coterminous project area:

(i) No Affect
(ii) No Adverse Affect
(iii) Executed Memorandum of Agreement, or

d. Documentation that:

(i) SHPA Section 14.09 has been completed by NYS DEC or another state agency.

9. *Discharge*s from *construction activities* that are subject to an existing SPDES individual or general permit where a SPDES permit for *construction activity* has been terminated or denied; or where the *owner or operator* has failed to renew an expired individual permit.

Part II. PERMIT COVERAGE

A. How to Obtain Coverage

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 prepare a SWPPP in accordance with all applicable requirements of this permit and then submit a completed Notice of Intent (NOI) to the Department to be authorized to discharge under this permit.

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 prepare a SWPPP in accordance with all applicable requirements of this permit and then have the SWPPP reviewed and accepted by the *regulated, traditional land use control MS4* prior to submitting the NOI to the Department. The *owner or operator* shall have the "MS4 SWPPP Acceptance" form signed in accordance with Part VII.H., and then submit that form along with a completed NOI to the Department.

3. The requirement for an *owner or operator* to have its SWPPP reviewed and accepted by the *regulated, traditional land use control MS4* prior to submitting the NOI to the Department does not apply to an *owner or operator* that is obtaining permit coverage in accordance with the requirements in Part II.F. (Change of *Owner or Operator*) or where the *owner or operator* of the *construction activity* is the *regulated, traditional land use control MS4* . This exemption does not apply to *construction activities* subject to the New York City Administrative Code.

B. Notice of Intent (NOI) Submittal

1. Prior to December 21, 2020, an owner or operator shall use either the electronic (eNOI) or paper version of the NOI that the Department prepared. Both versions of the NOI are located on the Department's website (http://www.dec.ny.gov/). The paper version of the NOI shall be signed in accordance with Part VII.H. of this permit and submitted to the following address:

   NOTICE OF INTENT
   NYS DEC, Bureau of Water Permits
   625 Broadway, 4th Floor
   Albany, New York 12233-3505

2. Beginning December 21, 2020 and in accordance with EPA's 2015 NPDES Electronic Reporting Rule (40 CFR Part 127), the *owner or operator* must submit the NOI electronically using the *Department's* online NOI.

3. The *owner or operator* shall have the SWPPP preparer sign the "SWPPP Preparer Certification" statement on the NOI prior to submitting the form to the Department.

4. As of the date the NOI is submitted to the Department, the *owner or operator* shall make the NOI and SWPPP available for review and copying in accordance with the requirements in Part VII.F. of this permit.

C. 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. See the Department's website (http://www.dec.ny.gov/) for more information,

   b. where required, all necessary Department permits subject to the *Uniform Procedures Act ("UPA")* (see 6 NYCRR Part 621), or the equivalent from another New York State agency, 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 Permit Administrator at the Regional Office listed 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. a complete 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.C.2 above will be authorized to *discharge* stormwater from their *construction activity* in accordance with the following schedule:

   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 electronic version of the NOI (eNOI) for *construction activities* with a SWPPP that has been prepared in conformance with the design criteria in the technical standard referenced in Part III.B.1 and the *performance criteria* in the technical standard referenced in Parts III.B., 2 or 3, for *construction activities* that require post-construction stormwater management practices pursuant to Part III.C.; or

      (ii) Sixty (60) business days from the date the Department receives a complete NOI (electronic or paper version) for *construction activities* with a SWPPP that has not been prepared in conformance with the design criteria in technical standard referenced in Part III.B.1. or, for *construction activities* that require post-construction stormwater management practices pursuant to Part III.C., the *performance criteria* in the technical standard referenced in Parts III.B., 2 or 3, or;

      (iii) Ten (10) business days from the date the Department receives a complete paper version of the NOI for *construction activities* with a SWPPP that has been prepared in conformance with the design criteria in the technical standard referenced in Part III.B.1 and the *performance criteria* in the technical standard referenced in Parts III.B., 2 or 3, for *construction activities* that require post-construction stormwater management practices pursuant to Part III.C.

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 both a complete electronic version of the NOI (eNOI) and signed "*MS4* SWPPP Acceptance" form, or

(ii) Ten (10) business days from the date the Department receives both a complete paper version of the NOI and signed "MS4 SWPPP Acceptance" form.

4. 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. The *owner or operator* shall not *commence construction activity* on the future or additional areas until their authorization to *discharge* under this permit goes into effect in accordance with Part II.C. of this permit.

D. 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. of this permit.

2. The *owner or operator* shall maintain a copy of the General Permit (GP-0-20-001), NOI, *NOI Acknowledgment Letter*, SWPPP, MS4 SWPPP Acceptance form, inspection reports, responsible contractor's or subcontractor's certification statement (see Part III.A.6.), and all documentation necessary to demonstrate eligibility with this permit at the *construction site* until all disturbed areas have achieved *final stabilization* and the NOT has been submitted to the Department. 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 *regulated, traditional land use control MS4* (provided the *regulated, traditional land use control 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. of this permit 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 temporarily or permanently ceased, the application of soil stabilization measures must be initiated by the end of the next business day and completed within seven (7) days from the date the current soil disturbance activity ceased. The soil stabilization measures selected shall be in conformance with the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016.

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. In accordance with statute, regulations, and the terms and conditions of this permit, 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 or consistent with Part VII.K..

5. Upon a finding of significant non-compliance with the practices described in the SWPPP or violation of this permit, the Department may order an immediate stop to all activity at the site until the non-compliance is remedied. The stop work order shall be in writing, describe the non-compliance in detail, and be sent to the *owner or operator*.

6. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4*, the *owner or operator* shall notify the

regulated, traditional land use control 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 *regulated, traditional land use control MS4*, the *owner or operator* shall have the SWPPP amendments or modifications reviewed and accepted by the *regulated, traditional land use control MS4* prior to commencing construction of the post-construction stormwater management practice.

E. Permit Coverage for Discharges Authorized Under GP-0-15-002

1. Upon renewal of SPDES General Permit for Stormwater Discharges from *Construction Activity* (Permit No. GP-0-15-002), an *owner or operator* of *a construction activity* with coverage under GP-0-15-002, as of the effective date of GP- 0-20-001, shall be authorized to *discharge* in accordance with GP- 0-20-001, unless otherwise notified by the Department.

   An *owner or operator* may continue to implement the technical/design components of the post-construction stormwater management controls provided that such design was done in conformance with the technical standards in place at the time of initial project authorization. However, they must comply with the other, non-design provisions of GP-0-20-001.

F. 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. For *construction activities* subject to the requirements of a *regulated, traditional land use control MS4,* the original *owner or operator* must also notify the MS4, in writing, of the change in ownership at least 30 calendar days prior to the change in ownership.

2. 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.B.1. of this permit. 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.

3. 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. A SWPPP shall be prepared and implemented by the *owner or operator* of each *construction activity* covered by this permit. The SWPPP must document the selection, design, installation, implementation and maintenance of the control measures and practices that will be used to meet the effluent limitations in Part I.B. of this permit and where applicable, the post-construction stormwater management practice requirements in Part I.C. of this permit. 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*. A copy of the completed, final NOI shall be included in the SWPPP.

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, including construction drawings:

    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*;

c. to address issues or deficiencies identified during an inspection by the *qualified inspector,* the Department or other regulatory authority; and

d. to document the final construction conditions.

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 or require the *owner or operator* to obtain coverage under an individual SPDES permit in accordance with Part II.D.4. of 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. 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 under penalty of law 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 *discharge*s from *construction activities* and that it is unlawful for any person to cause or contribute to a violation of *water quality standards*. Furthermore, I am aware that there are significant penalties for submitting false information, that I do not believe to be true, including the possibility of fine and imprisonment for knowing violations"

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.

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 technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016. Where erosion and sediment control practices are not designed in conformance with the design criteria included in the technical standard, the *owner or operator* must demonstrate *equivalence* to the technical standard. At a minimum, the erosion and sediment control component of the SWPPP shall include the following:

    a. Background information about the scope of the project, including the location, type and size of project

b. A site map/construction drawing(s) for the project, including a general location map. At a minimum, the site map shall show the total site area; all improvements; areas of disturbance; areas that will not be disturbed; existing vegetation; on-site and adjacent off-site surface water(s); floodplain/floodway boundaries; wetlands and drainage patterns that could be affected by the *construction activity*; existing and final contours ; 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 this general permit and the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016, for each stage of the project, including initial land clearing and grubbing to project completion and achievement of *final stabilization*;

g. A site map/construction drawing(s) showing the specific location(s), size(s), and length(s) of each erosion and sediment control practice;

h. The dimensions, material specifications, installation details, and operation and maintenance requirements for all erosion and sediment control practices. Include the location and sizing of any temporary sediment basins and structural practices that will be used to divert flows from exposed soils;

i. A maintenance inspection schedule for the contractor(s) identified in Part III.A.6. of this permit, 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 technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016;

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 design criteria in the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016. 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 standard.

2. Post-construction stormwater management practice component – The *owner or operator* of any construction project 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 applicable *sizing criteria* in Part I.C.2.a., c. or d. of this permit and the *performance criteria* in the technical standard, New York State Stormwater Management Design Manual dated January 2015

   Where post-construction stormwater management practices are not designed in conformance with the *performance criteria* in the technical standard, the *owner or operator* must include in the SWPPP the reason(s) for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

   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. Include the dimensions, material specifications and installation details for each post-construction stormwater management practice;

b. A site map/construction drawing(s) showing the specific location and size of each post-construction stormwater management practice;

c. A Stormwater Modeling and Analysis Report that includes:
   (i) Map(s) showing pre-development conditions, including watershed/subcatchments boundaries, flow paths/routing, and design points;

   (ii) Map(s) showing post-development conditions, including watershed/subcatchments boundaries, flow paths/routing, design points and post-construction stormwater management practices;

   (iii) Results of stormwater modeling (i.e. hydrology and hydraulic analysis) for the required storm events. Include supporting calculations (model runs), methodology, and a summary table that compares pre and post-development runoff rates and volumes for the different storm events;

   (iv) Summary table, with supporting calculations, which demonstrates that each post-construction stormwater management practice has been designed in conformance with the *sizing criteria* included in the Design Manual;

   (v) Identification of any *sizing criteria* that is not required based on the requirements included in Part I.C. of this permit; and

   (vi) Identification of any elements of the design that are not in conformance with the *performance criteria* in the Design Manual. Include the reason(s) for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the Design Manual;

d. Soil testing results and locations (test pits, borings);

e. Infiltration test results, when required; and

f. 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 applicable *sizing criteria* in Part I.C.2. b., c. or d. of this permit and the *performance criteria,* 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.f. above.

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 of this permit. *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 of this permit.

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 (including pollution prevention measures) and all post-construction stormwater management practices identified in the SWPPP are inspected and maintained in accordance with Part IV.B. and C. of this permit.

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. Contractor Maintenance Inspection Requirements

1. The *owner or operator* of each *construction activity* identified in Tables 1 and 2 of Appendix B shall have a *trained contractor* inspect the erosion and sediment control practices and pollution prevention measures being implemented within the active work area daily to ensure that they are being maintained in effective operating condition at all times. If deficiencies are identified, the contractor shall

begin implementing corrective actions within one business day and shall complete the corrective actions in a reasonable time frame.

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 *trained contractor* can stop conducting the maintenance inspections. The *trained contractor* shall begin conducting the maintenance inspections in accordance with Part IV.B.1. of this permit as soon as soil disturbance activities resume.

3. For construction sites where soil disturbance activities have been shut down with partial project completion, the *trained contractor* 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.

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. and IV.B. of this permit **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),
- New York State Erosion and Sediment Control Certificate Program holder
- 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 (5,000) 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.

b. For construction sites where soil disturbance activities are on-going and the *owner or operator* has received authorization in accordance with Part II.D.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 DOW Water (SPDES) Program contact at the Regional Office (see contact information in Appendix F) or, in areas under the jurisdiction of a *regulated, traditional land use control MS4,* the *regulated, traditional land use control MS4* (provided the *regulated, traditional land use control 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 DOW Water (SPDES) Program contact at the Regional Office (see contact information in Appendix F) or, in areas under the jurisdiction of a *regulated, traditional land use control MS4,* the *regulated, traditional land use control MS4* (provided the *regulated, traditional land use control 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.B.1 of this permit.

e. For construction sites that directly *discharge* to one of the 303(d) segments listed in Appendix E or is located in one of the watersheds listed in Appendix C, 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.

3. At a minimum, the *qualified inspector* shall inspect all erosion and sediment control practices and pollution prevention measures 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 and pollution prevention measures that need repair or maintenance;

g. Identification of all erosion and sediment control practices and pollution prevention measures that were not installed properly or are not functioning as designed and need to be reinstalled or replaced;

h. Description and sketch of areas with active soil disturbance activity, areas that have been disturbed but are inactive at the time of the inspection, and areas that have been stabilized (temporary and/or final) since the last inspection;

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 pollution prevention measures; and to correct deficiencies identified with the construction of the post-construction stormwater management practice(s);

k. Identification and status of all corrective actions that were required by previous inspection; and

l. 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 this permit 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.D.2. of this permit, 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.B.1 of this permit. The NOT form shall be one which is associated with this permit, signed in accordance with Part VII.H of this permit.

2. An *owner or operator* may terminate coverage when one or more the following conditions have been met:

   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.F. of this permit.

d. The *owner or operator* obtains coverage under an alternative SPDES general permit or an individual SPDES permit.

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 the requirements in Part V.A.2.a. or b. of this permit have been achieved.

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 have the *regulated, traditional land use control MS4* sign the "MS4 Acceptance" statement on the NOT in accordance with the requirements in Part VII.H. of this permit. The *regulated, traditional land use control 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 *regulated, traditional land use control 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.A.3. of this permit.

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:

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 a mechanism in place that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan, such as a deed covenant in the *owner or operator's* deed of record,

d. for post-construction stormwater management practices that are owned by a public or private institution (e.g. school, university, hospital), government agency or authority, or public utility; 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 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 Department receives a complete NOT submitted in accordance with Part V. of this general permit.

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.B.1 of this permit), all written correspondence requested by the Department, including individual permit applications, shall be sent to the address of the appropriate DOW Water (SPDES) Program contact at the 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. The stop work order shall be in writing, shall describe the non-compliance in detail, and shall be sent to the *owner or operator*.

If any human remains or archaeological remains are encountered during excavation, the *owner or operator* must immediately cease, or cause to cease, all *construction activity* in the area of the remains and notify the appropriate Regional Water Engineer (RWE). *Construction activity* shall not resume until written permission to do so has been received from the RWE.

B. Continuation of the Expired General Permit

This permit expires five (5) years from the effective date. If a new general permit is not issued prior to the expiration of this general permit, an *owner or operator* with coverage under this permit may continue to operate and *discharge* in accordance with the terms and conditions of this general permit, if it is extended pursuant to the State Administrative Procedure Act and 6 NYCRR Part 621, until a new general permit is issued.

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 furnish to the Department, within a reasonable specified time period of a written request, all documentation necessary to demonstrate eligibility and any information to determine compliance with this permit or to determine whether cause exists for modifying or revoking this permit, or suspending or denying coverage under this permit, in accordance with the terms and conditions 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 these documents. 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 of the documents required by this permit , 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) 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 using the contact information in Part II.A. of this permit. 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

(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. of this permit 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. of this permit;

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.

K. Requirement to Obtain Coverage Under an Alternative Permit

1. 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 Permit Administrator at the Regional Office. The Department may grant additional time upon demonstration, to the satisfaction of the Department, 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. 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 an authorized representative of the Department, EPA, applicable county health department, 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:

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), practices or operations regulated or required by this permit.

4. Sample or monitor at reasonable times, for purposes of assuring permit compliance or as otherwise authorized by the Act or ECL, any substances or parameters at any location.

N. Permit Actions

This permit may, at any time, be modified, suspended, revoked, or renewed by the Department in accordance with 6 NYCRR Part 621. 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. Any Department initiated 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

In accordance with 6NYCRR Part 750-2.4 and 750-2.5, any person who knowingly makes any false material statement, representation, or certification in any application, record, report or other document filed or required to be maintained under this permit, including reports of compliance or noncompliance shall, upon conviction, be punished in accordance with ECL §71-1933 and or Articles 175 and 210 of the New York State Penal Law.

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 – Acronyms and Definitions

Acronyms

APO – Agency Preservation Officer
BMP – Best Management Practice
CPESC – Certified Professional in Erosion and Sediment Control
Cpv – Channel Protection Volume
CWA – Clean Water Act (or the Federal Water Pollution Control Act, 33 U.S.C. §1251 et seq)
DOW – Division of Water
EAF – Environmental Assessment Form
ECL - Environmental Conservation Law
EPA – U. S. Environmental Protection Agency
HSG – Hydrologic Soil Group
MS4 – Municipal Separate Storm Sewer System
NOI – Notice of Intent
NOT – Notice of Termination
NPDES – National Pollutant Discharge Elimination System
OPRHP – Office of Parks, Recreation and Historic Places
Qf – Extreme Flood
Qp – Overbank Flood
RRv – Runoff Reduction Volume
RWE – Regional Water Engineer
SEQR – State Environmental Quality Review
SEQRA - State Environmental Quality Review Act
SHPA – State Historic Preservation Act
SPDES – State Pollutant Discharge Elimination System
SWPPP – Stormwater Pollution Prevention Plan
TMDL – Total Maximum Daily Load
UPA – Uniform Procedures Act
USDA – United States Department of Agriculture
WQv – Water Quality Volume

Definitions

All definitions in this section are solely for the purposes of this permit.

Agricultural Building – a structure designed and constructed to house farm implements, hay, grain, poultry, livestock or other horticultural products; excluding any structure designed, constructed or used, in whole or in part, for human habitation, as a place of employment where agricultural products are processed, treated or packaged, or as a place used by the public.

Agricultural Property –means the land for construction of a barn, *agricultural building*, silo, stockyard, pen or other structural practices identified in Table II in the "Agricultural Management Practices Catalog for Nonpoint Source Pollution in New York State" prepared by the Department in cooperation with agencies of New York Nonpoint Source Coordinating Committee (dated June 2007).

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.

Construction Site – means the land area where *construction activity(ies)* will occur. See definition for "*Commence (Commencement of) Construction Activities"* and "*Larger Common Plan of Development or Sale" also.*

Dewatering – means the act of draining rainwater and/or groundwater from building foundations, vaults or excavations/trenches.

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*.

Embankment –means an earthen or rock slope that supports a road/highway.

Endangered or Threatened Species – see 6 NYCRR Part 182 of the Department's rules and regulations for definition of terms and requirements.

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

Equivalent (Equivalence) – means that the practice or measure meets all the performance, longevity, maintenance, and safety objectives of the technical standard and will provide an equal or greater degree of water quality protection.

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 and Section 70-0117 of the ECL authorizing a category of discharges.

Groundwater(s) - 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.

Historic Property – means any building, structure, site, object or district that is listed on the State or National Registers of Historic Places or is determined to be eligible for listing on the State or National Registers of Historic Places.

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.

Infeasible – means not technologically possible, or not economically practicable and achievable in light of best industry practices.

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) environmental assessment form or other documents, 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.

Minimize – means reduce and/or eliminate to the extent achievable using control measures (including best management practices) that are technologically available and economically practicable and achievable in light of best industry practices.

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).

Natural Buffer –means an undisturbed area with natural cover running along a surface water (e.g. wetland, stream, river, lake, etc.).

New Development – means any land disturbance that does not meet the definition of Redevelopment Activity included in this appendix.

New York State Erosion and Sediment Control Certificate Program – a certificate program that establishes and maintains a process to identify and recognize individuals who are capable of developing, designing, inspecting and maintaining erosion and sediment control plans on projects that disturb soils in New York State. The certificate program is administered by the New York State Conservation District Employees Association.

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*.

Nonpoint Source - means any source of water pollution or pollutants which is not a discrete conveyance or *point source* permitted pursuant to Title 7 or 8 of Article 17 of the Environmental Conservation Law (see ECL Section 17-1403).

Overbank –means flow events that exceed the capacity of the stream channel and spill out into the adjacent floodplain.

Owner or Operator - means the person, persons or legal entity which owns or leases the property on which the *construction activity* is occurring; an entity that has operational control over the construction plans and specifications, including the ability to make modifications to the plans and specifications; and/or an entity that has day-to-day operational control of those activities at a project that are necessary to ensure compliance with the permit conditions.

Performance Criteria – means the design criteria listed under the "Required Elements" sections in Chapters 5, 6 and 10 of the technical standard, New York State Stormwater Management Design Manual, dated January 2015. It does not include the Sizing Criteria (i.e. WQv, RRv, Cpv, Qp and Qf) in Part I.C.2. of the permit.

Point Source - means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, vessel or other floating craft, or landfill leachate collection system from which *pollutants* are or may be discharged.

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 6 NYCRR Parts 700 et seq .

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, New York State Erosion and Sediment Control Certificate Program holder 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. 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.

Redevelopment Activity(ies) – means the disturbance and reconstruction of existing impervious area, including impervious areas that were removed from a project site within five (5) years of preliminary project plan submission to the local government (i.e. site plan, subdivision, etc.).

Regulated, Traditional Land Use Control MS4 - means a city, town or village with land use control authority that is authorized to discharge under New York State DEC's

SPDES General Permit For Stormwater Discharges from Municipal Separate Stormwater Sewer Systems (MS4s) or the City of New York's Individual SPDES Permit for their Municipal Separate Storm Sewer Systems (NY-0287890).

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,
- 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 stabilizes 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.

Site limitations – means site conditions that prevent the use of an infiltration technique and or infiltration of the total WQv. Typical site limitations include: seasonal high groundwater, shallow depth to bedrock, and soils with an infiltration rate less than 0.5 inches/hour. The existence of site limitations shall be confirmed and documented using actual field testing (i.e. test pits, soil borings, and infiltration test) or using information from the most current United States Department of Agriculture (USDA) Soil Survey for the County where the project is located.

Sizing Criteria – means the criteria included in Part I.C.2 of the permit that are used to size post-construction stormwater management control practices. The criteria include; Water Quality Volume (WQv), Runoff Reduction Volume (RRv), Channel Protection Volume (Cpv), *Overbank* Flood (Qp), and Extreme Flood (Qf).

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.

Steep Slope – means land area designated on the current United States Department of Agriculture ("USDA") Soil Survey as Soil Slope Phase "D", (provided the map unit name is inclusive of slopes greater than 25%) , or Soil Slope Phase E or F, (regardless of the map unit name), or a combination of the three designations.

Streambank – as used in this permit, means the terrain alongside the bed of a creek or stream. The bank consists of the sides of the channel, between which the flow is confined.

Stormwater Pollution Prevention Plan (SWPPP) – means a project specific report, including construction drawings, that among other things: describes the construction activity(ies), identifies the potential sources of pollution at the *construction site*; describes and shows the stormwater controls that will be used to control the pollutants (i.e. erosion and sediment controls; for many projects, includes post-construction stormwater management controls); and identifies procedures the *owner or operator* will implement to comply with the terms and conditions of the permit. See Part III of the permit for a complete description of the information that must be included in the SWPPP.

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 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.

Temporarily Ceased – means that an existing disturbed area will not be disturbed again within 14 calendar days of the previous soil disturbance.

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 source*s. 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 source*s, 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, New York State Erosion and Sediment Control Certificate Program holder, 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* is 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

The following construction activities that involve soil disturbances of one (1) or more acres of land, but less than five (5) acres:

- Single family home not located in one of the watersheds listed in Appendix C or not *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 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
- Construction of a barn or other *agricultural building*, silo, stock yard or pen.

The following construction activities that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land:

All construction activities located in the watersheds identified in Appendix D that involve soil disturbances between five thousand (5,000) square feet and one (1) acre of land.

The following construction activities that involve soil disturbances of one (1) or more acres of land:

- Installation of underground, linear utilities; such as gas lines, fiber-optic cable, cable TV, electric, telephone, sewer mains, and water mains
- Environmental enhancement projects, such as wetland mitigation projects, stormwater retrofits and stream restoration projects
- Pond construction
- Linear bike paths running through areas with vegetative cover, including bike paths surfaced with an impervious cover
- Cross-country ski trails and walking/hiking trails
- Sidewalk, bike path or walking path projects, surfaced with an impervious cover, that are not part of residential, commercial or institutional development;
- Sidewalk, bike path or walking path projects, surfaced with an impervious cover, that include incidental shoulder or curb work along an existing highway to support construction of the sidewalk, bike path or walking path.
- Slope stabilization projects
- Slope flattening that changes the grade of the site, but does not significantly change the runoff characteristics

Table 1 (Continued) CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A SWPPP THAT ONLY INCLUDES EROSION AND SEDIMENT CONTROLS

The following construction activities that involve soil disturbances of one (1) or more acres of land:

- Spoil areas that will be covered with vegetation
- Vegetated open space projects (i.e. recreational parks, lawns, meadows, fields, downhill ski trails) excluding projects that *alter hydrology from pre to post development* conditions,
- Athletic fields (natural grass) that do not include the construction or reconstruction of *impervious area* and do not *alter hydrology from pre to post development* conditions
- 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 *impervious cover*
- 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 greater than five acres and construction activities that include the construction or reconstruction of impervious area
- Temporary access roads, median crossovers, detour roads, lanes, or other temporary impervious areas that will be restored to pre-construction conditions once the construction activity is complete

Table 2

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

The following construction activities that involve soil disturbances of one (1) or more acres of land:

- Single family home located in one of the watersheds listed in Appendix C or *directly discharging* to one of the 303(d) segments listed in Appendix E
- Single family home that disturbs five (5) or more acres of land
- Single family residential subdivisions located in one of the watersheds listed in Appendix C or *directly discharging* 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 duplexes, townhomes, condominiums, senior housing complexes, apartment complexes, and mobile home parks
- Airports
- Amusement parks
- Breweries, cideries, and wineries, including establishments constructed on agricultural land
- Campgrounds
- Cemeteries that include the construction or reconstruction of impervious area (>5% of disturbed area) or *alter the hydrology from pre to post development* 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 *impervious area*, excluding projects that involve soil disturbances of less than five acres.
- Golf courses
- Institutional development; includes hospitals, prisons, schools and colleges
- Industrial facilities; includes industrial parks
- Landfills
- Municipal facilities; includes highway garages, transfer stations, office buildings, POTW's, water treatment plants, and water storage tanks
- Office complexes
- Playgrounds that include the construction or reconstruction of impervious area
- Sports complexes
- Racetracks; includes racetracks with earthen (dirt) surface
- Road construction or reconstruction, including roads constructed as part of the construction activities listed in Table 1

Table 2 (Continued)

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

The following construction activities that involve soil disturbances of one (1) or more acres of land:

- Parking lot construction or reconstruction, including parking lots constructed as part of the construction activities listed in Table 1
- Athletic fields (natural grass) that include the construction or reconstruction of impervious area (>5% of disturbed area) or *alter the hydrology from pre to post development* conditions
- Athletic fields with artificial turf
- Permanent access roads, parking areas, substations, compressor stations and well drilling pads, surfaced with *impervious cover,* and constructed as part of an over-head electric transmission line project, wind-power project, cell tower project, oil or gas well drilling project, sewer or water main project or other linear utility project
- Sidewalk, bike path or walking path projects, surfaced with an impervious cover, that are part of a residential, commercial or institutional development
- Sidewalk, bike path or walking path projects, surfaced with an impervious cover, that are part of a highway construction or reconstruction project
- All other construction activities that include the construction or reconstruction of *impervious area* or *alter the hydrology from pre to post development* conditions, and are not listed in Table 1

APPENDIX C – Watersheds Requiring Enhanced Phosphorus Removal

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
- Kinderhook Lake Watershed – Figure 5

Figure 1 - New York City Watershed East of the Hudson

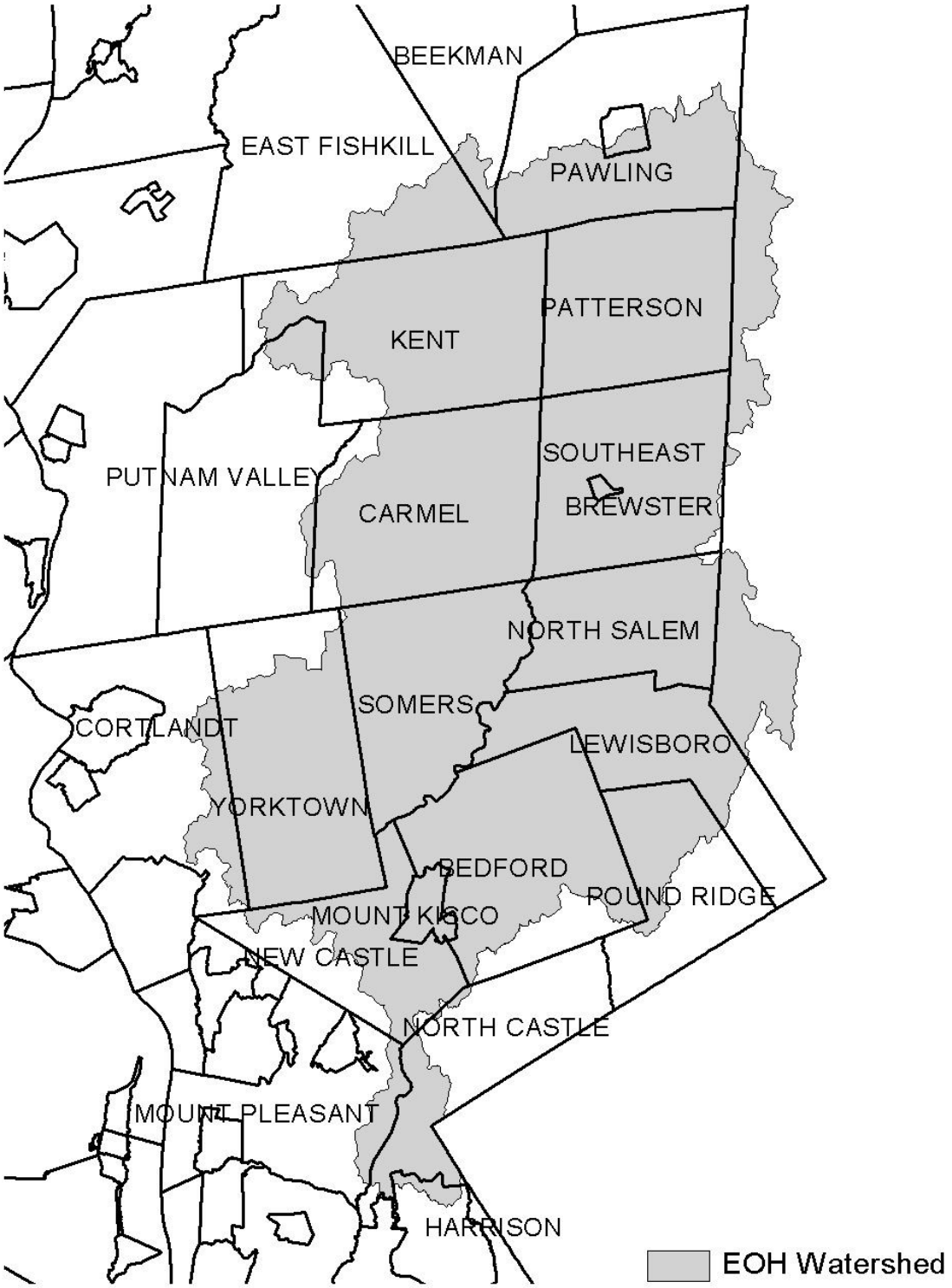


Figure 2 - Onondaga Lake Watershed

Figure 3 - Greenwood Lake Watershed

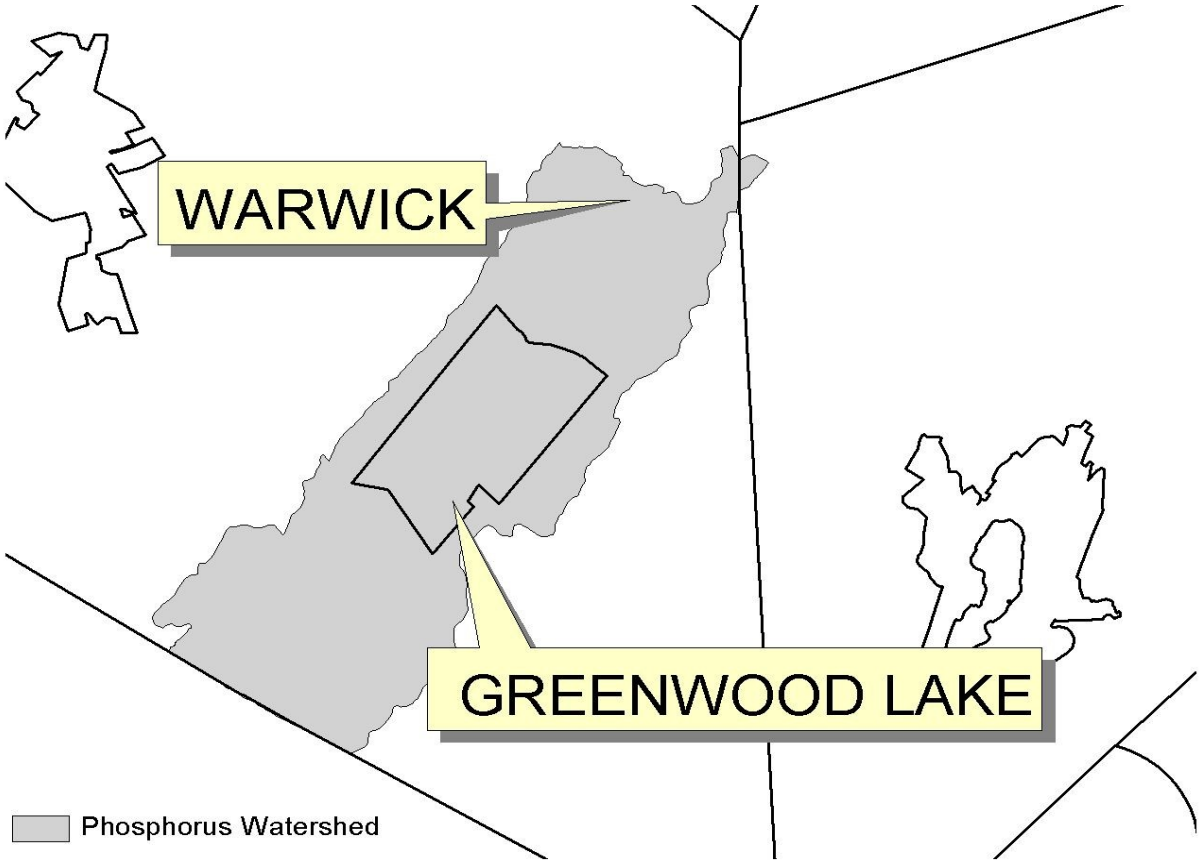


Figure 4 - Oscawana Lake Watershed

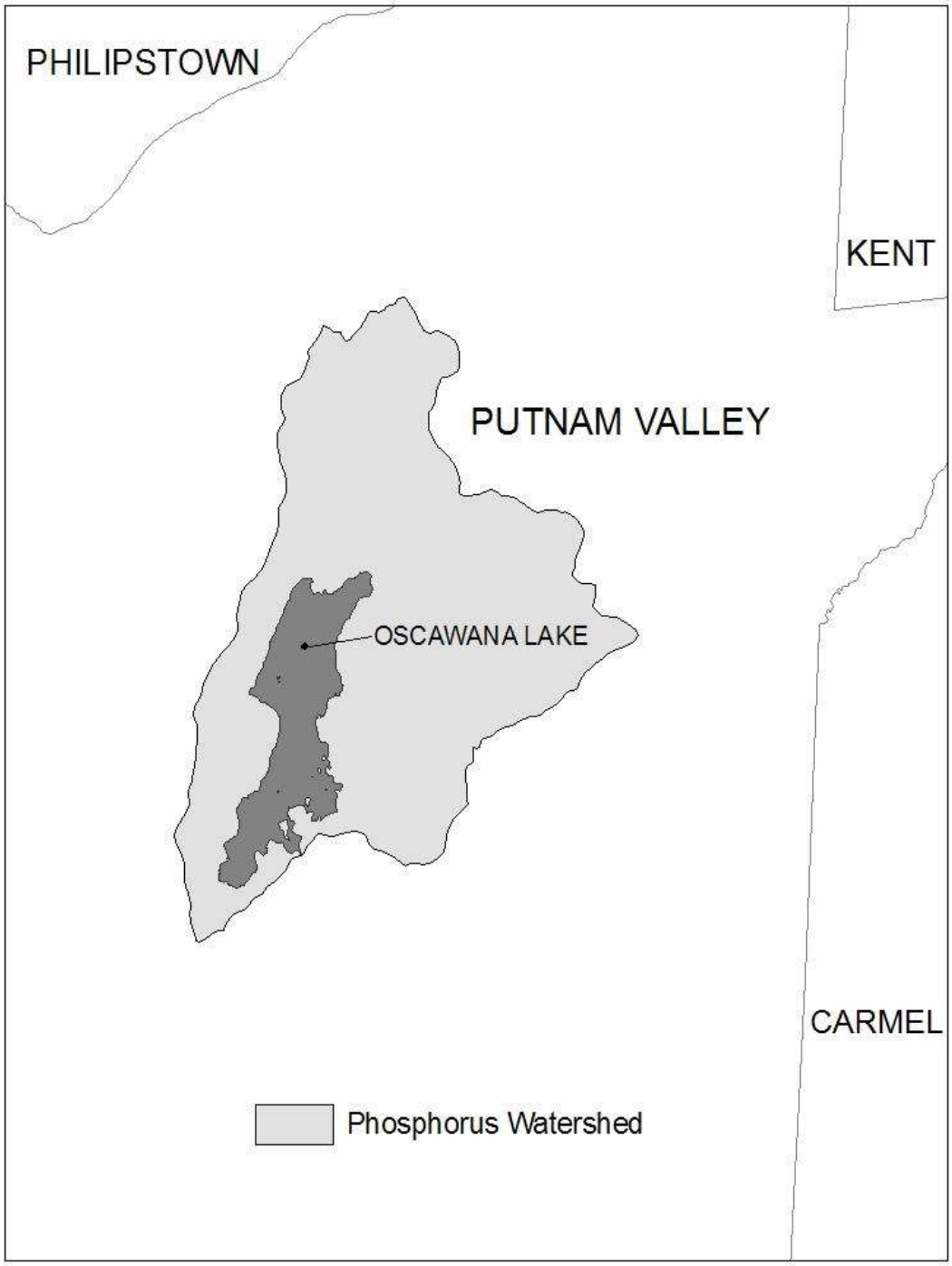
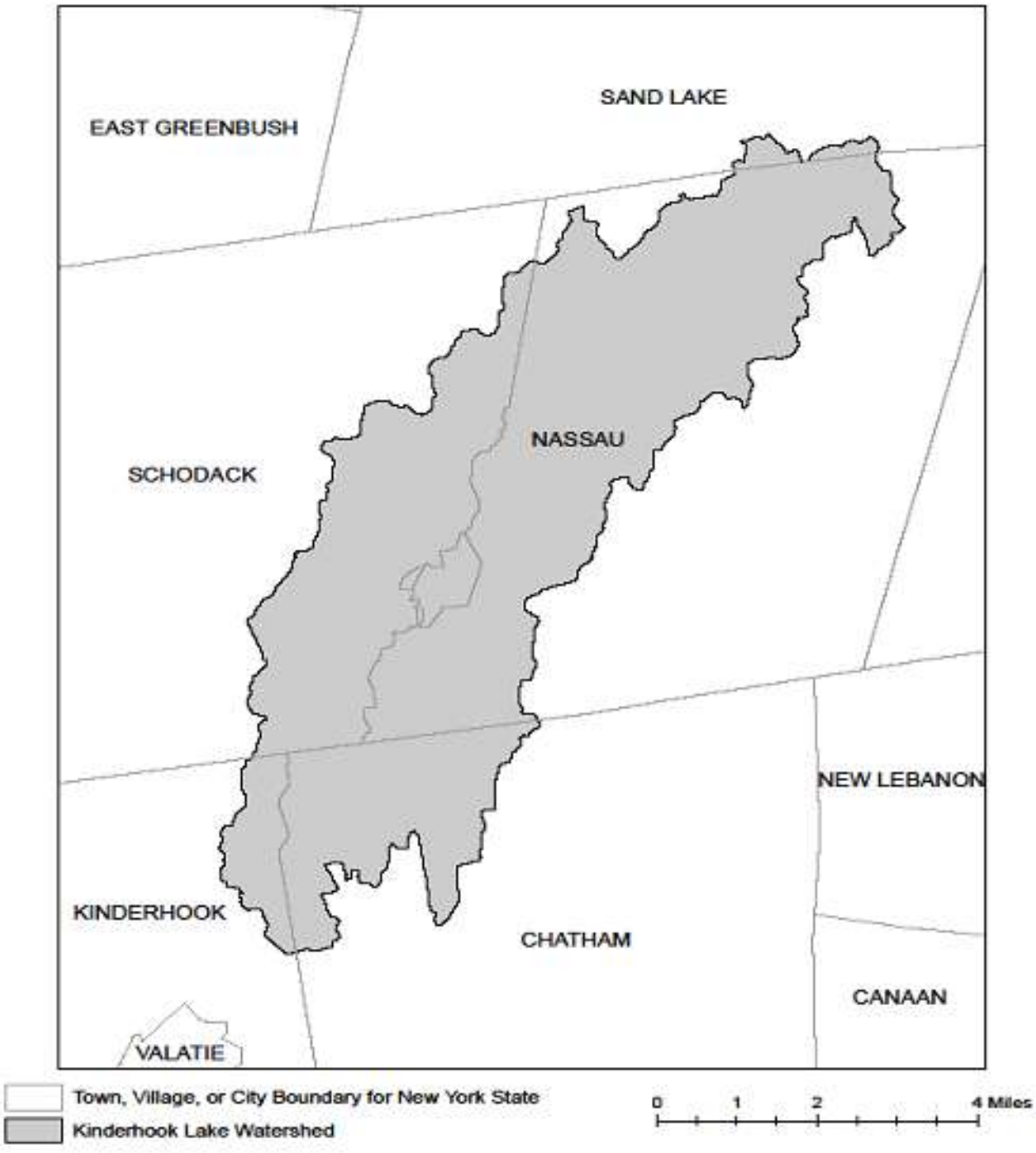


Figure 5 - Kinderhook Lake Watershed



APPENDIX D – Watersheds with Lower Disturbance Threshold

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 – 303(d) Segments Impaired by Construction Related Pollutant(s)

List of 303(d) segments impaired by pollutants related to *construction activity* (e.g. silt, sediment or nutrients). The list was developed using "The Final New York State 2016 Section 303(d) List of Impaired Waters Requiring a TMDL/Other Strategy" dated November 2016. *Owners or operators* of single family home and single family residential subdivisions with 25% or less total impervious cover at total site build-out 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 New York State Stormwater Management Design Manual ("Design Manual"), dated January 2015.

COUNTY	WATERBODY	POLLUTANT
Albany	Ann Lee (Shakers) Pond, Stump Pond	Nutrients
Albany	Basic Creek Reservoir	Nutrients
Allegany	Amity Lake, Saunders Pond	Nutrients
Bronx	Long Island Sound, Bronx	Nutrients
Bronx	Van Cortlandt Lake	Nutrients
Broome	Fly Pond, Deer Lake, Sky Lake	Nutrients
Broome	Minor Tribs to Lower Susquehanna (north)	Nutrients
Broome	Whitney Point Lake/Reservoir	Nutrients
Cattaraugus	Allegheny River/Reservoir	Nutrients
Cattaraugus	Beaver (Alma) Lake	Nutrients
Cattaraugus	Case Lake	Nutrients
Cattaraugus	Linlyco/Club Pond	Nutrients
Cayuga	Duck Lake	Nutrients
Cayuga	Little Sodus Bay	Nutrients
Chautauqua	Bear Lake	Nutrients
Chautauqua	Chadakoin River and tribs	Nutrients
Chautauqua	Chautauqua Lake, North	Nutrients
Chautauqua	Chautauqua Lake, South	Nutrients
Chautauqua	Findley Lake	Nutrients
Chautauqua	Hulburt/Clymer Pond	Nutrients
Clinton	Great Chazy River, Lower, Main Stem	Silt/Sediment
Clinton	Lake Champlain, Main Lake, Middle	Nutrients
Clinton	Lake Champlain, Main Lake, North	Nutrients
Columbia	Kinderhook Lake	Nutrients
Columbia	Robinson Pond	Nutrients
Cortland	Dean Pond	Nutrients

303(d) Segments Impaired by Construction Related Pollutant(s)

Dutchess	Fall Kill and tribs	Nutrients
Dutchess	Hillside Lake	Nutrients
Dutchess	Wappingers Lake	Nutrients
Dutchess	Wappingers Lake	Silt/Sediment
Erie	Beeman Creek and tribs	Nutrients
Erie	Ellicott Creek, Lower, and tribs	Silt/Sediment
Erie	Ellicott Creek, Lower, and tribs	Nutrients
Erie	Green Lake	Nutrients
Erie	Little Sister Creek, Lower, and tribs	Nutrients
Erie	Murder Creek, Lower, and tribs	Nutrients
Erie	Rush Creek and tribs	Nutrients
Erie	Scajaquada Creek, Lower, and tribs	Nutrients
Erie	Scajaquada Creek, Middle, and tribs	Nutrients
Erie	Scajaquada Creek, Upper, and tribs	Nutrients
Erie	South Branch Smoke Cr, Lower, and tribs	Silt/Sediment
Erie	South Branch Smoke Cr, Lower, and tribs	Nutrients
Essex	Lake Champlain, Main Lake, South	Nutrients
Essex	Lake Champlain, South Lake	Nutrients
Essex	Willsboro Bay	Nutrients
Genesee	Bigelow Creek and tribs	Nutrients
Genesee	Black Creek, Middle, and minor tribs	Nutrients
Genesee	Black Creek, Upper, and minor tribs	Nutrients
Genesee	Bowen Brook and tribs	Nutrients
Genesee	LeRoy Reservoir	Nutrients
Genesee	Oak Orchard Cr, Upper, and tribs	Nutrients
Genesee	Tonawanda Creek, Middle, Main Stem	Nutrients
Greene	Schoharie Reservoir	Silt/Sediment
Greene	Sleepy Hollow Lake	Silt/Sediment
Herkimer	Steele Creek tribs	Silt/Sediment
Herkimer	Steele Creek tribs	Nutrients
Jefferson	Moon Lake	Nutrients
Kings	Hendrix Creek	Nutrients
Kings	Prospect Park Lake	Nutrients
Lewis	Mill Creek/South Branch, and tribs	Nutrients
Livingston	Christie Creek and tribs	Nutrients
Livingston	Conesus Lake	Nutrients
Livingston	Mill Creek and minor tribs	Silt/Sediment
Monroe	Black Creek, Lower, and minor tribs	Nutrients
Monroe	Buck Pond	Nutrients
Monroe	Cranberry Pond	Nutrients

303(d) Segments Impaired by Construction Related Pollutant(s)

Monroe	Lake Ontario Shoreline, Western	Nutrients
Monroe	Long Pond	Nutrients
Monroe	Mill Creek and tribs	Nutrients
Monroe	Mill Creek/Blue Pond Outlet and tribs	Nutrients
Monroe	Minor Tribs to Irondequoit Bay	Nutrients
Monroe	Rochester Embayment - East	Nutrients
Monroe	Rochester Embayment - West	Nutrients
Monroe	Shipbuilders Creek and tribs	Nutrients
Monroe	Thomas Creek/White Brook and tribs	Nutrients
Nassau	Beaver Lake	Nutrients
Nassau	Camaans Pond	Nutrients
Nassau	East Meadow Brook, Upper, and tribs	Silt/Sediment
Nassau	East Rockaway Channel	Nutrients
Nassau	Grant Park Pond	Nutrients
Nassau	Hempstead Bay	Nutrients
Nassau	Hempstead Lake	Nutrients
Nassau	Hewlett Bay	Nutrients
Nassau	Hog Island Channel	Nutrients
Nassau	Long Island Sound, Nassau County Waters	Nutrients
Nassau	Massapequa Creek and tribs	Nutrients
Nassau	Milburn/Parsonage Creeks, Upp, and tribs	Nutrients
Nassau	Reynolds Channel, west	Nutrients
Nassau	Tidal Tribs to Hempstead Bay	Nutrients
Nassau	Tribs (fresh) to East Bay	Nutrients
Nassau	Tribs (fresh) to East Bay	Silt/Sediment
Nassau	Tribs to Smith/Halls Ponds	Nutrients
Nassau	Woodmere Channel	Nutrients
New York	Harlem Meer	Nutrients
New York	The Lake in Central Park	Nutrients
Niagara	Bergholtz Creek and tribs	Nutrients
Niagara	Hyde Park Lake	Nutrients
Niagara	Lake Ontario Shoreline, Western	Nutrients
Niagara	Lake Ontario Shoreline, Western	Nutrients
Oneida	Ballou, Nail Creeks and tribs	Nutrients
Onondaga	Harbor Brook, Lower, and tribs	Nutrients
Onondaga	Ley Creek and tribs	Nutrients
Onondaga	Minor Tribs to Onondaga Lake	Nutrients
Onondaga	Ninemile Creek, Lower, and tribs	Nutrients
Onondaga	Onondaga Creek, Lower, and tribs	Nutrients
Onondaga	Onondaga Creek, Middle, and tribs	Nutrients

303(d) Segments Impaired by Construction Related Pollutant(s)

Onondaga	Onondaga Lake, northern end	Nutrients
Onondaga	Onondaga Lake, southern end	Nutrients
Ontario	Great Brook and minor tribs	Silt/Sediment
Ontario	Great Brook and minor tribs	Nutrients
Ontario	Hemlock Lake Outlet and minor tribs	Nutrients
Ontario	Honeoye Lake	Nutrients
Orange	Greenwood Lake	Nutrients
Orange	Monhagen Brook and tribs	Nutrients
Orange	Orange Lake	Nutrients
Orleans	Lake Ontario Shoreline, Western	Nutrients
Orleans	Lake Ontario Shoreline, Western	Nutrients
Oswego	Lake Neatahwanta	Nutrients
Oswego	Pleasant Lake	Nutrients
Putnam	Bog Brook Reservoir	Nutrients
Putnam	Boyd Corners Reservoir	Nutrients
Putnam	Croton Falls Reservoir	Nutrients
Putnam	Diverting Reservoir	Nutrients
Putnam	East Branch Reservoir	Nutrients
Putnam	Lake Carmel	Nutrients
Putnam	Middle Branch Reservoir	Nutrients
Putnam	Oscawana Lake	Nutrients
Putnam	Palmer Lake	Nutrients
Putnam	West Branch Reservoir	Nutrients
Queens	Bergen Basin	Nutrients
Queens	Flushing Creek/Bay	Nutrients
Queens	Jamaica Bay, Eastern, and tribs (Queens)	Nutrients
Queens	Kissena Lake	Nutrients
Queens	Meadow Lake	Nutrients
Queens	Willow Lake	Nutrients
Rensselaer	Nassau Lake	Nutrients
Rensselaer	Snyders Lake	Nutrients
Richmond	Grasmere Lake/Bradys Pond	Nutrients
Rockland	Congers Lake, Swartout Lake	Nutrients
Rockland	Rockland Lake	Nutrients
Saratoga	Ballston Lake	Nutrients
Saratoga	Dwaas Kill and tribs	Silt/Sediment
Saratoga	Dwaas Kill and tribs	Nutrients
Saratoga	Lake Lonely	Nutrients
Saratoga	Round Lake	Nutrients
Saratoga	Tribs to Lake Lonely	Nutrients

303(d) Segments Impaired by Construction Related Pollutant(s)

Schenectady	Collins Lake	Nutrients
Schenectady	Duane Lake	Nutrients
Schenectady	Mariaville Lake	Nutrients
Schoharie	Engleville Pond	Nutrients
Schoharie	Summit Lake	Nutrients
Seneca	Reeder Creek and tribs	Nutrients
St.Lawrence	Black Lake Outlet/Black Lake	Nutrients
St.Lawrence	Fish Creek and minor tribs	Nutrients
Steuben	Smith Pond	Nutrients
Suffolk	Agawam Lake	Nutrients
Suffolk	Big/Little Fresh Ponds	Nutrients
Suffolk	Canaan Lake	Silt/Sediment
Suffolk	Canaan Lake	Nutrients
Suffolk	Flanders Bay, West/Lower Sawmill Creek	Nutrients
Suffolk	Fresh Pond	Nutrients
Suffolk	Great South Bay, East	Nutrients
Suffolk	Great South Bay, Middle	Nutrients
Suffolk	Great South Bay, West	Nutrients
Suffolk	Lake Ronkonkoma	Nutrients
Suffolk	Long Island Sound, Suffolk County, West	Nutrients
Suffolk	Mattituck (Marratooka) Pond	Nutrients
Suffolk	Meetinghouse/Terrys Creeks and tribs	Nutrients
Suffolk	Mill and Seven Ponds	Nutrients
Suffolk	Millers Pond	Nutrients
Suffolk	Moriches Bay, East	Nutrients
Suffolk	Moriches Bay, West	Nutrients
Suffolk	Peconic River, Lower, and tidal tribs	Nutrients
Suffolk	Quantuck Bay	Nutrients
Suffolk	Shinnecock Bay and Inlet	Nutrients
Suffolk	Tidal tribs to West Moriches Bay	Nutrients
Sullivan	Bodine, Montgomery Lakes	Nutrients
Sullivan	Davies Lake	Nutrients
Sullivan	Evens Lake	Nutrients
Sullivan	Pleasure Lake	Nutrients
Tompkins	Cayuga Lake, Southern End	Nutrients
Tompkins	Cayuga Lake, Southern End	Silt/Sediment
Tompkins	Owasco Inlet, Upper, and tribs	Nutrients
Ulster	Ashokan Reservoir	Silt/Sediment
Ulster	Esopus Creek, Upper, and minor tribs	Silt/Sediment
Warren	Hague Brook and tribs	Silt/Sediment

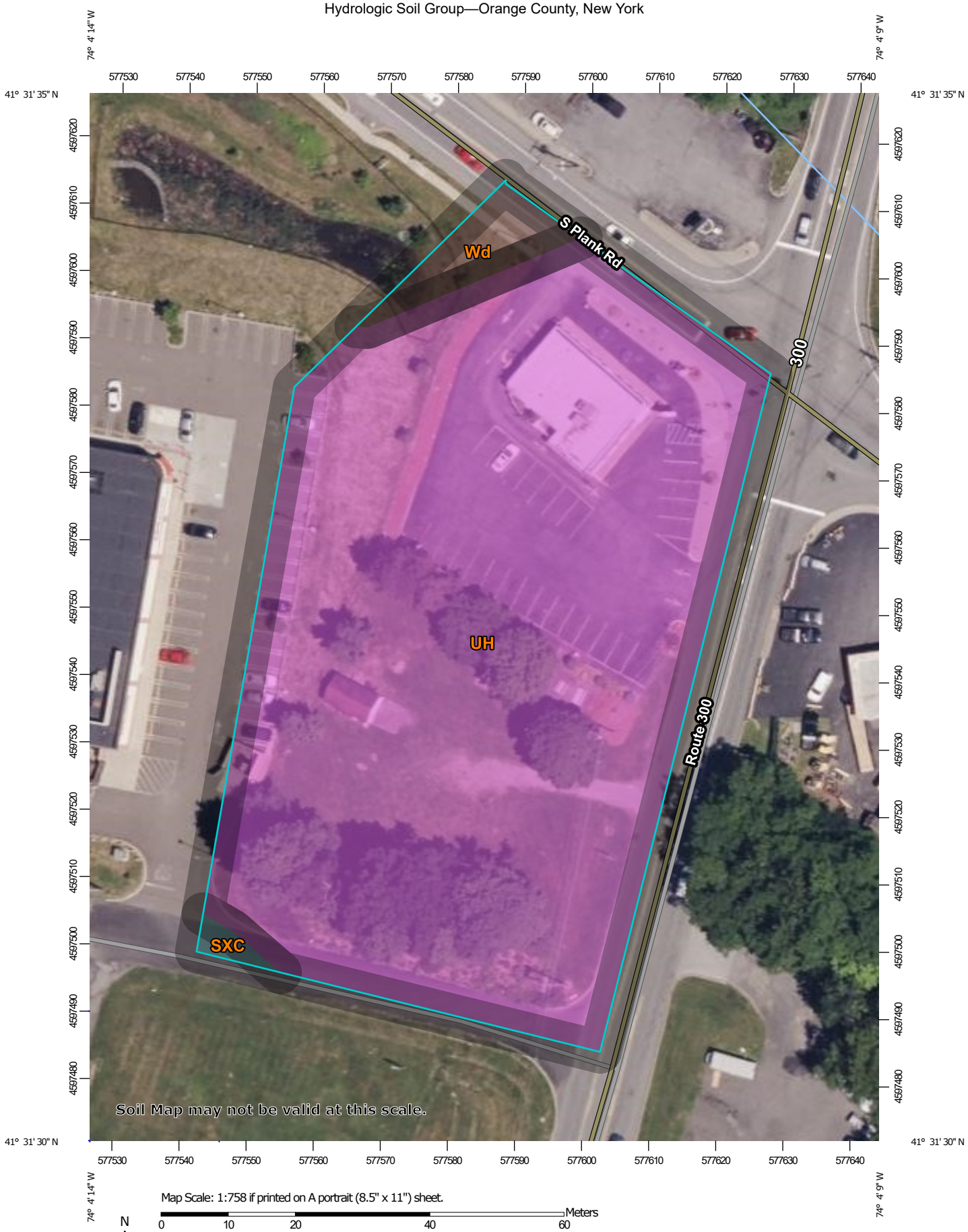
303(d) Segments Impaired by Construction Related Pollutant(s)

Warren	Huddle/Finkle Brooks and tribs	Silt/Sediment
Warren	Indian Brook and tribs	Silt/Sediment
Warren	Lake George	Silt/Sediment
Warren	Tribs to L.George, Village of L George	Silt/Sediment
Washington	Cossayuna Lake	Nutrients
Washington	Lake Champlain, South Bay	Nutrients
Washington	Tribs to L.George, East Shore	Silt/Sediment
Washington	Wood Cr/Champlain Canal and minor tribs	Nutrients
Wayne	Port Bay	Nutrients
Westchester	Amawalk Reservoir	Nutrients
Westchester	Blind Brook, Upper, and tribs	Silt/Sediment
Westchester	Cross River Reservoir	Nutrients
Westchester	Lake Katonah	Nutrients
Westchester	Lake Lincolndale	Nutrients
Westchester	Lake Meahagh	Nutrients
Westchester	Lake Mohegan	Nutrients
Westchester	Lake Shenorock	Nutrients
Westchester	Long Island Sound, Westchester (East)	Nutrients
Westchester	Mamaroneck River, Lower	Silt/Sediment
Westchester	Mamaroneck River, Upper, and minor tribs	Silt/Sediment
Westchester	Muscoot/Upper New Croton Reservoir	Nutrients
Westchester	New Croton Reservoir	Nutrients
Westchester	Peach Lake	Nutrients
Westchester	Reservoir No.1 (Lake Isle)	Nutrients
Westchester	Saw Mill River, Lower, and tribs	Nutrients
Westchester	Saw Mill River, Middle, and tribs	Nutrients
Westchester	Sheldrake River and tribs	Silt/Sediment
Westchester	Sheldrake River and tribs	Nutrients
Westchester	Silver Lake	Nutrients
Westchester	Teatown Lake	Nutrients
Westchester	Titicus Reservoir	Nutrients
Westchester	Truesdale Lake	Nutrients
Westchester	Wallace Pond	Nutrients
Wyoming	Java Lake	Nutrients
Wyoming	Silver Lake	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, Rensselaer, 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 Warrensburg, NY 12885-1172 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 ROADAVON, NY 14414-9519 TEL. (585) 226-2466	6274 EAST AVON-LIMA RD. AVON, NY 14414-9519 TEL. (585) 226-2466
9	ALLEGANY, CATTARAUGUS, CHAUTAUQUA, ERIE, NIAGARA AND WYOMING	270 MICHIGAN AVENUE BUFFALO, NY 14203-2999 TEL. (716) 851-7165	270 MICHIGAN AVENUE BUFFALO, NY 14203-2999 TEL. (716) 851-7070

NRCS WEB SOIL SURVEY



Map Scale: 1:758 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 10 20 40 60

Feet
0 35 70 140 210

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Orange County, New York
Survey Area Data: Version 24, Sep 6, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 31, 2022—Oct 27, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
SXC	Swartswood and Mardin soils, sloping, very stony	C	0.0	0.6%
UH	Udorthents, smoothed	A	1.7	96.3%
Wd	Wayland soils complex, non-calcareous substratum, 0 to 3 percent slopes, frequently flooded	B/D	0.1	3.1%
Totals for Area of Interest			**1.8**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

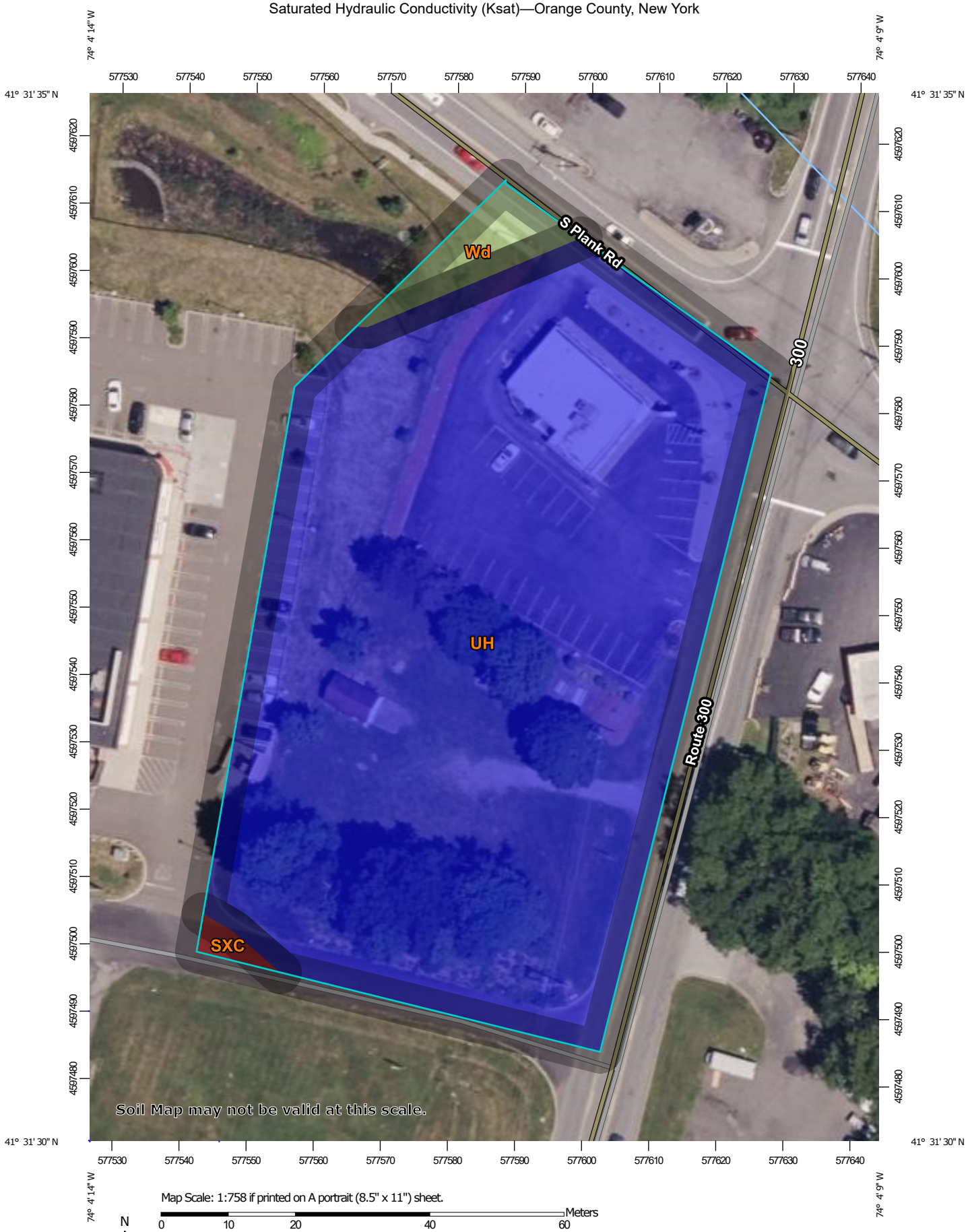
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Saturated Hydraulic Conductivity (Ksat)—Orange County, New York



Map Scale: 1:758 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 10 20 40 60

Feet: 0 35 70 140 210

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

<= 5.7390

> 5.7390 and <= 10.0000

> 10.0000 and <= 23.9909

Not rated or not available

Soil Rating Lines

<= 5.7390

> 5.7390 and <= 10.0000

> 10.0000 and <= 23.9909

Not rated or not available

Soil Rating Points

<= 5.7390

> 5.7390 and <= 10.0000

> 10.0000 and <= 23.9909

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Orange County, New York
Survey Area Data: Version 24, Sep 6, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 31, 2022—Oct 27, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Saturated Hydraulic Conductivity (Ksat)

Map unit symbol	Map unit name	Rating (micrometers per second)	Acres in AOI	Percent of AOI
SXC	Swartswood and Mardin soils, sloping, very stony	5.7390	0.0	0.6%
UH	Udorthents, smoothed	23.9909	1.7	96.3%
Wd	Wayland soils complex, non-calcareous substratum, 0 to 3 percent slopes, frequently flooded	10.0000	0.1	3.1%
Totals for Area of Interest			**1.8**	**100.0%**

Description

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity is considered in the design of soil drainage systems and septic tank absorption fields.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

The numeric Ksat values have been grouped according to standard Ksat class limits.

Rating Options

Units of Measure: micrometers per second

Aggregation Method: Dominant Component

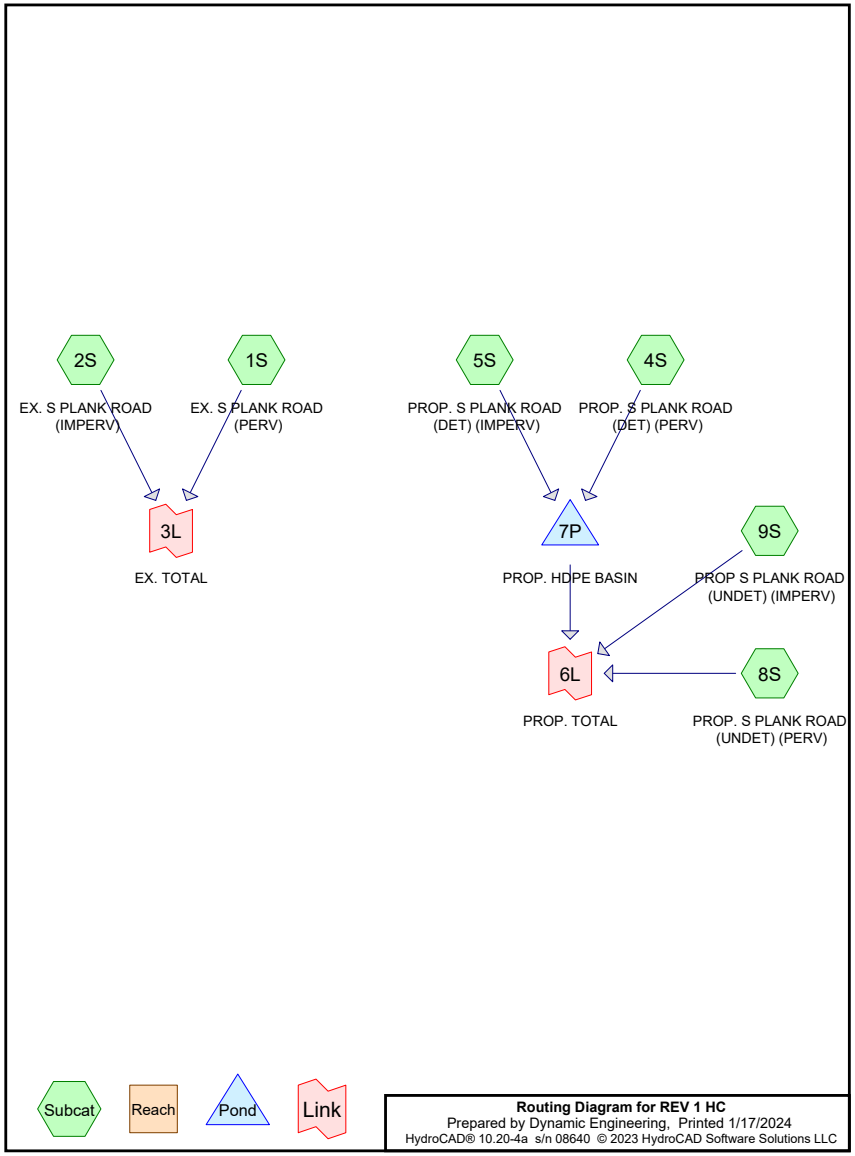
Component Percent Cutoff: None Specified

Tie-break Rule: Slowest

Interpret Nulls as Zero: No

Layer Options (Horizon Aggregation Method): All Layers (Weighted Average)

STORMWATER BASIN AREA INVESTIGATION REPORT, PREPARED BY DYNAMIC EARTH, LLC, DATED AUGUST 4, 2023



Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-Year	NRCC 24-hr	C	Default	24.00	1	2.64	2
2	10-Year	NRCC 24-hr	C	Default	24.00	1	4.80	2
3	100-Year	NRCC 24-hr	C	Default	24.00	1	8.57	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.866	49	50-75% Grass cover, Fair, HSG A (1S, 4S, 8S)
1.072	98	Paved parking, HSG A (2S, 5S, 9S)
1.938	**76**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
1.938	HSG A	1S, 2S, 4S, 5S, 8S, 9S
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
1.938		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.866	0.000	0.000	0.000	0.000	0.866	50-75% Grass cover, Fair	1S, 4S, 8S
1.072	0.000	0.000	0.000	0.000	1.072	Paved parking	2S, 5S, 9S
1.938	**0.000**	**0.000**	**0.000**	**0.000**	**1.938**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	1S	0.00	0.00	18.0	0.0220	0.011	0.0	15.0	0.0	
2	5S	0.00	0.00	26.0	0.0050	0.012	0.0	15.0	0.0	
3	5S	0.00	0.00	6.0	0.0041	0.012	0.0	15.0	0.0	
4	7P	358.00	353.50	61.0	0.0738	0.011	0.0	15.0	0.0	

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: EX. S PLANK ROAD Runoff Area=21,375 sf 0.00% Impervious Runoff Depth=0.03"
Flow Length=299' Tc=5.5 min CN=49 Runoff=0.00 cfs 0.001 af

Subcatchment2S: EX. S PLANK ROAD Runoff Area=20,837 sf 100.00% Impervious Runoff Depth=2.41"
Tc=5.5 min CN=98 Runoff=1.25 cfs 0.096 af

Subcatchment4S: PROP. S PLANK ROAD Runoff Area=8,798 sf 0.00% Impervious Runoff Depth=0.03"
Tc=5.9 min CN=49 Runoff=0.00 cfs 0.000 af

Subcatchment5S: PROP. S PLANK Runoff Area=24,505 sf 100.00% Impervious Runoff Depth=2.41"
Flow Length=301' Tc=5.9 min CN=98 Runoff=1.46 cfs 0.113 af

Subcatchment8S: PROP. S PLANK ROAD Runoff Area=7,561 sf 0.00% Impervious Runoff Depth=0.03"
Flow Length=188' Tc=7.5 min CN=49 Runoff=0.00 cfs 0.000 af

Subcatchment9S: PROP S PLANK ROAD Runoff Area=1,348 sf 100.00% Impervious Runoff Depth=2.41"
Tc=7.5 min CN=98 Runoff=0.08 cfs 0.006 af

Pond 7P: PROP. HDPE BASIN Peak Elev=359.94' Storage=2,117 cf Inflow=1.46 cfs 0.113 af
Outflow=1.09 cfs 0.078 af

Link 3L: EX. TOTAL Inflow=1.25 cfs 0.097 af
Primary=1.25 cfs 0.097 af

Link 6L: PROP. TOTAL Inflow=1.15 cfs 0.084 af
Primary=1.15 cfs 0.084 af

Total Runoff Area = 1.938 ac Runoff Volume = 0.217 af Average Runoff Depth = 1.35"
44.70% Pervious = 0.866 ac 55.30% Impervious = 1.072 ac

Summary for Subcatchment 1S: EX. S PLANK ROAD (PERV)

[49] Hint: Tc<2dt may require smaller dt

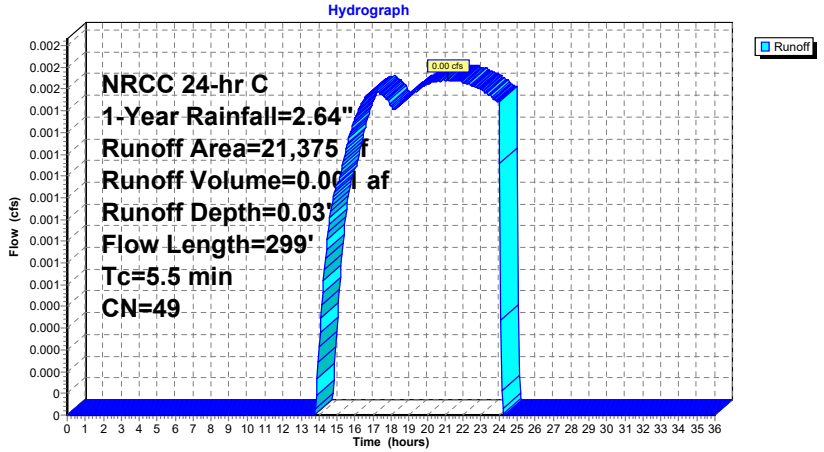
Runoff = 0.00 cfs @ 21.14 hrs, Volume= 0.001 af, Depth= 0.03"
Routed to Link 3L : EX. TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 1-Year Rainfall=2.64"

Area (sf)	CN	Description
21,375	49	50-75% Grass cover, Fair, HSG A
21,375		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	100	0.1150	0.34		**Sheet Flow, A-B SHEET** Grass: Short n= 0.150 P2= 3.21"
0.2	61	0.0902	4.84		**Shallow Concentrated Flow, B-C SCF** Unpaved Kv= 16.1 fps
0.4	120	0.0542	4.73		**Shallow Concentrated Flow, C-D SCF** Paved Kv= 20.3 fps
0.0	18	0.0220	9.23	11.32	**Pipe Channel, D-E PIPE** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011 Concrete pipe, straight & clean
5.5	299	Total			

Subcatchment 1S: EX. S PLANK ROAD (PERV)



Hydrograph for Subcatchment 1S: EX. S PLANK ROAD (PERV)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.00	2.64	0.03	0.00
0.50	0.01	0.00	0.00	26.50	2.64	0.03	0.00
1.00	0.03	0.00	0.00	27.00	2.64	0.03	0.00
1.50	0.05	0.00	0.00	27.50	2.64	0.03	0.00
2.00	0.06	0.00	0.00	28.00	2.64	0.03	0.00
2.50	0.08	0.00	0.00	28.50	2.64	0.03	0.00
3.00	0.10	0.00	0.00	29.00	2.64	0.03	0.00
3.50	0.12	0.00	0.00	29.50	2.64	0.03	0.00
4.00	0.14	0.00	0.00	30.00	2.64	0.03	0.00
4.50	0.16	0.00	0.00	30.50	2.64	0.03	0.00
5.00	0.18	0.00	0.00	31.00	2.64	0.03	0.00
5.50	0.20	0.00	0.00	31.50	2.64	0.03	0.00
6.00	0.23	0.00	0.00	32.00	2.64	0.03	0.00
6.50	0.25	0.00	0.00	32.50	2.64	0.03	0.00
7.00	0.28	0.00	0.00	33.00	2.64	0.03	0.00
7.50	0.31	0.00	0.00	33.50	2.64	0.03	0.00
8.00	0.34	0.00	0.00	34.00	2.64	0.03	0.00
8.50	0.38	0.00	0.00	34.50	2.64	0.03	0.00
9.00	0.42	0.00	0.00	35.00	2.64	0.03	0.00
9.50	0.46	0.00	0.00	35.50	2.64	0.03	0.00
10.00	0.52	0.00	0.00	36.00	2.64	0.03	0.00
10.50	0.59	0.00	0.00				
11.00	0.68	0.00	0.00				
11.50	0.83	0.00	0.00				
12.00	1.26	0.00	0.00				
12.50	1.81	0.00	0.00				
13.00	1.96	0.00	0.00				
13.50	2.05	0.00	0.00				
14.00	2.12	0.00	0.00				
14.50	2.18	0.00	0.00				
15.00	2.22	0.00	0.00				
15.50	2.26	0.00	0.00				
16.00	2.30	0.00	0.00				
16.50	2.33	0.01	0.00				
17.00	2.36	0.01	0.00				
17.50	2.39	0.01	0.00				
18.00	2.41	0.01	0.00				
18.50	2.44	0.01	0.00				
19.00	2.46	0.01	0.00				
19.50	2.48	0.01	0.00				
20.00	2.50	0.02	0.00				
20.50	2.52	0.02	0.00				
21.00	2.54	0.02	**0.00**				
21.50	2.56	0.02	**0.00**				
22.00	2.58	0.02	0.00				
22.50	2.59	0.02	0.00				
23.00	2.61	0.03	0.00				
23.50	2.63	0.03	0.00				
24.00	**2.64**	**0.03**	0.00				
24.50	2.64	0.03	0.00				
25.00	2.64	0.03	0.00				
25.50	2.64	0.03	0.00				

Summary for Subcatchment 2S: EX. S PLANK ROAD (IMPERV)

[49] Hint: Tc<2dt may require smaller dt

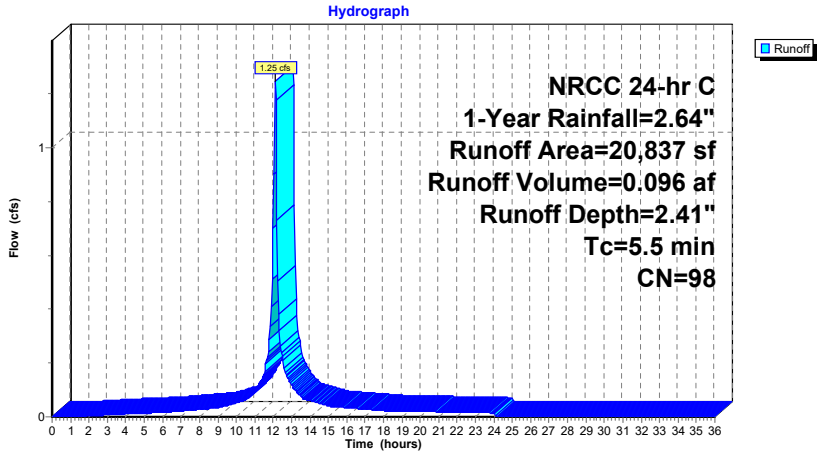
Runoff = 1.25 cfs @ 12.12 hrs, Volume= 0.096 af, Depth= 2.41"
Routed to Link 3L : EX. TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 1-Year Rainfall=2.64"

Area (sf)	CN	Description
20,837	98	Paved parking, HSG A
20,837		100.00% Impervious Area

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

Subcatchment 2S: EX. S PLANK ROAD (IMPERV)



Hydrograph for Subcatchment 2S: EX. S PLANK ROAD (IMPERV)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.00	2.64	2.41	0.00
0.50	0.01	0.00	0.00	26.50	2.64	2.41	0.00
1.00	0.03	0.00	0.00	27.00	2.64	2.41	0.00
1.50	0.05	0.00	0.00	27.50	2.64	2.41	0.00
2.00	0.06	0.00	0.00	28.00	2.64	2.41	0.00
2.50	0.08	0.01	0.01	28.50	2.64	2.41	0.00
3.00	0.10	0.01	0.01	29.00	2.64	2.41	0.00
3.50	0.12	0.02	0.01	29.50	2.64	2.41	0.00
4.00	0.14	0.03	0.01	30.00	2.64	2.41	0.00
4.50	0.16	0.04	0.01	30.50	2.64	2.41	0.00
5.00	0.18	0.06	0.01	31.00	2.64	2.41	0.00
5.50	0.20	0.07	0.01	31.50	2.64	2.41	0.00
6.00	0.23	0.09	0.02	32.00	2.64	2.41	0.00
6.50	0.25	0.11	0.02	32.50	2.64	2.41	0.00
7.00	0.28	0.13	0.02	33.00	2.64	2.41	0.00
7.50	0.31	0.15	0.02	33.50	2.64	2.41	0.00
8.00	0.34	0.18	0.03	34.00	2.64	2.41	0.00
8.50	0.38	0.21	0.03	34.50	2.64	2.41	0.00
9.00	0.42	0.25	0.03	35.00	2.64	2.41	0.00
9.50	0.46	0.29	0.04	35.50	2.64	2.41	0.00
10.00	0.52	0.34	0.05	36.00	2.64	2.41	0.00
10.50	0.59	0.40	0.06				
11.00	0.68	0.49	0.10				
11.50	0.83	0.62	0.15				
12.00	1.26	1.04	**0.70**				
12.50	1.81	1.59	**0.22**				
13.00	1.96	1.73	0.12				
13.50	2.05	1.83	0.08				
14.00	2.12	1.89	0.06				
14.50	2.18	1.95	0.05				
15.00	2.22	1.99	0.04				
15.50	2.26	2.03	0.04				
16.00	2.30	2.07	0.03				
16.50	2.33	2.10	0.03				
17.00	2.36	2.13	0.03				
17.50	2.39	2.16	0.03				
18.00	2.41	2.18	0.02				
18.50	2.44	2.21	0.02				
19.00	2.46	2.23	0.02				
19.50	2.48	2.25	0.02				
20.00	2.50	2.27	0.02				
20.50	2.52	2.29	0.02				
21.00	2.54	2.31	0.02				
21.50	2.56	2.33	0.02				
22.00	2.58	2.35	0.02				
22.50	2.59	2.36	0.02				
23.00	2.61	2.38	0.02				
23.50	2.63	2.40	0.01				
24.00	**2.64**	**2.41**	0.01				
24.50	2.64	2.41	0.00				
25.00	2.64	2.41	0.00				
25.50	2.64	2.41	0.00				

Summary for Subcatchment 4S: PROP. S PLANK ROAD (DET) (PERV)

[49] Hint: Tc<2dt may require smaller dt

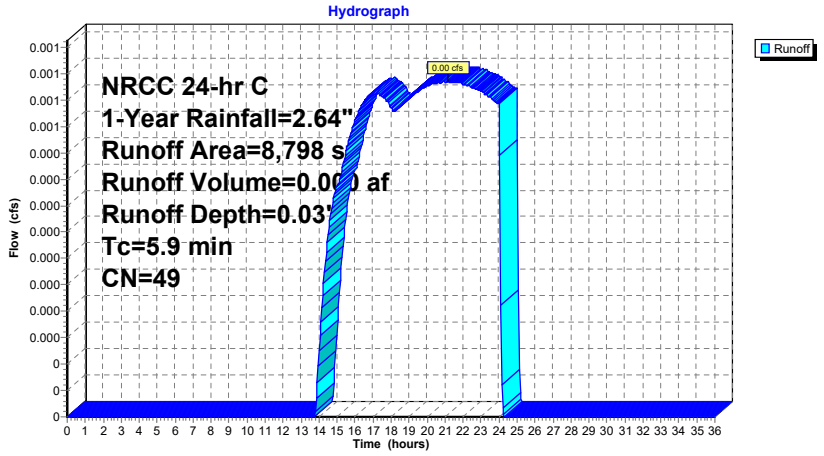
Runoff = 0.00 cfs @ 21.14 hrs, Volume= 0.000 af, Depth= 0.03"
Routed to Pond 7P : PROP. HDPE BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 1-Year Rainfall=2.64"

Area (sf)	CN	Description
8,798	49	50-75% Grass cover, Fair, HSG A
8,798		100.00% Pervious Area

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

Subcatchment 4S: PROP. S PLANK ROAD (DET) (PERV)



Hydrograph for Subcatchment 4S: PROP. S PLANK ROAD (DET) (PERV)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.00	2.64	0.03	0.00
0.50	0.01	0.00	0.00	26.50	2.64	0.03	0.00
1.00	0.03	0.00	0.00	27.00	2.64	0.03	0.00
1.50	0.05	0.00	0.00	27.50	2.64	0.03	0.00
2.00	0.06	0.00	0.00	28.00	2.64	0.03	0.00
2.50	0.08	0.00	0.00	28.50	2.64	0.03	0.00
3.00	0.10	0.00	0.00	29.00	2.64	0.03	0.00
3.50	0.12	0.00	0.00	29.50	2.64	0.03	0.00
4.00	0.14	0.00	0.00	30.00	2.64	0.03	0.00
4.50	0.16	0.00	0.00	30.50	2.64	0.03	0.00
5.00	0.18	0.00	0.00	31.00	2.64	0.03	0.00
5.50	0.20	0.00	0.00	31.50	2.64	0.03	0.00
6.00	0.23	0.00	0.00	32.00	2.64	0.03	0.00
6.50	0.25	0.00	0.00	32.50	2.64	0.03	0.00
7.00	0.28	0.00	0.00	33.00	2.64	0.03	0.00
7.50	0.31	0.00	0.00	33.50	2.64	0.03	0.00
8.00	0.34	0.00	0.00	34.00	2.64	0.03	0.00
8.50	0.38	0.00	0.00	34.50	2.64	0.03	0.00
9.00	0.42	0.00	0.00	35.00	2.64	0.03	0.00
9.50	0.46	0.00	0.00	35.50	2.64	0.03	0.00
10.00	0.52	0.00	0.00	36.00	2.64	0.03	0.00
10.50	0.59	0.00	0.00				
11.00	0.68	0.00	0.00				
11.50	0.83	0.00	0.00				
12.00	1.26	0.00	0.00				
12.50	1.81	0.00	0.00				
13.00	1.96	0.00	0.00				
13.50	2.05	0.00	0.00				
14.00	2.12	0.00	0.00				
14.50	2.18	0.00	0.00				
15.00	2.22	0.00	0.00				
15.50	2.26	0.00	0.00				
16.00	2.30	0.00	0.00				
16.50	2.33	0.01	0.00				
17.00	2.36	0.01	0.00				
17.50	2.39	0.01	0.00				
18.00	2.41	0.01	0.00				
18.50	2.44	0.01	0.00				
19.00	2.46	0.01	0.00				
19.50	2.48	0.01	0.00				
20.00	2.50	0.02	0.00				
20.50	2.52	0.02	0.00				
21.00	2.54	0.02	**0.00**				
21.50	2.56	0.02	**0.00**				
22.00	2.58	0.02	0.00				
22.50	2.59	0.02	0.00				
23.00	2.61	0.03	0.00				
23.50	2.63	0.03	0.00				
24.00	**2.64**	**0.03**	0.00				
24.50	2.64	0.03	0.00				
25.00	2.64	0.03	0.00				
25.50	2.64	0.03	0.00				

Summary for Subcatchment 5S: PROP. S PLANK ROAD (DET) (IMPERV)

[49] Hint: Tc<2dt may require smaller dt

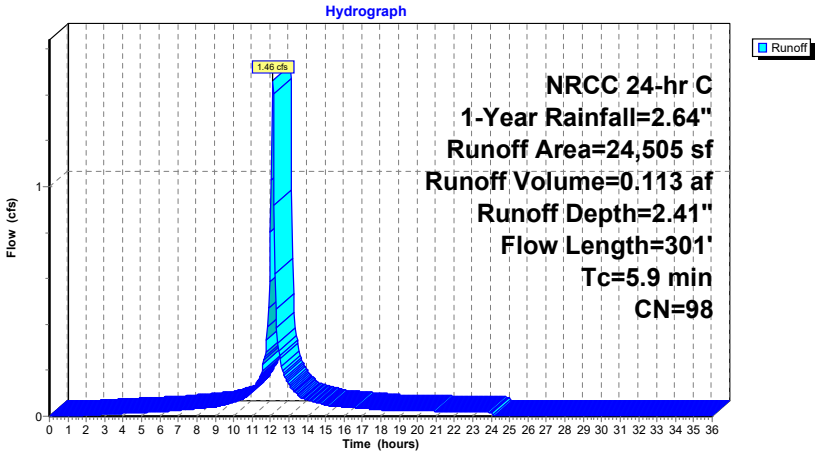
Runoff = 1.46 cfs @ 12.13 hrs, Volume= 0.113 af, Depth= 2.41"
Routed to Pond 7P : PROP. HDPE BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 1-Year Rainfall=2.64"

Area (sf)	CN	Description
24,505	98	Paved parking, HSG A
24,505		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	74	0.0890	0.29		**Sheet Flow, A-B SHEET** Grass: Short n= 0.150 P2= 3.21"
0.5	26	0.0150	0.94		**Sheet Flow, B-C SHEET** Smooth surfaces n= 0.011 P2= 3.21"
1.1	169	0.0150	2.49		**Shallow Concentrated Flow, C-D SCF** Paved Kv= 20.3 fps
0.1	26	0.0050	4.03	4.95	**Pipe Channel, D-E PIPE** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.0	6	0.0041	3.65	4.48	**Pipe Channel, E-F PIPE** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
5.9	301	Total			

Subcatchment 5S: PROP. S PLANK ROAD (DET) (IMPERV)



Hydrograph for Subcatchment 5S: PROP. S PLANK ROAD (DET) (IMPERV)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.00	2.64	2.41	0.00
0.50	0.01	0.00	0.00	26.50	2.64	2.41	0.00
1.00	0.03	0.00	0.00	27.00	2.64	2.41	0.00
1.50	0.05	0.00	0.00	27.50	2.64	2.41	0.00
2.00	0.06	0.00	0.00	28.00	2.64	2.41	0.00
2.50	0.08	0.01	0.01	28.50	2.64	2.41	0.00
3.00	0.10	0.01	0.01	29.00	2.64	2.41	0.00
3.50	0.12	0.02	0.01	29.50	2.64	2.41	0.00
4.00	0.14	0.03	0.01	30.00	2.64	2.41	0.00
4.50	0.16	0.04	0.01	30.50	2.64	2.41	0.00
5.00	0.18	0.06	0.02	31.00	2.64	2.41	0.00
5.50	0.20	0.07	0.02	31.50	2.64	2.41	0.00
6.00	0.23	0.09	0.02	32.00	2.64	2.41	0.00
6.50	0.25	0.11	0.02	32.50	2.64	2.41	0.00
7.00	0.28	0.13	0.03	33.00	2.64	2.41	0.00
7.50	0.31	0.15	0.03	33.50	2.64	2.41	0.00
8.00	0.34	0.18	0.03	34.00	2.64	2.41	0.00
8.50	0.38	0.21	0.04	34.50	2.64	2.41	0.00
9.00	0.42	0.25	0.04	35.00	2.64	2.41	0.00
9.50	0.46	0.29	0.05	35.50	2.64	2.41	0.00
10.00	0.52	0.34	0.06	36.00	2.64	2.41	0.00
10.50	0.59	0.40	0.07				
11.00	0.68	0.49	0.11				
11.50	0.83	0.62	0.18				
12.00	1.26	1.04	**0.80**				
12.50	1.81	1.59	**0.27**				
13.00	1.96	1.73	0.14				
13.50	2.05	1.83	0.09				
14.00	2.12	1.89	0.07				
14.50	2.18	1.95	0.06				
15.00	2.22	1.99	0.05				
15.50	2.26	2.03	0.04				
16.00	2.30	2.07	0.04				
16.50	2.33	2.10	0.04				
17.00	2.36	2.13	0.03				
17.50	2.39	2.16	0.03				
18.00	2.41	2.18	0.03				
18.50	2.44	2.21	0.03				
19.00	2.46	2.23	0.02				
19.50	2.48	2.25	0.02				
20.00	2.50	2.27	0.02				
20.50	2.52	2.29	0.02				
21.00	2.54	2.31	0.02				
21.50	2.56	2.33	0.02				
22.00	2.58	2.35	0.02				
22.50	2.59	2.36	0.02				
23.00	2.61	2.38	0.02				
23.50	2.63	2.40	0.02				
24.00	**2.64**	**2.41**	0.02				
24.50	2.64	2.41	0.00				
25.00	2.64	2.41	0.00				
25.50	2.64	2.41	0.00				

Summary for Subcatchment 8S: PROP. S PLANK ROAD (UNDET) (PERV)

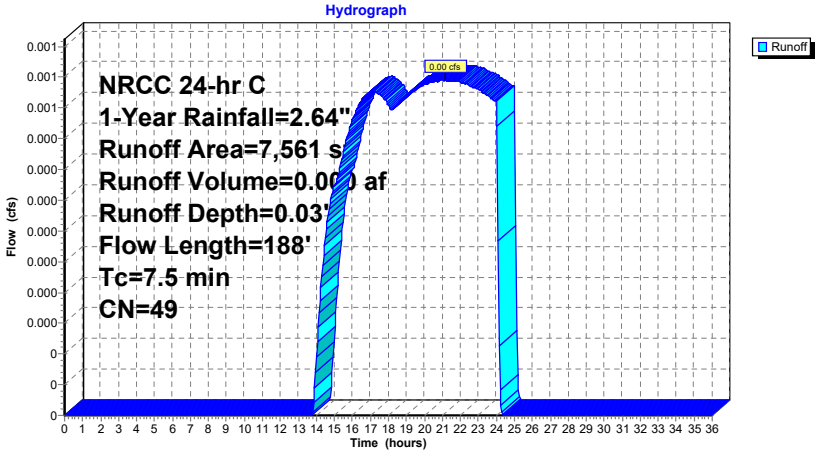
Runoff = 0.00 cfs @ 21.15 hrs, Volume= 0.000 af, Depth= 0.03"
Routed to Link 6L : PROP. TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 1-Year Rainfall=2.64"

Area (sf)	CN	Description
7,561	49	50-75% Grass cover, Fair, HSG A
7,561		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	100	0.0450	0.24		**Sheet Flow, A-B SHEET** Grass: Short n= 0.150 P2= 3.21"
0.1	27	0.0500	4.54		**Shallow Concentrated Flow, B-C SCF** Paved Kv= 20.3 fps
0.2	43	0.0500	3.60		**Shallow Concentrated Flow, C-D SCF** Unpaved Kv= 16.1 fps
0.1	18	0.0500	4.54		**Shallow Concentrated Flow, D-E SCF** Paved Kv= 20.3 fps
7.5	188	Total			

Subcatchment 8S: PROP. S PLANK ROAD (UNDET) (PERV)



Hydrograph for Subcatchment 8S: PROP. S PLANK ROAD (UNDET) (PERV)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.00	2.64	0.03	0.00
0.50	0.01	0.00	0.00	26.50	2.64	0.03	0.00
1.00	0.03	0.00	0.00	27.00	2.64	0.03	0.00
1.50	0.05	0.00	0.00	27.50	2.64	0.03	0.00
2.00	0.06	0.00	0.00	28.00	2.64	0.03	0.00
2.50	0.08	0.00	0.00	28.50	2.64	0.03	0.00
3.00	0.10	0.00	0.00	29.00	2.64	0.03	0.00
3.50	0.12	0.00	0.00	29.50	2.64	0.03	0.00
4.00	0.14	0.00	0.00	30.00	2.64	0.03	0.00
4.50	0.16	0.00	0.00	30.50	2.64	0.03	0.00
5.00	0.18	0.00	0.00	31.00	2.64	0.03	0.00
5.50	0.20	0.00	0.00	31.50	2.64	0.03	0.00
6.00	0.23	0.00	0.00	32.00	2.64	0.03	0.00
6.50	0.25	0.00	0.00	32.50	2.64	0.03	0.00
7.00	0.28	0.00	0.00	33.00	2.64	0.03	0.00
7.50	0.31	0.00	0.00	33.50	2.64	0.03	0.00
8.00	0.34	0.00	0.00	34.00	2.64	0.03	0.00
8.50	0.38	0.00	0.00	34.50	2.64	0.03	0.00
9.00	0.42	0.00	0.00	35.00	2.64	0.03	0.00
9.50	0.46	0.00	0.00	35.50	2.64	0.03	0.00
10.00	0.52	0.00	0.00	36.00	2.64	0.03	0.00
10.50	0.59	0.00	0.00				
11.00	0.68	0.00	0.00				
11.50	0.83	0.00	0.00				
12.00	1.26	0.00	0.00				
12.50	1.81	0.00	0.00				
13.00	1.96	0.00	0.00				
13.50	2.05	0.00	0.00				
14.00	2.12	0.00	0.00				
14.50	2.18	0.00	0.00				
15.00	2.22	0.00	0.00				
15.50	2.26	0.00	0.00				
16.00	2.30	0.00	0.00				
16.50	2.33	0.01	0.00				
17.00	2.36	0.01	0.00				
17.50	2.39	0.01	0.00				
18.00	2.41	0.01	0.00				
18.50	2.44	0.01	0.00				
19.00	2.46	0.01	0.00				
19.50	2.48	0.01	0.00				
20.00	2.50	0.02	0.00				
20.50	2.52	0.02	0.00				
21.00	2.54	0.02	**0.00**				
21.50	2.56	0.02	**0.00**				
22.00	2.58	0.02	0.00				
22.50	2.59	0.02	0.00				
23.00	2.61	0.03	0.00				
23.50	2.63	0.03	0.00				
24.00	**2.64**	**0.03**	0.00				
24.50	2.64	0.03	0.00				
25.00	2.64	0.03	0.00				
25.50	2.64	0.03	0.00				

Summary for Subcatchment 9S: PROP S PLANK ROAD (UNDET) (IMPERV)

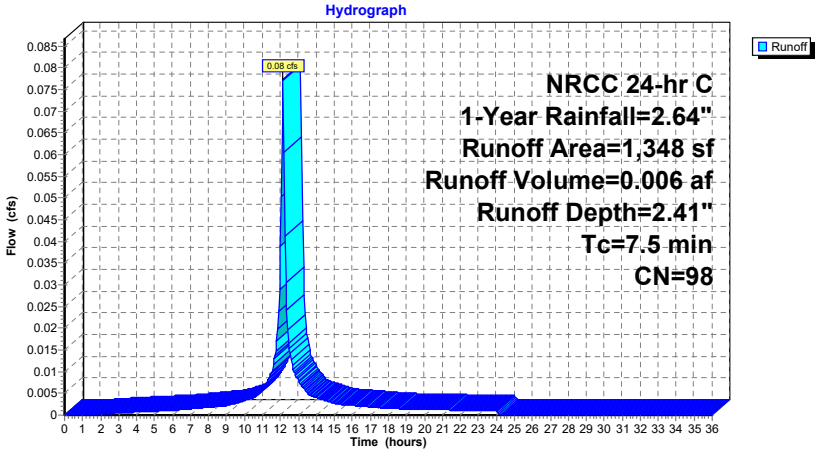
Runoff = 0.08 cfs @ 12.14 hrs, Volume= 0.006 af, Depth= 2.41"
Routed to Link 6L : PROP. TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 1-Year Rainfall=2.64"

Area (sf)	CN	Description
1,348	98	Paved parking, HSG A
1,348		100.00% Impervious Area

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

Subcatchment 9S: PROP S PLANK ROAD (UNDET) (IMPERV)



Hydrograph for Subcatchment 9S: PROP S PLANK ROAD (UNDET) (IMPERV)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.00	2.64	2.41	0.00
0.50	0.01	0.00	0.00	26.50	2.64	2.41	0.00
1.00	0.03	0.00	0.00	27.00	2.64	2.41	0.00
1.50	0.05	0.00	0.00	27.50	2.64	2.41	0.00
2.00	0.06	0.00	0.00	28.00	2.64	2.41	0.00
2.50	0.08	0.01	0.00	28.50	2.64	2.41	0.00
3.00	0.10	0.01	0.00	29.00	2.64	2.41	0.00
3.50	0.12	0.02	0.00	29.50	2.64	2.41	0.00
4.00	0.14	0.03	0.00	30.00	2.64	2.41	0.00
4.50	0.16	0.04	0.00	30.50	2.64	2.41	0.00
5.00	0.18	0.06	0.00	31.00	2.64	2.41	0.00
5.50	0.20	0.07	0.00	31.50	2.64	2.41	0.00
6.00	0.23	0.09	0.00	32.00	2.64	2.41	0.00
6.50	0.25	0.11	0.00	32.50	2.64	2.41	0.00
7.00	0.28	0.13	0.00	33.00	2.64	2.41	0.00
7.50	0.31	0.15	0.00	33.50	2.64	2.41	0.00
8.00	0.34	0.18	0.00	34.00	2.64	2.41	0.00
8.50	0.38	0.21	0.00	34.50	2.64	2.41	0.00
9.00	0.42	0.25	0.00	35.00	2.64	2.41	0.00
9.50	0.46	0.29	0.00	35.50	2.64	2.41	0.00
10.00	0.52	0.34	0.00	36.00	2.64	2.41	0.00
10.50	0.59	0.40	0.00				
11.00	0.68	0.49	0.01				
11.50	0.83	0.62	0.01				
12.00	1.26	1.04	**0.04**				
12.50	1.81	1.59	**0.02**				
13.00	1.96	1.73	0.01				
13.50	2.05	1.83	0.01				
14.00	2.12	1.89	0.00				
14.50	2.18	1.95	0.00				
15.00	2.22	1.99	0.00				
15.50	2.26	2.03	0.00				
16.00	2.30	2.07	0.00				
16.50	2.33	2.10	0.00				
17.00	2.36	2.13	0.00				
17.50	2.39	2.16	0.00				
18.00	2.41	2.18	0.00				
18.50	2.44	2.21	0.00				
19.00	2.46	2.23	0.00				
19.50	2.48	2.25	0.00				
20.00	2.50	2.27	0.00				
20.50	2.52	2.29	0.00				
21.00	2.54	2.31	0.00				
21.50	2.56	2.33	0.00				
22.00	2.58	2.35	0.00				
22.50	2.59	2.36	0.00				
23.00	2.61	2.38	0.00				
23.50	2.63	2.40	0.00				
24.00	**2.64**	**2.41**	0.00				
24.50	2.64	2.41	0.00				
25.00	2.64	2.41	0.00				
25.50	2.64	2.41	0.00				

Summary for Pond 7P: PROP. HDPE BASIN

Inflow Area = 0.765 ac, 73.58% Impervious, Inflow Depth = 1.78" for 1-Year event
Inflow = 1.46 cfs @ 12.13 hrs, Volume= 0.113 af
Outflow = 1.09 cfs @ 12.19 hrs, Volume= 0.078 af, Atten= 26%, Lag= 3.9 min
Primary = 1.09 cfs @ 12.19 hrs, Volume= 0.078 af
Routed to Link 6L : PROP. TOTAL

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 359.94' @ 12.19 hrs Surf.Area= 1,453 sf Storage= 2,117 cf

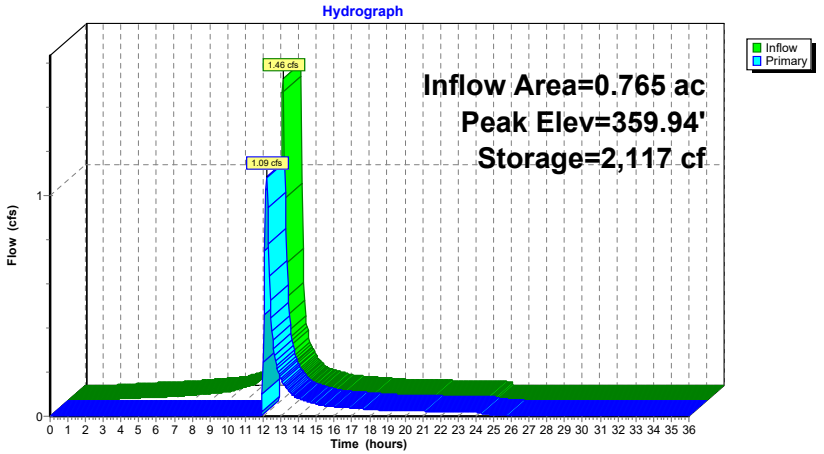
Plug-Flow detention time= 219.2 min calculated for 0.078 af (69% of inflow)
Center-of-Mass det. time= 113.7 min (878.4 - 764.6)

Volume	Invert	Avail.Storage	Storage Description
#1	358.00'	1,696 cf	**36.0" Round Pipe Storage** x 3 Inside #2 L= 80.0' 2,309 cf Overall - 3.0" Wall Thickness = 1,696 cf
#2	357.25'	1,691 cf	**17.50'W x 83.00'L x 4.50'H Prismatoid** 6,536 cf Overall - 2,309 cf Embedded = 4,227 cf x 40.0% Voids
		3,387 cf	Total Available Storage

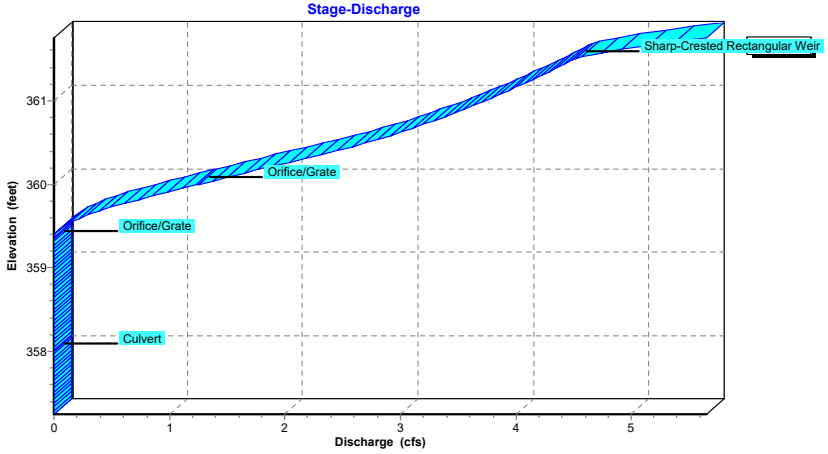
Device	Routing	Invert	Outlet Devices
#1	Primary	358.00'	**15.0" Round Culvert** L= 61.0' Ke= 0.500 Inlet / Outlet Invert= 358.00' / 353.50' S= 0.0738 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf
#2	Device 1	359.35'	**10.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	360.00'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	361.50'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=1.07 cfs @ 12.19 hrs HW=359.94' (Free Discharge)
└**1=Culvert** (Passes 1.07 cfs of 6.77 cfs potential flow)
  └**2=Orifice/Grate** (Orifice Controls 1.07 cfs @ 2.61 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)
  └**4=Sharp-Crested Rectangular Weir**(Controls 0.00 cfs)

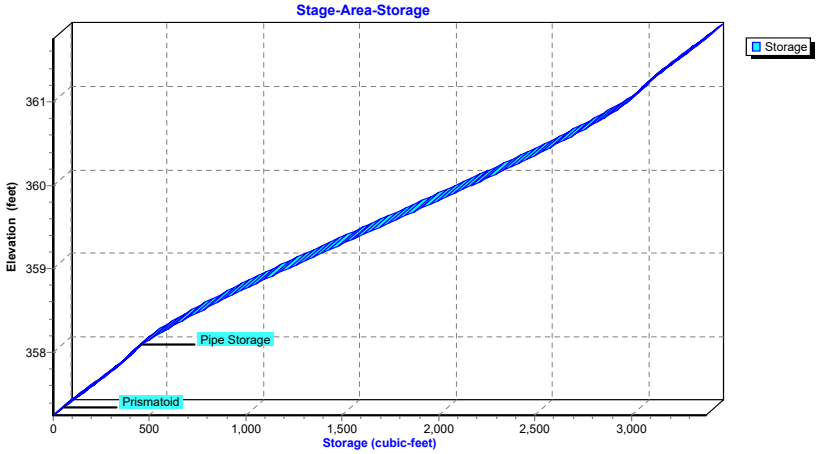
Pond 7P: PROP. HDPE BASIN



Pond 7P: PROP. HDPE BASIN



Pond 7P: PROP. HDPE BASIN



Hydrograph for Pond 7P: PROP. HDPE BASIN

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	357.25	0.00
1.00	0.00	0	357.25	0.00
2.00	0.00	4	357.26	0.00
3.00	0.01	25	357.29	0.00
4.00	0.01	62	357.36	0.00
5.00	0.02	112	357.44	0.00
6.00	0.02	174	357.55	0.00
7.00	0.03	254	357.69	0.00
8.00	0.03	358	357.89	0.00
9.00	0.04	488	358.14	0.00
10.00	0.06	669	358.38	0.00
11.00	0.11	954	358.71	0.00
12.00	**0.80**	**1,795**	**359.60**	**0.24**
13.00	**0.14**	**1,753**	**359.56**	**0.17**
14.00	0.07	1,686	359.49	0.08
15.00	0.05	1,661	359.47	0.06
16.00	0.04	1,649	359.45	0.04
17.00	0.03	1,639	359.44	0.04
18.00	0.03	1,630	359.43	0.03
19.00	0.03	1,624	359.43	0.03
20.00	0.02	1,621	359.42	0.02
21.00	0.02	1,619	359.42	0.02
22.00	0.02	1,617	359.42	0.02
23.00	0.02	1,614	359.42	0.02
24.00	0.02	1,612	359.42	0.02
25.00	0.00	1,579	359.38	0.01
26.00	0.00	1,566	359.37	0.00
27.00	0.00	1,562	359.36	0.00
28.00	0.00	1,559	359.36	0.00
29.00	0.00	1,557	359.36	0.00
30.00	0.00	1,556	359.36	0.00
31.00	0.00	1,554	359.36	0.00
32.00	0.00	1,553	359.35	0.00
33.00	0.00	1,552	359.35	0.00
34.00	0.00	1,552	359.35	0.00
35.00	0.00	1,551	359.35	0.00
36.00	0.00	1,551	359.35	0.00

Stage-Discharge for Pond 7P: PROP. HDPE BASIN

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
357.25	0.00	359.85	0.82
357.30	0.00	359.90	0.96
357.35	0.00	359.95	1.11
357.40	0.00	360.00	1.25
357.45	0.00	360.05	1.40
357.50	0.00	360.10	1.55
357.55	0.00	360.15	1.70
357.60	0.00	360.20	1.84
357.65	0.00	360.25	1.99
357.70	0.00	360.30	2.15
357.75	0.00	360.35	2.30
357.80	0.00	360.40	2.45
357.85	0.00	360.45	2.60
357.90	0.00	360.50	2.72
357.95	0.00	360.55	2.84
358.00	0.00	360.60	2.96
358.05	0.00	360.65	3.07
358.10	0.00	360.70	3.17
358.15	0.00	360.75	3.27
358.20	0.00	360.80	3.37
358.25	0.00	360.85	3.47
358.30	0.00	360.90	3.56
358.35	0.00	360.95	3.65
358.40	0.00	361.00	3.74
358.45	0.00	361.05	3.82
358.50	0.00	361.10	3.90
358.55	0.00	361.15	3.99
358.60	0.00	361.20	4.07
358.65	0.00	361.25	4.14
358.70	0.00	361.30	4.22
358.75	0.00	361.35	4.30
358.80	0.00	361.40	4.37
358.85	0.00	361.45	4.44
358.90	0.00	361.50	4.51
358.95	0.00	361.55	4.66
359.00	0.00	361.60	4.86
359.05	0.00	361.65	5.10
359.10	0.00	361.70	5.36
359.15	0.00	361.75	**5.65**
359.20	0.00		
359.25	0.00		
359.30	0.00		
359.35	0.00		
359.40	0.01		
359.45	0.04		
359.50	0.09		
359.55	0.15		
359.60	0.23		
359.65	0.33		
359.70	0.44		
359.75	0.56		
359.80	0.69		

Stage-Area-Storage for Pond 7P: PROP. HDPE BASIN

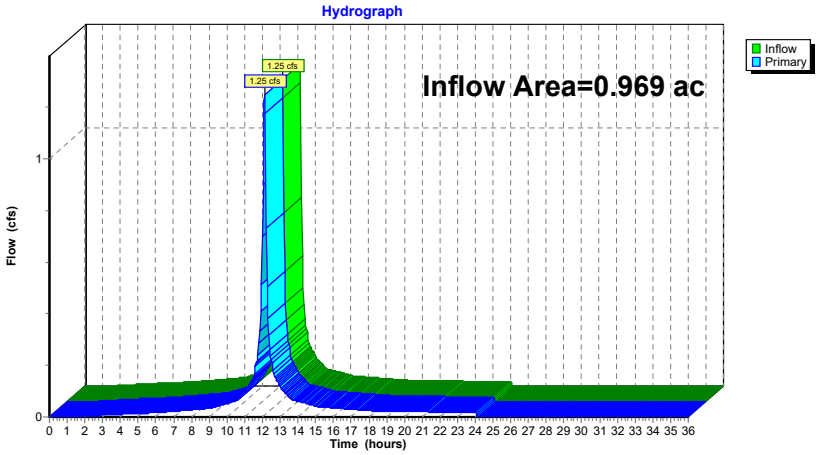
Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
357.25	0	359.85	2,030
357.30	29	359.90	2,077
357.35	58	359.95	2,125
357.40	87	360.00	2,172
357.45	116	360.05	2,218
357.50	145	360.10	2,265
357.55	174	360.15	2,311
357.60	203	360.20	2,357
357.65	232	360.25	2,402
357.70	261	360.30	2,447
357.75	291	360.35	2,491
357.80	317	360.40	2,535
357.85	341	360.45	2,578
357.90	364	360.50	2,620
357.95	386	360.55	2,662
358.00	406	360.60	2,703
358.05	433	360.65	2,743
358.10	463	360.70	2,782
358.15	496	360.75	2,820
358.20	531	360.80	2,856
358.25	568	360.85	2,891
358.30	605	360.90	2,924
358.35	644	360.95	2,955
358.40	684	361.00	2,981
358.45	725	361.05	3,002
358.50	767	361.10	3,023
358.55	809	361.15	3,046
358.60	853	361.20	3,070
358.65	896	361.25	3,097
358.70	941	361.30	3,126
358.75	985	361.35	3,155
358.80	1,031	361.40	3,184
358.85	1,076	361.45	3,213
358.90	1,122	361.50	3,242
358.95	1,169	361.55	3,271
359.00	1,216	361.60	3,300
359.05	1,263	361.65	3,329
359.10	1,310	361.70	3,358
359.15	1,357	361.75	**3,387**
359.20	1,405		
359.25	1,453		
359.30	1,501		
359.35	1,549		
359.40	1,597		
359.45	1,645		
359.50	1,694		
359.55	1,742		
359.60	1,790		
359.65	1,838		
359.70	1,886		
359.75	1,934		
359.80	1,982		

Summary for Link 3L: EX. TOTAL

Inflow Area = 0.969 ac, 49.36% Impervious, Inflow Depth = 1.20" for 1-Year event
Inflow = 1.25 cfs @ 12.12 hrs, Volume= 0.097 af
Primary = 1.25 cfs @ 12.12 hrs, Volume= 0.097 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Link 3L: EX. TOTAL



Hydrograph for Link 3L: EX. TOTAL

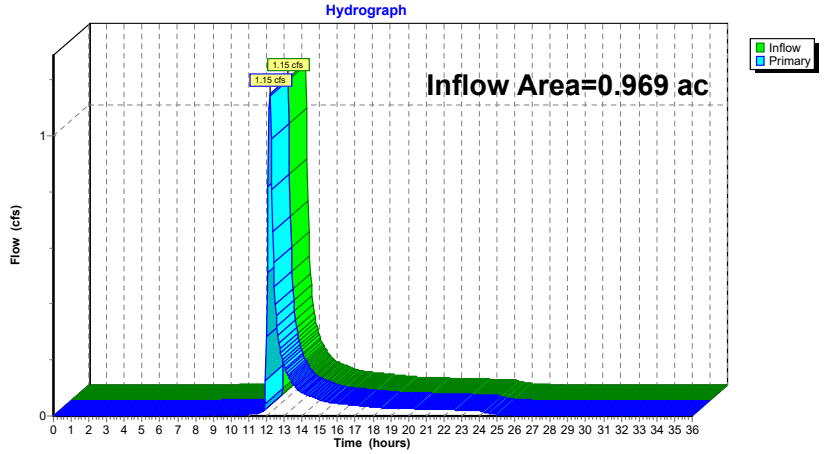
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	26.00	0.00	0.00	0.00
0.50	0.00	0.00	0.00	26.50	0.00	0.00	0.00
1.00	0.00	0.00	0.00	27.00	0.00	0.00	0.00
1.50	0.00	0.00	0.00	27.50	0.00	0.00	0.00
2.00	0.00	0.00	0.00	28.00	0.00	0.00	0.00
2.50	0.01	0.00	0.01	28.50	0.00	0.00	0.00
3.00	0.01	0.00	0.01	29.00	0.00	0.00	0.00
3.50	0.01	0.00	0.01	29.50	0.00	0.00	0.00
4.00	0.01	0.00	0.01	30.00	0.00	0.00	0.00
4.50	0.01	0.00	0.01	30.50	0.00	0.00	0.00
5.00	0.01	0.00	0.01	31.00	0.00	0.00	0.00
5.50	0.01	0.00	0.01	31.50	0.00	0.00	0.00
6.00	0.02	0.00	0.02	32.00	0.00	0.00	0.00
6.50	0.02	0.00	0.02	32.50	0.00	0.00	0.00
7.00	0.02	0.00	0.02	33.00	0.00	0.00	0.00
7.50	0.02	0.00	0.02	33.50	0.00	0.00	0.00
8.00	0.03	0.00	0.03	34.00	0.00	0.00	0.00
8.50	0.03	0.00	0.03	34.50	0.00	0.00	0.00
9.00	0.03	0.00	0.03	35.00	0.00	0.00	0.00
9.50	0.04	0.00	0.04	35.50	0.00	0.00	0.00
10.00	0.05	0.00	0.05	36.00	0.00	0.00	0.00
10.50	0.06	0.00	0.06				
11.00	0.10	0.00	0.10				
11.50	0.15	0.00	0.15				
12.00	**0.70**	0.00	**0.70**				
12.50	**0.22**	0.00	**0.22**				
13.00	0.12	0.00	0.12				
13.50	0.08	0.00	0.08				
14.00	0.06	0.00	0.06				
14.50	0.05	0.00	0.05				
15.00	0.04	0.00	0.04				
15.50	0.04	0.00	0.04				
16.00	0.04	0.00	0.04				
16.50	0.03	0.00	0.03				
17.00	0.03	0.00	0.03				
17.50	0.03	0.00	0.03				
18.00	0.02	0.00	0.02				
18.50	0.02	0.00	0.02				
19.00	0.02	0.00	0.02				
19.50	0.02	0.00	0.02				
20.00	0.02	0.00	0.02				
20.50	0.02	0.00	0.02				
21.00	0.02	0.00	0.02				
21.50	0.02	0.00	0.02				
22.00	0.02	0.00	0.02				
22.50	0.02	0.00	0.02				
23.00	0.02	0.00	0.02				
23.50	0.02	0.00	0.02				
24.00	0.02	0.00	0.02				
24.50	0.00	0.00	0.00				
25.00	0.00	0.00	0.00				
25.50	0.00	0.00	0.00				

Summary for Link 6L: PROP. TOTAL

Inflow Area = 0.969 ac, 61.25% Impervious, Inflow Depth = 1.05" for 1-Year event
Inflow = 1.15 cfs @ 12.19 hrs, Volume= 0.084 af
Primary = 1.15 cfs @ 12.19 hrs, Volume= 0.084 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Link 6L: PROP. TOTAL



Hydrograph for Link 6L: PROP. TOTAL

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	26.00	0.00	0.00	0.00
0.50	0.00	0.00	0.00	26.50	0.00	0.00	0.00
1.00	0.00	0.00	0.00	27.00	0.00	0.00	0.00
1.50	0.00	0.00	0.00	27.50	0.00	0.00	0.00
2.00	0.00	0.00	0.00	28.00	0.00	0.00	0.00
2.50	0.00	0.00	0.00	28.50	0.00	0.00	0.00
3.00	0.00	0.00	0.00	29.00	0.00	0.00	0.00
3.50	0.00	0.00	0.00	29.50	0.00	0.00	0.00
4.00	0.00	0.00	0.00	30.00	0.00	0.00	0.00
4.50	0.00	0.00	0.00	30.50	0.00	0.00	0.00
5.00	0.00	0.00	0.00	31.00	0.00	0.00	0.00
5.50	0.00	0.00	0.00	31.50	0.00	0.00	0.00
6.00	0.00	0.00	0.00	32.00	0.00	0.00	0.00
6.50	0.00	0.00	0.00	32.50	0.00	0.00	0.00
7.00	0.00	0.00	0.00	33.00	0.00	0.00	0.00
7.50	0.00	0.00	0.00	33.50	0.00	0.00	0.00
8.00	0.00	0.00	0.00	34.00	0.00	0.00	0.00
8.50	0.00	0.00	0.00	34.50	0.00	0.00	0.00
9.00	0.00	0.00	0.00	35.00	0.00	0.00	0.00
9.50	0.00	0.00	0.00	35.50	0.00	0.00	0.00
10.00	0.00	0.00	0.00	36.00	0.00	0.00	0.00
10.50	0.00	0.00	0.00				
11.00	0.01	0.00	0.01				
11.50	0.01	0.00	0.01				
12.00	**0.28**	0.00	**0.28**				
12.50	**0.40**	0.00	**0.40**				
13.00	0.18	0.00	0.18				
13.50	0.12	0.00	0.12				
14.00	0.08	0.00	0.08				
14.50	0.07	0.00	0.07				
15.00	0.06	0.00	0.06				
15.50	0.05	0.00	0.05				
16.00	0.05	0.00	0.05				
16.50	0.04	0.00	0.04				
17.00	0.04	0.00	0.04				
17.50	0.04	0.00	0.04				
18.00	0.03	0.00	0.03				
18.50	0.03	0.00	0.03				
19.00	0.03	0.00	0.03				
19.50	0.03	0.00	0.03				
20.00	0.03	0.00	0.03				
20.50	0.03	0.00	0.03				
21.00	0.02	0.00	0.02				
21.50	0.02	0.00	0.02				
22.00	0.02	0.00	0.02				
22.50	0.02	0.00	0.02				
23.00	0.02	0.00	0.02				
23.50	0.02	0.00	0.02				
24.00	0.02	0.00	0.02				
24.50	0.01	0.00	0.01				
25.00	0.01	0.00	0.01				
25.50	0.00	0.00	0.00				

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: EX. S PLANK ROAD Runoff Area=21,375 sf 0.00% Impervious Runoff Depth=0.56"
Flow Length=299' Tc=5.5 min CN=49 Runoff=0.21 cfs 0.023 af

Subcatchment2S: EX. S PLANK ROAD Runoff Area=20,837 sf 100.00% Impervious Runoff Depth=4.56"
Tc=5.5 min CN=98 Runoff=2.30 cfs 0.182 af

Subcatchment4S: PROP. S PLANK ROAD Runoff Area=8,798 sf 0.00% Impervious Runoff Depth=0.56"
Tc=5.9 min CN=49 Runoff=0.09 cfs 0.009 af

Subcatchment5S: PROP. S PLANK Runoff Area=24,505 sf 100.00% Impervious Runoff Depth=4.56"
Flow Length=301' Tc=5.9 min CN=98 Runoff=2.69 cfs 0.214 af

Subcatchment8S: PROP. S PLANK ROAD Runoff Area=7,561 sf 0.00% Impervious Runoff Depth=0.56"
Flow Length=188' Tc=7.5 min CN=49 Runoff=0.06 cfs 0.008 af

Subcatchment9S: PROP S PLANK ROAD Runoff Area=1,348 sf 100.00% Impervious Runoff Depth=4.56"
Tc=7.5 min CN=98 Runoff=0.14 cfs 0.012 af

Pond 7P: PROP. HDPE BASIN Peak Elev=360.32' Storage=2,465 cf Inflow=2.76 cfs 0.223 af
Outflow=2.21 cfs 0.188 af

Link 3L: EX. TOTAL Inflow=2.48 cfs 0.205 af
Primary=2.48 cfs 0.205 af

Link 6L: PROP. TOTAL Inflow=2.41 cfs 0.208 af
Primary=2.41 cfs 0.208 af

Total Runoff Area = 1.938 ac Runoff Volume = 0.448 af Average Runoff Depth = 2.78"
44.70% Pervious = 0.866 ac 55.30% Impervious = 1.072 ac

Summary for Subcatchment 1S: EX. S PLANK ROAD (PERV)

[49] Hint: Tc<2dt may require smaller dt

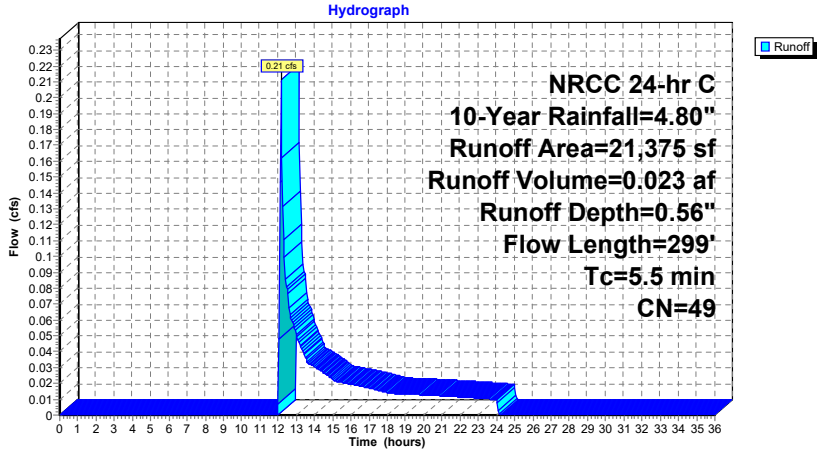
Runoff = 0.21 cfs @ 12.15 hrs, Volume= 0.023 af, Depth= 0.56"
Routed to Link 3L : EX. TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 10-Year Rainfall=4.80"

Area (sf)	CN	Description
21,375	49	50-75% Grass cover, Fair, HSG A
21,375		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	100	0.1150	0.34		**Sheet Flow, A-B SHEET** Grass: Short n= 0.150 P2= 3.21"
0.2	61	0.0902	4.84		**Shallow Concentrated Flow, B-C SCF** Unpaved Kv= 16.1 fps
0.4	120	0.0542	4.73		**Shallow Concentrated Flow, C-D SCF** Paved Kv= 20.3 fps
0.0	18	0.0220	9.23	11.32	**Pipe Channel, D-E PIPE** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011 Concrete pipe, straight & clean
5.5	299	Total			

Subcatchment 1S: EX. S PLANK ROAD (PERV)



Hydrograph for Subcatchment 1S: EX. S PLANK ROAD (PERV)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.00	4.80	0.56	0.00
0.50	0.03	0.00	0.00	26.50	4.80	0.56	0.00
1.00	0.06	0.00	0.00	27.00	4.80	0.56	0.00
1.50	0.09	0.00	0.00	27.50	4.80	0.56	0.00
2.00	0.12	0.00	0.00	28.00	4.80	0.56	0.00
2.50	0.15	0.00	0.00	28.50	4.80	0.56	0.00
3.00	0.18	0.00	0.00	29.00	4.80	0.56	0.00
3.50	0.22	0.00	0.00	29.50	4.80	0.56	0.00
4.00	0.25	0.00	0.00	30.00	4.80	0.56	0.00
4.50	0.29	0.00	0.00	30.50	4.80	0.56	0.00
5.00	0.33	0.00	0.00	31.00	4.80	0.56	0.00
5.50	0.37	0.00	0.00	31.50	4.80	0.56	0.00
6.00	0.41	0.00	0.00	32.00	4.80	0.56	0.00
6.50	0.46	0.00	0.00	32.50	4.80	0.56	0.00
7.00	0.51	0.00	0.00	33.00	4.80	0.56	0.00
7.50	0.56	0.00	0.00	33.50	4.80	0.56	0.00
8.00	0.62	0.00	0.00	34.00	4.80	0.56	0.00
8.50	0.69	0.00	0.00	34.50	4.80	0.56	0.00
9.00	0.76	0.00	0.00	35.00	4.80	0.56	0.00
9.50	0.85	0.00	0.00	35.50	4.80	0.56	0.00
10.00	0.95	0.00	0.00	36.00	4.80	0.56	0.00
10.50	1.07	0.00	0.00				
11.00	1.24	0.00	0.00				
11.50	1.50	0.00	0.00				
12.00	2.29	0.00	**0.01**				
12.50	3.30	0.13	**0.08**				
13.00	3.56	0.18	0.05				
13.50	3.73	0.23	0.04				
14.00	3.85	0.26	0.03				
14.50	3.95	0.29	0.03				
15.00	4.04	0.31	0.02				
15.50	4.11	0.33	0.02				
16.00	4.18	0.35	0.02				
16.50	4.24	0.37	0.02				
17.00	4.29	0.39	0.02				
17.50	4.34	0.40	0.02				
18.00	4.39	0.42	0.01				
18.50	4.43	0.43	0.01				
19.00	4.47	0.45	0.01				
19.50	4.51	0.46	0.01				
20.00	4.55	0.47	0.01				
20.50	4.58	0.48	0.01				
21.00	4.62	0.50	0.01				
21.50	4.65	0.51	0.01				
22.00	4.68	0.52	0.01				
22.50	4.71	0.53	0.01				
23.00	4.74	0.54	0.01				
23.50	4.77	0.55	0.01				
24.00	**4.80**	**0.56**	0.01				
24.50	4.80	0.56	0.00				
25.00	4.80	0.56	0.00				
25.50	4.80	0.56	0.00				

Summary for Subcatchment 2S: EX. S PLANK ROAD (IMPERV)

[49] Hint: Tc<2dt may require smaller dt

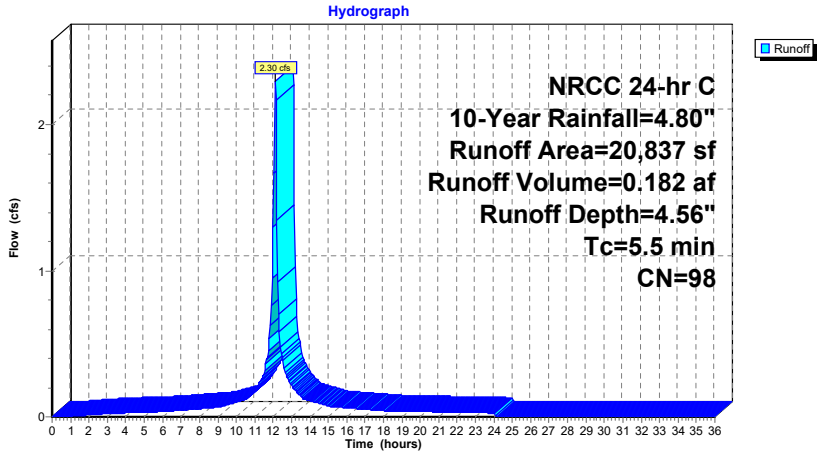
Runoff = 2.30 cfs @ 12.12 hrs, Volume= 0.182 af, Depth= 4.56"
Routed to Link 3L : EX. TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 10-Year Rainfall=4.80"

Area (sf)	CN	Description
20,837	98	Paved parking, HSG A
20,837		100.00% Impervious Area

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

Subcatchment 2S: EX. S PLANK ROAD (IMPERV)



Hydrograph for Subcatchment 2S: EX. S PLANK ROAD (IMPERV)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.00	4.80	4.56	0.00
0.50	0.03	0.00	0.00	26.50	4.80	4.56	0.00
1.00	0.06	0.00	0.00	27.00	4.80	4.56	0.00
1.50	0.09	0.01	0.01	27.50	4.80	4.56	0.00
2.00	0.12	0.02	0.01	28.00	4.80	4.56	0.00
2.50	0.15	0.04	0.02	28.50	4.80	4.56	0.00
3.00	0.18	0.06	0.02	29.00	4.80	4.56	0.00
3.50	0.22	0.08	0.02	29.50	4.80	4.56	0.00
4.00	0.25	0.11	0.03	30.00	4.80	4.56	0.00
4.50	0.29	0.14	0.03	30.50	4.80	4.56	0.00
5.00	0.33	0.17	0.03	31.00	4.80	4.56	0.00
5.50	0.37	0.20	0.03	31.50	4.80	4.56	0.00
6.00	0.41	0.24	0.04	32.00	4.80	4.56	0.00
6.50	0.46	0.28	0.04	32.50	4.80	4.56	0.00
7.00	0.51	0.32	0.05	33.00	4.80	4.56	0.00
7.50	0.56	0.38	0.05	33.50	4.80	4.56	0.00
8.00	0.62	0.43	0.06	34.00	4.80	4.56	0.00
8.50	0.69	0.49	0.06	34.50	4.80	4.56	0.00
9.00	0.76	0.56	0.07	35.00	4.80	4.56	0.00
9.50	0.85	0.64	0.08	35.50	4.80	4.56	0.00
10.00	0.95	0.74	0.10	36.00	4.80	4.56	0.00
10.50	1.07	0.86	0.12				
11.00	1.24	1.02	0.18				
11.50	1.50	1.28	0.29				
12.00	2.29	2.06	**1.30**				
12.50	3.30	3.06	**0.41**				
13.00	3.56	3.33	0.22				
13.50	3.73	3.50	0.14				
14.00	3.85	3.62	0.11				
14.50	3.95	3.72	0.09				
15.00	4.04	3.80	0.08				
15.50	4.11	3.88	0.07				
16.00	4.18	3.94	0.06				
16.50	4.24	4.00	0.06				
17.00	4.29	4.06	0.05				
17.50	4.34	4.11	0.05				
18.00	4.39	4.15	0.04				
18.50	4.43	4.19	0.04				
19.00	4.47	4.23	0.04				
19.50	4.51	4.27	0.04				
20.00	4.55	4.31	0.04				
20.50	4.58	4.35	0.03				
21.00	4.62	4.38	0.03				
21.50	4.65	4.41	0.03				
22.00	4.68	4.45	0.03				
22.50	4.71	4.48	0.03				
23.00	4.74	4.51	0.03				
23.50	4.77	4.54	0.03				
24.00	**4.80**	**4.56**	0.03				
24.50	4.80	4.56	0.00				
25.00	4.80	4.56	0.00				
25.50	4.80	4.56	0.00				

Summary for Subcatchment 4S: PROP. S PLANK ROAD (DET) (PERV)

[49] Hint: Tc<2dt may require smaller dt

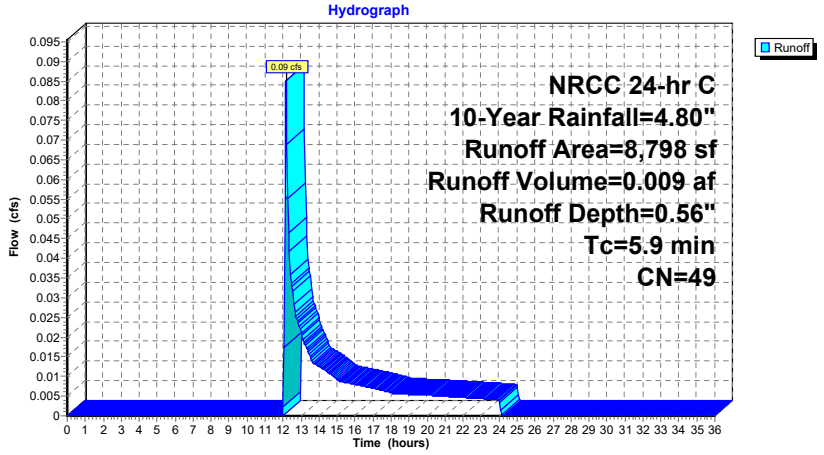
Runoff = 0.09 cfs @ 12.16 hrs, Volume= 0.009 af, Depth= 0.56"
Routed to Pond 7P : PROP. HDPE BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 10-Year Rainfall=4.80"

Area (sf)	CN	Description
8,798	49	50-75% Grass cover, Fair, HSG A
8,798		100.00% Pervious Area

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

Subcatchment 4S: PROP. S PLANK ROAD (DET) (PERV)



Hydrograph for Subcatchment 4S: PROP. S PLANK ROAD (DET) (PERV)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.00	4.80	0.56	0.00
0.50	0.03	0.00	0.00	26.50	4.80	0.56	0.00
1.00	0.06	0.00	0.00	27.00	4.80	0.56	0.00
1.50	0.09	0.00	0.00	27.50	4.80	0.56	0.00
2.00	0.12	0.00	0.00	28.00	4.80	0.56	0.00
2.50	0.15	0.00	0.00	28.50	4.80	0.56	0.00
3.00	0.18	0.00	0.00	29.00	4.80	0.56	0.00
3.50	0.22	0.00	0.00	29.50	4.80	0.56	0.00
4.00	0.25	0.00	0.00	30.00	4.80	0.56	0.00
4.50	0.29	0.00	0.00	30.50	4.80	0.56	0.00
5.00	0.33	0.00	0.00	31.00	4.80	0.56	0.00
5.50	0.37	0.00	0.00	31.50	4.80	0.56	0.00
6.00	0.41	0.00	0.00	32.00	4.80	0.56	0.00
6.50	0.46	0.00	0.00	32.50	4.80	0.56	0.00
7.00	0.51	0.00	0.00	33.00	4.80	0.56	0.00
7.50	0.56	0.00	0.00	33.50	4.80	0.56	0.00
8.00	0.62	0.00	0.00	34.00	4.80	0.56	0.00
8.50	0.69	0.00	0.00	34.50	4.80	0.56	0.00
9.00	0.76	0.00	0.00	35.00	4.80	0.56	0.00
9.50	0.85	0.00	0.00	35.50	4.80	0.56	0.00
10.00	0.95	0.00	0.00	36.00	4.80	0.56	0.00
10.50	1.07	0.00	0.00				
11.00	1.24	0.00	0.00				
11.50	1.50	0.00	0.00				
12.00	2.29	0.00	**0.00**				
12.50	3.30	0.13	**0.03**				
13.00	3.56	0.18	0.02				
13.50	3.73	0.23	0.02				
14.00	3.85	0.26	0.01				
14.50	3.95	0.29	0.01				
15.00	4.04	0.31	0.01				
15.50	4.11	0.33	0.01				
16.00	4.18	0.35	0.01				
16.50	4.24	0.37	0.01				
17.00	4.29	0.39	0.01				
17.50	4.34	0.40	0.01				
18.00	4.39	0.42	0.01				
18.50	4.43	0.43	0.01				
19.00	4.47	0.45	0.01				
19.50	4.51	0.46	0.01				
20.00	4.55	0.47	0.01				
20.50	4.58	0.48	0.01				
21.00	4.62	0.50	0.00				
21.50	4.65	0.51	0.00				
22.00	4.68	0.52	0.00				
22.50	4.71	0.53	0.00				
23.00	4.74	0.54	0.00				
23.50	4.77	0.55	0.00				
24.00	**4.80**	**0.56**	0.00				
24.50	4.80	0.56	0.00				
25.00	4.80	0.56	0.00				
25.50	4.80	0.56	0.00				

Summary for Subcatchment 5S: PROP. S PLANK ROAD (DET) (IMPERV)

[49] Hint: Tc<2dt may require smaller dt

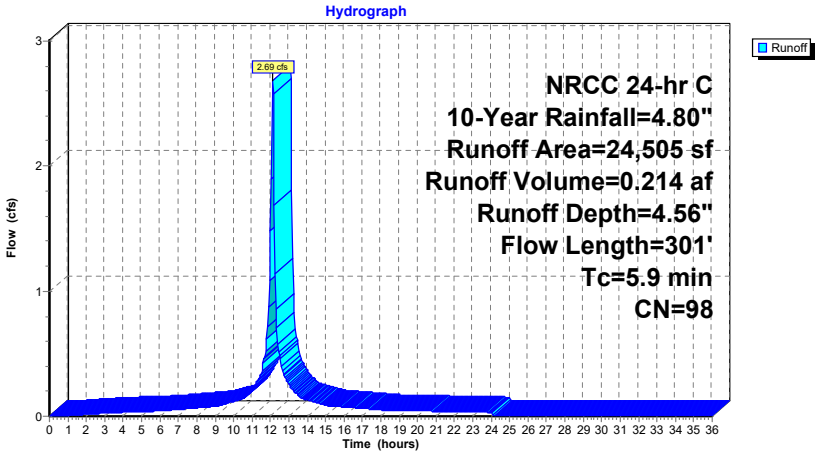
Runoff = 2.69 cfs @ 12.13 hrs, Volume= 0.214 af, Depth= 4.56"
Routed to Pond 7P : PROP. HDPE BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 10-Year Rainfall=4.80"

Area (sf)	CN	Description
24,505	98	Paved parking, HSG A
24,505		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	74	0.0890	0.29		**Sheet Flow, A-B SHEET** Grass: Short n= 0.150 P2= 3.21"
0.5	26	0.0150	0.94		**Sheet Flow, B-C SHEET** Smooth surfaces n= 0.011 P2= 3.21"
1.1	169	0.0150	2.49		**Shallow Concentrated Flow, C-D SCF** Paved Kv= 20.3 fps
0.1	26	0.0050	4.03	4.95	**Pipe Channel, D-E PIPE** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.0	6	0.0041	3.65	4.48	**Pipe Channel, E-F PIPE** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
5.9	301	Total			

Subcatchment 5S: PROP. S PLANK ROAD (DET) (IMPERV)



Hydrograph for Subcatchment 5S: PROP. S PLANK ROAD (DET) (IMPERV)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.00	4.80	4.56	0.00
0.50	0.03	0.00	0.00	26.50	4.80	4.56	0.00
1.00	0.06	0.00	0.00	27.00	4.80	4.56	0.00
1.50	0.09	0.01	0.01	27.50	4.80	4.56	0.00
2.00	0.12	0.02	0.02	28.00	4.80	4.56	0.00
2.50	0.15	0.04	0.02	28.50	4.80	4.56	0.00
3.00	0.18	0.06	0.02	29.00	4.80	4.56	0.00
3.50	0.22	0.08	0.03	29.50	4.80	4.56	0.00
4.00	0.25	0.11	0.03	30.00	4.80	4.56	0.00
4.50	0.29	0.14	0.03	30.50	4.80	4.56	0.00
5.00	0.33	0.17	0.04	31.00	4.80	4.56	0.00
5.50	0.37	0.20	0.04	31.50	4.80	4.56	0.00
6.00	0.41	0.24	0.04	32.00	4.80	4.56	0.00
6.50	0.46	0.28	0.05	32.50	4.80	4.56	0.00
7.00	0.51	0.32	0.05	33.00	4.80	4.56	0.00
7.50	0.56	0.38	0.06	33.50	4.80	4.56	0.00
8.00	0.62	0.43	0.07	34.00	4.80	4.56	0.00
8.50	0.69	0.49	0.07	34.50	4.80	4.56	0.00
9.00	0.76	0.56	0.08	35.00	4.80	4.56	0.00
9.50	0.85	0.64	0.10	35.50	4.80	4.56	0.00
10.00	0.95	0.74	0.12	36.00	4.80	4.56	0.00
10.50	1.07	0.86	0.14				
11.00	1.24	1.02	0.21				
11.50	1.50	1.28	0.34				
12.00	2.29	2.06	**1.48**				
12.50	3.30	3.06	**0.49**				
13.00	3.56	3.33	0.26				
13.50	3.73	3.50	0.17				
14.00	3.85	3.62	0.13				
14.50	3.95	3.72	0.11				
15.00	4.04	3.80	0.09				
15.50	4.11	3.88	0.08				
16.00	4.18	3.94	0.07				
16.50	4.24	4.00	0.07				
17.00	4.29	4.06	0.06				
17.50	4.34	4.11	0.06				
18.00	4.39	4.15	0.05				
18.50	4.43	4.19	0.05				
19.00	4.47	4.23	0.04				
19.50	4.51	4.27	0.04				
20.00	4.55	4.31	0.04				
20.50	4.58	4.35	0.04				
21.00	4.62	4.38	0.04				
21.50	4.65	4.41	0.04				
22.00	4.68	4.45	0.04				
22.50	4.71	4.48	0.03				
23.00	4.74	4.51	0.03				
23.50	4.77	4.54	0.03				
24.00	**4.80**	**4.56**	0.03				
24.50	4.80	4.56	0.00				
25.00	4.80	4.56	0.00				
25.50	4.80	4.56	0.00				

Summary for Subcatchment 8S: PROP. S PLANK ROAD (UNDET) (PERV)

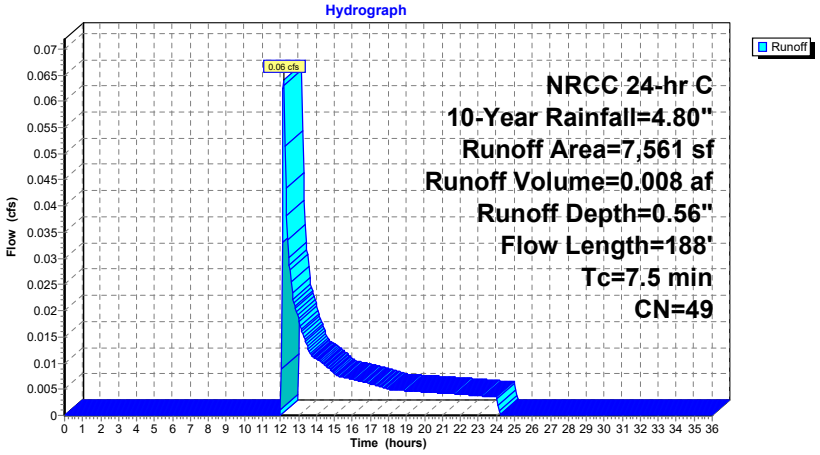
Runoff = 0.06 cfs @ 12.18 hrs, Volume= 0.008 af, Depth= 0.56"
Routed to Link 6L : PROP. TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 10-Year Rainfall=4.80"

Area (sf)	CN	Description
7,561	49	50-75% Grass cover, Fair, HSG A
7,561		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	100	0.0450	0.24		**Sheet Flow, A-B SHEET** Grass: Short n= 0.150 P2= 3.21"
0.1	27	0.0500	4.54		**Shallow Concentrated Flow, B-C SCF** Paved Kv= 20.3 fps
0.2	43	0.0500	3.60		**Shallow Concentrated Flow, C-D SCF** Unpaved Kv= 16.1 fps
0.1	18	0.0500	4.54		**Shallow Concentrated Flow, D-E SCF** Paved Kv= 20.3 fps
7.5	188	Total			

Subcatchment 8S: PROP. S PLANK ROAD (UNDET) (PERV)



Hydrograph for Subcatchment 8S: PROP. S PLANK ROAD (UNDET) (PERV)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.00	4.80	0.56	0.00
0.50	0.03	0.00	0.00	26.50	4.80	0.56	0.00
1.00	0.06	0.00	0.00	27.00	4.80	0.56	0.00
1.50	0.09	0.00	0.00	27.50	4.80	0.56	0.00
2.00	0.12	0.00	0.00	28.00	4.80	0.56	0.00
2.50	0.15	0.00	0.00	28.50	4.80	0.56	0.00
3.00	0.18	0.00	0.00	29.00	4.80	0.56	0.00
3.50	0.22	0.00	0.00	29.50	4.80	0.56	0.00
4.00	0.25	0.00	0.00	30.00	4.80	0.56	0.00
4.50	0.29	0.00	0.00	30.50	4.80	0.56	0.00
5.00	0.33	0.00	0.00	31.00	4.80	0.56	0.00
5.50	0.37	0.00	0.00	31.50	4.80	0.56	0.00
6.00	0.41	0.00	0.00	32.00	4.80	0.56	0.00
6.50	0.46	0.00	0.00	32.50	4.80	0.56	0.00
7.00	0.51	0.00	0.00	33.00	4.80	0.56	0.00
7.50	0.56	0.00	0.00	33.50	4.80	0.56	0.00
8.00	0.62	0.00	0.00	34.00	4.80	0.56	0.00
8.50	0.69	0.00	0.00	34.50	4.80	0.56	0.00
9.00	0.76	0.00	0.00	35.00	4.80	0.56	0.00
9.50	0.85	0.00	0.00	35.50	4.80	0.56	0.00
10.00	0.95	0.00	0.00	36.00	4.80	0.56	0.00
10.50	1.07	0.00	0.00				
11.00	1.24	0.00	0.00				
11.50	1.50	0.00	0.00				
12.00	2.29	0.00	**0.00**				
12.50	3.30	0.13	**0.03**				
13.00	3.56	0.18	0.02				
13.50	3.73	0.23	0.01				
14.00	3.85	0.26	0.01				
14.50	3.95	0.29	0.01				
15.00	4.04	0.31	0.01				
15.50	4.11	0.33	0.01				
16.00	4.18	0.35	0.01				
16.50	4.24	0.37	0.01				
17.00	4.29	0.39	0.01				
17.50	4.34	0.40	0.01				
18.00	4.39	0.42	0.01				
18.50	4.43	0.43	0.00				
19.00	4.47	0.45	0.00				
19.50	4.51	0.46	0.00				
20.00	4.55	0.47	0.00				
20.50	4.58	0.48	0.00				
21.00	4.62	0.50	0.00				
21.50	4.65	0.51	0.00				
22.00	4.68	0.52	0.00				
22.50	4.71	0.53	0.00				
23.00	4.74	0.54	0.00				
23.50	4.77	0.55	0.00				
24.00	**4.80**	**0.56**	0.00				
24.50	4.80	0.56	0.00				
25.00	4.80	0.56	0.00				
25.50	4.80	0.56	0.00				

Summary for Subcatchment 9S: PROP S PLANK ROAD (UNDET) (IMPERV)

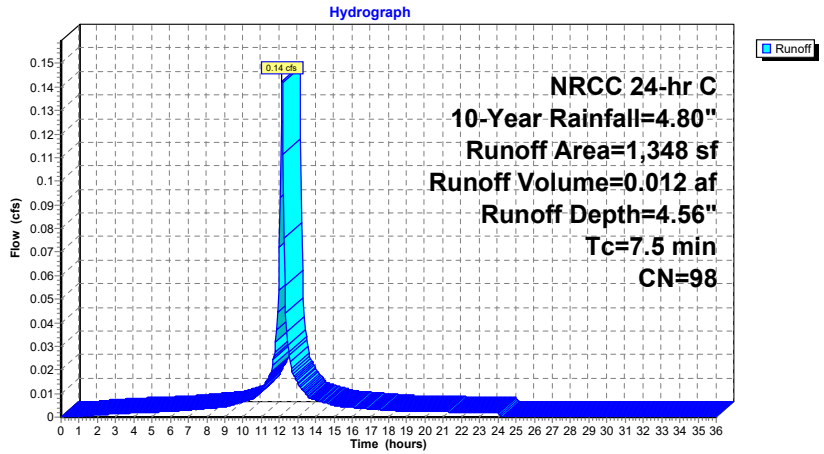
Runoff = 0.14 cfs @ 12.14 hrs, Volume= 0.012 af, Depth= 4.56"
Routed to Link 6L : PROP. TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 10-Year Rainfall=4.80"

Area (sf)	CN	Description
1,348	98	Paved parking, HSG A
1,348		100.00% Impervious Area

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

Subcatchment 9S: PROP S PLANK ROAD (UNDET) (IMPERV)



Hydrograph for Subcatchment 9S: PROP S PLANK ROAD (UNDET) (IMPERV)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.00	4.80	4.56	0.00
0.50	0.03	0.00	0.00	26.50	4.80	4.56	0.00
1.00	0.06	0.00	0.00	27.00	4.80	4.56	0.00
1.50	0.09	0.01	0.00	27.50	4.80	4.56	0.00
2.00	0.12	0.02	0.00	28.00	4.80	4.56	0.00
2.50	0.15	0.04	0.00	28.50	4.80	4.56	0.00
3.00	0.18	0.06	0.00	29.00	4.80	4.56	0.00
3.50	0.22	0.08	0.00	29.50	4.80	4.56	0.00
4.00	0.25	0.11	0.00	30.00	4.80	4.56	0.00
4.50	0.29	0.14	0.00	30.50	4.80	4.56	0.00
5.00	0.33	0.17	0.00	31.00	4.80	4.56	0.00
5.50	0.37	0.20	0.00	31.50	4.80	4.56	0.00
6.00	0.41	0.24	0.00	32.00	4.80	4.56	0.00
6.50	0.46	0.28	0.00	32.50	4.80	4.56	0.00
7.00	0.51	0.32	0.00	33.00	4.80	4.56	0.00
7.50	0.56	0.38	0.00	33.50	4.80	4.56	0.00
8.00	0.62	0.43	0.00	34.00	4.80	4.56	0.00
8.50	0.69	0.49	0.00	34.50	4.80	4.56	0.00
9.00	0.76	0.56	0.00	35.00	4.80	4.56	0.00
9.50	0.85	0.64	0.01	35.50	4.80	4.56	0.00
10.00	0.95	0.74	0.01	36.00	4.80	4.56	0.00
10.50	1.07	0.86	0.01				
11.00	1.24	1.02	0.01				
11.50	1.50	1.28	0.02				
12.00	2.29	2.06	**0.07**				
12.50	3.30	3.06	**0.03**				
13.00	3.56	3.33	0.01				
13.50	3.73	3.50	0.01				
14.00	3.85	3.62	0.01				
14.50	3.95	3.72	0.01				
15.00	4.04	3.80	0.00				
15.50	4.11	3.88	0.00				
16.00	4.18	3.94	0.00				
16.50	4.24	4.00	0.00				
17.00	4.29	4.06	0.00				
17.50	4.34	4.11	0.00				
18.00	4.39	4.15	0.00				
18.50	4.43	4.19	0.00				
19.00	4.47	4.23	0.00				
19.50	4.51	4.27	0.00				
20.00	4.55	4.31	0.00				
20.50	4.58	4.35	0.00				
21.00	4.62	4.38	0.00				
21.50	4.65	4.41	0.00				
22.00	4.68	4.45	0.00				
22.50	4.71	4.48	0.00				
23.00	4.74	4.51	0.00				
23.50	4.77	4.54	0.00				
24.00	**4.80**	**4.56**	0.00				
24.50	4.80	4.56	0.00				
25.00	4.80	4.56	0.00				
25.50	4.80	4.56	0.00				

Summary for Pond 7P: PROP. HDPE BASIN

Inflow Area = 0.765 ac, 73.58% Impervious, Inflow Depth = 3.51" for 10-Year event
Inflow = 2.76 cfs @ 12.13 hrs, Volume= 0.223 af
Outflow = 2.21 cfs @ 12.18 hrs, Volume= 0.188 af, Atten= 20%, Lag= 3.1 min
Primary = 2.21 cfs @ 12.18 hrs, Volume= 0.188 af
Routed to Link 6L : PROP. TOTAL

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 360.32' @ 12.18 hrs Surf.Area= 1,453 sf Storage= 2,465 cf

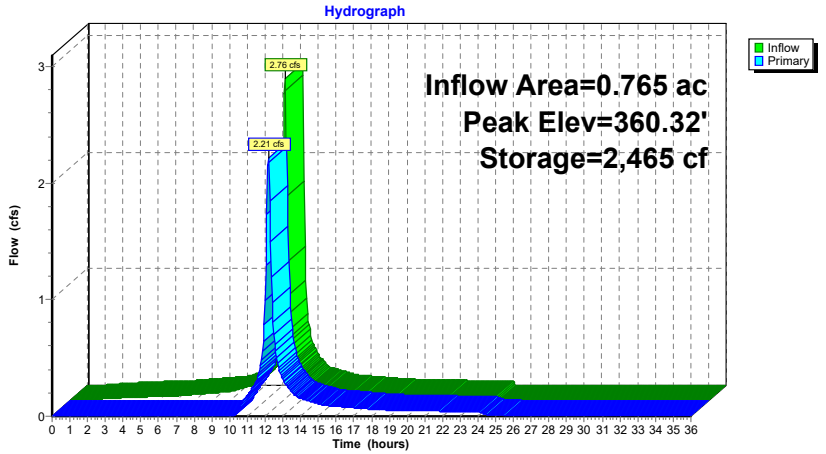
Plug-Flow detention time= 156.2 min calculated for 0.188 af (84% of inflow)
Center-of-Mass det. time= 80.9 min (839.1 - 758.2)

Volume	Invert	Avail.Storage	Storage Description
#1	358.00'	1,696 cf	**36.0" Round Pipe Storage** x 3 Inside #2 L= 80.0' 2,309 cf Overall - 3.0" Wall Thickness = 1,696 cf
#2	357.25'	1,691 cf	**17.50'W x 83.00'L x 4.50'H Prismatoid** 6,536 cf Overall - 2,309 cf Embedded = 4,227 cf x 40.0% Voids
		3,387 cf	Total Available Storage

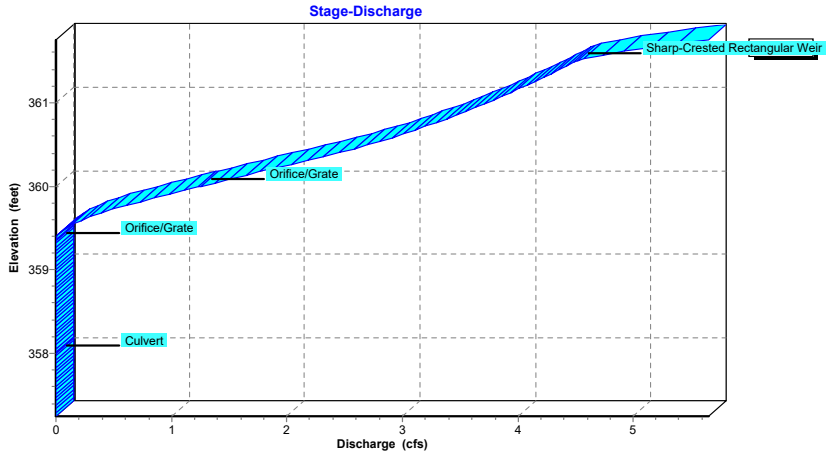
Device	Routing	Invert	Outlet Devices
#1	Primary	358.00'	**15.0" Round Culvert** L= 61.0' Ke= 0.500 Inlet / Outlet Invert= 358.00' / 353.50' S= 0.0738 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf
#2	Device 1	359.35'	**10.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	360.00'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	361.50'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=2.17 cfs @ 12.18 hrs HW=360.31' (Free Discharge)
└**1=Culvert** (Passes 2.17 cfs of 7.66 cfs potential flow)
  └**2=Orifice/Grate** (Orifice Controls 1.93 cfs @ 3.54 fps)
  └**3=Orifice/Grate** (Orifice Controls 0.24 cfs @ 1.89 fps)
  └**4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

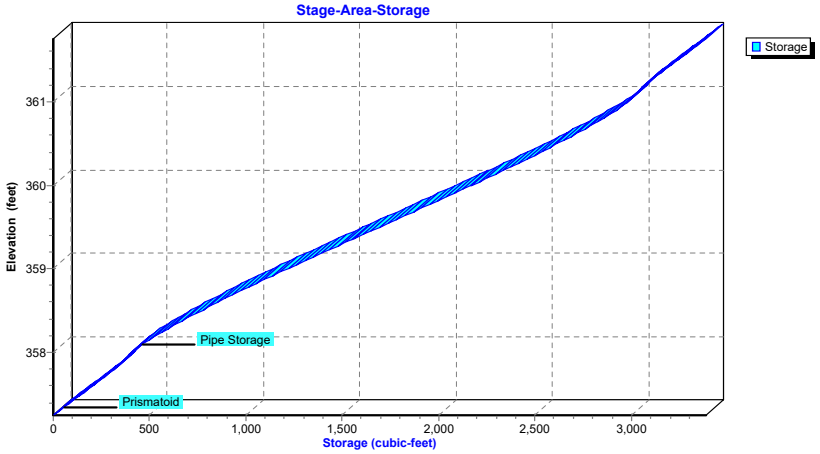
Pond 7P: PROP. HDPE BASIN



Pond 7P: PROP. HDPE BASIN



Pond 7P: PROP. HDPE BASIN



Hydrograph for Pond 7P: PROP. HDPE BASIN

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	357.25	0.00
1.00	0.00	1	357.25	0.00
2.00	0.02	36	357.31	0.00
3.00	0.02	110	357.44	0.00
4.00	0.03	212	357.61	0.00
5.00	0.04	334	357.84	0.00
6.00	0.04	475	358.12	0.00
7.00	0.05	645	358.35	0.00
8.00	0.07	860	358.61	0.00
9.00	0.08	1,120	358.90	0.00
10.00	0.12	1,473	359.27	0.00
11.00	0.21	1,758	359.57	0.18
12.00	**1.48**	**2,087**	**359.91**	**0.99**
13.00	**0.28**	**1,833**	**359.64**	**0.32**
14.00	0.14	1,741	359.55	0.15
15.00	0.10	1,708	359.52	0.11
16.00	0.08	1,690	359.50	0.08
17.00	0.07	1,677	359.48	0.07
18.00	0.06	1,665	359.47	0.06
19.00	0.05	1,658	359.46	0.05
20.00	0.05	1,654	359.46	0.05
21.00	0.04	1,651	359.46	0.04
22.00	0.04	1,648	359.45	0.04
23.00	0.04	1,643	359.45	0.04
24.00	0.03	1,638	359.44	0.04
25.00	0.00	1,586	359.39	0.01
26.00	0.00	1,569	359.37	0.00
27.00	0.00	1,563	359.36	0.00
28.00	0.00	1,560	359.36	0.00
29.00	0.00	1,558	359.36	0.00
30.00	0.00	1,556	359.36	0.00
31.00	0.00	1,555	359.36	0.00
32.00	0.00	1,553	359.35	0.00
33.00	0.00	1,553	359.35	0.00
34.00	0.00	1,552	359.35	0.00
35.00	0.00	1,551	359.35	0.00
36.00	0.00	1,551	359.35	0.00

Stage-Discharge for Pond 7P: PROP. HDPE BASIN

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
357.25	0.00	359.85	0.82
357.30	0.00	359.90	0.96
357.35	0.00	359.95	1.11
357.40	0.00	360.00	1.25
357.45	0.00	360.05	1.40
357.50	0.00	360.10	1.55
357.55	0.00	360.15	1.70
357.60	0.00	360.20	1.84
357.65	0.00	360.25	1.99
357.70	0.00	360.30	2.15
357.75	0.00	360.35	2.30
357.80	0.00	360.40	2.45
357.85	0.00	360.45	2.60
357.90	0.00	360.50	2.72
357.95	0.00	360.55	2.84
358.00	0.00	360.60	2.96
358.05	0.00	360.65	3.07
358.10	0.00	360.70	3.17
358.15	0.00	360.75	3.27
358.20	0.00	360.80	3.37
358.25	0.00	360.85	3.47
358.30	0.00	360.90	3.56
358.35	0.00	360.95	3.65
358.40	0.00	361.00	3.74
358.45	0.00	361.05	3.82
358.50	0.00	361.10	3.90
358.55	0.00	361.15	3.99
358.60	0.00	361.20	4.07
358.65	0.00	361.25	4.14
358.70	0.00	361.30	4.22
358.75	0.00	361.35	4.30
358.80	0.00	361.40	4.37
358.85	0.00	361.45	4.44
358.90	0.00	361.50	4.51
358.95	0.00	361.55	4.66
359.00	0.00	361.60	4.86
359.05	0.00	361.65	5.10
359.10	0.00	361.70	5.36
359.15	0.00	361.75	**5.65**
359.20	0.00		
359.25	0.00		
359.30	0.00		
359.35	0.00		
359.40	0.01		
359.45	0.04		
359.50	0.09		
359.55	0.15		
359.60	0.23		
359.65	0.33		
359.70	0.44		
359.75	0.56		
359.80	0.69		

Stage-Area-Storage for Pond 7P: PROP. HDPE BASIN

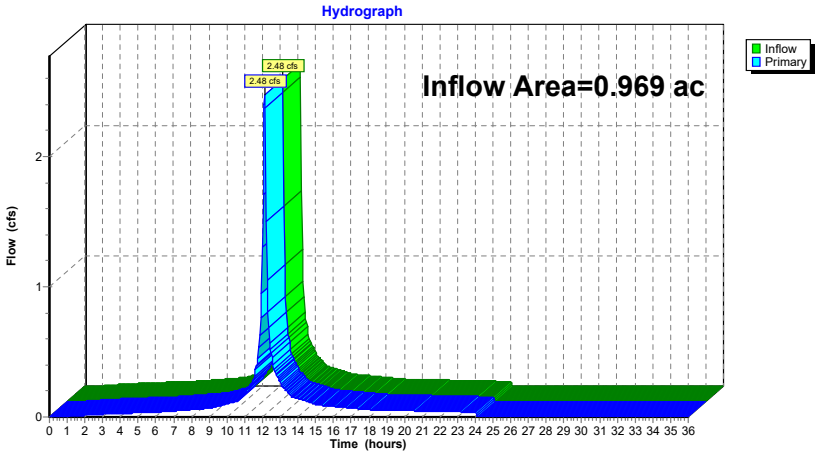
Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
357.25	0	359.85	2,030
357.30	29	359.90	2,077
357.35	58	359.95	2,125
357.40	87	360.00	2,172
357.45	116	360.05	2,218
357.50	145	360.10	2,265
357.55	174	360.15	2,311
357.60	203	360.20	2,357
357.65	232	360.25	2,402
357.70	261	360.30	2,447
357.75	291	360.35	2,491
357.80	317	360.40	2,535
357.85	341	360.45	2,578
357.90	364	360.50	2,620
357.95	386	360.55	2,662
358.00	406	360.60	2,703
358.05	433	360.65	2,743
358.10	463	360.70	2,782
358.15	496	360.75	2,820
358.20	531	360.80	2,856
358.25	568	360.85	2,891
358.30	605	360.90	2,924
358.35	644	360.95	2,955
358.40	684	361.00	2,981
358.45	725	361.05	3,002
358.50	767	361.10	3,023
358.55	809	361.15	3,046
358.60	853	361.20	3,070
358.65	896	361.25	3,097
358.70	941	361.30	3,126
358.75	985	361.35	3,155
358.80	1,031	361.40	3,184
358.85	1,076	361.45	3,213
358.90	1,122	361.50	3,242
358.95	1,169	361.55	3,271
359.00	1,216	361.60	3,300
359.05	1,263	361.65	3,329
359.10	1,310	361.70	3,358
359.15	1,357	361.75	**3,387**
359.20	1,405		
359.25	1,453		
359.30	1,501		
359.35	1,549		
359.40	1,597		
359.45	1,645		
359.50	1,694		
359.55	1,742		
359.60	1,790		
359.65	1,838		
359.70	1,886		
359.75	1,934		
359.80	1,982		

Summary for Link 3L: EX. TOTAL

Inflow Area = 0.969 ac, 49.36% Impervious, Inflow Depth = 2.54" for 10-Year event
Inflow = 2.48 cfs @ 12.12 hrs, Volume= 0.205 af
Primary = 2.48 cfs @ 12.12 hrs, Volume= 0.205 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Link 3L: EX. TOTAL



Hydrograph for Link 3L: EX. TOTAL

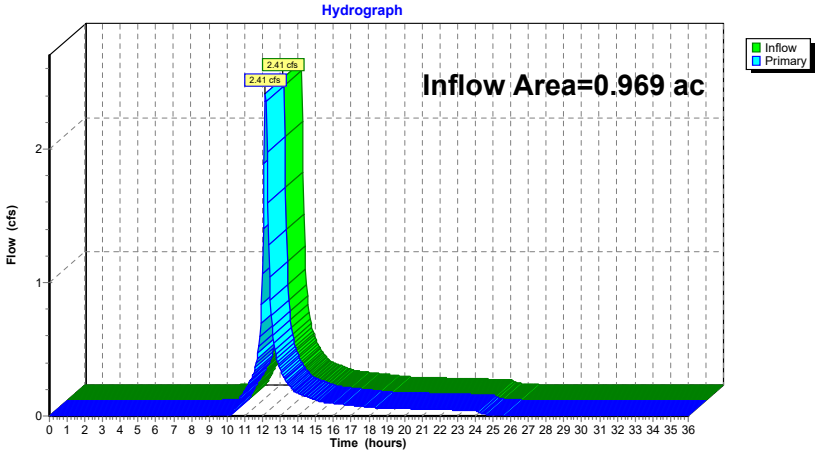
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	26.00	0.00	0.00	0.00
0.50	0.00	0.00	0.00	26.50	0.00	0.00	0.00
1.00	0.00	0.00	0.00	27.00	0.00	0.00	0.00
1.50	0.01	0.00	0.01	27.50	0.00	0.00	0.00
2.00	0.01	0.00	0.01	28.00	0.00	0.00	0.00
2.50	0.02	0.00	0.02	28.50	0.00	0.00	0.00
3.00	0.02	0.00	0.02	29.00	0.00	0.00	0.00
3.50	0.02	0.00	0.02	29.50	0.00	0.00	0.00
4.00	0.03	0.00	0.03	30.00	0.00	0.00	0.00
4.50	0.03	0.00	0.03	30.50	0.00	0.00	0.00
5.00	0.03	0.00	0.03	31.00	0.00	0.00	0.00
5.50	0.03	0.00	0.03	31.50	0.00	0.00	0.00
6.00	0.04	0.00	0.04	32.00	0.00	0.00	0.00
6.50	0.04	0.00	0.04	32.50	0.00	0.00	0.00
7.00	0.05	0.00	0.05	33.00	0.00	0.00	0.00
7.50	0.05	0.00	0.05	33.50	0.00	0.00	0.00
8.00	0.06	0.00	0.06	34.00	0.00	0.00	0.00
8.50	0.06	0.00	0.06	34.50	0.00	0.00	0.00
9.00	0.07	0.00	0.07	35.00	0.00	0.00	0.00
9.50	0.08	0.00	0.08	35.50	0.00	0.00	0.00
10.00	0.10	0.00	0.10	36.00	0.00	0.00	0.00
10.50	0.12	0.00	0.12				
11.00	0.18	0.00	0.18				
11.50	0.29	0.00	0.29				
12.00	**1.31**	0.00	**1.31**				
12.50	**0.49**	0.00	**0.49**				
13.00	0.27	0.00	0.27				
13.50	0.18	0.00	0.18				
14.00	0.14	0.00	0.14				
14.50	0.12	0.00	0.12				
15.00	0.10	0.00	0.10				
15.50	0.09	0.00	0.09				
16.00	0.08	0.00	0.08				
16.50	0.08	0.00	0.08				
17.00	0.07	0.00	0.07				
17.50	0.06	0.00	0.06				
18.00	0.06	0.00	0.06				
18.50	0.05	0.00	0.05				
19.00	0.05	0.00	0.05				
19.50	0.05	0.00	0.05				
20.00	0.05	0.00	0.05				
20.50	0.05	0.00	0.05				
21.00	0.05	0.00	0.05				
21.50	0.04	0.00	0.04				
22.00	0.04	0.00	0.04				
22.50	0.04	0.00	0.04				
23.00	0.04	0.00	0.04				
23.50	0.04	0.00	0.04				
24.00	0.04	0.00	0.04				
24.50	0.00	0.00	0.00				
25.00	0.00	0.00	0.00				
25.50	0.00	0.00	0.00				

Summary for Link 6L: PROP. TOTAL

Inflow Area = 0.969 ac, 61.25% Impervious, Inflow Depth = 2.57" for 10-Year event
Inflow = 2.41 cfs @ 12.17 hrs, Volume= 0.208 af
Primary = 2.41 cfs @ 12.17 hrs, Volume= 0.208 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Link 6L: PROP. TOTAL



Hydrograph for Link 6L: PROP. TOTAL

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	26.00	0.00	0.00	0.00
0.50	0.00	0.00	0.00	26.50	0.00	0.00	0.00
1.00	0.00	0.00	0.00	27.00	0.00	0.00	0.00
1.50	0.00	0.00	0.00	27.50	0.00	0.00	0.00
2.00	0.00	0.00	0.00	28.00	0.00	0.00	0.00
2.50	0.00	0.00	0.00	28.50	0.00	0.00	0.00
3.00	0.00	0.00	0.00	29.00	0.00	0.00	0.00
3.50	0.00	0.00	0.00	29.50	0.00	0.00	0.00
4.00	0.00	0.00	0.00	30.00	0.00	0.00	0.00
4.50	0.00	0.00	0.00	30.50	0.00	0.00	0.00
5.00	0.00	0.00	0.00	31.00	0.00	0.00	0.00
5.50	0.00	0.00	0.00	31.50	0.00	0.00	0.00
6.00	0.00	0.00	0.00	32.00	0.00	0.00	0.00
6.50	0.00	0.00	0.00	32.50	0.00	0.00	0.00
7.00	0.00	0.00	0.00	33.00	0.00	0.00	0.00
7.50	0.00	0.00	0.00	33.50	0.00	0.00	0.00
8.00	0.00	0.00	0.00	34.00	0.00	0.00	0.00
8.50	0.00	0.00	0.00	34.50	0.00	0.00	0.00
9.00	0.00	0.00	0.00	35.00	0.00	0.00	0.00
9.50	0.01	0.00	0.01	35.50	0.00	0.00	0.00
10.00	0.01	0.00	0.01	36.00	0.00	0.00	0.00
10.50	0.08	0.00	0.08				
11.00	0.19	0.00	0.19				
11.50	0.32	0.00	0.32				
12.00	**1.07**	0.00	**1.07**				
12.50	**0.75**	0.00	**0.75**				
13.00	0.35	0.00	0.35				
13.50	0.23	0.00	0.23				
14.00	0.17	0.00	0.17				
14.50	0.15	0.00	0.15				
15.00	0.12	0.00	0.12				
15.50	0.10	0.00	0.10				
16.00	0.10	0.00	0.10				
16.50	0.09	0.00	0.09				
17.00	0.08	0.00	0.08				
17.50	0.07	0.00	0.07				
18.00	0.07	0.00	0.07				
18.50	0.06	0.00	0.06				
19.00	0.06	0.00	0.06				
19.50	0.06	0.00	0.06				
20.00	0.06	0.00	0.06				
20.50	0.05	0.00	0.05				
21.00	0.05	0.00	0.05				
21.50	0.05	0.00	0.05				
22.00	0.05	0.00	0.05				
22.50	0.05	0.00	0.05				
23.00	0.04	0.00	0.04				
23.50	0.04	0.00	0.04				
24.00	0.04	0.00	0.04				
24.50	0.01	0.00	0.01				
25.00	0.01	0.00	0.01				
25.50	0.00	0.00	0.00				

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: EX. S PLANK ROAD Runoff Area=21,375 sf 0.00% Impervious Runoff Depth=2.49"
Flow Length=299' Tc=5.5 min CN=49 Runoff=1.46 cfs 0.102 af

Subcatchment2S: EX. S PLANK ROAD Runoff Area=20,837 sf 100.00% Impervious Runoff Depth=8.33"
Tc=5.5 min CN=98 Runoff=4.12 cfs 0.332 af

Subcatchment4S: PROP. S PLANK ROAD Runoff Area=8,798 sf 0.00% Impervious Runoff Depth=2.49"
Tc=5.9 min CN=49 Runoff=0.60 cfs 0.042 af

Subcatchment5S: PROP. S PLANK Runoff Area=24,505 sf 100.00% Impervious Runoff Depth=8.33"
Flow Length=301' Tc=5.9 min CN=98 Runoff=4.82 cfs 0.391 af

Subcatchment8S: PROP. S PLANK ROAD Runoff Area=7,561 sf 0.00% Impervious Runoff Depth=2.49"
Flow Length=188' Tc=7.5 min CN=49 Runoff=0.48 cfs 0.036 af

Subcatchment9S: PROP S PLANK ROAD Runoff Area=1,348 sf 100.00% Impervious Runoff Depth=8.33"
Tc=7.5 min CN=98 Runoff=0.26 cfs 0.021 af

Pond 7P: PROP. HDPE BASIN Peak Elev=361.33' Storage=3,145 cf Inflow=5.41 cfs 0.432 af
Outflow=4.28 cfs 0.397 af

Link 3L: EX. TOTAL Inflow=5.55 cfs 0.434 af
Primary=5.55 cfs 0.434 af

Link 6L: PROP. TOTAL Inflow=4.99 cfs 0.454 af
Primary=4.99 cfs 0.454 af

Total Runoff Area = 1.938 ac Runoff Volume = 0.924 af Average Runoff Depth = 5.72"
44.70% Pervious = 0.866 ac 55.30% Impervious = 1.072 ac

Summary for Subcatchment 1S: EX. S PLANK ROAD (PERV)

[49] Hint: Tc<2dt may require smaller dt

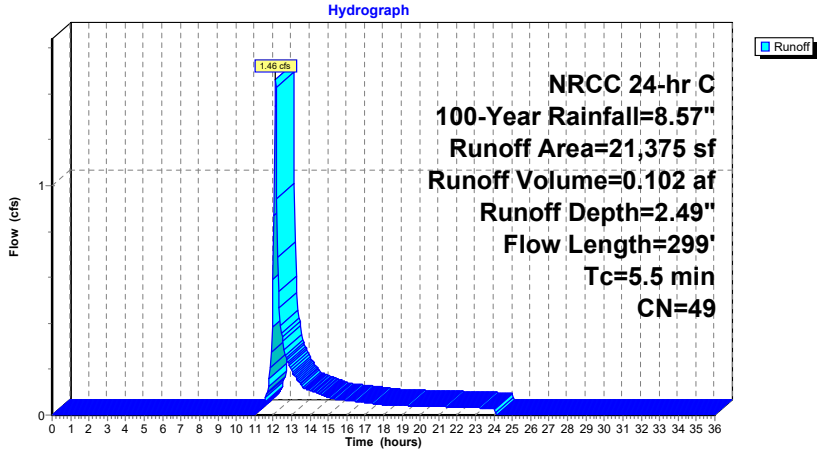
Runoff = 1.46 cfs @ 12.13 hrs, Volume= 0.102 af, Depth= 2.49"
Routed to Link 3L : EX. TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 100-Year Rainfall=8.57"

Area (sf)	CN	Description
21,375	49	50-75% Grass cover, Fair, HSG A
21,375		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	100	0.1150	0.34		**Sheet Flow, A-B SHEET** Grass: Short n= 0.150 P2= 3.21"
0.2	61	0.0902	4.84		**Shallow Concentrated Flow, B-C SCF** Unpaved Kv= 16.1 fps
0.4	120	0.0542	4.73		**Shallow Concentrated Flow, C-D SCF** Paved Kv= 20.3 fps
0.0	18	0.0220	9.23	11.32	**Pipe Channel, D-E PIPE** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011 Concrete pipe, straight & clean
5.5	299	Total			

Subcatchment 1S: EX. S PLANK ROAD (PERV)



Hydrograph for Subcatchment 1S: EX. S PLANK ROAD (PERV)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.00	8.57	2.49	0.00
0.50	0.05	0.00	0.00	26.50	8.57	2.49	0.00
1.00	0.10	0.00	0.00	27.00	8.57	2.49	0.00
1.50	0.15	0.00	0.00	27.50	8.57	2.49	0.00
2.00	0.21	0.00	0.00	28.00	8.57	2.49	0.00
2.50	0.27	0.00	0.00	28.50	8.57	2.49	0.00
3.00	0.33	0.00	0.00	29.00	8.57	2.49	0.00
3.50	0.39	0.00	0.00	29.50	8.57	2.49	0.00
4.00	0.45	0.00	0.00	30.00	8.57	2.49	0.00
4.50	0.52	0.00	0.00	30.50	8.57	2.49	0.00
5.00	0.59	0.00	0.00	31.00	8.57	2.49	0.00
5.50	0.66	0.00	0.00	31.50	8.57	2.49	0.00
6.00	0.74	0.00	0.00	32.00	8.57	2.49	0.00
6.50	0.82	0.00	0.00	32.50	8.57	2.49	0.00
7.00	0.91	0.00	0.00	33.00	8.57	2.49	0.00
7.50	1.01	0.00	0.00	33.50	8.57	2.49	0.00
8.00	1.11	0.00	0.00	34.00	8.57	2.49	0.00
8.50	1.23	0.00	0.00	34.50	8.57	2.49	0.00
9.00	1.36	0.00	0.00	35.00	8.57	2.49	0.00
9.50	1.51	0.00	0.00	35.50	8.57	2.49	0.00
10.00	1.69	0.00	0.00	36.00	8.57	2.49	0.00
10.50	1.91	0.00	0.00				
11.00	2.21	0.00	0.00				
11.50	2.68	0.03	0.05				
12.00	4.08	0.32	**0.59**				
12.50	5.89	1.02	**0.34**				
13.00	6.36	1.25	0.20				
13.50	6.66	1.40	0.13				
14.00	6.88	1.51	0.11				
14.50	7.06	1.61	0.09				
15.00	7.21	1.69	0.08				
15.50	7.34	1.76	0.07				
16.00	7.46	1.83	0.06				
16.50	7.56	1.89	0.06				
17.00	7.66	1.95	0.05				
17.50	7.75	2.00	0.05				
18.00	7.83	2.05	0.04				
18.50	7.91	2.09	0.04				
19.00	7.98	2.13	0.04				
19.50	8.05	2.18	0.04				
20.00	8.12	2.22	0.04				
20.50	8.18	2.25	0.04				
21.00	8.24	2.29	0.04				
21.50	8.30	2.33	0.04				
22.00	8.36	2.36	0.03				
22.50	8.42	2.40	0.03				
23.00	8.47	2.43	0.03				
23.50	8.52	2.46	0.03				
24.00	**8.57**	**2.49**	0.03				
24.50	8.57	2.49	0.00				
25.00	8.57	2.49	0.00				
25.50	8.57	2.49	0.00				

Summary for Subcatchment 2S: EX. S PLANK ROAD (IMPERV)

[49] Hint: Tc<2dt may require smaller dt

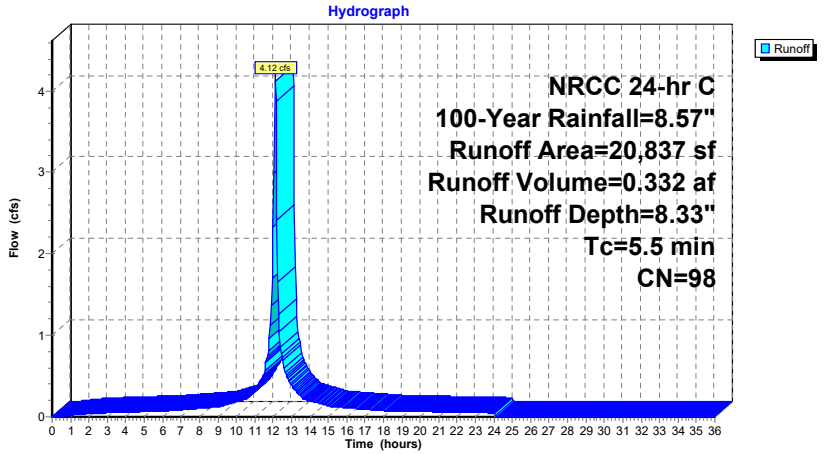
Runoff = 4.12 cfs @ 12.12 hrs, Volume= 0.332 af, Depth= 8.33"
Routed to Link 3L : EX. TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 100-Year Rainfall=8.57"

Area (sf)	CN	Description
20,837	98	Paved parking, HSG A
20,837		100.00% Impervious Area

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

Subcatchment 2S: EX. S PLANK ROAD (IMPERV)



Hydrograph for Subcatchment 2S: EX. S PLANK ROAD (IMPERV)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.00	8.57	8.33	0.00
0.50	0.05	0.00	0.00	26.50	8.57	8.33	0.00
1.00	0.10	0.01	0.02	27.00	8.57	8.33	0.00
1.50	0.15	0.04	0.03	27.50	8.57	8.33	0.00
2.00	0.21	0.08	0.04	28.00	8.57	8.33	0.00
2.50	0.27	0.12	0.04	28.50	8.57	8.33	0.00
3.00	0.33	0.17	0.05	29.00	8.57	8.33	0.00
3.50	0.39	0.22	0.05	29.50	8.57	8.33	0.00
4.00	0.45	0.28	0.06	30.00	8.57	8.33	0.00
4.50	0.52	0.34	0.06	30.50	8.57	8.33	0.00
5.00	0.59	0.40	0.06	31.00	8.57	8.33	0.00
5.50	0.66	0.47	0.07	31.50	8.57	8.33	0.00
6.00	0.74	0.54	0.07	32.00	8.57	8.33	0.00
6.50	0.82	0.61	0.08	32.50	8.57	8.33	0.00
7.00	0.91	0.70	0.09	33.00	8.57	8.33	0.00
7.50	1.01	0.80	0.10	33.50	8.57	8.33	0.00
8.00	1.11	0.90	0.10	34.00	8.57	8.33	0.00
8.50	1.23	1.02	0.11	34.50	8.57	8.33	0.00
9.00	1.36	1.14	0.12	35.00	8.57	8.33	0.00
9.50	1.51	1.29	0.15	35.50	8.57	8.33	0.00
10.00	1.69	1.47	0.19	36.00	8.57	8.33	0.00
10.50	1.91	1.68	0.22				
11.00	2.21	1.98	0.33				
11.50	2.68	2.45	0.52				
12.00	4.08	3.85	**2.33**				
12.50	5.89	5.65	**0.74**				
13.00	6.36	6.12	0.39				
13.50	6.66	6.42	0.25				
14.00	6.88	6.64	0.20				
14.50	7.06	6.82	0.17				
15.00	7.21	6.97	0.13				
15.50	7.34	7.10	0.12				
16.00	7.46	7.22	0.11				
16.50	7.56	7.33	0.10				
17.00	7.66	7.42	0.09				
17.50	7.75	7.51	0.08				
18.00	7.83	7.60	0.07				
18.50	7.91	7.67	0.07				
19.00	7.98	7.74	0.07				
19.50	8.05	7.81	0.07				
20.00	8.12	7.88	0.06				
20.50	8.18	7.94	0.06				
21.00	8.24	8.00	0.06				
21.50	8.30	8.06	0.06				
22.00	8.36	8.12	0.05				
22.50	8.42	8.18	0.05				
23.00	8.47	8.23	0.05				
23.50	8.52	8.28	0.05				
24.00	**8.57**	**8.33**	0.05				
24.50	8.57	8.33	0.00				
25.00	8.57	8.33	0.00				
25.50	8.57	8.33	0.00				

Summary for Subcatchment 4S: PROP. S PLANK ROAD (DET) (PERV)

[49] Hint: Tc<2dt may require smaller dt

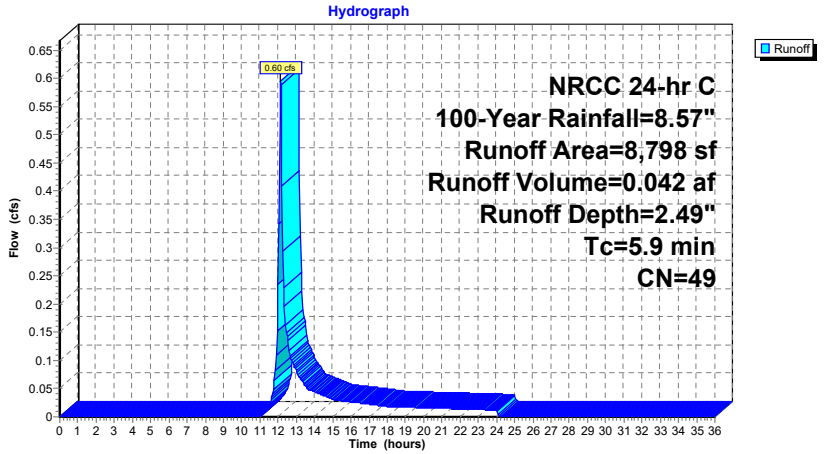
Runoff = 0.60 cfs @ 12.14 hrs, Volume= 0.042 af, Depth= 2.49"
Routed to Pond 7P : PROP. HDPE BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 100-Year Rainfall=8.57"

Area (sf)	CN	Description
8,798	49	50-75% Grass cover, Fair, HSG A
8,798		100.00% Pervious Area

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

Subcatchment 4S: PROP. S PLANK ROAD (DET) (PERV)



Hydrograph for Subcatchment 4S: PROP. S PLANK ROAD (DET) (PERV)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.00	8.57	2.49	0.00
0.50	0.05	0.00	0.00	26.50	8.57	2.49	0.00
1.00	0.10	0.00	0.00	27.00	8.57	2.49	0.00
1.50	0.15	0.00	0.00	27.50	8.57	2.49	0.00
2.00	0.21	0.00	0.00	28.00	8.57	2.49	0.00
2.50	0.27	0.00	0.00	28.50	8.57	2.49	0.00
3.00	0.33	0.00	0.00	29.00	8.57	2.49	0.00
3.50	0.39	0.00	0.00	29.50	8.57	2.49	0.00
4.00	0.45	0.00	0.00	30.00	8.57	2.49	0.00
4.50	0.52	0.00	0.00	30.50	8.57	2.49	0.00
5.00	0.59	0.00	0.00	31.00	8.57	2.49	0.00
5.50	0.66	0.00	0.00	31.50	8.57	2.49	0.00
6.00	0.74	0.00	0.00	32.00	8.57	2.49	0.00
6.50	0.82	0.00	0.00	32.50	8.57	2.49	0.00
7.00	0.91	0.00	0.00	33.00	8.57	2.49	0.00
7.50	1.01	0.00	0.00	33.50	8.57	2.49	0.00
8.00	1.11	0.00	0.00	34.00	8.57	2.49	0.00
8.50	1.23	0.00	0.00	34.50	8.57	2.49	0.00
9.00	1.36	0.00	0.00	35.00	8.57	2.49	0.00
9.50	1.51	0.00	0.00	35.50	8.57	2.49	0.00
10.00	1.69	0.00	0.00	36.00	8.57	2.49	0.00
10.50	1.91	0.00	0.00				
11.00	2.21	0.00	0.00				
11.50	2.68	0.03	0.02				
12.00	4.08	0.32	**0.23**				
12.50	5.89	1.02	**0.14**				
13.00	6.36	1.25	0.08				
13.50	6.66	1.40	0.05				
14.00	6.88	1.51	0.04				
14.50	7.06	1.61	0.04				
15.00	7.21	1.69	0.03				
15.50	7.34	1.76	0.03				
16.00	7.46	1.83	0.03				
16.50	7.56	1.89	0.02				
17.00	7.66	1.95	0.02				
17.50	7.75	2.00	0.02				
18.00	7.83	2.05	0.02				
18.50	7.91	2.09	0.02				
19.00	7.98	2.13	0.02				
19.50	8.05	2.18	0.02				
20.00	8.12	2.22	0.02				
20.50	8.18	2.25	0.02				
21.00	8.24	2.29	0.02				
21.50	8.30	2.33	0.01				
22.00	8.36	2.36	0.01				
22.50	8.42	2.40	0.01				
23.00	8.47	2.43	0.01				
23.50	8.52	2.46	0.01				
24.00	**8.57**	**2.49**	0.01				
24.50	8.57	2.49	0.00				
25.00	8.57	2.49	0.00				
25.50	8.57	2.49	0.00				

Summary for Subcatchment 5S: PROP. S PLANK ROAD (DET) (IMPERV)

[49] Hint: Tc<2dt may require smaller dt
[47] Hint: Peak is 108% of capacity of segment #5

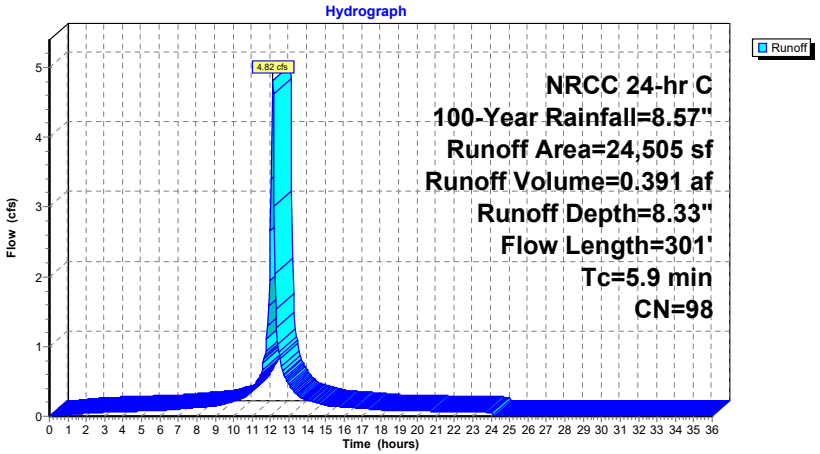
Runoff = 4.82 cfs @ 12.13 hrs, Volume= 0.391 af, Depth= 8.33"
Routed to Pond 7P : PROP. HDPE BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 100-Year Rainfall=8.57"

Area (sf)	CN	Description
24,505	98	Paved parking, HSG A
24,505		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	74	0.0890	0.29		**Sheet Flow, A-B SHEET** Grass: Short n= 0.150 P2= 3.21"
0.5	26	0.0150	0.94		**Sheet Flow, B-C SHEET** Smooth surfaces n= 0.011 P2= 3.21"
1.1	169	0.0150	2.49		**Shallow Concentrated Flow, C-D SCF** Paved Kv= 20.3 fps
0.1	26	0.0050	4.03	4.95	**Pipe Channel, D-E PIPE** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.0	6	0.0041	3.65	4.48	**Pipe Channel, E-F PIPE** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
5.9	301	Total			

Subcatchment 5S: PROP. S PLANK ROAD (DET) (IMPERV)



Hydrograph for Subcatchment 5S: PROP. S PLANK ROAD (DET) (IMPERV)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.00	8.57	8.33	0.00
0.50	0.05	0.00	0.00	26.50	8.57	8.33	0.00
1.00	0.10	0.01	0.02	27.00	8.57	8.33	0.00
1.50	0.15	0.04	0.03	27.50	8.57	8.33	0.00
2.00	0.21	0.08	0.04	28.00	8.57	8.33	0.00
2.50	0.27	0.12	0.05	28.50	8.57	8.33	0.00
3.00	0.33	0.17	0.06	29.00	8.57	8.33	0.00
3.50	0.39	0.22	0.06	29.50	8.57	8.33	0.00
4.00	0.45	0.28	0.07	30.00	8.57	8.33	0.00
4.50	0.52	0.34	0.07	30.50	8.57	8.33	0.00
5.00	0.59	0.40	0.07	31.00	8.57	8.33	0.00
5.50	0.66	0.47	0.08	31.50	8.57	8.33	0.00
6.00	0.74	0.54	0.08	32.00	8.57	8.33	0.00
6.50	0.82	0.61	0.09	32.50	8.57	8.33	0.00
7.00	0.91	0.70	0.10	33.00	8.57	8.33	0.00
7.50	1.01	0.80	0.11	33.50	8.57	8.33	0.00
8.00	1.11	0.90	0.12	34.00	8.57	8.33	0.00
8.50	1.23	1.02	0.13	34.50	8.57	8.33	0.00
9.00	1.36	1.14	0.15	35.00	8.57	8.33	0.00
9.50	1.51	1.29	0.18	35.50	8.57	8.33	0.00
10.00	1.69	1.47	0.22	36.00	8.57	8.33	0.00
10.50	1.91	1.68	0.25				
11.00	2.21	1.98	0.38				
11.50	2.68	2.45	0.61				
12.00	4.08	3.85	**2.66**				
12.50	5.89	5.65	**0.87**				
13.00	6.36	6.12	0.46				
13.50	6.66	6.42	0.30				
14.00	6.88	6.64	0.23				
14.50	7.06	6.82	0.20				
15.00	7.21	6.97	0.16				
15.50	7.34	7.10	0.14				
16.00	7.46	7.22	0.13				
16.50	7.56	7.33	0.12				
17.00	7.66	7.42	0.11				
17.50	7.75	7.51	0.10				
18.00	7.83	7.60	0.09				
18.50	7.91	7.67	0.08				
19.00	7.98	7.74	0.08				
19.50	8.05	7.81	0.08				
20.00	8.12	7.88	0.08				
20.50	8.18	7.94	0.07				
21.00	8.24	8.00	0.07				
21.50	8.30	8.06	0.07				
22.00	8.36	8.12	0.06				
22.50	8.42	8.18	0.06				
23.00	8.47	8.23	0.06				
23.50	8.52	8.28	0.06				
24.00	**8.57**	**8.33**	0.05				
24.50	8.57	8.33	0.00				
25.00	8.57	8.33	0.00				
25.50	8.57	8.33	0.00				

Summary for Subcatchment 8S: PROP. S PLANK ROAD (UNDET) (PERV)

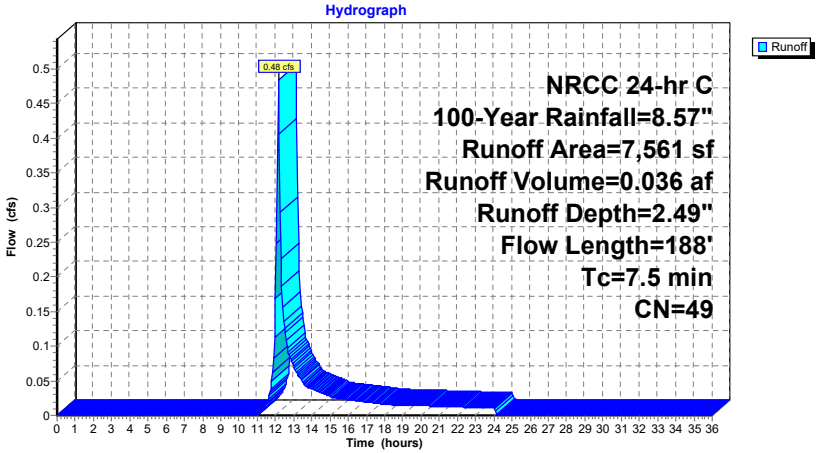
Runoff = 0.48 cfs @ 12.15 hrs, Volume= 0.036 af, Depth= 2.49"
Routed to Link 6L : PROP. TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 100-Year Rainfall=8.57"

Area (sf)	CN	Description
7,561	49	50-75% Grass cover, Fair, HSG A
7,561		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	100	0.0450	0.24		**Sheet Flow, A-B SHEET** Grass: Short n= 0.150 P2= 3.21"
0.1	27	0.0500	4.54		**Shallow Concentrated Flow, B-C SCF** Paved Kv= 20.3 fps
0.2	43	0.0500	3.60		**Shallow Concentrated Flow, C-D SCF** Unpaved Kv= 16.1 fps
0.1	18	0.0500	4.54		**Shallow Concentrated Flow, D-E SCF** Paved Kv= 20.3 fps
7.5	188	Total			

Subcatchment 8S: PROP. S PLANK ROAD (UNDET) (PERV)



Hydrograph for Subcatchment 8S: PROP. S PLANK ROAD (UNDET) (PERV)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.00	8.57	2.49	0.00
0.50	0.05	0.00	0.00	26.50	8.57	2.49	0.00
1.00	0.10	0.00	0.00	27.00	8.57	2.49	0.00
1.50	0.15	0.00	0.00	27.50	8.57	2.49	0.00
2.00	0.21	0.00	0.00	28.00	8.57	2.49	0.00
2.50	0.27	0.00	0.00	28.50	8.57	2.49	0.00
3.00	0.33	0.00	0.00	29.00	8.57	2.49	0.00
3.50	0.39	0.00	0.00	29.50	8.57	2.49	0.00
4.00	0.45	0.00	0.00	30.00	8.57	2.49	0.00
4.50	0.52	0.00	0.00	30.50	8.57	2.49	0.00
5.00	0.59	0.00	0.00	31.00	8.57	2.49	0.00
5.50	0.66	0.00	0.00	31.50	8.57	2.49	0.00
6.00	0.74	0.00	0.00	32.00	8.57	2.49	0.00
6.50	0.82	0.00	0.00	32.50	8.57	2.49	0.00
7.00	0.91	0.00	0.00	33.00	8.57	2.49	0.00
7.50	1.01	0.00	0.00	33.50	8.57	2.49	0.00
8.00	1.11	0.00	0.00	34.00	8.57	2.49	0.00
8.50	1.23	0.00	0.00	34.50	8.57	2.49	0.00
9.00	1.36	0.00	0.00	35.00	8.57	2.49	0.00
9.50	1.51	0.00	0.00	35.50	8.57	2.49	0.00
10.00	1.69	0.00	0.00	36.00	8.57	2.49	0.00
10.50	1.91	0.00	0.00				
11.00	2.21	0.00	0.00				
11.50	2.68	0.03	0.02				
12.00	4.08	0.32	**0.17**				
12.50	5.89	1.02	**0.13**				
13.00	6.36	1.25	0.07				
13.50	6.66	1.40	0.05				
14.00	6.88	1.51	0.04				
14.50	7.06	1.61	0.03				
15.00	7.21	1.69	0.03				
15.50	7.34	1.76	0.02				
16.00	7.46	1.83	0.02				
16.50	7.56	1.89	0.02				
17.00	7.66	1.95	0.02				
17.50	7.75	2.00	0.02				
18.00	7.83	2.05	0.02				
18.50	7.91	2.09	0.02				
19.00	7.98	2.13	0.01				
19.50	8.05	2.18	0.01				
20.00	8.12	2.22	0.01				
20.50	8.18	2.25	0.01				
21.00	8.24	2.29	0.01				
21.50	8.30	2.33	0.01				
22.00	8.36	2.36	0.01				
22.50	8.42	2.40	0.01				
23.00	8.47	2.43	0.01				
23.50	8.52	2.46	0.01				
24.00	**8.57**	**2.49**	0.01				
24.50	8.57	2.49	0.00				
25.00	8.57	2.49	0.00				
25.50	8.57	2.49	0.00				

Summary for Subcatchment 9S: PROP S PLANK ROAD (UNDET) (IMPERV)

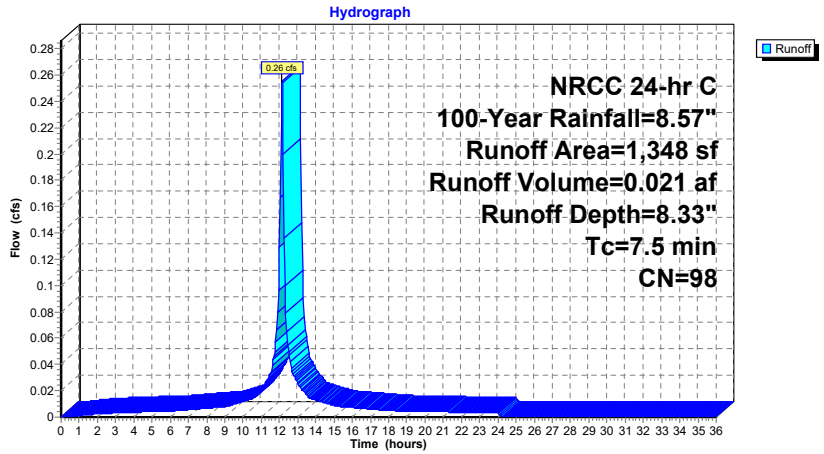
Runoff = 0.26 cfs @ 12.14 hrs, Volume= 0.021 af, Depth= 8.33"
Routed to Link 6L : PROP. TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 100-Year Rainfall=8.57"

Area (sf)	CN	Description
1,348	98	Paved parking, HSG A
1,348		100.00% Impervious Area

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

Subcatchment 9S: PROP S PLANK ROAD (UNDET) (IMPERV)



Hydrograph for Subcatchment 9S: PROP S PLANK ROAD (UNDET) (IMPERV)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.00	8.57	8.33	0.00
0.50	0.05	0.00	0.00	26.50	8.57	8.33	0.00
1.00	0.10	0.01	0.00	27.00	8.57	8.33	0.00
1.50	0.15	0.04	0.00	27.50	8.57	8.33	0.00
2.00	0.21	0.08	0.00	28.00	8.57	8.33	0.00
2.50	0.27	0.12	0.00	28.50	8.57	8.33	0.00
3.00	0.33	0.17	0.00	29.00	8.57	8.33	0.00
3.50	0.39	0.22	0.00	29.50	8.57	8.33	0.00
4.00	0.45	0.28	0.00	30.00	8.57	8.33	0.00
4.50	0.52	0.34	0.00	30.50	8.57	8.33	0.00
5.00	0.59	0.40	0.00	31.00	8.57	8.33	0.00
5.50	0.66	0.47	0.00	31.50	8.57	8.33	0.00
6.00	0.74	0.54	0.00	32.00	8.57	8.33	0.00
6.50	0.82	0.61	0.00	32.50	8.57	8.33	0.00
7.00	0.91	0.70	0.01	33.00	8.57	8.33	0.00
7.50	1.01	0.80	0.01	33.50	8.57	8.33	0.00
8.00	1.11	0.90	0.01	34.00	8.57	8.33	0.00
8.50	1.23	1.02	0.01	34.50	8.57	8.33	0.00
9.00	1.36	1.14	0.01	35.00	8.57	8.33	0.00
9.50	1.51	1.29	0.01	35.50	8.57	8.33	0.00
10.00	1.69	1.47	0.01	36.00	8.57	8.33	0.00
10.50	1.91	1.68	0.01				
11.00	2.21	1.98	0.02				
11.50	2.68	2.45	0.03				
12.00	4.08	3.85	**0.13**				
12.50	5.89	5.65	**0.05**				
13.00	6.36	6.12	0.03				
13.50	6.66	6.42	0.02				
14.00	6.88	6.64	0.01				
14.50	7.06	6.82	0.01				
15.00	7.21	6.97	0.01				
15.50	7.34	7.10	0.01				
16.00	7.46	7.22	0.01				
16.50	7.56	7.33	0.01				
17.00	7.66	7.42	0.01				
17.50	7.75	7.51	0.01				
18.00	7.83	7.60	0.00				
18.50	7.91	7.67	0.00				
19.00	7.98	7.74	0.00				
19.50	8.05	7.81	0.00				
20.00	8.12	7.88	0.00				
20.50	8.18	7.94	0.00				
21.00	8.24	8.00	0.00				
21.50	8.30	8.06	0.00				
22.00	8.36	8.12	0.00				
22.50	8.42	8.18	0.00				
23.00	8.47	8.23	0.00				
23.50	8.52	8.28	0.00				
24.00	**8.57**	**8.33**	0.00				
24.50	8.57	8.33	0.00				
25.00	8.57	8.33	0.00				
25.50	8.57	8.33	0.00				

Summary for Pond 7P: PROP. HDPE BASIN

Inflow Area = 0.765 ac, 73.58% Impervious, Inflow Depth = 6.79" for 100-Year event
Inflow = 5.41 cfs @ 12.13 hrs, Volume= 0.432 af
Outflow = 4.28 cfs @ 12.18 hrs, Volume= 0.397 af, Atten= 21%, Lag= 3.2 min
Primary = 4.28 cfs @ 12.18 hrs, Volume= 0.397 af
Routed to Link 6L : PROP. TOTAL

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 361.33' @ 12.18 hrs Surf.Area= 1,453 sf Storage= 3,145 cf

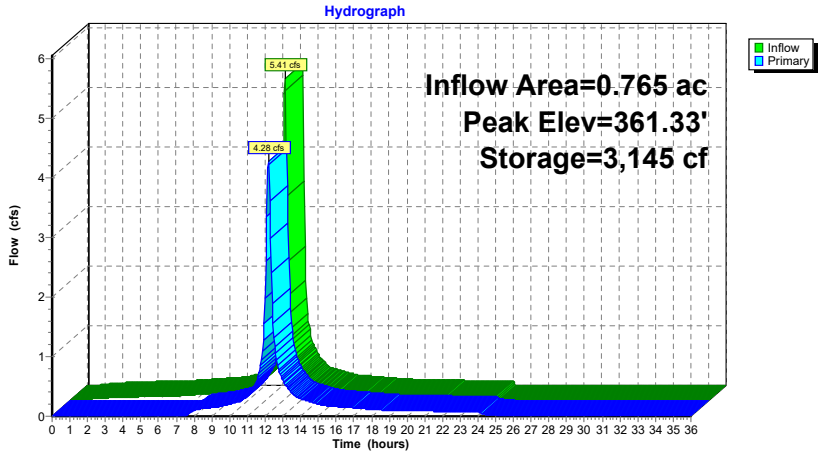
Plug-Flow detention time= 102.3 min calculated for 0.396 af (92% of inflow)
Center-of-Mass det. time= 56.3 min (811.0 - 754.8)

Volume	Invert	Avail.Storage	Storage Description
#1	358.00'	1,696 cf	**36.0" Round Pipe Storage** x 3 Inside #2 L= 80.0' 2,309 cf Overall - 3.0" Wall Thickness = 1,696 cf
#2	357.25'	1,691 cf	**17.50'W x 83.00'L x 4.50'H Prismatoid** 6,536 cf Overall - 2,309 cf Embedded = 4,227 cf x 40.0% Voids
		3,387 cf	Total Available Storage

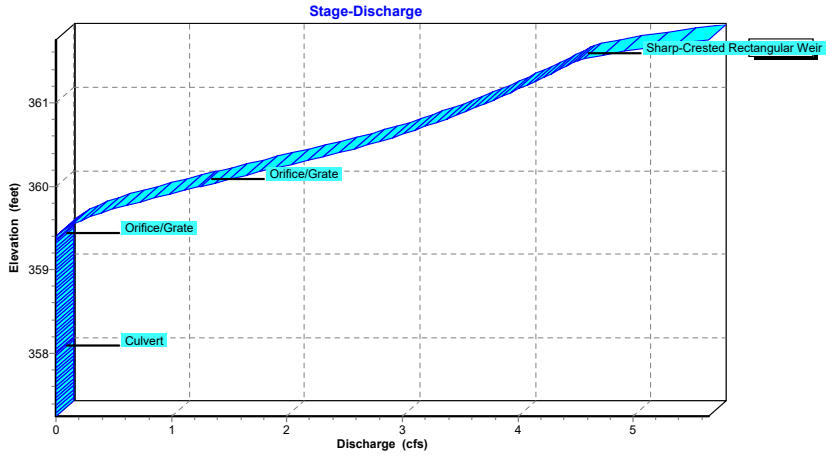
Device	Routing	Invert	Outlet Devices
#1	Primary	358.00'	**15.0" Round Culvert** L= 61.0' Ke= 0.500 Inlet / Outlet Invert= 358.00' / 353.50' S= 0.0738 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf
#2	Device 1	359.35'	**10.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	360.00'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	361.50'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=4.19 cfs @ 12.18 hrs HW=361.28' (Free Discharge)
└**1=Culvert** (Passes 4.19 cfs of 9.63 cfs potential flow)
├**2=Orifice/Grate** (Orifice Controls 3.23 cfs @ 5.93 fps)
├**3=Orifice/Grate** (Orifice Controls 0.96 cfs @ 4.89 fps)
└**4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

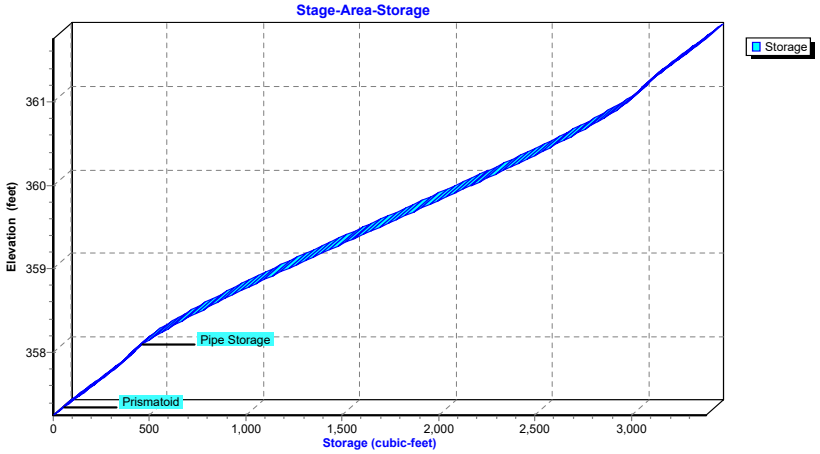
Pond 7P: PROP. HDPE BASIN



Pond 7P: PROP. HDPE BASIN



Pond 7P: PROP. HDPE BASIN



Hydrograph for Pond 7P: PROP. HDPE BASIN

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	357.25	0.00
1.00	0.02	20	357.28	0.00
2.00	0.04	139	357.49	0.00
3.00	0.06	320	357.81	0.00
4.00	0.07	541	358.21	0.00
5.00	0.07	792	358.53	0.00
6.00	0.08	1,070	358.84	0.00
7.00	0.10	1,396	359.19	0.00
8.00	0.12	1,701	359.51	0.10
9.00	0.15	1,733	359.54	0.14
10.00	0.22	1,773	359.58	0.20
11.00	0.38	1,846	359.66	0.35
12.00	**2.89**	**2,397**	**360.24**	**1.98**
13.00	**0.54**	**1,951**	**359.77**	**0.60**
14.00	0.28	1,819	359.63	0.29
15.00	0.19	1,773	359.58	0.20
16.00	0.16	1,746	359.55	0.16
17.00	0.13	1,730	359.54	0.14
18.00	0.11	1,711	359.52	0.11
19.00	0.10	1,702	359.51	0.10
20.00	0.09	1,697	359.50	0.09
21.00	0.09	1,692	359.50	0.09
22.00	0.08	1,686	359.49	0.08
23.00	0.07	1,680	359.49	0.07
24.00	0.07	1,674	359.48	0.07
25.00	0.00	1,592	359.39	0.01
26.00	0.00	1,571	359.37	0.00
27.00	0.00	1,564	359.37	0.00
28.00	0.00	1,561	359.36	0.00
29.00	0.00	1,558	359.36	0.00
30.00	0.00	1,556	359.36	0.00
31.00	0.00	1,555	359.36	0.00
32.00	0.00	1,554	359.35	0.00
33.00	0.00	1,553	359.35	0.00
34.00	0.00	1,552	359.35	0.00
35.00	0.00	1,551	359.35	0.00
36.00	0.00	1,551	359.35	0.00

Stage-Discharge for Pond 7P: PROP. HDPE BASIN

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
357.25	0.00	359.85	0.82
357.30	0.00	359.90	0.96
357.35	0.00	359.95	1.11
357.40	0.00	360.00	1.25
357.45	0.00	360.05	1.40
357.50	0.00	360.10	1.55
357.55	0.00	360.15	1.70
357.60	0.00	360.20	1.84
357.65	0.00	360.25	1.99
357.70	0.00	360.30	2.15
357.75	0.00	360.35	2.30
357.80	0.00	360.40	2.45
357.85	0.00	360.45	2.60
357.90	0.00	360.50	2.72
357.95	0.00	360.55	2.84
358.00	0.00	360.60	2.96
358.05	0.00	360.65	3.07
358.10	0.00	360.70	3.17
358.15	0.00	360.75	3.27
358.20	0.00	360.80	3.37
358.25	0.00	360.85	3.47
358.30	0.00	360.90	3.56
358.35	0.00	360.95	3.65
358.40	0.00	361.00	3.74
358.45	0.00	361.05	3.82
358.50	0.00	361.10	3.90
358.55	0.00	361.15	3.99
358.60	0.00	361.20	4.07
358.65	0.00	361.25	4.14
358.70	0.00	361.30	4.22
358.75	0.00	361.35	4.30
358.80	0.00	361.40	4.37
358.85	0.00	361.45	4.44
358.90	0.00	361.50	4.51
358.95	0.00	361.55	4.66
359.00	0.00	361.60	4.86
359.05	0.00	361.65	5.10
359.10	0.00	361.70	5.36
359.15	0.00	361.75	**5.65**
359.20	0.00		
359.25	0.00		
359.30	0.00		
359.35	0.00		
359.40	0.01		
359.45	0.04		
359.50	0.09		
359.55	0.15		
359.60	0.23		
359.65	0.33		
359.70	0.44		
359.75	0.56		
359.80	0.69		

Stage-Area-Storage for Pond 7P: PROP. HDPE BASIN

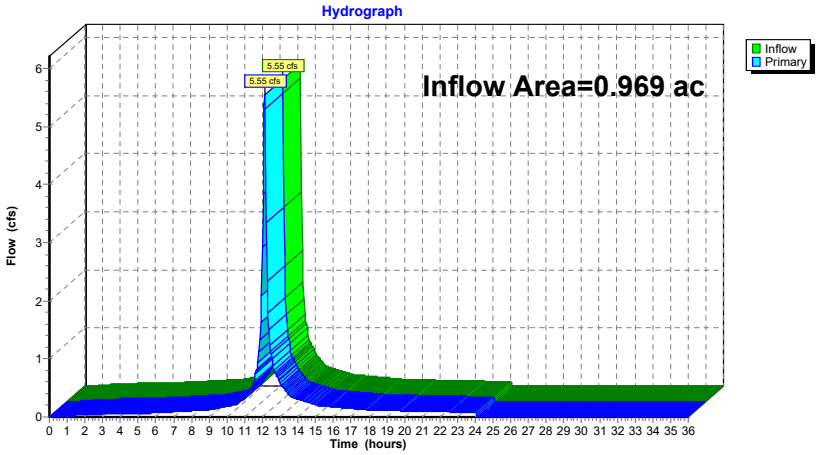
Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
357.25	0	359.85	2,030
357.30	29	359.90	2,077
357.35	58	359.95	2,125
357.40	87	360.00	2,172
357.45	116	360.05	2,218
357.50	145	360.10	2,265
357.55	174	360.15	2,311
357.60	203	360.20	2,357
357.65	232	360.25	2,402
357.70	261	360.30	2,447
357.75	291	360.35	2,491
357.80	317	360.40	2,535
357.85	341	360.45	2,578
357.90	364	360.50	2,620
357.95	386	360.55	2,662
358.00	406	360.60	2,703
358.05	433	360.65	2,743
358.10	463	360.70	2,782
358.15	496	360.75	2,820
358.20	531	360.80	2,856
358.25	568	360.85	2,891
358.30	605	360.90	2,924
358.35	644	360.95	2,955
358.40	684	361.00	2,981
358.45	725	361.05	3,002
358.50	767	361.10	3,023
358.55	809	361.15	3,046
358.60	853	361.20	3,070
358.65	896	361.25	3,097
358.70	941	361.30	3,126
358.75	985	361.35	3,155
358.80	1,031	361.40	3,184
358.85	1,076	361.45	3,213
358.90	1,122	361.50	3,242
358.95	1,169	361.55	3,271
359.00	1,216	361.60	3,300
359.05	1,263	361.65	3,329
359.10	1,310	361.70	3,358
359.15	1,357	361.75	**3,387**
359.20	1,405		
359.25	1,453		
359.30	1,501		
359.35	1,549		
359.40	1,597		
359.45	1,645		
359.50	1,694		
359.55	1,742		
359.60	1,790		
359.65	1,838		
359.70	1,886		
359.75	1,934		
359.80	1,982		

Summary for Link 3L: EX. TOTAL

Inflow Area = 0.969 ac, 49.36% Impervious, Inflow Depth = 5.37" for 100-Year event
Inflow = 5.55 cfs @ 12.12 hrs, Volume= 0.434 af
Primary = 5.55 cfs @ 12.12 hrs, Volume= 0.434 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Link 3L: EX. TOTAL



Hydrograph for Link 3L: EX. TOTAL

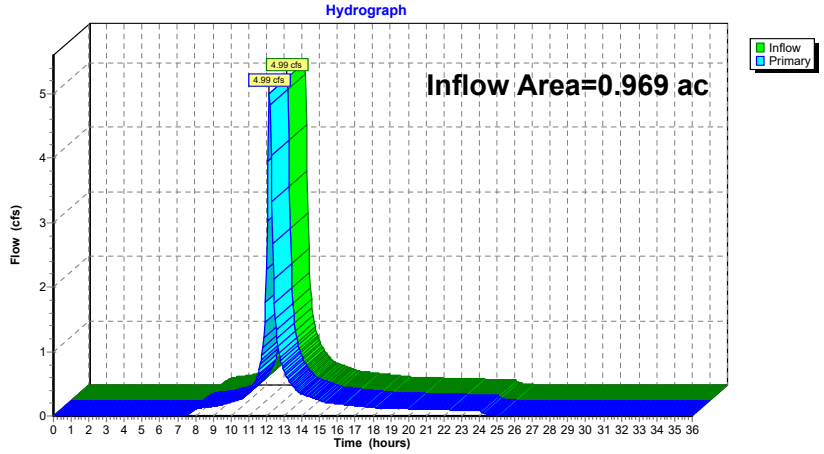
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	26.00	0.00	0.00	0.00
0.50	0.00	0.00	0.00	26.50	0.00	0.00	0.00
1.00	0.02	0.00	0.02	27.00	0.00	0.00	0.00
1.50	0.03	0.00	0.03	27.50	0.00	0.00	0.00
2.00	0.04	0.00	0.04	28.00	0.00	0.00	0.00
2.50	0.04	0.00	0.04	28.50	0.00	0.00	0.00
3.00	0.05	0.00	0.05	29.00	0.00	0.00	0.00
3.50	0.05	0.00	0.05	29.50	0.00	0.00	0.00
4.00	0.06	0.00	0.06	30.00	0.00	0.00	0.00
4.50	0.06	0.00	0.06	30.50	0.00	0.00	0.00
5.00	0.06	0.00	0.06	31.00	0.00	0.00	0.00
5.50	0.07	0.00	0.07	31.50	0.00	0.00	0.00
6.00	0.07	0.00	0.07	32.00	0.00	0.00	0.00
6.50	0.08	0.00	0.08	32.50	0.00	0.00	0.00
7.00	0.09	0.00	0.09	33.00	0.00	0.00	0.00
7.50	0.10	0.00	0.10	33.50	0.00	0.00	0.00
8.00	0.10	0.00	0.10	34.00	0.00	0.00	0.00
8.50	0.11	0.00	0.11	34.50	0.00	0.00	0.00
9.00	0.12	0.00	0.12	35.00	0.00	0.00	0.00
9.50	0.15	0.00	0.15	35.50	0.00	0.00	0.00
10.00	0.19	0.00	0.19	36.00	0.00	0.00	0.00
10.50	0.22	0.00	0.22				
11.00	0.33	0.00	0.33				
11.50	0.57	0.00	0.57				
12.00	**2.92**	0.00	**2.92**				
12.50	**1.08**	0.00	**1.08**				
13.00	0.59	0.00	0.59				
13.50	0.38	0.00	0.38				
14.00	0.31	0.00	0.31				
14.50	0.26	0.00	0.26				
15.00	0.21	0.00	0.21				
15.50	0.19	0.00	0.19				
16.00	0.17	0.00	0.17				
16.50	0.16	0.00	0.16				
17.00	0.15	0.00	0.15				
17.50	0.13	0.00	0.13				
18.00	0.12	0.00	0.12				
18.50	0.11	0.00	0.11				
19.00	0.11	0.00	0.11				
19.50	0.11	0.00	0.11				
20.00	0.10	0.00	0.10				
20.50	0.10	0.00	0.10				
21.00	0.10	0.00	0.10				
21.50	0.09	0.00	0.09				
22.00	0.09	0.00	0.09				
22.50	0.09	0.00	0.09				
23.00	0.08	0.00	0.08				
23.50	0.08	0.00	0.08				
24.00	0.08	0.00	0.08				
24.50	0.00	0.00	0.00				
25.00	0.00	0.00	0.00				
25.50	0.00	0.00	0.00				

Summary for Link 6L: PROP. TOTAL

Inflow Area = 0.969 ac, 61.25% Impervious, Inflow Depth = 5.63" for 100-Year event
Inflow = 4.99 cfs @ 12.17 hrs, Volume= 0.454 af
Primary = 4.99 cfs @ 12.17 hrs, Volume= 0.454 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Link 6L: PROP. TOTAL



Hydrograph for Link 6L: PROP. TOTAL

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	26.00	0.00	0.00	0.00
0.50	0.00	0.00	0.00	26.50	0.00	0.00	0.00
1.00	0.00	0.00	0.00	27.00	0.00	0.00	0.00
1.50	0.00	0.00	0.00	27.50	0.00	0.00	0.00
2.00	0.00	0.00	0.00	28.00	0.00	0.00	0.00
2.50	0.00	0.00	0.00	28.50	0.00	0.00	0.00
3.00	0.00	0.00	0.00	29.00	0.00	0.00	0.00
3.50	0.00	0.00	0.00	29.50	0.00	0.00	0.00
4.00	0.00	0.00	0.00	30.00	0.00	0.00	0.00
4.50	0.00	0.00	0.00	30.50	0.00	0.00	0.00
5.00	0.00	0.00	0.00	31.00	0.00	0.00	0.00
5.50	0.00	0.00	0.00	31.50	0.00	0.00	0.00
6.00	0.00	0.00	0.00	32.00	0.00	0.00	0.00
6.50	0.00	0.00	0.00	32.50	0.00	0.00	0.00
7.00	0.01	0.00	0.01	33.00	0.00	0.00	0.00
7.50	0.01	0.00	0.01	33.50	0.00	0.00	0.00
8.00	0.10	0.00	0.10	34.00	0.00	0.00	0.00
8.50	0.13	0.00	0.13	34.50	0.00	0.00	0.00
9.00	0.15	0.00	0.15	35.00	0.00	0.00	0.00
9.50	0.18	0.00	0.18	35.50	0.00	0.00	0.00
10.00	0.22	0.00	0.22	36.00	0.00	0.00	0.00
10.50	0.26	0.00	0.26				
11.00	0.37	0.00	0.37				
11.50	0.62	0.00	0.62				
12.00	**2.28**	0.00	**2.28**				
12.50	**1.50**	0.00	**1.50**				
13.00	0.70	0.00	0.70				
13.50	0.46	0.00	0.46				
14.00	0.34	0.00	0.34				
14.50	0.29	0.00	0.29				
15.00	0.24	0.00	0.24				
15.50	0.21	0.00	0.21				
16.00	0.19	0.00	0.19				
16.50	0.18	0.00	0.18				
17.00	0.16	0.00	0.16				
17.50	0.15	0.00	0.15				
18.00	0.13	0.00	0.13				
18.50	0.12	0.00	0.12				
19.00	0.12	0.00	0.12				
19.50	0.11	0.00	0.11				
20.00	0.11	0.00	0.11				
20.50	0.11	0.00	0.11				
21.00	0.10	0.00	0.10				
21.50	0.10	0.00	0.10				
22.00	0.10	0.00	0.10				
22.50	0.09	0.00	0.09				
23.00	0.09	0.00	0.09				
23.50	0.09	0.00	0.09				
24.00	0.08	0.00	0.08				
24.50	0.02	0.00	0.02				
25.00	0.01	0.00	0.01				
25.50	0.01	0.00	0.01				

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DYNAMIC ENGINEERING

Stormwater Collection System Calculations

Project: Proposed Popeyes Restaurant
Job #: 1021-22-01041
Location: Newburgh NY
Design Storm: 25 Year

Computed By: JD
Checked By: MB
Date:

NOTES:
1) Design method used is Rational Method, unless otherwise noted.
2) Refer to Weighted Runoff Coefficient table for calculation of incremental areas and C values

PIPE SECTION		SUBCATCHMENT AREA	INCREMENTAL		CUMULATIVE	TIME OF CONCENTRATION			I	PEAK RUNOFF		PIPING INPUT			PIPING DATA		
FROM	TO	Area (Acres)	"C"	A x C Ac	A x C (acres)	Tc to Inlet (min)	Tc in Pipe (min.)	Final Tc (min)	(In/Hr)	Q to Inlet (CFS)	Q cum. for Pipe (CFS)	Dia. (In)	Length (Ft)	Man. "n"	Slope (ft/ft)	Pipe Capacity (cfs)	Pipe Velocity (fps)
STORM STR 4	STORM STR 3	0.25	0.78	0.20	0.20	6.00	0.18	6.00	7.70	1.54	1.54	15	51.0	0.010	0.0050	5.94	4.84
STORM STR 3	STORM STR 2	0.04	0.87	0.03	0.23	6.00	0.14	6.18	7.70	0.23	1.77	15	40.0	0.010	0.0050	5.94	4.84
STORM STR 2	STORM STR 5	0.41	0.73	0.30	0.53	6.00	0.22	6.32	7.70	2.31	4.08	15	49.0	0.013	0.0050	4.57	3.73
STORM STR 5	UNDERGROUND BASIN	0.00	0.95	0.00	0.53	6.00	0.02	6.54	7.59	0.00	4.02	15	6.0	0.012	0.0050	4.95	4.04
UNDERGROUND BASIN	EX. INLET	0.70	0.95	0.67	1.20	6.00	0.25	6.56	7.59	5.08	9.11	15	55.0	0.013	0.0050	4.57	3.73

SITE LOGBOOK

APPENDIX F
CONSTRUCTION SITE INSPECTION AND MAINTENANCE LOG BOOK

STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM FOR CONSTRUCTION ACTIVITIES

SAMPLE CONSTRUCTION SITE LOG BOOK

Table of Contents

I. **PRE-CONSTRUCTION MEETING DOCUMENTS**

Project Name _____

Permit No. _____ **Date of Authorization** _____

Name of Operator _____

Prime Contractor _____

a. **Preamble to Site Assessment and Inspections**

The Following Information To Be Read By All Person's Involved in The Construction of Stormwater Related Activities:

The Operator agrees to have a qualified inspector[1] conduct an assessment of the site prior to the commencement of construction[2] and certify in this inspection report that the appropriate erosion and sediment controls described in the SWPPP have been adequately installed or implemented to ensure overall preparedness of the site for the commencement of construction.

Prior to the commencement of construction, the Operator shall certify in this site logbook that the SWPPP has been prepared in accordance with the State's standards and meets all Federal, State and local erosion and sediment control requirements. A preconstruction meeting should be held to review all of the SWPPP requirements with construction personnel.

When construction starts, site inspections shall be conducted by the qualified inspector at least every 7 calendar days. The Operator shall maintain a record of all inspection reports in this site logbook. The site logbook shall be maintained on site and be made available to the permitting authorities upon request.

Prior to filing the Notice of Termination or the end of permit term, the Operator shall have a qualified inspector perform a final site inspection. The qualified inspector shall certify that the site has undergone final stabilization[3] using either vegetative or structural stabilization methods and that all temporary erosion and sediment controls (such as silt fencing) not needed for long-term erosion control have been removed. In addition, the Operator must identify and certify that all permanent structures described in the SWPPP have been constructed and provide the owner(s) with an operation and maintenance plan that ensures the structure(s) continuously functions as designed.

1 Refer to "Qualified Inspector" inspection requirements in the current SPDES General Permit for Stormwater Discharges from Construction Activity for complete list of inspection requirements.

2 "Commencement of construction" means the initial removal of vegetation and disturbance of soils associated with clearing, grading or excavating activities or other construction activities.

3 "Final stabilization" means that all soil-disturbing activities at the site have been completed and a uniform, perennial vegetative cover with a density of eighty (80) percent has been established or equivalent stabilization measures (such as the use of mulches or geotextiles) have been employed on all unpaved areas and areas not covered by permanent structures.

b. Pre-construction Site Assessment Checklist
(NOTE: Provide comments below as necessary)

1. Notice of Intent, SWPPP, and Contractors Certification:

Yes No NA

[ ] [ ] [ ] Has a Notice of Intent been filed with the NYS Department of Conservation?
[ ] [ ] [ ] Is the SWPPP on-site? Where?_____
[ ] [ ] [ ] Is the Plan current? What is the latest revision date?_____
[ ] [ ] [ ] Is a copy of the NOI (with brief description) onsite? Where?_____
[ ] [ ] [ ] Have all contractors involved with stormwater related activities signed a contractor's certification?

2. Resource Protection

Yes No NA

[ ] [ ] [ ] Are construction limits clearly flagged or fenced?
[ ] [ ] [ ] Important trees and associated rooting zones, on-site septic system absorption fields, existing vegetated areas suitable for filter strips, especially in perimeter areas, have been flagged for protection.
[ ] [ ] [ ] Creek crossings installed prior to land-disturbing activity, including clearing and blasting.

3. Surface Water Protection

Yes No NA

[ ] [ ] [ ] Clean stormwater runoff has been diverted from areas to be disturbed.
[ ] [ ] [ ] Bodies of water located either on site or in the vicinity of the site have been identified and protected.
[ ] [ ] [ ] Appropriate practices to protect on-site or downstream surface water are installed.
[ ] [ ] [ ] Are clearing and grading operations divided into areas <5 acres?

4. Stabilized Construction Access

Yes No NA

[ ] [ ] [ ] A temporary construction entrance to capture mud and debris from construction vehicles before they enter the public highway has been installed.
[ ] [ ] [ ] Other access areas (entrances, construction routes, equipment parking areas) are stabilized immediately as work takes place with gravel or other cover.
[ ] [ ] [ ] Sediment tracked onto public streets is removed or cleaned on a regular basis.

5. Sediment Controls

Yes No NA

[ ] [ ] [ ] Silt fence material and installation comply with the standard drawing and specifications.
[ ] [ ] [ ] Silt fences are installed at appropriate spacing intervals
[ ] [ ] [ ] Sediment/detention basin was installed as first land disturbing activity.
[ ] [ ] [ ] Sediment traps and barriers are installed.

6. Pollution Prevention for Waste and Hazardous Materials

Yes No NA

[ ] [ ] [ ] The Operator or designated representative has been assigned to implement the spill prevention avoidance and response plan.
[ ] [ ] [ ] The plan is contained in the SWPPP on page _____
[ ] [ ] [ ] Appropriate materials to control spills are onsite. Where? _____

II. CONSTRUCTION DURATION INSPECTIONS

a. Directions:

Inspection Forms will be filled out during the entire construction phase of the project.

Required Elements:

1) On a site map, indicate the extent of all disturbed site areas and drainage pathways. Indicate site areas that are expected to undergo initial disturbance or significant site work within the next 14-day period;

2) Indicate on a site map all areas of the site that have undergone temporary or permanent stabilization;

3) Indicate all disturbed site areas that have not undergone active site work during the previous 14-day period;

4) Inspect all sediment control practices and record the approximate degree of sediment accumulation as a percentage of sediment storage volume (for example, 10 percent, 20 percent, 50 percent);

5) Inspect all erosion and sediment control practices and record all maintenance requirements such as verifying the integrity of barrier or diversion systems (earthen berms or silt fencing) and containment systems (sediment basins and sediment traps). Identify any evidence of rill or gully erosion occurring on slopes and any loss of stabilizing vegetation or seeding/mulching. Document any excessive deposition of sediment or ponding water along barrier or diversion systems. Record the depth of sediment within containment structures, any erosion near outlet and overflow structures, and verify the ability of rock filters around perforated riser pipes to pass water; and

6) Immediately report to the Operator any deficiencies that are identified with the implementation of the SWPPP.

SITE PLAN/SKETCH

_____ _____

Inspector (print name) **Date of Inspection**

_____ _____

Qualified Inspector (print name) **Qualified Inspector Signature**

The above signed acknowledges that, to the best of his/her knowledge, all information provided on the forms is accurate and complete.

Maintaining Water Quality

Yes No NA
[ ] [ ] [ ] Is there an increase in turbidity causing a substantial visible contrast to natural conditions at the outfalls?
[ ] [ ] [ ] Is there residue from oil and floating substances, visible oil film, or globules or grease at the outfalls?
[ ] [ ] [ ] All disturbance is within the limits of the approved plans.
[ ] [ ] [ ] Have receiving lake/bay, stream, and/or wetland been impacted by silt from project?

Housekeeping

1. General Site Conditions

Yes No NA
[ ] [ ] [ ] Is construction site litter, debris and spoils appropriately managed?
[ ] [ ] [ ] Are facilities and equipment necessary for implementation of erosion and sediment control in working order and/or properly maintained?
[ ] [ ] [ ] Is construction impacting the adjacent property?
[ ] [ ] [ ] Is dust adequately controlled?

2. Temporary Stream Crossing

Yes No NA
[ ] [ ] [ ] Maximum diameter pipes necessary to span creek without dredging are installed.
[ ] [ ] [ ] Installed non-woven geotextile fabric beneath approaches.
[ ] [ ] [ ] Is fill composed of aggregate (no earth or soil)?
[ ] [ ] [ ] Rock on approaches is clean enough to remove mud from vehicles & prevent sediment from entering stream during high flow.

3. Stabilized Construction Access

Yes No NA
[ ] [ ] [ ] Stone is clean enough to effectively remove mud from vehicles.
[ ] [ ] [ ] Installed per standards and specifications?
[ ] [ ] [ ] Does all traffic use the stabilized entrance to enter and leave site?
[ ] [ ] [ ] Is adequate drainage provided to prevent ponding at entrance?

Runoff Control Practices

1. Excavation Dewatering

Yes No NA
[ ] [ ] [ ] Upstream and downstream berms (sandbags, inflatable dams, etc.) are installed per plan.
[ ] [ ] [ ] Clean water from upstream pool is being pumped to the downstream pool.
[ ] [ ] [ ] Sediment laden water from work area is being discharged to a silt-trapping device.
[ ] [ ] [ ] Constructed upstream berm with one-foot minimum freeboard.

Runoff Control Practices (continued)

2. Flow Spreader

Yes No NA

[ ] [ ] [ ] Installed per plan.
[ ] [ ] [ ] Constructed on undisturbed soil, not on fill, receiving only clear, non-sediment laden flow.
[ ] [ ] [ ] Flow sheets out of level spreader without erosion on downstream edge.

3. Interceptor Dikes and Swales

Yes No NA

[ ] [ ] [ ] Installed per plan with minimum side slopes 2H:1V or flatter.
[ ] [ ] [ ] Stabilized by geotextile fabric, seed, or mulch with no erosion occurring.
[ ] [ ] [ ] Sediment-laden runoff directed to sediment trapping structure

4. Stone Check Dam

Yes No NA

[ ] [ ] [ ] Is channel stable? (flow is not eroding soil underneath or around the structure).
[ ] [ ] [ ] Check is in good condition (rocks in place and no permanent pools behind the structure).
[ ] [ ] [ ] Has accumulated sediment been removed?.

5. Rock Outlet Protection

Yes No NA

[ ] [ ] [ ] Installed per plan.
[ ] [ ] [ ] Installed concurrently with pipe installation.

Soil Stabilization

1. Topsoil and Spoil Stockpiles

Yes No NA

[ ] [ ] [ ] Stockpiles are stabilized with vegetation and/or mulch.
[ ] [ ] [ ] Sediment control is installed at the toe of the slope.

2. Revegetation

Yes No NA

[ ] [ ] [ ] Temporary seedings and mulch have been applied to idle areas.
[ ] [ ] [ ] 4 inches minimum of topsoil has been applied under permanent seedings

Sediment Control Practices

1. Silt Fence and Linear Barriers

Yes No NA

[ ] [ ] [ ] Installed on Contour, 10 feet from toe of slope (not across conveyance channels).
[ ] [ ] [ ] Joints constructed by wrapping the two ends together for continuous support.
[ ] [ ] [ ] Fabric buried 6 inches minimum.
[ ] [ ] [ ] Posts are stable, fabric is tight and without rips or frayed areas.
Sediment accumulation is ___% of design capacity.

Sediment Control Practices (continued)

2. Storm Drain Inlet Protection (Use for Stone & Block; Filter Fabric; Curb; or, Excavated; Filter Sock or Manufactured practices)

Yes No NA

[ ] [ ] [ ] Installed concrete blocks lengthwise so open ends face outward, not upward.
[ ] [ ] [ ] Placed wire screen between No. 3 crushed stone and concrete blocks.
[ ] [ ] [ ] Drainage area is 1acre or less.
[ ] [ ] [ ] Excavated area is 900 cubic feet.
[ ] [ ] [ ] Excavated side slopes should be 2:1.
[ ] [ ] [ ] 2" x 4" frame is constructed and structurally sound.
[ ] [ ] [ ] Posts 3-foot maximum spacing between posts.
[ ] [ ] [ ] Fabric is embedded 1 to 1.5 feet below ground and secured to frame/posts with staples at max 8-inch spacing.
[ ] [ ] [ ] Posts are stable, fabric is tight and without rips or frayed areas.
[ ] [ ] [ ] Manufactured insert fabric is free of tears and punctures.
[ ] [ ] [ ] Filter Sock is not torn or flattened and fill material is contained within the mesh sock.

Sediment accumulation ___% of design capacity.

3. Temporary Sediment Trap

Yes No NA

[ ] [ ] [ ] Outlet structure is constructed per the approved plan or drawing.
[ ] [ ] [ ] Geotextile fabric has been placed beneath rock fill.
[ ] [ ] [ ] Sediment trap slopes and disturbed areas are stabilized.

Sediment accumulation is ___% of design capacity.

4. Temporary Sediment Basin

Yes No NA

[ ] [ ] [ ] Basin and outlet structure constructed per the approved plan.
[ ] [ ] [ ] Basin side slopes are stabilized with seed/mulch.
[ ] [ ] [ ] Drainage structure flushed and basin surface restored upon removal of sediment basin facility.
[ ] [ ] [ ] Sediment basin dewatering pool is dewatering at appropriate rate.

Sediment accumulation is ___% of design capacity.

Note: Not all erosion and sediment control practices are included in this listing. Add additional pages to this list as required by site specific design. All practices shall be maintained in accordance with their respective standards.

Construction inspection checklists for post-development stormwater management practices can be found in Appendix F of the New York Stormwater Management Design Manual.

CONSTRUCTION DURATION INSPECTIONS

b. Modifications to the SWPPP (To be completed as described below)

The Operator shall amend the SWPPP whenever:

1. There is a significant change in design, construction, operation, or maintenance which may have a significant effect on the potential for the discharge of pollutants to the waters of the United States and which has not otherwise been addressed in the SWPPP; or
2. The SWPPP proves to be ineffective in:
   a. Eliminating or significantly minimizing pollutants from sources identified in the SWPPP and as required by this permit; or
   b. Achieving the general objectives of controlling pollutants in stormwater discharges from permitted construction activity; and
3. Additionally, the SWPPP shall be amended to identify any new contractor or subcontractor that will implement any measure of the SWPPP.

Modification & Reason:

CONTRACTOR CERTIFICATIONS AND FORMS

Contractor's Certifications & Forms

CONTRACTOR'S CERTIFICATION STATEMENT

I. SITE INFORMATION

Project Location: Parcel 70.06-1-50.4 & 47
64 & 140 Leber Road
Town of Orangetown, Rockland County, New York

II. CONTRACTORS INFORMATION

Contracting Firm Name: _____
Contracting Firm Address: _____
Telephone Number(s): _____
Contact(s): 1) _____
2) _____

III. CERTIFICATION

"I hereby certify under penalty of law 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 developer must comply with the terms and conditions of the NYC Stormwater Construction Permit, 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 am aware that there are significant penalties for submitting false information that I do not believe to be true, including the possibility of fine and imprisonment for knowing violations."

_____ _____
Contractor (print name) Contractor Signature

_____ _____
Title Date

SUBCONTRACTOR'S CERTIFICATION STATEMENT

I. SITE INFORMATION

Project Location: Parcel 70.06-1-50.4 & 47
64 & 140 Leber Road
Town of Orangetown, Rockland County, New York

II. CONTRACTORS INFORMATION

Contracting Firm Name: _____
Contracting Firm Address: _____
Telephone Number(s): _____
Contact(s): 1) _____
2) _____

III. CERTIFICATION

"I hereby certify under penalty of law 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 developer must comply with the terms and conditions of the NYC Stormwater Construction Permit, 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 am aware that there are significant penalties for submitting false information that I do not believe to be true, including the possibility of fine and imprisonment for knowing violations."

_____ _____
Subcontractor (print name) Subcontractor Signature

_____ _____
Title Date

EROSION AND WATER QUALITY CONTROL IDENTIFICATION

The contractor and/or subcontractors that will implement each erosion control measure must be identified:

IDENTIFICATION

Name of Contractor and/or Subcontractor	Measure to be Implemented

[Include additional rows or delete as necessary.]

*(**Note:** Each contractor and subcontractor identified must sign a copy of the certification statement. Those copies must be filed with the SWPPP, kept on-site, and kept up to date.*

This identification does not reassign or remove responsibility for all measures as agreed to the contract documents. The contractor is responsible for all subcontractors.)

MS4 SWPPP ACCEPTANCE FORM

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

MS4 Stormwater Pollution Prevention Plan (SWPPP) Acceptance Form

for

Construction Activities Seeking Authorization Under SPDES General Permit

*(NOTE: Attach Completed Form to Notice Of Intent and Submit to Address Above)

I. Project Owner/Operator Information	
1. Owner/Operator Name:	Newburgh Chicken, LLC
2. Contact Person:	Ed Baksh
3. Street Address:	301 Route 17 North, Suite 802
4. City/State/Zip:	Rutherford, NJ 07070
II. Project Site Information	
5. Project/Site Name:	Proposed Popeye's Restaurant
6. Street Address:	197 South Plank Road
7. City/State/Zip:	Town of Newburgh, New York 12550
III. Stormwater Pollution Prevention Plan (SWPPP) Review and Acceptance Information	
8. SWPPP Reviewed by:	
9. Title/Position:	
10. Date Final SWPPP Reviewed and Accepted:	
IV. Regulated MS4 Information	
11. Name of MS4:	
12. MS4 SPDES Permit Identification Number: NYR20A	
13. Contact Person:	
14. Street Address:	
15. City/State/Zip:	
16. Telephone Number:	

MS4 SWPPP Acceptance Form - continued

V. Certification Statement - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative

I hereby certify that the final Stormwater Pollution Prevention Plan (SWPPP) for the construction project identified in question 5 has been reviewed and meets the substantive requirements in the SPDES General Permit For Stormwater Discharges from Municipal Separate Storm Sewer Systems (MS4s). Note: The MS4, through the acceptance of the SWPPP, assumes no responsibility for the accuracy and adequacy of the design included in the SWPPP. In addition, review and acceptance of the SWPPP by the MS4 does not relieve the owner/operator or their SWPPP preparer of responsibility or liability for errors or omissions in the plan.

Printed Name:

Title/Position:

Signature:

Date:

VI. Additional Information

(NYS DEC - MS4 SWPPP Acceptance Form - January 2015)

POST CONSTRUCTION STORMWATER MAINTENANCE AGREEMENT AND SMP INSPECTION DOCUMENTS

Stormwater Pond/Wetland Operation, Maintenance and Management Inspection Checklist

Project _____
Location: _____
Site Status: _____

Date: _____
Time: _____

Inspector: _____

Maintenance Item	Satisfactory/ Unsatisfactory	Comments
1. Embankment and emergency spillway (Annual, After Major Storms)		
1. Vegetation and ground cover adequate		
2. Embankment erosion		
3. Animal burrows		
4. Unauthorized planting		
5. Cracking, bulging, or sliding of dam		
a. Upstream face		
b. Downstream face		
c. At or beyond toe		
downstream		
upstream		
d. Emergency spillway		
6.Pond, toe & chimney drains clear and functioning		
7.Seeps/leaks on downstream face		
8.Slope protection or riprap failure		
9. Vertical/horizontal alignment of top of dam “As-Built”		

Maintenance Item	Satisfactory/ Unsatisfactory	Comments
10. Emergency spillway clear of obstructions and debris		
11. Other (specify)		
2. Riser and principal spillway (Annual)		
Type: Reinforced concrete _____ Corrugated pipe _____ Masonry _____ 1. Low flow orifice obstructed		
2. Low flow trash rack. a. Debris removal necessary		
b. Corrosion control		
3. Weir trash rack maintenance a. Debris removal necessary		
b. corrosion control		
4. Excessive sediment accumulation insider riser		
5. Concrete/masonry condition riser and barrels a. cracks or displacement		
b. Minor spalling (<1")		
c. Major spalling (rebars exposed)		
d. Joint failures		
e. Water tightness		
6. Metal pipe condition		
7. Control valve a. Operational/exercised		
b. Chained and locked		
8. Pond drain valve a. Operational/exercised		
b. Chained and locked		
9. Outfall channels functioning		
10. Other (specify)		

Maintenance Item	Satisfactory/ Unsatisfactory	Comments
3. Permanent Pool (Wet Ponds) (monthly)		
1. Undesirable vegetative growth		
2. Floating or floatable debris removal required		
3. Visible pollution		
4. Shoreline problem		
5. Other (specify)		
4. Sediment Forebays		
1.Sedimentation noted		
2. Sediment cleanout when depth < 50% design depth		
5. Dry Pond Areas		
1. Vegetation adequate		
2. Undesirable vegetative growth		
3. Undesirable woody vegetation		
4. Low flow channels clear of obstructions		
5. Standing water or wet spots		
6. Sediment and / or trash accumulation		
7. Other (specify)		
6. Condition of Outfalls (Annual , After Major Storms)		
1. Riprap failures		
2. Slope erosion		
3. Storm drain pipes		
4.Endwalls / Headwalls		
5. Other (specify)		
7. Other (Monthly)		
1. Encroachment on pond, wetland or easement area		

Maintenance Item	Satisfactory/ Unsatisfactory	Comments
2. Complaints from residents		
3.Aesthetics a. Grass growing required		
b. Graffiti removal needed		
c. Other (specify)		
4. Conditions of maintenance access routes.		
5. Signs of hydrocarbon build-up		
6. Any public hazards (specify)		
8. Wetland Vegetation (Annual)		
1. Vegetation healthy and growing Wetland maintaining 50% surface area coverage of wetland plants after the second growing season. (If unsatisfactory, reinforcement plantings needed)		
2. Dominant wetland plants: Survival of desired wetland plant species Distribution according to landscaping plan?		
3. Evidence of invasive species		
4. Maintenance of adequate water depths for desired wetland plant species		
5. Harvesting of emergent plantings needed		
6. Have sediment accumulations reduced pool volume significantly or are plants “choked” with sediment		
7. Eutrophication level of the wetland.		
8. Other (specify)		

Comments:

Actions to be Taken:

_____

_____

_____

_____

Infiltration Trench Operation, Maintenance, and Management Inspection Checklist

Project:
Location:
Site Status:

Date:

Time:

Inspector:

MAINTENANCE ITEM	SATISFACTORY / UNSATISFACTORY	COMMENTS
1. Debris Cleanout (Monthly)		
Trench surface clear of debris		
Inflow pipes clear of debris		
Overflow spillway clear of debris		
Inlet area clear of debris		
2. Sediment Traps or Forebays (Annual)		
Obviously trapping sediment		
Greater than 50% of storage volume remaining		
3. Dewatering (Monthly)		
Trench dewaters between storms		
4. Sediment Cleanout of Trench (Annual)		
No evidence of sedimentation in trench		
Sediment accumulation doesn't yet require cleanout		
5. Inlets (Annual)		

MAINTENANCE ITEM	SATISFACTORY / UNSATISFACTORY	COMMENTS
Good condition		
No evidence of erosion		
6. Outlet/Overflow Spillway (Annual)		
Good condition, no need for repair		
No evidence of erosion		
7. Aggregate Repairs (Annual)		
Surface of aggregate clean		
Top layer of stone does not need replacement		
Trench does not need rehabilitation		

Comments:

Actions to be Taken:

Sand/Organic Filter Operation, Maintenance and Management Inspection Checklist

Project:
Location:
Site Status:

Date:

Time:

Inspector:

MAINTENANCE ITEM	SATISFACTORY / UNSATISFACTORY	COMMENTS
1. Debris Cleanout (Monthly)		
Contributing areas clean of debris		
Filtration facility clean of debris		
Inlet and outlets clear of debris		
2. Oil and Grease (Monthly)		
No evidence of filter surface clogging		
Activities in drainage area minimize oil and grease entry		
3. Vegetation (Monthly)		
Contributing drainage area stabilized		
No evidence of erosion		
Area mowed and clipping removed		
4. Water Retention Where Required (Monthly)		
Water holding chambers at normal pool		
No evidence of leakage		
5. Sediment Deposition (Annual)		

MAINTENANCE ITEM	SATISFACTORY / UNSATISFACTORY	COMMENTS
Filter chamber free of sediments		
Sedimentation chamber not more than half full of sediments		
6. Structural Components (Annual)		
No evidence of structural deterioration		
Any grates are in good condition		
No evidence of spalling or cracking of structural parts		
7. Outlet/Overflow Spillway (Annual)		
Good condition, no need for repairs		
No evidence of erosion (if draining into a natural channel)		
8. Overall Function of Facility (Annual)		
Evidence of flow bypassing facility		
No noticeable odors outside of facility		

Comments:

Actions to be Taken:

Bioretention Operation, Maintenance and Management Inspection Checklist

Project:
Location:
Site Status:

Date:

Time:

Inspector:

MAINTENANCE ITEM	SATISFACTORY / UNSATISFACTORY	COMMENTS
1. Debris Cleanout (Monthly)		
Bioretention and contributing areas clean of debris		
No dumping of yard wastes into practice		
Litter (branches, etc.) have been removed		
2. Vegetation (Monthly)		
Plant height not less than design water depth		
Fertilized per specifications		
Plant composition according to approved plans		
No placement of inappropriate plants		
Grass height not greater than 6 inches		
No evidence of erosion		
3. Check Dams/Energy Dissipaters/Sumps (Annual, After Major Storms)		
No evidence of sediment buildup		

MAINTENANCE ITEM	SATISFACTORY / UNSATISFACTORY	COMMENTS
Sumps should not be more than 50% full of sediment		
No evidence of erosion at downstream toe of drop structure		
4. Dewatering (Monthly)		
Dewaters between storms		
No evidence of standing water		
5. Sediment Deposition (Annual)		
Swale clean of sediments		
Sediments should not be > 20% of swale design depth		
6. Outlet/Overflow Spillway (Annual, After Major Storms)		
Good condition, no need for repair		
No evidence of erosion		
No evidence of any blockages		
7. Integrity of Filter Bed (Annual)		
Filter bed has not been blocked or filled inappropriately		

Comments:

Actions to be Taken:

Open Channel Operation, Maintenance, and Management Inspection Checklist

Project:
Location:
Site Status:

Date:

Time:

Inspector:

MAINTENANCE ITEM	SATISFACTORY/ UNSATISFACTORY	COMMENTS
1. Debris Cleanout (Monthly)		
Contributing areas clean of debris		
2. Check Dams or Energy Dissipators (Annual, After Major Storms)		
No evidence of flow going around structures		
No evidence of erosion at downstream toe		
Soil permeability		
Groundwater / bedrock		
3. Vegetation (Monthly)		
Mowing done when needed		
Minimum mowing depth not exceeded		
No evidence of erosion		
Fertilized per specification		
4. Dewatering (Monthly)		
Dewaters between storms		

MAINTENANCE ITEM	SATISFACTORY/ UNSATISFACTORY	COMMENTS
5. Sediment deposition (Annual)		
Clean of sediment		
6. Outlet/Overflow Spillway (Annual)		
Good condition, no need for repairs		
No evidence of erosion		

Comments:

Actions to be Taken:

DRAINAGE AREA MAPS

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Newtown, Pennsylvania T: 267.685.0276 | Philadelphia, Pennsylvania T: 215.253.4888 | Bethlehem, Pennsylvania T: 610.598.4400 | Annapolis, Maryland T: 410.567.5000

TITLE:

EXISTING DRAINAGE AREA MAP

PROJECT: **NEWBURGH CHICKEN, LLC.**
PROPOSED POPEYES
PARCEL 60-3-6.1
197 SOUTH PLANK ROAD
TOWN OF NEWBURGH, ORANGE COUNTY, NEW YORK

JOB No:	1021 22-01041
DATE:	11/08/2023
DRAWN BY:	RPK
DESIGNED BY:	JD
CHECKED BY:	RW
CHECKED BY:	MB
SCALE:	(H) 1"=20' (V)
SHEET No:	1 OF 3
Rev. #	0

Rev.	Date	Comments	By

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TITLE: PROPOSED DRAINAGE AREA MAP

PROJECT: NEWBURGH CHICKEN, LLC.
PROPOSED POPEYES
PARCEL 60-3-6.1
197 SOUTH PLANK ROAD
TOWN OF NEWBURGH, ORANGE COUNTY, NEW YORK

JOB No:	1021 22-01041
DATE:	11/08/2023
DRAWN BY:	RPK
SCALE:	(H) 1"=20' (V)
DESIGNED BY:	JD
CHECKED BY:	RW
CHECKED BY:	MB
SHEET No:	2 OF 3
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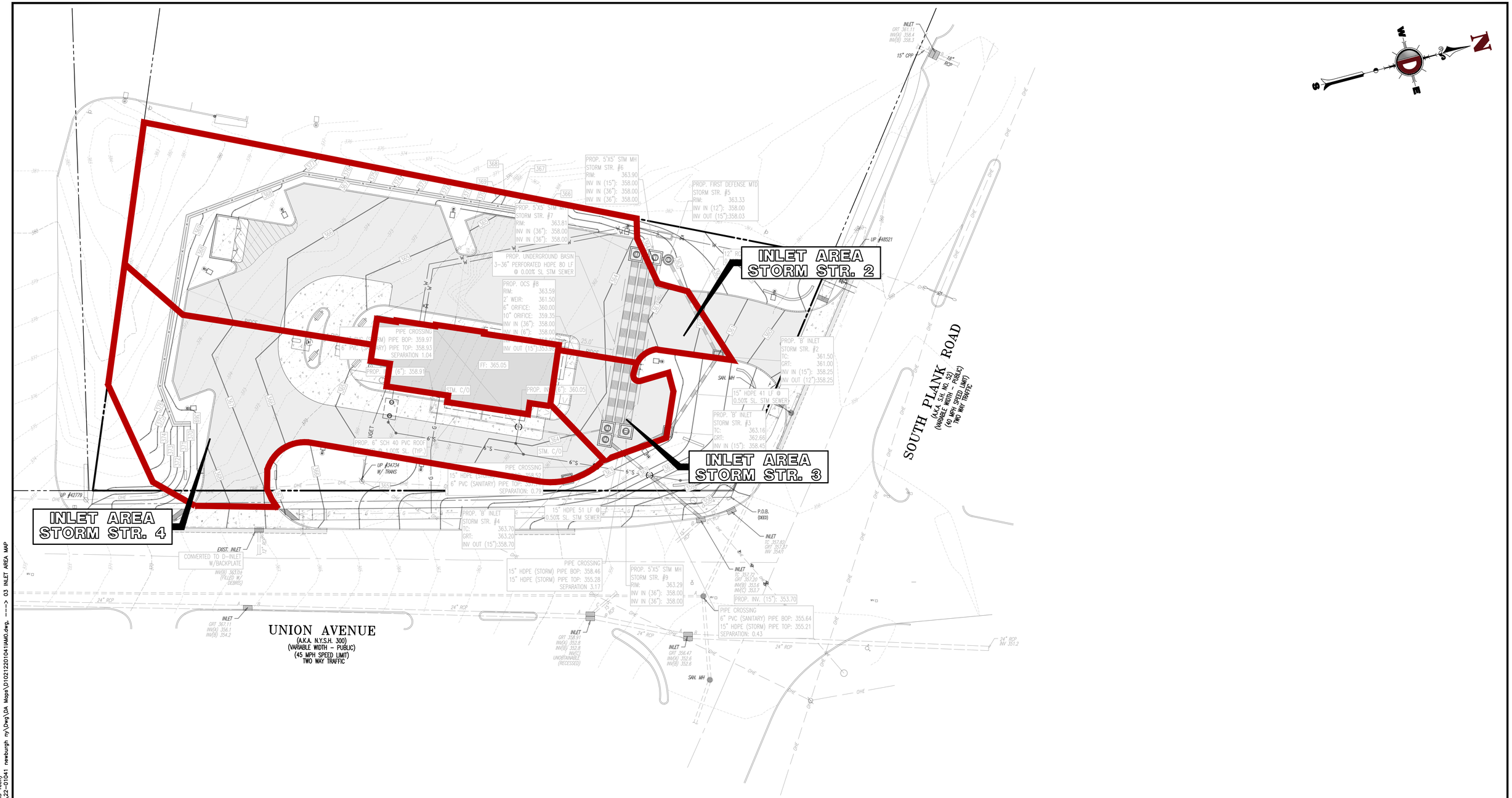

GRAPHIC SCALE

−20 0 10 20 40 80

(IN FEET)
1 INCH = 20 FT.

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Newtown, Pennsylvania T: 267.685.0276 | Philadelphia, Pennsylvania T: 215.233.4888 | Bethlehem, Pennsylvania T: 610.598.4400 | Annapolis, Maryland T: 410.567.5000
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T: 732.974.0198
F: 732.974.3521
www.dynamicec.com

TITLE:

INLET AREA MAP

PROJECT: **NEWBURGH CHICKEN, LLC.**
PROPOSED POPEYES
PARCEL 60-3-6.1
197 SOUTH PLANK ROAD
TOWN OF NEWBURGH, ORANGE COUNTY, NEW YORK

JOB No:	1021 22-01041
DRAWN BY:	RPK
DESIGNED BY:	JD
CHECKED BY:	RW
CHECKED BY:	MB
DATE:	11/08/2023
SCALE: (H) 1"=20' (V)	
SHEET No:	3 OF 3
Rev. #	0

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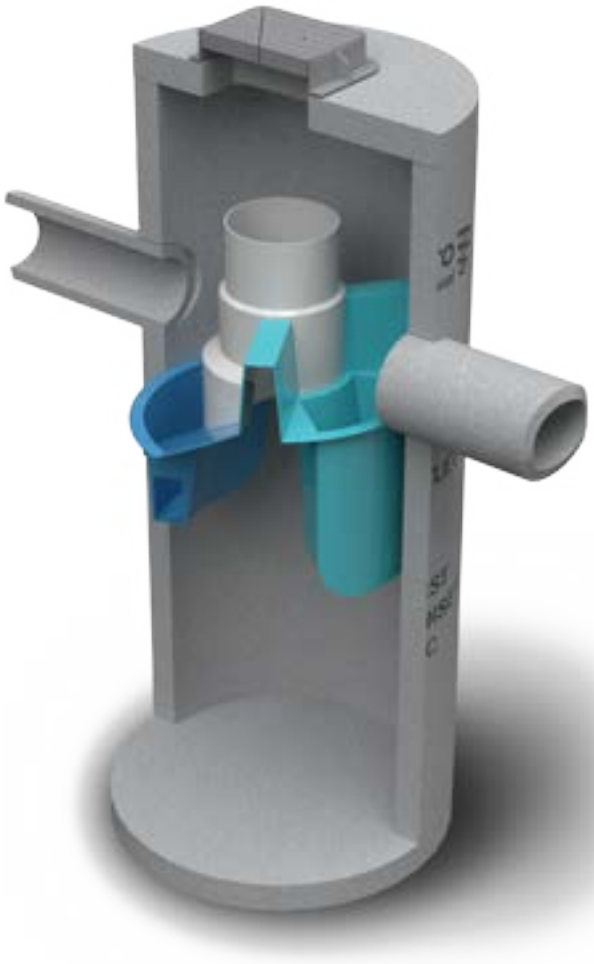
File: \\decpc.local\decfolders\data\decpc projects\1021 parish network, llc\22-01041 newburgh ny\Dwg\DA Maps\01021220104 1AM0.dwg, ----> 03 INLET AREA MAP

HYDRO INTERNATIONAL FIRST DEFENSE OPERATIONS AND MAINTENANCE (O&M) MANUAL

Hydro International



Operation and Maintenance Manual

First Defense® and First Defense® High Capacity

Vortex Separator for Stormwater Treatment

Table of Contents

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DISCLAIMER: Information and data contained in this manual is exclusively for the purpose of assisting in the operation and maintenance of Hydro International plc's First Defense®. No warranty is given nor can liability be accepted for use of this information for any other purpose. Hydro International plc has a policy of continuous product development and reserves the right to amend specifications without notice.

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Hydro Maintenance Services

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Nobody Knows our Systems Better than we do

Avoid Service Negligence

Sanitation services providers not intimately familiar with stormwater treatment systems are at risk of the following:

- Inadvertently breaking parts or failing to clean/replace system components appropriately.
- Charging you for more frequent maintenance because they lacked the tools to service your system properly in the first place.
- Billing you for replacement parts that might have been covered under your Hydro warranty plan
- Charging for maintenance that may not yet have been required.

Leave the Dirty Work to us

Trash, sediment and polluted water is stored inside treatment systems until they are removed by our team with a vactor truck. Sometimes teams must physically enter the system chambers in order to prepare the system for maintenance and install any replacement parts. Services include but are not limited to:

- Solids removal
- Removal of liquid pollutants
- Replacement media installation (when applicable)

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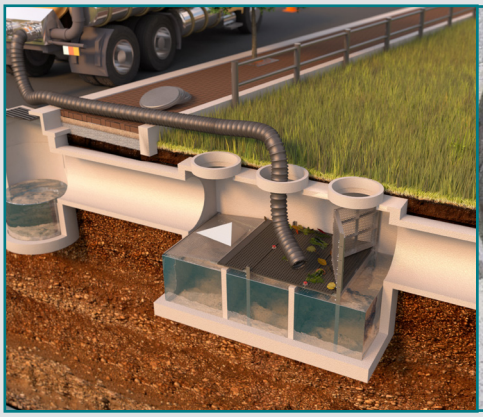
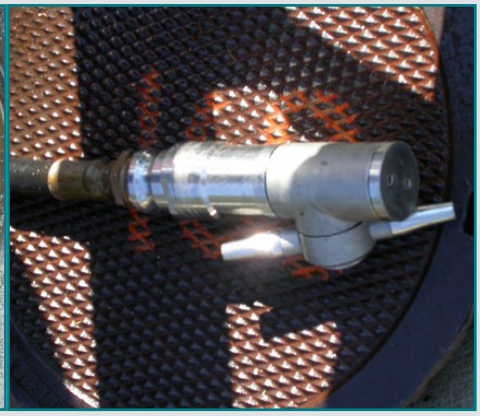
Tel: (207) 756-6200 Fax: (207) 756-6212 Web: www.hydro-int.com

Better Tools, Better Results

Not all vactor trucks are created equal. Appropriate tools and suction power are needed to service stormwater systems appropriately. Companies who don't specialize in stormwater treatment won't have the tools to properly clean systems or install new parts.





Service Warranty

Make sure you're not paying for service that is covered under your warranty plan. Only Hydro International's service teams can identify tune-ups that should be on us, not you.

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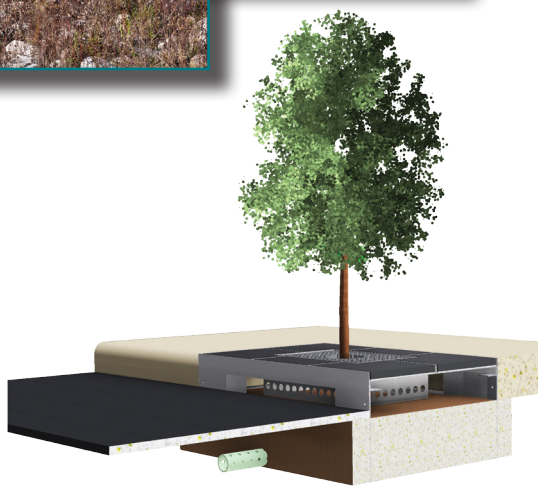

I. First Defense® by Hydro International

Introduction

The First Defense® is an enhanced vortex separator that combines an effective and economical stormwater treatment chamber with an integral peak flow bypass. It efficiently removes total suspended solids (TSS), trash and hydrocarbons from stormwater runoff without washing out previously captured pollutants. The First Defense® is available in several model configurations (refer to *Section II. Model Sizes & Configurations*, page 4) to accommodate a wide range of pipe sizes, peak flows and depth constraints.

Operation

The First Defense® operates on simple fluid hydraulics. It is self-activating, has no moving parts, no external power requirement and is fabricated with durable non-corrosive components. No manual procedures are required to operate the unit and maintenance is limited to monitoring accumulations of stored pollutants and periodic clean-outs. The First Defense® has been designed to allow for easy and safe access for inspection, monitoring and clean-out procedures. Neither entry into the unit nor removal of the internal components is necessary for maintenance, thus safety concerns related to confined-space-entry are avoided.

Pollutant Capture and Retention

The internal components of the First Defense® have been designed to optimize pollutant capture. Sediment is captured and retained in the base of the unit, while oil and floatables are stored on the water surface in the inner volume (Fig.1).

The pollutant storage volumes are isolated from the built-in bypass chamber to prevent washout during high-flow storm events. The sump of the First Defense® retains a standing water level between storm events. This ensures a quiescent flow regime at the onset of a storm, preventing resuspension and washout of pollutants captured during previous events.

Accessories such as oil absorbent pads are available for enhanced oil removal and storage. Due to the separation of the oil and floatable storage volume from the outlet, the potential for washout of stored pollutants between clean-outs is minimized.

Applications

- Stormwater treatment at the point of entry into the drainage line
- Sites constrained by space, topography or drainage profiles with limited slope and depth of cover
- Retrofit installations where stormwater treatment is placed on or tied into an existing storm drain line
- Pretreatment for filters, infiltration and storage

Advantages

- Inlet options include surface grate or multiple inlet pipes
- Integral high capacity bypass conveys large peak flows without the need for “offline” arrangements using separate junction manholes
- Proven to prevent pollutant washout at up to 500% of its treatment flow
- Long flow path through the device ensures a long residence time within the treatment chamber, enhancing pollutant settling
- Delivered to site pre-assembled and ready for installation

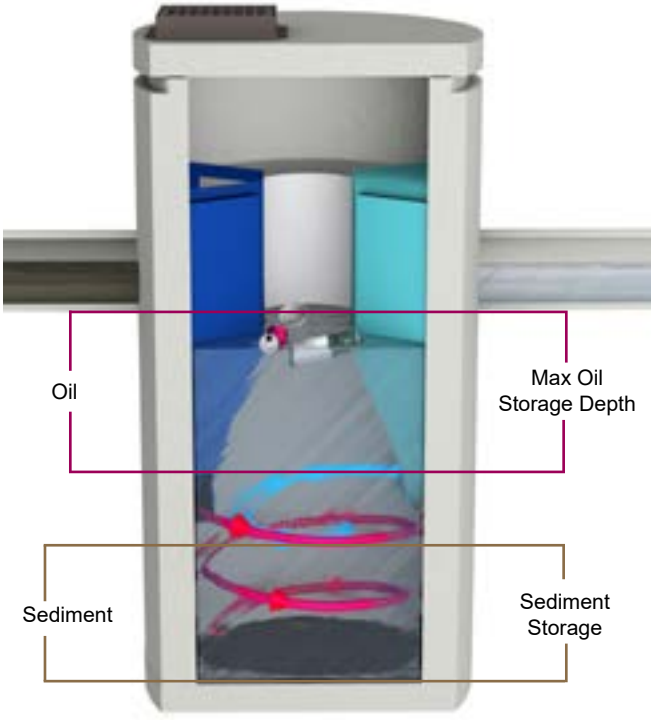

Fig.1 Pollutant storage volumes in the First Defense®.

II. Model Sizes & Configurations

The First Defense® inlet and internal bypass arrangements are available in several model sizes and configurations. The components of the First Defense®-4HC and First Defense®-6HC have modified geometries as to allow greater design flexibility needed to accommodate various site constraints.

All First Defense® models include the internal components that are designed to remove and retain total suspended solids (TSS), gross solids, floatable trash and hydrocarbons (Fig.2a - 2b). First Defense® model parameters and design criteria are shown in Table 1.

First Defense® Components

1. **Built-In Bypass**
2. **Inlet Pipe**
3. **Inlet Chute**
4. **Floatables Draw-off Port**
5. **Outlet Pipe**
6. **Floatables Storage**
7. **Sediment Storage**
8. **Inlet Grate or Cover**

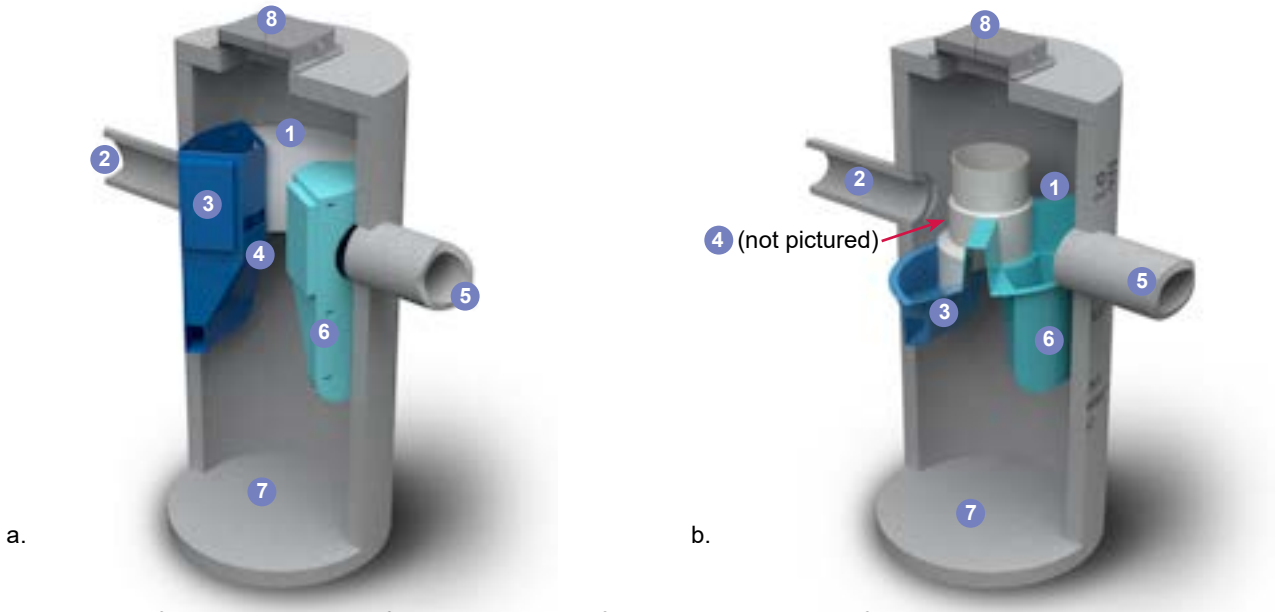

Fig.2a) First Defense®-4 and First Defense®-6; b) First Defense®-4HC and First Defense®-6HC, with higher capacity dual internal bypass and larger maximum pipe diameter.

First Defense® High Capacity Model Number	Diameter	Typical TSS Treatment Flow Rates		Peak Online Flow Rate	Maximum Pipe Diameter[1]	Oil Storage Capacity	Typical Sediment Storage Capacity[2]	Minimum Distance from Outlet Invert to Top of Rim[3]	Standard Distance from Outlet Invert to Sump Floor
		NJDEP Certified	106µm						
	(ft / m)	(cfs / L/s)	(cfs / L/s)	(cfs / L/s)	(in / mm)	(gal / L)	(yd^3 / m^3)	(ft / m)	(ft / m)
FD-3HC	3 / 0.9	0.84 / 23.7	1.60 / 45.3	15 / 424	18 / 457	125 / 473	0.4 / 0.3	2.0 - 3.5 / 0.6 - 1.0	3.71 / 1.13
FD-4HC	4 / 1.2	1.50 / 42.4	1.88 / 50.9	18 / 510	24 / 600	191 / 723	0.7 / 0.5	2.3 - 3.9 / 0.7 - 1.2	4.97 / 1.5
FD-5HC	5 / 1.5	2.34 / 66.2	2.94 / 82.1	20 / 566	24 / 609	300 / 1135	1.1 / .84	2.5 - 4.5 / 0.7 - 1.3	5.19 / 1.5
FD-6HC	6 / 1.8	3.38 / 95.7	4.73 / 133.9	32 / 906	30 / 750	496 / 1,878	1.6 / 1.2	3.0 - 5.1 / 0.9 - 1.6	5.97 / 1.8
FD-8HC	8 / 2.4	6.00 / 169.9	7.52 / 212.9	50 / 1,415	48 / 1219	1120 / 4239	2.8 / 2.1	3.0 - 6.0 / 0.9 -1.8	7.40 / 2.2

[1]Contact Hydro International when larger pipe sizes are required.
[2]Contact Hydro International when custom sediment storage capacity is required.
[3]Minimum distance for models depends on pipe diameter.

III. Maintenance

Overview

The First Defense® protects the environment by removing a wide range of pollutants from stormwater runoff. Periodic removal of these captured pollutants is essential to the continuous, long-term functioning of the First Defense®. The First Defense® will capture and retain sediment and oil until the sediment and oil storage volumes are full to capacity. When sediment and oil storage capacities are reached, the First Defense® will no longer be able to store removed sediment and oil. Maximum pollutant storage capacities are provided in Table 1.

The First Defense® allows for easy and safe inspection, monitoring and clean-out procedures. A commercially or municipally owned sump-vac is used to remove captured sediment and floatables. Access ports are located in the top of the manhole.

Maintenance events may include Inspection, Oil & Floatables Removal, and Sediment Removal. Maintenance events do not require entry into the First Defense®, nor do they require the internal components of the First Defense® to be removed. In the case of inspection and floatables removal, a vactor truck is not required. However, a vactor truck is required if the maintenance event is to include oil removal and/or sediment removal.

Maintenance Equipment Considerations

The internal components of the First Defense®-HC have a centrally located circular shaft through which the sediment storage sump can be accessed with a sump vac hose. The open diameter of this access shaft is 15 inches in diameter (Fig.3). Therefore, the nozzle fitting of any vactor hose used for maintenance should be less than 15 inches in diameter.

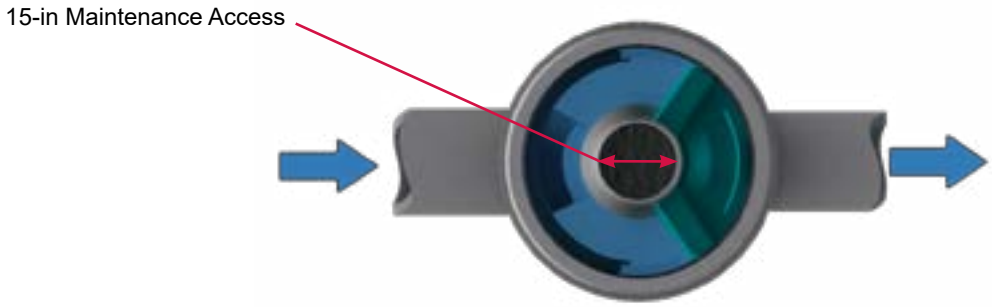

Fig.3 The central opening to the sump of the First Defense®-HC is 15 inches in diameter.

Determining Your Maintenance Schedule

The frequency of clean out is determined in the field after installation. During the first year of operation, the unit should be inspected every six months to determine the rate of sediment and floatables accumulation. A simple probe such as a Sludge-Judge® can be used to determine the level of accumulated solids stored in the sump. This information can be recorded in the maintenance log (see page 9) to establish a routine maintenance schedule.

The vactor procedure, including both sediment and oil / flotables removal, for a 6-ft First Defense® typically takes less than 30 minutes and removes a combined water/oil volume of about 765 gallons.

Inspection Procedures

1. Set up any necessary safety equipment around the access port or grate of the First Defense® as stipulated by local ordinances. Safety equipment should notify passing pedestrian and road traffic that work is being done.

2. Remove the grate or lid to the manhole.

3. Without entering the vessel, look down into the chamber to inspect the inside. Make note of any irregularities. Fig.4 shows the standing water level that should be observed.

4. Without entering the vessel, use the pole with the skimmer net to remove floatables and loose debris from the components and water surface.

5. Using a sediment probe such as a Sludge Judge®, measure the depth of sediment that has collected in the sump of the vessel.

6. On the Maintenance Log (see page 9), record the date, unit location, estimated volume of floatables and gross debris removed, and the depth of sediment measured. Also note any apparent irregularities such as damaged components or blockages.

7. Securely replace the grate or lid.

8. Take down safety equipment.

9. Notify Hydro International of any irregularities noted during inspection.

Floatables and Sediment Clean Out

Floatables clean out is typically done in conjunction with sediment removal. A commercially or municipally owned sump-vac is used to remove captured sediment and floatables (Fig.5).

Floatables and loose debris can also be netted with a skimmer and pole. The access port located at the top of the manhole provides unobstructed access for a vactor hose and skimmer pole to be lowered to the base of the sump.

Scheduling

- Floatables and sump clean out are typically conducted once a year during any season.

- Floatables and sump clean out should occur as soon as possible following a spill in the contributing drainage area.

Fig.4 Floatables are removed with a vactor hose (First Defense model FD-4, shown).

Recommended Equipment

- Safety Equipment (traffic cones, etc)
- Crow bar or other tool to remove grate or lid
- Pole with skimmer or net (if only floatables are being removed)
- Sediment probe (such as a Sludge Judge®)
- Vactor truck (flexible hose recommended)
- First Defense® Maintenance Log

Floatables and sediment Clean Out Procedures

1. Set up any necessary safety equipment around the access port or grate of the First Defense® as stipulated by local ordinances. Safety equipment should notify passing pedestrian and road traffic that work is being done.

2. Remove the grate or lid to the manhole.

3. Without entering the vessel, look down into the chamber to inspect the inside. Make note of any irregularities.

4. Remove oil and floatables stored on the surface of the water with the vactor hose (Fig.5) or with the skimmer or net (not pictured).

5. Using a sediment probe such as a Sludge Judge®, measure the depth of sediment that has collected in the sump of the vessel and record it in the Maintenance Log (page 9).

6. Once all floatables have been removed, drop the vactor hose to the base of the sump. Vactor out the sediment and gross debris off the sump floor (Fig.5).

7. Retract the vactor hose from the vessel.

8. On the Maintenance Log provided by Hydro International, record the date, unit location, estimated volume of floatables and gross debris removed, and the depth of sediment measured. Also note any apparent irregularities such as damaged components, blockages, or irregularly high or low water levels.

9. Securely replace the grate or lid.

Fig.5 Sediment is removed with a vactor hose (First Defense model FD-4, shown).

Maintenance at a Glance

Inspection	- Regularly during first year of installation - Every 6 months after the first year of installation
Oil and Floatables Removal	- Once per year, with sediment removal - Following a spill in the drainage area
Sediment Removal	- Once per year or as needed - Following a spill in the drainage area
NOTE: For most clean outs the entire volume of liquid does not need to be removed from the manhole. Only remove the first few inches of oils and floatables from the water surface to reduce the total volume of liquid removed during a clean out.	

First Defense® Installation Log

HYDRO INTERNATIONAL REFERENCE NUMBER:	
SITE NAME:	
SITE LOCATION:	
OWNER:	CONTRACTOR:
CONTACT NAME:	CONTACT NAME:
COMPANY NAME:	COMPANY NAME:
ADDRESS:	ADDRESS:
TELEPHONE:	TELEPHONE:
FAX:	FAX:

INSTALLATION DATE: / /

MODEL SIZE (CIRCLE ONE): **FD-4** **FD-4HC** **FD-6** **FD-6HC**

INLET (CIRCLE ALL THAT APPLY): **GRATED INLET (CATCH BASIN)** **INLET PIPE (FLOW THROUGH)**

Hydro International (Stormwater), 94 Hutchins Drive, Portland ME 04102
Tel: (207) 756-6200 Fax: (207) 756-6212 Web: www.hydro-int.com

First Defense® Inspection and Maintenance Log

Date	Initials	Depth of Floatables and Oils	Sediment Depth Measured	Volume of Sediment Removed	Site Activity and Comments

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