CARMINA WOOD
DESIGN

STORMWATER POLLUTION PREVENTION PLAN
for
CONSTRUCTION ACTIVITIES

At

Amherst Development Park
6000-6040 North Bailey Ave
Town of Amherst, Erie County, New York

Prepared for

Benderson Development Company, LLC

570 Delaware Avenue
Buffalo, NY 14202

Prepared by

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101 SCOPE

A. **PURPOSE:** Benderson Development Company, LLC has placed an emphasis on following the New York State Department of Environmental Conservation (NYSDEC) SPDES General Permit for Stormwater Discharges from Construction Activity governing storm water discharges during construction, and in accordance with erosion control practices. The Contractor's participation in this program is mandatory and its non-compliance is subject to various remedies, including without limitation, monetary set-offs, withholding payments; reimbursement for costs, expenses (including reasonable attorney's fees), fines and civil penalties incurred by Benderson Development Company, LLC; and/or liquidated damages. This section provides a descriptive explanation of Benderson Development Company, LLC Storm Water Pollution Prevention Program and required Contractor participation.

The Engineer of record for this project certifies that this SWPPP meets the requirements and is in compliance with the New York State Stormwater Management Design Manual and latest NYSDEC Phase II stormwater regulation requirements.

B. **SPDES General Permit for Stormwater Discharges from Construction Activity:** Regulations promulgated by the NYSDEC to regulate the discharge of storm water from construction activities on sites where more than one (1) acre of soil is disturbed. One of the ways to comply with these regulations for affected sites is to request coverage under the General Permit for Construction Activities for New York State. In order to use the General Permit, a Notice of Intent (NOI) form must be completed and electronically submitted to the NYSDEC at least 5 business days prior to any earth-disturbing activities (this time frame may increase to 60 business days if a full review of the SWPPP is determined necessary by the NYSDEC) and a Storm Water Pollution Prevention Plan (SWPPP) for the site must be prepared and followed during the construction activities. Once a copy of the SPDES permit is received from NYSDEC, a copy will be included in Appendix F of this report.

Approval from a regulated, traditional land use control MS4:

1. An **owner or operator** of a construction activity that is not subject to the requirements of a regulated, traditional land use control MS4 must first develop a SWPPP in accordance with all applicable requirements of this permit and then submit a completed NOI form to the NYSDEC.

2. An **owner or operator** of a construction activity that is subject to the requirements of a regulated, traditional land use control MS4 must first develop a SWPPP in accordance with all applicable requirements of this permit and then have its SWPPP reviewed and accepted by the MS4 prior to submitting the NOI to the NYSDEC. The **owner or operator** shall have the "MS4 SWPPP Acceptance" form signed by the principal executive officer or ranking elected official from the regulated, traditional land use control MS4, or by a duly authorized representative of that person, and then submit that form along with the NOI to the address referenced under "Notice of Intent (NOI) Submittal".

C. **RESPONSIBILITIES OF THE CONTRACTOR:** The Contractor shall manage the discharge of storm water from the site in accordance with the NYSDEC General Permit for Construction Activities conditions and the following provisions of this section. The Operator shall be responsible for conducting the storm water management practices in accordance with the permit. The Contractor shall be responsible for providing **qualified inspector**s to conduct the inspections required by the SWPPP. The Contractor shall be responsible for any enforcement action taken or imposed by federal, state, or local agencies, including the cost of fines, construction delays, and remedial actions resulting from the Contractor's failure to

comply with the permit provisions. It shall be the responsibility of the Contractor to make any changes to the SWPPP necessary when the Contractor or any of his subcontractors elects to use borrow or fill or material storage sites, either contiguous to or remote from the construction site, when such sites are used solely for this construction site. Such sites are considered to be part of the construction site covered by the permit and this SWPPP. Off-site borrow, fill, or material storage sites which are used for multiple construction projects are not subject to this requirement, unless specifically required by state or local jurisdictional entity regulations. The Contractor should consider this requirement in negotiating with earthwork subcontractors, since the choice of an off-site borrow, fill, or material storage site may impact their duty to implement, make changes to, and perform inspections required by the SWPPP for the site.

D. **NOTICE OF INTENT:** The Operator has petitioned the NYSDEC for coverage under the storm water discharges during construction at this site to be covered by the SPDES General Permit for Construction Activity for the State of New York. A Notice of Intent (NOI) for coverage under this permit has been filed by the Operator. The SWPPP must be prepared prior to submittal of the NOI form. The Operator will require the Contractor to be a co-permittee with the Operator. The Contractor will be required to post the NOI at the construction site along with any building permits.

E. **CONTRACTOR CERTIFICATION & TRAINING:** Proof of Training/Certification of the Contractor's designated individual shall be kept on site at all times.

F. **REQUIREMENTS FOR THE GENERAL CONTRACTOR AND SUBCONTRACTOR(S):** The General Contractor and Subcontractor(s) shall sign the "Contractor's Certification Statement" (located in the Appendix of this report) verifying they have been instructed on how to comply with and fully understand the requirements of the SPDES General Permit for Construction Activity for the State of New York and the SWPPP. These certifications must be signed, by a responsible corporate officer or other party meeting the "Signatory Requirements" of the SPDES General Permit, on behalf of each entity, prior to the beginning of any construction activities.

G. **STORM WATER POLLUTION PREVENTION PROGRAM LOCATION REQUIREMENTS:** The SWPPP is meant to be a working document that shall be maintained at the site of the Construction Activities at all times throughout the project, shall be readily available upon request by the Operator's personnel or NYSDEC or any other agency with regulatory authority over storm water issues, and shall be kept on-site until the site complies with the Final Stabilization section of this document. A sign or other notice must be posted near the main entrance of the construction site which contains a completed NOI, the location of the SWPPP and the name and phone number of a contact person responsible for scheduling SWPPP viewing times, and any other state specific requirements.

H. **INSPECTIONS AND RECORD-KEEPING:**

A. **<u>General Construction Site Inspection and Maintenance Requirements</u>**

1. The **owner or operator** must ensure that all erosion and sediment control practices and all post-construction stormwater management practices identified in the SWPPP are maintained in effective operating condition at all times.

2. The terms of this permit shall not be construed to prohibit the State of New York from exercising any authority pursuant to the ECL, common law or federal law, or prohibit New York State from taking any measures, whether civil or criminal, to prevent violations of the laws of the State of New York, or protect the public health and safety and/or the environment.

B. **Owner or operator Maintenance Inspection Requirements**

1. The **owner or operator** shall inspect, in accordance with the requirements in the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, the erosion and sediment controls identified in the SWPPP to ensure that they are being maintained in effective operating condition at all times.

2. For construction sites where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and temporary stabilization measures have been applied to all disturbed areas, the **owner or operator** can stop conducting the maintenance inspections. The **owner or operator** shall begin conducting the maintenance inspections in accordance with Part IV.B.1. of the General 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 **owner or operator** can stop conducting the maintenance inspections if all areas disturbed as of the project shutdown date have achieved final stabilization and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational.

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 of the General Permit **cannot** conduct the **qualified inspector** site inspections unless they meet the **qualified inspector** qualifications included in Appendix A of the General Permit. In order to perform these inspections, the trained contractor would have to be a:

- Licensed Professional Engineer,
- Certified Professional in Erosion and Sediment Control (CPESC),
- Registered Landscape Architect, or
- Someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided they have received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity.

1. A **qualified inspector** shall conduct site inspections for all construction activities identified in Tables 1 and 2 of Appendix B of the General Permit, 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 of the General Permit and not directly discharging to one of the 303(d) segments listed in Appendix E of the General Permit;

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 of the General Permit;

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 of the General Permit that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land.

2. Unless otherwise notified by the Department, the **qualified inspector** shall conduct site inspections in accordance with the following timetable:

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

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

c. For construction sites where soil disturbance activities have been **temporarily suspended (e.g. winter shutdown) and temporary stabilization measures have been applied to all disturbed areas**, the **qualified inspector** shall conduct a site inspection at least once every thirty (30) calendar days. The **owner or operator** shall notify the Regional Office stormwater contact person (see contact information in Appendix F of the General Permit) or, in areas under the jurisdiction of a regulated, traditional land use control MS4, the MS4 (provided the MS4 is not the **owner or operator** of the construction activity) in writing prior to reducing the frequency of inspections.

d. For construction sites where **soil disturbance activities have been shut down with partial project completion**, the **qualified inspector** can stop conducting inspections if all areas disturbed as of the project shutdown date have achieved final stabilization and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational. The **owner or operator** shall notify the Regional Office stormwater contact person or, in areas under the jurisdiction of a regulated, traditional land use control MS4, the MS4 (provided the MS4 is not the **owner or operator** of the construction activity). in writing prior to the shutdown. If soil disturbance activities are not resumed within 2 years from the date of shutdown, the **owner or operator** shall have the **qualified inspector** perform a final inspection and certify that all disturbed areas have achieved final stabilization, and all temporary, structural erosion and sediment control measures have been removed; and that all post-construction stormwater management practices have been constructed in conformance with the SWPPP by signing the “Final Stabilization” and “Post-Construction Stormwater Management Practice” certification statements on the NOT. The **owner or operator** shall then submit the completed NOT form to the address in Part II.A.1 of the General Permit.

3. At a minimum, the **qualified inspector** shall inspect all erosion and sediment control practices to ensure integrity and effectiveness, all post-construction stormwater management practices under construction to ensure that they are constructed in conformance with the SWPPP, all areas of disturbance that have not achieved final stabilization, all points of discharge to natural surface waterbodies located within, or immediately adjacent to, the property boundaries of the construction site, and all points of discharge from the construction site.

4. The **qualified inspector** shall prepare an inspection report subsequent to each and every inspection. At a minimum, the inspection report shall include and/or address the following:

    a. Date and time of inspection;

    b. Name and title of person(s) performing inspection;

    c. A description of the weather and soil conditions (e.g. dry, wet, saturated) at the time of the inspection;

    d. A description of the condition of the runoff at all points of discharge from the construction site. This shall include identification of any discharges of sediment from the construction site. Include discharges from conveyance systems (i.e. pipes, culverts, ditches, etc.) and overland flow;

    e. A description of the condition of all natural surface waterbodies located within, or immediately adjacent to, the property boundaries of the construction site which receive runoff from disturbed areas. This shall include identification of any discharges of sediment to the surface waterbody;

    f. Identification of all erosion and sediment control practices that need repair or maintenance;

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

    h. Description and sketch of areas that are disturbed at the time of the inspection and areas that have been stabilized (temporary and/or final) since the last inspection;

    i. Current phase of construction of all post-construction stormwater management practices and identification of all construction that is not in conformance with the SWPPP and technical standards;

    j. Corrective action(s) that must be taken to install, repair, replace or maintain erosion and sediment control practices; and to correct deficiencies identified with the construction of the post-construction stormwater management practice(s); and

    k. Digital photographs, with date stamp, that clearly show the condition of all practices that have been identified as needing corrective actions. The **qualified inspector** shall attach paper color copies of the digital photographs to the inspection report being maintained onsite within seven (7) calendar days of the date of the inspection. The **qualified inspector** shall also take digital photographs, with date stamp, that clearly show the condition of the practice(s) after the corrective action has been completed. The **qualified inspector** shall attach paper color copies of the digital photographs to the

inspection report that documents the completion of the corrective action work within seven (7) calendar days of that inspection.

5. Within one business day of the completion of an inspection, the **qualified inspector** shall notify the **owner or operator** and appropriate contractor or subcontractor identified in Part III.A.6. of any corrective actions that need to be taken. The contractor or subcontractor shall begin implementing the corrective actions within one business day of this notification and shall complete the corrective actions in a reasonable time frame.

6. All inspection reports shall be signed by the **qualified inspector**. Pursuant to Part II.C.2 of the General Permit, the inspection reports shall be maintained on site with the SWPPP.

Record Retention - The **owner or operator** shall retain a copy of the NOI, NOI Acknowledgment Letter, SWPPP, MS4 SWPPP Acceptance form and any inspection reports that were prepared in conjunction with this permit for a period of at least five (5) years from the date that the site achieves final stabilization. This period may be extended by the Department, in its sole discretion, at any time upon written notification.

I. **SWPPP MODIFICATIONS:** The inspection report should also identify if any revisions to the SWPPP are warranted due to unexpected conditions. The SWPPP is meant to be a dynamic working guide that is to be kept current and amended whenever there is a change in design, construction, operation, or maintenance at the construction site that has or could have a significant effect on the discharge of pollutants or when the plan proves to be ineffective in eliminating or significantly minimizing pollutant discharges. The Contractor's failure to modify or report deficiencies to the Operator will result in the Contractor being liable for fines and construction delays resulting from any federal, state, or local agency enforcement action.

J. **FINAL STABILIZATION AND TERMINATION OF PERMIT COVERAGE:** A site can be considered finally stabilized when all soil disturbing activities have been completed and a uniform perennial vegetative cover with a density of **85%** for the unpaved areas and areas not covered by permanent structures has been established or equivalent permanent stabilization measures have been established and the facility no longer discharges storm water associated with construction activities and a Notice of Termination (NOT) form filed by the Operator(s) with the NYSDEC. The Operator's Project Manager must complete the NOT. The NOT must be signed by the signatory (or equivalent position) on the NOI and subsequently submitted to the appropriate agency. The Operator's Project Manager must provide a completed copy of the NOT to the Contractor for inclusion in the SWPPP, which will then be optically scanned into the final SWPPP document as required. This filing terminates coverage under the General Permit and terminates the Contractor's responsibility to implement the SWPPP, but the requirements of the SWPPP, including periodic inspections, must be continued until the NOT is filed. The **owner or operator** shall also have the **qualified inspector** perform a final site inspection prior to submitting the NOT to the Department. Final payment and/or the release of retainage will be withheld until all provisions of the SWPPP have been submitted, completed and accepted by the Operator.

The Town of Amherst - Notice of Termination Requirement: Prior to submitting the NOT, the Town of Amherst requires a Level 1 inspection of all stormwater management practices. See Appendix G: Town of Amherst Level 1 Inspection – Post Construction Stormwater Management.

102 PROJECT NAME AND LOCATION

Amherst Development Park

6000-6040 North Bailey Ave

Town of Amherst, County of Erie, New York

42.996°N, 78.817°W

Estimated Area of Site ≈ 17.34 acres

Estimated Area to be Disturbed by Construction Activities ≈ 7.29+/- acres

A general location map is included as Appendix A.

103 OPERATOR'S NAME AND ADDRESS

Benderson Development Company, LLC

570 Delaware Ave.

Buffalo, NY 14202

Contact Person: Matt Oates

Telephone: 716-878-9397

104 PROJECT DESCRIPTION

This project is a site redevelopment of the existing Amherst Development Park located on the south side of Ridge Lea Road and on the west side of North Bailey Ave in the Town of Amherst. The site is located north of Meyer Road and east of Niagara Falls Boulevard. The Boulevard Consumer Square is located north and west of the project site, Amherst Commerce Park is located east of the project site and Boulevard Towers Apartments are located south of the project site. The site is currently fully developed and occupied by existing commercial buildings that will remain. Proposed construction will include two building additions and parking lot/driveway expansions. Site construction will also include utility improvements and new stormwater management areas. The overall site is 17.34 of which 7.29 acres will be disturbed by construction activities. The project site is currently zoned R-D.

Soil disturbing activities will include:

A. Construction of temporary construction exit points

B. Clearing & grubbing of the site within disturbance limits

C. Installation of stormwater management areas including topsoil & seed

D. Installation of storm sewer pipes and inlets

E. Construction of utilities

F. Construction of curb and parking lot

G. Final grading & landscaping

H. Construction of buildings

This project is owned by Benderson Development Company, LLC and will be developed by Benderson Development Company, LLC. The work area consists of approximately 7.29+/- acres for which erosion and sediment controls have been developed and fully addressed in this written plan and the Erosion and Sediment Control Plans. See the construction documents for additional details

105 RUNOFF COEFFICIENT, SOILS, AND RAINFALL INFORMATION

The initial runoff curve number for the pre-construction site is "CN" = 92. The post-construction runoff curve number for the site will be "CN" = 95. Approximately 7.29+/- acres total will be disturbed by construction activities.

See soils information located in Appendix I.

The site is in Erie County, which receives an average of approximately 45 inches rainfall annually with the highest amounts of rainfall received in the months of May thru September. Annual snow for this area is approximately 120 inches.

106 WATERS

The runoff generated from this site will discharge to an unnamed open/closed drainage system north of the site that discharges to Ellicott Creek and ultimately the Niagara River.

107 INDIAN COUNTRY LANDS

This project is not located on Indian Lands.

108 ENDANGERED AND THREATENED SPECIES

No endangered or threatened species have been determined to be on the site.

109 CRITICAL HABITAT

See section 108 above.

110 HISTORIC PLACES

No critical habitats have been determined to be on the site.

111 WETLANDS AND/OR OTHER SURFACE WATERS

No wetlands or other surface waters are located on the site

112 EROSION AND SEDIMENT CONTROLS

112.1 STABILIZATION PRACTICES

Stabilization practices for this site include:

A. Land clearing activities shall be done only in areas where earthwork will be performed and shall progress as earthwork is needed.

B. Use of stabilization method for all slopes having a slope greater than 1V:3H.

C. Permanent seeding and planting of all unpaved areas using the hydromulching grass seeding technique.

D. Mulching exposed areas.

E. Vegetation preservation in undisturbed areas.

F. Frequent watering to minimize wind erosion during construction.

a. **For sites where 5 acres or more are disturbed at any one time**: In areas where soil disturbance activity has been temporarily or permanently ceased, temporary and/or permanent soil stabilization measures shall be installed and/or implemented within seven (7) days from the date the soil disturbance activity ceased. The soil stabilization measures selected shall be in conformance with the most current version of the New York Standards and Specifications for Erosion and Sediment Control.

b. The **owner or operator** shall prepare a phasing plan that defines maximum disturbed area per phase and shows required cuts and fills.

c. The **owner or operator** shall install any additional measures needed to protect water quality.

112.2 STRUCTURAL PRACTICES

Structural practices for this site include:

A. Inlet protection using a method detailed in the Construction Documents.

B. Perimeter protection using temporary silt fence/silt sock or silt sock.

C. Outlet protection using rip-rap stone and end sections.

D. Stabilized Construction Entrance.

E. Temporary stone wash off areas.

F. Storm sewer, curb/gutter.

G. Sediment traps and basins.

112.3 SEQUENCE OF MAJOR ACTIVITIES

The Contractor will be responsible for implementing the following erosion control and storm water management control measures. The Contractor may designate these tasks to certain subcontractors as he sees fit, but the ultimate responsibility for implementing these controls and ensuring their proper functioning remains with the Contractor. The order of activities will be as follows:

A. Construct temporary construction exits at locations shown on the Demolition & Erosion Control Plan Sheet.

B. Install perimeter silt fence/silt sock in the locations shown on the Demolition & Erosion Control Plan Sheet.

C. Clear & Grub site.

D. Installation of detention basin to act as sediment basins (do not install bioretention soil or underdrains until stabilized).

E. Commence site grading.

F. Disturbed areas of the site where construction activity has ceased for more than 14 days shall be temporarily seeded and watered.

G. Construction of buildings.

H. Installation of proposed utilities.

I. Finalize pavement subgrade preparation.

J. Construct all curb, drainage inlets, storm sewer pipes and storm sewer manholes, as shown on the plans. Install temporary inlet protection at the locations of all inlets.

K. Dust control.

L. Remove inlet protection around inlets and manholes no more than 48 hours prior to placing stabilized base course.

M. Install base material as required for pavement.

N. Carry out final grading and seeding and planting.

O. Clean storm system following construction, clean detention basins of any silt and return to design grades.

P. Remove silt fencing/silt sock only after all paving is complete and exposed surfaces are stabilized.

Q. Remove temporary construction exits only prior to pavement construction in these areas.

Note: Sediment control storage during construction (traps & basins) during construction shall be 134 cy per acre of disturbance per NYSDEC requirements.

112.4 STORM WATER MANAGEMENT

Refer to Appendix D, Engineer's Report

113 OTHER CONTROLS

113.1 OFF-SITE VEHICLE TRACKING

A stabilized construction exit will be provided to help reduce vehicle tracking of sediments. Existing paved areas will remain as long as possible and will be used for vehicle wash areas and to further aid in the reduction of vehicle tracking of sediments. The paved streets adjacent to the site entrance shall be inspected daily and swept as necessary to remove any excess mud, dirt, or rock tracked from the site. Dump trucks hauling material to/from the construction site will be covered with a tarpaulin. The job site superintendent will be responsible for seeing that these procedures are followed.

113.2 EXCAVATION SPOIL MATERIALS

Excavation spoil materials are generated during the excavation of the development's building and utilities installation. These materials must be properly managed to prevent them from contributing to storm water discharges. The materials generated from the development of this project will be hauled off-site or stockpiled for re-use in designated areas which will have temporary erosion & sediment control measures installed. Any removal from site will be done under the necessary permits required by the local governing agencies.

113.3 DUST CONTROL

Minimizing wind erosion and controlling dust will be accomplished by one or more of the following methods:

A. Frequent watering of excavation and fill areas.

B. Providing gravel or paving at entrance/exit drives, parking areas and transit paths.

113.4 WASTE DISPOSAL

If needed, all waste materials will be collected and stored in securely lidded metal dumpsters rented from an approved waste management company. The dumpster will comply with all local and state solid waste management regulations.

All trash and construction debris from the site will be deposited in the dumpsters. The dumpsters will be emptied when full and then hauled to a NYSDEC approved landfill for proper disposal. No construction waste will be buried on-site. All personnel will be instructed regarding the correct procedures for waste disposal.

113.5 SANITARY WASTE

If needed, portable toilet units or field offices with toilet facilities connected to the municipal sanitary sewer will be used for sanitary purposes. All portable toilet units will be emptied a minimum of once per week by a licensed portable facility provided in compliance with local and state regulations.

113.6 CONCRETE WASTE FROM CONCRETE TRUCKS

A. Emptying of excess unhardened concrete and/or washout from concrete delivery trucks will be allowed on the job site, but in either (1) specifically designated diked areas which have been prepared to prevent contact between concrete and/or washout and storm water which will be discharged from the site or (2) in locations where waste concrete will be poured into forms to make rip-rap or other useful concrete products.

B. Hardened waste concrete from the designated diked areas described above will be disposed of in accordance with applicable local and state regulations with regards to disposal of construction debris.

113.7 HAZARDOUS SUBSTANCES & HAZARDOUS WASTE

A. All hazardous waste materials will be disposed of by the Contractor in the manner specified by local, state, and/or federal regulations and by the manufacturer of such products. Site personnel will be instructed in these practices by the job superintendent, who will also be responsible for seeing these practices are followed. Material Safety Data Sheets (MSDS's) for each substance with hazardous properties that is used on the job site will be obtained and used

for the proper management of potential wastes that may result from these products. An MSDS will be posted in the immediate area where such products are stored and/or used and another copy of each MSDS will be maintained in the SWPPP file at the job site construction office. Each employee who must handle a substance with hazardous properties will be instructed on the use of MSDS sheets and the specific information in the applicable MSDS for the product he/she is using, particularly regarding spill control techniques.

B. The contractor will implement the Spill Prevention Control and Countermeasures (SPCC) Plan found within this SWPPP and will train all personnel in the proper cleanup and handling of spilled materials. No spilled hazardous materials of hazardous wastes will be allowed to come in contact with storm water discharges. If such contact occurs, the storm water discharge shall be contained on site until appropriate measures in compliance with state and federal regulations are taken to dispose of such contaminated storm water. It shall be the responsibility of the job superintendent to properly train all personnel in the use of the SPCC plan.

C. Any spills of hazardous materials which are in excess of the Reportable Quantities as defined by the EPA regulations shall be immediately reported to the EPA National Response Center at 1-100-424-1102. From SWPPP-9 "Reportable Quantity Release Form" must be filled out.

D. In order to minimize the potential for a spill of hazardous materials to come in contact with storm water, the following steps will be implemented:

1. All materials with hazardous properties (such as pesticides, petroleum products, fertilizers, detergents, construction chemicals, acids, paints, paint solvents, cleaning solvents, additives for soil stabilization, concrete curing compounds and additives, etc.) will be stored in a secure location, under cover, when not in use.

2. The minimum practical quantity of all such materials will be kept on the job site.

3. A spill control and containment kit (containing for example, absorbent such as kitty litter or sawdust, acid neutralizing powder, brooms, dust pans, mops, rags, gloves, goggles, plastic and metal trash containers, etc.) will be provided at the storage site.

4. All of the product in a container will be used before the container is disposed of. All such containers will be triple rinsed with water prior to disposal. The rinse water used in these containers will be disposed of in a manner in compliance with state and federal regulations and will not be allowed to mix with storm water discharges.

5. All products will be stored in and used from the original container with the original product label.

6. All products will be used in strict compliance with instructions on the product label.

7. The disposal of excess or used products will be in strict compliance with instructions on the product label.

113.8 CONTAMINATED SOILS

A. Any contaminated soils (resulting from spills of materials with hazardous properties) which may result from construction activities will be contained and cleaned up immediately in accordance with the procedures given in the Spill Prevention Control and Countermeasures (SPCC) Plan and in accordance with applicable state and federal regulations.

B. The job site superintendent will be responsible for seeing that these procedures are followed.

114 COMPLIANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS

The Contractor will obtain copies of any and all local and state regulations which are applicable to storm water management, erosion control, and pollution minimization at this job site and will comply fully with such regulations. The Contractor will submit written evidence of such compliance if requested by the Operator or any agent of a regulatory body. The Contractor will comply with all conditions of the SPDES General Permit for Construction Activity for the State of New York, including the conditions related to maintaining the SWPPP and evidence of compliance with the SWPPP at the job site and allowing regulatory personnel access to the job site and to records in order to determine compliance.

The SWPPP for this site development project requires regulated MS4 approval from the Town of Amherst. All changes to the SWPPP must be approved by the Town of Amherst prior to applying changes to the SWPPP in the field.

115 INSPECTION AND MAINTENANCE PROCEDURES

The following inspection and maintenance practices will be used to maintain erosion and sediment controls and stabilization measures.

1. All control measures will be inspected by the owner/operator at least weekly and shall continue until the site complies with the Final Stabilization section of this document (See Section 116).

2. All control measures will be inspected by a Qualified Professional at least weekly and shall continue until the site complies with the Final Stabilization section of this document (See Section 116).

3. All measures will be maintained in good working order; if repairs or other measures are found to be necessary, they will be initiated within 24 hours of report.

4. Built up sediment will be removed from silt fence/silt sock when it has reached one-third the height of the fence.

5. Silt fence/silt socks will be inspected for depth of sediment, tears, etc., to see if the fabric is securely attached to the fence posts, and to see that the fence posts are securely in the ground.

6. Temporary and permanent seeding and all other stabilization measures will be inspected for bare spots, washouts, and healthy growth.

7. A maintenance inspection report will be made after each inspection. Copies of the report forms to be completed by the inspector are included in this SWPPP.

8. The job site superintendent will be responsible for selecting and training the individuals who will be responsible for these inspections, maintenance and repair activities, and filling out inspection and maintenance reports.

9. Personnel selected for the inspection and maintenance responsibilities will receive training from the job site superintendent. They will be trained in all the inspection and maintenance practices necessary for keeping the erosion and sediment controls that are used onsite in good working order. They will also be trained in the completion of, initiation of actions required by, and the

filing of the inspection forms. Documentation of this personnel training will be kept on site with the SWPPP.

10. Disturbed areas and materials storage areas will be inspected for evidence of or potential for pollutants entering stormwater systems.

11. Report to the NYSDEC within 24 hours any noncompliance with the SWPPP that will endanger public health or the environment. Follow up with a written report within 5 days of the noncompliance event. The following events require 24 hour reporting: a) any unanticipated bypass which exceeds any effluent limitation in the permit, b) any upset which exceeds any effluent limitation in the permit, and c) a violation of a maximum daily discharge limitation for any of the pollutants listed by the NYSDEC in the permit to be reported within 24 hours. The written submission must contain a description of the non-compliance and its cause; the period of non-compliance, including exact dates and times, and if the non-compliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the non-compliance.

12. Releases of hazardous substances or oil in excess of reportable quantities (as established under 40 CFR 110, 40 CFR 117 or 40 CFR 302) must be reported.

Upon completion of construction, the property owner is responsible for ensuring that the stormwater facilities are regularly inspected and maintained. Maintenance and inspection procedures are as follows.

1. On a quarterly basis and following significant rainfall events or snow-melts, perform the following:

    - Inspect catch basins, storm manholes, treatment structures, storm piping and stormwater pond for debris and accumulation of sediment.
    - Remove and properly dispose of any collected debris and sediment in accordance with applicable state, federal and local regulations.
    - Flush piping with water if necessary to remove accumulated sediment.
    - Bioretention areas shall be maintained per the NYSDEC Maintenance and Management Checklist included in this SWPPP.
    - Check all stone outfall structures for erosion and re-stone if necessary to prevent further erosion.
    - Inspect grassed/landscaped areas for un-vegetated areas or areas with less than 85% healthy stand of grass and reseed and mulch as necessary. Water daily if reseeded in July and August.
    - A record of all inspections should be kept.

2. Maintain all lawn areas by regular mowing, including the grassed slopes of the stormwater pond and any grass swales. Any eroded areas shall be regarded, seeded and mulched immediately.

116 INSPECTION AND MAINTENANCE REPORT FORMS

Once installation of any required or optional erosion control device or measure has been implemented, inspections shall be performed by a Qualified Professional at least once every seven (7) calendar days. For construction sites where soil disturbance activities are on-going and the **owner or operator** has received authorization in accordance with Part II.C.3 of the General Permit 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. The owner and contractor shall obtain from the MS4 an approval for disturbing more than five-acres at any given time. For construction sites where active construction has been suspended, inspection frequency under the general permit can be reduced to once every 30 days, provided temporary stabilization measures have been applied to all disturbed areas. The forms found in this SWPPP shall be used by the inspectors to inventory and report the condition of each measure to assist in maintaining the erosion and sediment control measures in good working order.

These report forms shall become an integral part of the SWPPP and shall be made readily accessible to governmental inspection officials, the Operator's Engineer, and the Operator for review upon request during visits to the project site. In addition, copies of the reports shall be provided to any of these persons, upon request, via mail or facsimile transmission. Inspection and maintenance report forms are to be maintained by the permittee for five years following the final stabilization of the site.

117 OTHER RECORD-KEEPING REQUIREMENTS

The Contractor shall keep the following records related to construction activities at the site:

- Dates when major grading activities occur and the areas which were graded
- Dates and details concerning the installation of structural controls
- Dates when construction activities cease in an area
- Dates when an areas is stabilized, either temporarily or permanently
- Dates of rainfall and the amount of rainfall
- Dates and descriptions of the character and amount of any spills of hazardous materials
- Records of reports filed with regulatory agencies if reportable quantities of hazardous materials spilled

118 SPILL PREVENTION CONTROL AND COUNTERMEASURES (SPCC) PLAN

118.1 MATERIALS COVERED

The following materials or substances are expected to be present onsite during construction:

- Concrete/Additives/Wastes
- Cleaning solvents
- Sanitary wastes
- Detergents
- Petroleum based products
- Paints/Solvents
- Pesticides
- Solid and construction wastes
- Acids
- Fertilizers

- Soil stabilization additives

118.2 MATERIAL MANAGEMENT PRACTICES

The following are the material management practices that will be used to reduce the risk of spills or other accidental exposure of materials and substances to stormwater runoff. The job site superintendent will be responsible for ensuring that these procedures are followed.

A. Good Housekeeping

The following good housekeeping practices will be followed onsite during the construction project.

1. An effort will be made to store only enough products required to do the job.

2. All materials stored onsite will be stored in a neat, orderly manner and, if possible, under a roof or in a containment area. At a minimum, all containers will be stored with their lids on when not in use. Drip pans shall be provided under all dispensers.

3. Products will be kept in their original containers with the original manufacturer's label in legible condition.

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

5. Whenever possible, all of a product will be used up before disposing of the container.

6. Manufacturer's recommendations for proper use and disposal will be followed.

7. The job site superintendent will be responsible for daily inspections to ensure proper use and disposal of materials.

B. Hazardous Products

These practices will be used to reduce the risks associated with hazardous materials. Material Safety Data Sheets (MSDS's) for each substance with hazardous properties that is used on the job site will be obtained and used for the proper management of potential wastes that may result from these products. An MSDS will be posted in the immediate area where such product is stored and/or used and another copy of each MSDS will be maintained in the SWPPP file at the job site construction trailer office. Each employee who must handle a substance with hazardous properties will be instructed on the use of MSDS sheets and the specific information in the applicable MSDS for the product he/she is using, particularly regarding spill control techniques.

1. Products will be kept in original containers with the original labels in legible condition.

2. Original labels and material safety data sheets (MSDS's) will be procured and used for each material.

3. If surplus product must be disposed of, manufacturer's or local/state/federal recommended methods for proper disposal will be followed.

4. A spill control and containment kit (containing for example, absorbent such as kitty litter or sawdust, acid neutralizing powder, brooms, dust pans, mops, rags, gloves, goggles, plastic and metal trash containers, etc.) will be provided at the storage site.

5. All of the product in a container will be used before the container is disposed of. All such containers will be triple rinsed with water prior to disposal. The rinse water used in these containers will be disposed of in a manner in compliance with state and federal regulations and will not be allowed to mix with storm water discharges.

C. Hazardous Waste

All hazardous waste materials will be disposed of by the Contractor in the manner specified by local, state, and/or federal regulations and by the manufacturer of such products. Site personnel will be instructed in these practices by the job site superintendent, who will also be responsible for seeing that these practices are followed.

D. Product Specific Practices

The following product specific practices will be followed on the job site.

1. Petroleum Products

All onsite vehicles will be monitored for leaks and receive regular preventative maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers which are clearly labeled. Any petroleum storage tanks stored onsite will be located within a containment area that is designed with an impervious surface between the tank and the ground. The secondary containment must be designed to provide a containment volume that is equal to 110% of the volume of the largest tank. Drip pans shall be provided for all dispensers. Any asphalt substances used onsite will be applied according to the manufacturer's recommendations. The location of any fuel tanks and/or equipment storage areas must be identified on a plan by the contractor once the locations have been determined.

2. Fertilizers

Fertilizers will be applied only in the minimum amounts recommended by the manufacturer. Once applied, fertilizer will be worked in the soil to limit exposure to stormwater. Storage will be in a covered shed. The contents of any partially used bags of fertilizer will be transferred to a sealable plastic bin to avoid spills.

3. Paints, Paint Solvents, and Cleaning Solvents

All containers will be tightly sealed and stored when not in use. Excess paint and solvents will not be discharged to the storm sewer system but will be properly disposed of according to manufacturer's instructions or state and federal regulations.

4. Concrete Wastes

Concrete trucks will be allowed to wash out or discharge surplus concrete or drum wash water on the site, but only in either (1) specifically designated diked areas which have been prepared to prevent contact between the concrete and/or wash out and storm

water which will be discharged from the site or (2) in locations where waste concrete can be poured into forms to make riprap or other useful concrete products.

The hardened residue from the concrete wash out diked areas will be disposed of in the same manner as other non-hazardous construction waste materials or may be broken up and used on site as deemed appropriate by the Contractor. The job site superintendent will be responsible for seeing that these procedures are followed.

All concrete wash out areas will be located in an area where the likelihood of the area contributing to storm water discharges is negligible. If required, additional BMPs must be implemented to prevent concrete wastes from contributing to storm water discharges. The location of concrete wash out area(s) must be identified on a plan by the contractor once the locations have been determined. In addition, a standard detail on the construction of the concrete wash out shall be included on this plan.

E. Solid and Construction Wastes

All waste materials will be collected and stored in an appropriately covered container and/or securely lidded metal dumpster rented from a local waste management company which must be a solid waste management company licensed to do business in New York and the Town of Amherst. The dumpster will comply with all local and state solid waste management regulations.

All trash and construction debris from the site will be deposited in the dumpster. The dumpster will be emptied a minimum of twice per week or more often if necessary, and the trash will be hauled to a landfill approved by the NYSDEC. No construction waste materials will be buried on site. All personnel will be instructed regarding the correct procedures for waste disposal.

All waste dumpsters and roll-off containers will be located in an area where the likelihood of the containers contributing to storm water discharges is negligible. If required, additional BMPs must be implemented, such as sandbags around the base, to prevent wastes from contributing to storm water discharges. The location of waste dumpsters and roll-off containers must be identified on a plan by the contractor once the locations have been determined.

F. Sanitary Wastes

Portable toilet units or field offices with toilet facilities connected to the municipal sanitary sewer will be used for sanitary purposes. All portable toilet units will be emptied a minimum of once per week by a licensed portable facility provided in compliance with local and state regulations.

All sanitary waste units will be located in an area where the likelihood of the unit contributing to storm water discharges is negligible. If required, additional BMPs must be implemented, such as sandbags around the base, to prevent wastes from contributing to storm water discharges. The location of sanitary waste units must be identified on a plan by the contractor once the locations have been determined.

G. Contaminated Soils

Any contaminated soils (resulting from spills of materials with hazardous properties) which may result from construction activities will be contained and cleaned up immediately in accordance with the procedures given in the Materials Management Plan and in accordance with applicable state and federal regulations.

118.3 SPILL PREVENTION AND RESPONSE PROCEDURES

The Contractor will train all personnel in the proper handling and cleanup of spilled materials. No spilled hazardous materials or hazardous wastes will be allowed to come in contact with storm water discharges. If such contact occurs, the storm water discharge will be contained on site until appropriate measures in compliance with state and federal regulations are taken to dispose of such contaminated storm water. It shall be the responsibility of the job site superintendent to properly train all personnel in spill prevention and clean up procedures.

A. In order to minimize the potential for a spill of hazardous materials to come into contact with storm water, the following steps will be implemented:

1. All materials with hazardous properties (such as pesticides, petroleum products, fertilizers, detergents, construction chemicals, acids, paints, paint solvents, cleaning solvents, additives for soil stabilization, concrete curing compounds and additives, etc.) will be stored in a secure location, with their lids on, preferably under cover, when not in use.

2. The minimum practical quantity of all such materials will be kept on the job site.

3. A spill control and containment kit (containing, for example, absorbent materials, acid neutralizing powder, brooms, dust pans, mops, rags, gloves, goggles, plastic and metal trash containers, etc.) will be provided at the storage site.

4. Manufacturer's recommended methods for spill cleanup will be clearly posted and site personnel will be trained regarding these procedures and the location of the information and cleanup supplies.

B. In the event of a spill, the following procedures should be followed

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

2. The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with the hazardous substances.

3. The project manager and the Engineer of Record will be notified immediately.

   Spills of toxic or hazardous materials will be reported to the appropriate federal, state, and/or local government agency, regardless of the size of the spill. Spills of amounts that exceed Reportable Quantities of certain substances specifically mentioned in federal regulations (40 CFR 110, 40 CFR 117, and 40 CFR 302) must be immediately reported to the EPA National Response Center, telephone 1-100-424-1102. From SWPPP-9 “Reportable Quantity Release Form” must be filled out.

4. If the spill exceeds a Reportable Quantity, the SWPPP must be modified within seven (7) calendar days of knowledge of the discharge to provide a description of the release, the circumstances leading to the release, and the date of the release. The plans must identify measures to prevent the recurrence of such releases and to respond to such releases.

C. The job site superintendent will be the spill prevention and response coordinator. He will designate the individuals who will receive spill prevention and response training. These

individuals will each become responsible for a particular phase of prevention and response. The names of these personnel will be posted in the material storage area and in the office trailer onsite.

119 CONTROL OF NON-STORM WATER DISCHARGES

Certain types of discharges are allowable under the NYSDEC SPDES General Permit for Construction Activity for the State of New York, and it is the intent of this SWPPP to allow such discharges. These types of discharges will be allowed under the conditions that no pollutants will be allowed to come in contact with the water prior to or after its discharge. The control measures which have been outlined previously in this SWPPP will be strictly followed to ensure that no contamination of these non-storm water discharges takes place. The following allowable non-storm water discharges which may occur at the job site include:

A. Discharges from firefighting activities.

B. Fire hydrant flushings (see note below)

C. Waters used to wash vehicles or control dust in order to minimize offsite sediment tracking.

D. Routine external building washdown which does not use detergents.

E. Pavement wash waters where spills or leaks of hazardous materials have not occurred or detergents have not been used.

F. Air conditioning condensate.

G. Springs or other uncontaminated groundwater, including dewatering ground water infiltration.

H. Foundation or footing drains where no contamination with process materials such as solvents is present.

Note: The Contractor shall discharge any super-chlorinated water from water distribution pipe disinfection activities into sanitary sewer system

120 STORM WATER CONTROL FACILITY MAINTENANCE

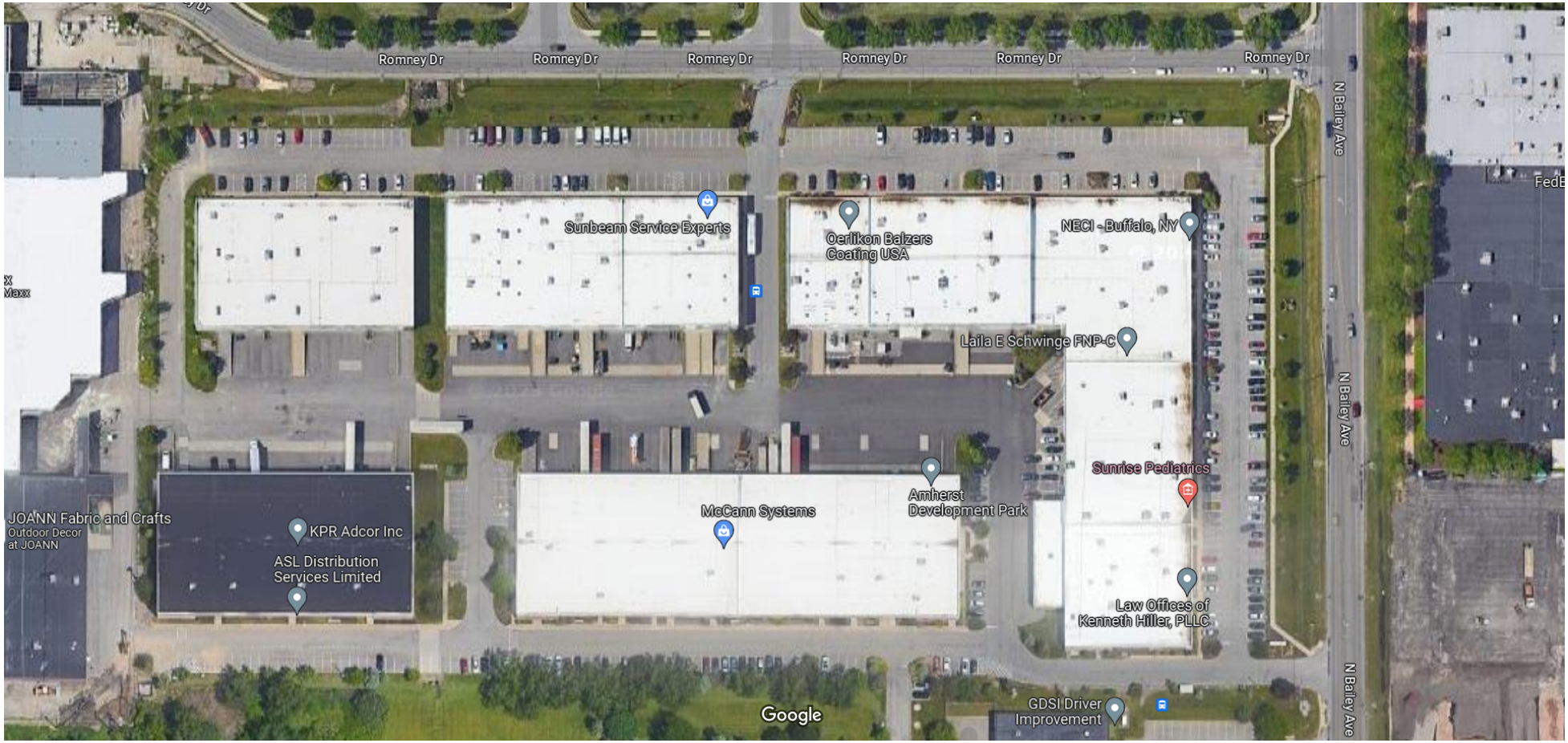
The frequency of inspections for the bioretention areas shall match the frequencies listed on the “Stormwater Management Maintenance” in Appendix J of the SWPPP.

The proposed catch basins, as per section 115, shall be inspected 4 times per year for removal of floatable debris. Any silt buildup over 6” in depth shall be removed and disposed of properly off-site.

Appendix A

Site Location Maps

Google Maps romney road

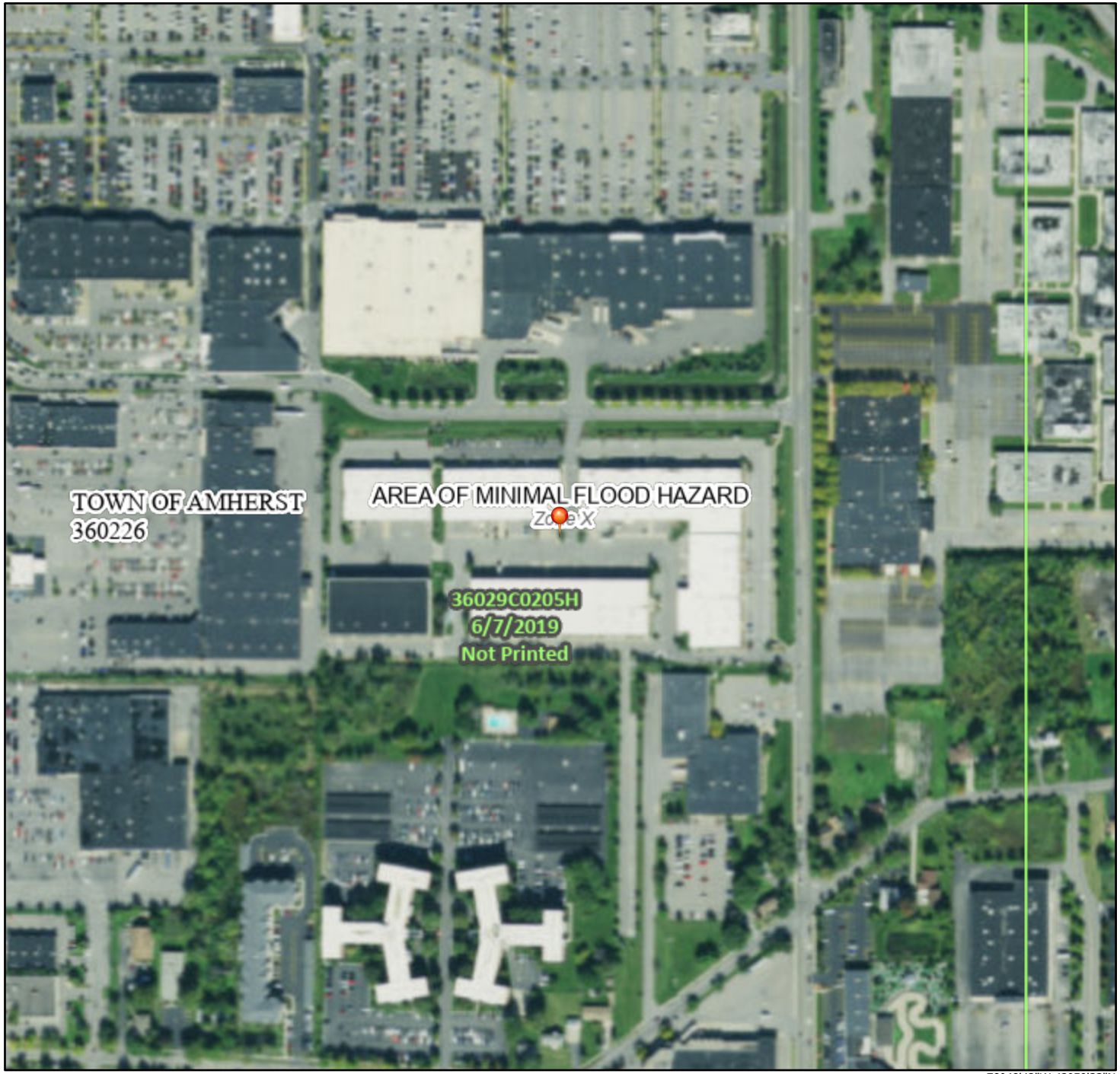


Imagery ©2023 Airbus, CNES / Airbus, Maxar Technologies, New York GIS, U.S. Geological Survey, USDA/FPAC/GEO, Map data ©2023 100 ft

National Flood Hazard Layer FIRMette

FEMA

78°49'19"W 43°N



78°48'42"W 42°59'33"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 11/13/2023 at 9:45 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

CRIS Cultural Resource Information System

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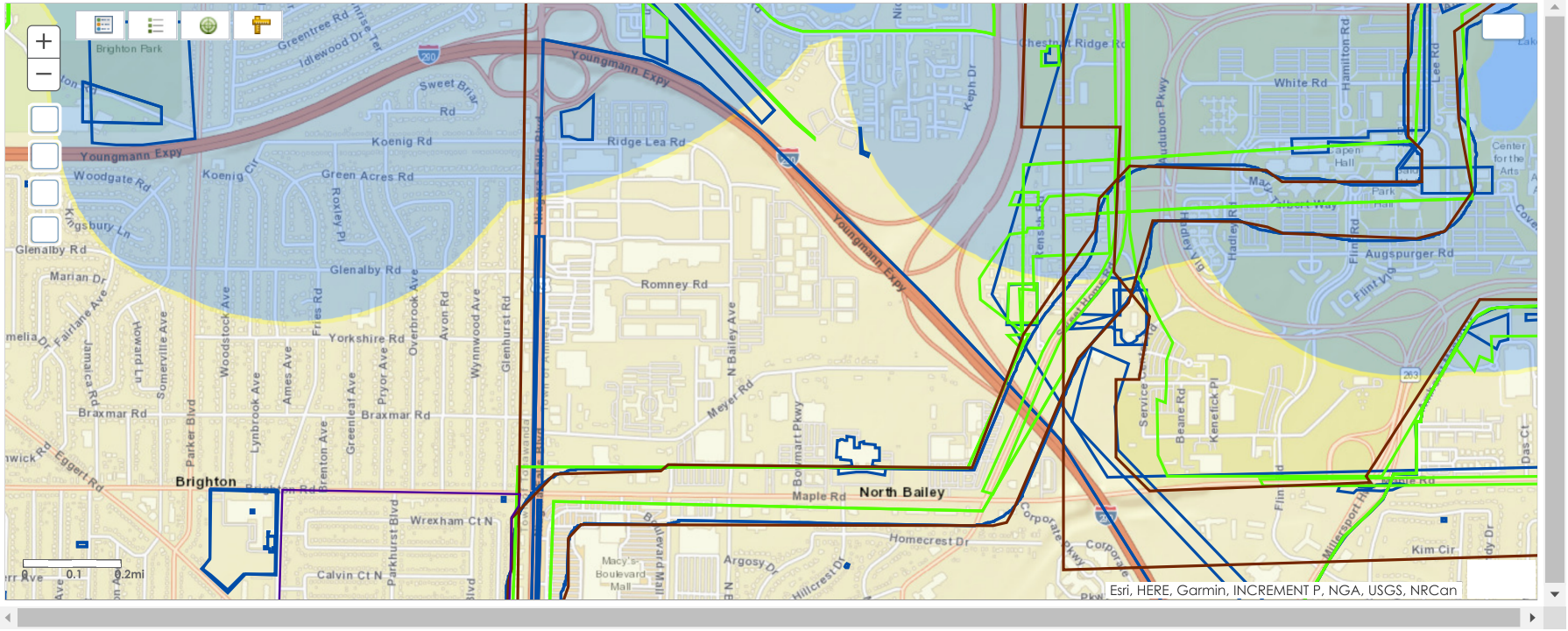


Version 1.2.18

Appendix B

NYSDEC Notice of Intent (NOI)

0644089821

NOTICE OF INTENT

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

NYR _____ (for DEC use only)

Stormwater Discharges Associated with Construction Activity Under State Pollutant Discharge Elimination System (SPDES) General Permit # GP-0-20-001

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

-IMPORTANT-

RETURN THIS FORM TO THE ADDRESS ABOVE

OWNER/OPERATOR MUST SIGN FORM

Owner/Operator Information

Owner/Operator (Company Name/Private Owner Name/Municipality Name)
Benderson Development Company

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

Owner/Operator Contact Person First Name
Matt

Owner/Operator Mailing Address
570 Delaware Ave

City
Buffalo

State: NY
Zip: 14202 -

Phone (Owner/Operator): 716 - 878 - 9397
Fax (Owner/Operator): - -

Email (Owner/Operator)
MattOates@benderson.com

FED TAX ID
16 - 1549911 (not required for individuals)

Project Site Information

Project/Site Name
Amherst Development Park

Street Address (NOT P.O. BOX)
6000-6040 North Bailey Ave

Side of Street
○ **North** ○ **South** ○ **East** ● **West**

City/Town/Village (THAT ISSUES BUILDING PERMIT)
Town of Amherst

State: NY
Zip: 14226-
County: Erie
DEC Region: 9

Name of Nearest Cross Street
Romney Road

Distance to Nearest Cross Street (Feet)
0

Project In Relation to Cross Street
○ **North** ● **South** ○ **East** ○ **West**

Tax Map Numbers
Section-Block-Parcel
54.14-1-19.1

Tax Map Numbers

1. Provide the Geographic Coordinates for the project site. To do this, go to the NYSDEC Stormwater Interactive Map on the DEC website at:

https://gisservices.dec.ny.gov/gis/stormwater/

Zoom into your Project Location such that you can accurately click on the centroid of your site. Once you have located the centroid of your project site, go to the bottom right hand corner of the map for the X, Y coordinates. Enter the coordinates into the boxes below. For problems with the interactive map use the help function.

X Coordinates (Easting)
-7 8817
Ex. -73.749

Y Coordinates (Northing)
42996
Ex. 42.652

2. What is the nature of this construction project?

○ **New Construction**

● **Redevelopment with increase in impervious area**

○ **Redevelopment with no increase in impervious area**

3. Select the predominant land use for both pre and post development conditions.
SELECT ONLY ONE CHOICE FOR EACH

Pre-Development Existing Land Use

- ○ FOREST
- ○ PASTURE/OPEN LAND
- ○ CULTIVATED LAND
- ○ SINGLE FAMILY HOME
- ○ SINGLE FAMILY SUBDIVISION
- ○ TOWN HOME RESIDENTIAL
- ○ MULTIFAMILY RESIDENTIAL
- ○ INSTITUTIONAL/SCHOOL
- ○ INDUSTRIAL
- ● COMMERCIAL
- ○ ROAD/HIGHWAY
- ○ RECREATIONAL/SPORTS FIELD
- ○ BIKE PATH/TRAIL
- ○ LINEAR UTILITY
- ○ PARKING LOT
- ○ OTHER

Post-Development Future Land Use

- ○ SINGLE FAMILY HOME — Number of Lots
- ○ SINGLE FAMILY SUBDIVISION
- ○ TOWN HOME RESIDENTIAL
- ○ MULTIFAMILY RESIDENTIAL
- ○ INSTITUTIONAL/SCHOOL
- ○ INDUSTRIAL
- ● COMMERCIAL
- ○ MUNICIPAL
- ○ ROAD/HIGHWAY
- ○ RECREATIONAL/SPORTS FIELD
- ○ BIKE PATH/TRAIL
- ○ LINEAR UTILITY (water, sewer, gas, etc.)
- ○ PARKING LOT
- ○ CLEARING/GRADING ONLY
- ○ DEMOLITION, NO REDEVELOPMENT
- ○ WELL DRILLING ACTIVITY *(Oil, Gas, etc.)
- ○ OTHER

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

4. In accordance with the larger common plan of development or sale, enter the total project site area; the total area to be disturbed; existing impervious area to be disturbed (for redevelopment activities); and the future impervious area constructed within the disturbed area. (Round to the nearest tenth of an acre.)

Total Site Area	Total Area To Be Disturbed	Existing Impervious Area To Be Disturbed	Future Impervious Area Within Disturbed Area
17.3	7.3	4.4	5.5

5. Do you plan to disturb more than 5 acres of soil at any one time? ● **Yes** ○ **No**

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

A	B	C	D
0 %	0 %	0 %	100 %

7. Is this a phased project? ○ **Yes** ● **No**

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

Start Date 06/01/2025 – **End Date** 06/01/2026

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

Name

Ellicott Creek

9a. Type of waterbody identified in Question 9?

- ○ Wetland / State Jurisdiction On Site (Answer 9b)
- ○ Wetland / State Jurisdiction Off Site
- ○ Wetland / Federal Jurisdiction On Site (Answer 9b)
- ○ Wetland / Federal Jurisdiction Off Site
- ○ Stream / Creek On Site
- ● Stream / Creek Off Site
- ○ River On Site
- ○ River Off Site
- ○ Lake On Site
- ○ Lake Off Site
- ○ Other Type On Site
- ○ Other Type Off Site

9b. How was the wetland identified?

- ○ Regulatory Map
- ○ Delineated by Consultant
- ○ Delineated by Army Corps of Engineers
- ○ Other (identify)

10. Has the surface waterbody(ies) in question 9 been identified as a 303(d) segment in Appendix E of GP-0-20-001? ● **Yes** ○ **No**

11. Is this project located in one of the Watersheds identified in Appendix C of GP-0-20-001? ○ **Yes** ● **No**

12. Is the project located in one of the watershed areas associated with AA and AA-S classified waters? ○ **Yes** ● **No**
If no, skip question 13.

13. Does this construction activity disturb land with no existing impervious cover and where the Soil Slope Phase is identified as an E or F on the USDA Soil Survey? ○ **Yes** ● **No**
If Yes, what is the acreage to be disturbed?

.

14. Will the project disturb soils within a State regulated wetland or the protected 100 foot adjacent area? ○ **Yes** ● **No**

15. Does the site runoff enter a separate storm sewer system (including roadside drains, swales, ditches, culverts, etc)? ● **Yes** ○ **No** ○ **Unknown**

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

Town of Amherst & NYSDOT

open/closed stormwater drainage system

17. Does any runoff from the site enter a sewer classified as a Combined Sewer? ○ **Yes** ● **No** ○ **Unknown**

18. Will future use of this site be an agricultural property as defined by the NYS Agriculture and Markets Law? ○ **Yes** ● **No**

19. Is this property owned by a state authority, state agency, federal government or local government? ○ **Yes** ● **No**

20. Is this a remediation project being done under a Department approved work plan? (i.e. CERCLA, RCRA, Voluntary Cleanup Agreement, etc.) ○ **Yes** ● **No**

21. Has the required Erosion and Sediment Control component of the SWPPP been developed in conformance with the current NYS Standards and Specifications for Erosion and Sediment Control (aka Blue Book)? ● **Yes** ○ **No**

22. Does this construction activity require the development of a SWPPP that includes the post-construction stormwater management practice component (i.e. Runoff Reduction, Water Quality and Quantity Control practices/techniques)? ● **Yes** ○ **No**
If No, skip questions 23 and 27-39.

23. Has the post-construction stormwater management practice component of the SWPPP been developed in conformance with the current NYS Stormwater Management Design Manual? ● **Yes** ○ **No**

24. The Stormwater Pollution Prevention Plan (SWPPP) was prepared by:

- ● **Professional Engineer (P.E.)**
- ○ **Soil and Water Conservation District (SWCD)**
- ○ **Registered Landscape Architect (R.L.A)**
- ○ **Certified Professional in Erosion and Sediment Control (CPESC)**
- ○ **Owner/Operator**
- ○ **Other**

SWPPP Preparer: Carmina Wood Design

Contact Name (Last, Space, First): Wood, Christopher

Mailing Address: 80 Silo City Row Ste 100

City: Buffalo

State: NY Zip: 14203-

Phone: 716-842-3165 Fax: --- --- ----

Email: cwood@carminawooddesign.com

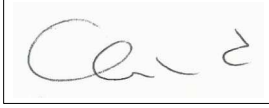
SWPPP Preparer Certification

I hereby certify that the Stormwater Pollution Prevention Plan (SWPPP) for this project has been prepared in accordance with the terms and conditions of the GP-0-20-001. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of this permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

First Name Christopher **MI**

Last Name Wood

Signature



Date 12 / 04 / 2024

25. Has a construction sequence schedule for the planned management practices been prepared? ● Yes ○ No

26. Select **all** of the erosion and sediment control practices that will be employed on the project site:

Temporary Structural

- ○ Check Dams
- ○ Construction Road Stabilization
- ● Dust Control
- ○ Earth Dike
- ○ Level Spreader
- ○ Perimeter Dike/Swale
- ○ Pipe Slope Drain
- ○ Portable Sediment Tank
- ○ Rock Dam
- ○ Sediment Basin
- ○ Sediment Traps
- ● Silt Fence
- ● Stabilized Construction Entrance
- ● Storm Drain Inlet Protection
- ○ Straw/Hay Bale Dike
- ○ Temporary Access Waterway Crossing
- ○ Temporary Stormdrain Diversion
- ○ Temporary Swale
- ○ Turbidity Curtain
- ○ Water bars

Biotechnical

- ○ Brush Matting
- ○ Wattling

Vegetative Measures

- ○ Brush Matting
- ○ Dune Stabilization
- ○ Grassed Waterway
- ● Mulching
- ○ Protecting Vegetation
- ○ Recreation Area Improvement
- ● Seeding
- ● Sodding
- ○ Straw/Hay Bale Dike
- ○ Streambank Protection
- ○ Temporary Swale
- ● Topsoiling
- ○ Vegetating Waterways

Permanent Structural

- ○ Debris Basin
- ○ Diversion
- ○ Grade Stabilization Structure
- ○ Land Grading
- ○ Lined Waterway (Rock)
- ○ Paved Channel (Concrete)
- ○ Paved Flume
- ○ Retaining Wall
- ○ Riprap Slope Protection
- ● Rock Outlet Protection
- ○ Streambank Protection

Other

Post-construction Stormwater Management Practice (SMP) Requirements

Important: Completion of Questions 27-39 is not required if response to Question 22 is No.

27. Identify all site planning practices that were used to prepare the final site plan/layout for the project.

- ○ **Preservation of Undisturbed Areas**
- ○ **Preservation of Buffers**
- ○ **Reduction of Clearing and Grading**
- ● **Locating Development in Less Sensitive Areas**
- ○ **Roadway Reduction**
- ○ **Sidewalk Reduction**
- ○ **Driveway Reduction**
- ○ **Cul-de-sac Reduction**
- ○ **Building Footprint Reduction**
- ○ **Parking Reduction**

27a. Indicate which of the following soil restoration criteria was used to address the requirements in Section 5.1.6("Soil Restoration") of the Design Manual (2010 version).

- ● All disturbed areas will be restored in accordance with the Soil Restoration requirements in Table 5.3 of the Design Manual (see page 5-22).
- ○ Compacted areas were considered as impervious cover when calculating the **WQv Required**, and the compacted areas were assigned a post-construction Hydrologic Soil Group (HSG) designation that is one level less permeable than existing conditions for the hydrology analysis.

28. Provide the total Water Quality Volume (WQv) required for this project (based on final site plan/layout).

Total WQv Required

		0	.	6	4	5	**acre-feet**

29. Identify the RR techniques (Area Reduction), RR techniques(Volume Reduction) and Standard SMPs with RRv Capacity in Table 1 (See Page 9) that were used to reduce the Total WQv Required(#28).

Also, provide in Table 1 the total impervious area that contributes runoff to each technique/practice selected. For the Area Reduction Techniques, provide the total contributing area (includes pervious area) and, if applicable, the total impervious area that contributes runoff to the technique/practice.

Note: Redevelopment projects shall use Tables 1 and 2 to identify the SMPs used to treat and/or reduce the WQv required. If runoff reduction techniques will not be used to reduce the required WQv, skip to question 33a after identifying the SMPs.

Table 1 - Runoff Reduction (RR) Techniques and Standard Stormwater Management Practices (SMPs)

	Total Contributing Area (acres)		Total Contributing Impervious Area(acres)
RR Techniques (Area Reduction)			
○ Conservation of Natural Areas (RR-1)		and/or	
○ Sheetflow to Riparian Buffers/Filters Strips (RR-2)		and/or	
○ Tree Planting/Tree Pit (RR-3)		and/or	
○ Disconnection of Rooftop Runoff (RR-4)		and/or	
RR Techniques (Volume Reduction)			
○ Vegetated Swale (RR-5)			
○ Rain Garden (RR-6)			
○ Stormwater Planter (RR-7)			
○ Rain Barrel/Cistern (RR-8)			
○ Porous Pavement (RR-9)			
○ Green Roof (RR-10)			
Standard SMPs with RRv Capacity			
○ Infiltration Trench (I-1)			
○ Infiltration Basin (I-2)			
○ Dry Well (I-3)			
○ Underground Infiltration System (I-4)			
○ Bioretention (F-5)			1 . 1 7
○ Dry Swale (O-1)			
Standard SMPs			
○ Micropool Extended Detention (P-1)			
○ Wet Pond (P-2)			
○ Wet Extended Detention (P-3)			
○ Multiple Pond System (P-4)			
○ Pocket Pond (P-5)			
○ Surface Sand Filter (F-1)			
○ Underground Sand Filter (F-2)			
○ Perimeter Sand Filter (F-3)			
○ Organic Filter (F-4)			
○ Shallow Wetland (W-1)			
○ Extended Detention Wetland (W-2)			
○ Pond/Wetland System (W-3)			
○ Pocket Wetland (W-4)			
○ Wet Swale (O-2)			

Table 2 - Alternative SMPs (DO NOT INCLUDE PRACTICES BEING USED FOR PRETREATMENT ONLY)

Alternative SMP	Total Contributing Impervious Area(acres)
● **Hydrodynamic**	
○ **Wet Vault**	
○ **Media Filter**	
○ **Other** _____	3.26

Provide the name and manufacturer of the Alternative SMPs (i.e. proprietary practice(s)) being used for WQv treatment.

Name: HydroStorm

Manufacturer: HydroWorks

Note: Redevelopment projects which do not use RR techniques, shall use questions 28, 29, 33 and 33a to provide SMPs used, total WQv required and total WQv provided for the project.

30. Indicate the Total RRv provided by the RR techniques (Area/Volume Reduction) and Standard SMPs with RRv capacity identified in question 29.

Total RRv provided

0.072 **acre-feet**

31. Is the Total RRv provided (#30) greater than or equal to the total WQv required (#28).

○ **Yes** ● **No**

If Yes, go to question 36.
If No, go to question 32.

32. Provide the Minimum RRv required based on HSG.
[Minimum RRv Required = (P)(0.95)(Ai)/12, Ai=(S)(Aic)]

Minimum RRv Required

0.033 **acre-feet**

32a. Is the Total RRv provided (#30) greater than or equal to the Minimum RRv Required (#32)?

● **Yes** ○ **No**

If Yes, go to question 33.
Note: Use the space provided in question #39 to summarize the specific site limitations and justification for not reducing 100% of WQv required (#28). A detailed evaluation of the specific site limitations and justification for not reducing 100% of the WQv required (#28) must also be included in the SWPPP.
If No, sizing criteria has not been met, so NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

33. Identify the Standard SMPs in Table 1 and, if applicable, the Alternative SMPs in Table 2 that were used to treat the remaining total WQv(=Total WQv Required in 28 - Total RRv Provided in 30).

Also, provide in Table 1 and 2 the total impervious area that contributes runoff to each practice selected.

Note: Use Tables 1 and 2 to identify the SMPs used on Redevelopment projects.

33a. Indicate the Total WQv provided (i.e. WQv treated) by the SMPs identified in question #33 and Standard SMPs with RRv Capacity identified in question 29.

WQv Provided

0.655 **acre-feet**

Note: For the standard SMPs with RRv capacity, the WQv provided by each practice = the WQv calculated using the contributing drainage area to the practice - RRv provided by the practice. (See Table 3.5 in Design Manual)

34. Provide the sum of the Total RRv provided (#30) and the WQv provided (#33a).

0.573

35. Is the sum of the RRv provided (#30) and the WQv provided (#33a) greater than or equal to the total WQv required (#28)? ◉ **Yes** ○ **No**

If Yes, go to question 36.
If No, sizing criteria has not been met, so NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

36. Provide the total Channel Protection Storage Volume (CPv) required and provided or select waiver (36a), if applicable.

CPv Required

0.207 **acre-feet**

CPv Provided

0.207 **acre-feet**

36a. The need to provide channel protection has been waived because:

○ Site discharges directly to tidal waters or a fifth order or larger stream.

○ Reduction of the total CPv is achieved on site through runoff reduction techniques or infiltration systems.

37. Provide the Overbank Flood (Qp) and Extreme Flood (Qf) control criteria or select waiver (37a), if applicable.

Total Overbank Flood Control Criteria (Qp)

Pre-Development

64.87 **CFS**

Post-development

57.81 **CFS**

Total Extreme Flood Control Criteria (Qf)

Pre-Development

115.36 **CFS**

Post-development

97.46 **CFS**

37a. The need to meet the Qp and Qf criteria has been waived because:

- ○ Site discharges directly to tidal waters or a fifth order or larger stream.
- ○ Downstream analysis reveals that the Qp and Qf controls are not required

38. Has a long term Operation and Maintenance Plan for the post-construction stormwater management practice(s) been developed? ● **Yes** ○ **No**

If Yes, Identify the entity responsible for the long term Operation and Maintenance

Benderson Development Company

39. Use this space to summarize the specific site limitations and justification for not reducing 100% of WQv required(#28). (See question 32a) This space can also be used for other pertinent project information.

-RRv is required for any new impervious within a redevelopment project
-Onsite soils with slow infiltration rates (Hydrologic soil group "D")

40. Identify other DEC permits, existing and new, that are required for this project/facility.

- ○ Air Pollution Control
- ○ Coastal Erosion
- ○ Hazardous Waste
- ○ Long Island Wells
- ○ Mined Land Reclamation
- ○ Solid Waste
- ○ Navigable Waters Protection / Article 15
- ○ Water Quality Certificate
- ○ Dam Safety
- ○ Water Supply
- ○ Freshwater Wetlands/Article 24
- ○ Tidal Wetlands
- ○ Wild, Scenic and Recreational Rivers
- ○ Stream Bed or Bank Protection / Article 15
- ○ Endangered or Threatened Species(Incidental Take Permit)
- ○ Individual SPDES
- ○ SPDES Multi-Sector GP [N][Y][R][ ][ ][ ][ ][ ][ ]
- ○ Other [ ]
- ● None

41. Does this project require a US Army Corps of Engineers Wetland Permit? ○ **Yes** ● **No**
If Yes, Indicate Size of Impact. [ ][ ][ ][ ][ ].[ ]

42. Is this project subject to the requirements of a regulated, traditional land use control MS4? ○ **Yes** ● **No**
(If No, skip question 43)

43. Has the "MS4 SWPPP Acceptance" form been signed by the principal executive officer or ranking elected official and submitted along with this NOI? ● **Yes** ○ **No**

44. If this NOI is being submitted for the purpose of continuing or transferring coverage under a general permit for stormwater runoff from construction activities, please indicate the former SPDES number assigned. [N][Y][R][ ][ ][ ][ ][ ][ ]

Owner/Operator Certification

I have read or been advised of the permit conditions and believe that I understand them. I also understand that, under the terms of the permit, there may be reporting requirements. I hereby certify that this document and the corresponding documents were prepared under my direction or supervision. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further understand that coverage under the general permit will be identified in the acknowledgment that I will receive as a result of submitting this NOI and can be as long as sixty (60) business days as provided for in the general permit. I also understand that, by submitting this NOI, I am acknowledging that the SWPPP has been developed and will be implemented as the first element of construction, and agreeing to comply with all the terms and conditions of the general permit for which this NOI is being submitted.

Print First Name: Matt

MI:

Print Last Name: Oates

Owner/Operator Signature:

Date: / /

Appendix C

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:	Benderson Development, LLC
2. Contact Person:	Matt Oates
3. Street Address:	570 Delaware Ave
4. City/State/Zip:	Buffalo, NY 14202
II. Project Site Information	
5. Project/Site Name:	Amherst Development Park
6. Street Address:	6000-6040 North Bailey Ave
7. City/State/Zip:	Amherst, NY 14226
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:	Town of Amherst
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)

Appendix D

Engineer's Report

CARMINA WOOD
DESIGN

STORMWATER REPORT

for

Amherst Development Park

6000-6040 North Bailey Ave
Town of Amherst, Erie County, New York

Prepared for

Benderson Development Company, LLC

570 Delaware Avenue
Buffalo, NY 14202

Prepared by

Carmina Wood Design

80 Silo City Suite 100
Buffalo, NY 14203

Telephone: (716) 842-3165

November 2023

Revised 2/11/2025

Table of Contents

Section 1 – Location & Description

This project is a site redevelopment of the existing Amherst Development Park located on the south side of Romney Road and on the west side of North Bailey Ave in the Town of Amherst. The site is located north of Meyer Road and east of Niagara Falls Boulevard. The Boulevard Consumer Square is located north and west of the project site, Amherst Commerce Park is located east of the project site and Boulevard Towers Apartments are located south of the project site. The site is currently fully developed and occupied by existing commercial buildings that will remain. Proposed site construction will include one 10,069 sf building addition and parking lot/driveway expansions. Site construction will also include utility improvements and new stormwater management areas. The overall site is 17.34 of which 7.29 acres will be disturbed by construction activities. The project site is currently zoned R-D.

Section 2 – Stormwater Drainage System

The existing site is generally flat. An existing open/closed drainage system onsite drains north to an open swale along the north side of Romney Rd. Three existing 3'x5' arch stormwater conveyance pipes are also located onsite within a 30' wide Town of Amherst Drainage easement. These conveyance pipes flow from the south property line to north and discharge into the open swale along Romney Rd. The existing swale flows east along Romney Rd and north along North Bailey Ave and outlets to an existing stormwater management pond located adjacent to Interstate 290. Runoff from the pond is then conveyed north via open and closed drainage systems and discharges to Ellicott Creek and ultimately the Niagara River. All proposed stormwater runoff from the project site will continue to discharge to the existing stormwater system along Romney Road.

This project is subject to the Boulevard Central Special Stormwater Design Conditions adopted by the Town of Amherst. In addition to the requirements of the NYSDEC SPDES General Permit, the project must also provide the following criteria for Projected Growth Redevelopment Scenarios and Enhanced Phosphorus Removal:

- Provide 10% escalation of proposed peak flow when compared to existing conditions peak flows.
- Median curve number (CN) to compute existing conditions.
- Water Quality volume based on the 1-year, 24-hour storm according to Chapter 10 of the NYSDEC Stormwater Management Design Manual.

For purposes of the runoff analysis and the stormwater drainage system design, portions of the project site were classified as "Redevelopment" per NYSDEC Stormwater Management Design Manual Chapter 9 requirements. The nature of this construction project will be a "Redevelopment" with an increase in impervious area. The proposed stormwater management system was designed to attenuate proposed runoff to existing conditions prior to discharge.

The proposed stormwater drainage system will consist of a combination of overland sheet flow and HDPE pipe channel flow connected by a series of drainage inlets located throughout the project site. Proposed stormwater runoff will be collected and conveyed to detention ponds and underground stormwater chamber detention areas onsite and discharged via outlet control pipes to the existing stormwater system along Romney Road.

The bioretention areas will provide Runoff Reduction and Water Quality volume requirements for "New Development" areas. The filter area planting soil depth varies throughout the bioretention areas but maintains a minimum of at least 2.5 feet of soil. A series of 6" underdrains below the planting soil will be located throughout the bioretention areas connected by overflow drainage inlets to convey runoff directly to the closed stormwater management system. Water quality treatment structures will be installed onsite to address water quality requirements for "Redevelopment" areas.

The NYSDEC Stormwater Management Design Manual requires a five-step process for Stormwater Management Planning as outlined in Chapter 3. The five steps include:

1. Site planning to preserve natural features and reduce impervious cover: No existing natural features exist onsite.
2. Calculation of Water Quality Volume (WQv) for site. See "Storm Sewer Drainage Calculations".

3. Incorporation of Green Infrastructure techniques and standard SMPs with Runoff Reduction Volume (RRv) capacity. Bioretention areas were incorporated into the site design to provide required RRv and WQv for "New Development" areas. See "Storm Sewer Drainage Calculations".
4. Use of standard SMPs where applicable, to treat the portion of water quality volume not addressed by green infrastructure techniques and standard SMPs with RRv capacity. Water quality treatment structures will be installed onsite to address water quality requirements for "Redevelopment" areas. See "Storm Sewer Drainage Calculations".
5. Design of volume and peak rate control practices where required. See "Storm Sewer Drainage Calculations".

The NYSDEC Stormwater Management Design Manual requires (5) five different criteria be considered when designing a stormwater management system. Those criteria are Water Quality, Runoff Reduction Volume, Channel Protection, Overbank Flooding and Extreme Storm Protection. Below is a summary of each item and how it is incorporated into this project.

Water Quality:
The NYSDEC requires water quality treatment prior to discharge. This will be achieved by the application of bioretention areas and water quality treatment structures. The total WQv provided was 0.645 ac-ft and equal to the required WQv of 0.645 ac-ft. The required water quality volume was calculated based on the proposed 7.29 acres of proposed development area.

Runoff Reduction Volume:
The NYSDEC requires reduction of the total water quality volume by green infrastructure techniques and SMPs to replicate pre-development hydrology. Bioretention areas were incorporated into the site layout to provide the required RRv for contributing runoff areas in the WQv. The RRv provided was 0.072 ac-ft and greater than the required RRv min. of 0.033 ac-ft. The required runoff reduction volume was calculated based on 2.94 acres of proposed "new development" area that includes 1.17 acres of "new impervious" area.

100% of the required WQv was not reduced due to the followings site specific limitations: Drainage areas with impermeable soils, Type D. In addition, below is a summary of how each green infrastructure technique was evaluated and determined to be feasible or infeasible:

1. Conservation of natural areas: no natural existing features present onsite.
2. Sheetflow to riparian buffers or filter strips: no riparian buffers possible on the site; filter strips not feasible given the limited area for development.
3. Vegetated Open Swales: swales were not feasible given the limited area for development.
4. Tree Plantings: new trees were planted throughout the site.
5. Disconnection of Roof Top Runoff: disconnection not feasible for these types of projects.
6. Stream Daylighting: is not feasible given the limited area for development.
7. Rain Garden: bioretention areas installed throughout site.
8. Green Roof: the proposed use of the building makes this an unfeasible practice.
9. Stormwater Planter: this method is not recommended for these types of projects.
10. Rain Barrels & Cisterns: collected water would not be used for irrigation.
11. Porous Pavement: porous pavement is not recommended for areas with impermeable soils (Type D) and areas with sediment laden runoff (salting in winter months).

Channel Protection:
The NYSDEC requires that 24-Hour extended detention be provided for the proposed 1-year storm event. A volume of 12,134 cf will be accommodated in the stormwater detention areas onsite.

Overbank Flooding:
The NYSDEC requires that the 10-year proposed storm event be attenuated with detention and that the outlet be restricted to the 10-year existing storm event. Storage of this storm will be provided within the onsite stormwater detention areas. At this storm event the stormwater drainage system will allow discharge of 52.15 cfs, which is below the existing peak 10-year runoff of 64.87 cfs.

Extreme Storm Protection:
The NYSDEC requires that the 100-year proposed storm event be attenuated with detention and that the outlet be restricted to the 100-year existing storm event. Storage of this storm will be provided within the onsite stormwater detention areas. At this storm event the stormwater drainage system will allow discharge of 85.32 cfs, which is below the existing peak 100-year runoff of 115.36 cfs.

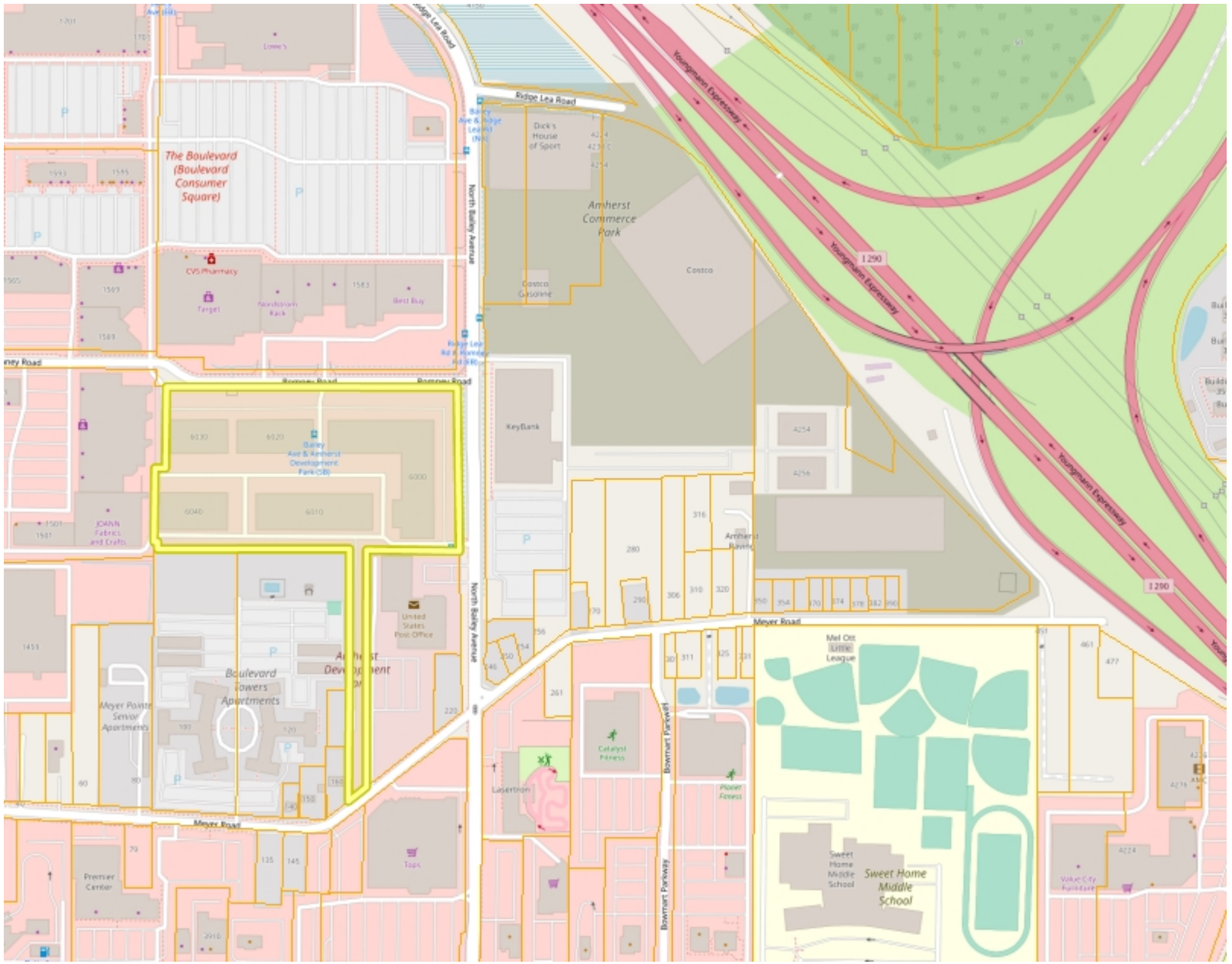
Town of Amherst Requirements:
The Town requires that the proposed 25-year storm event be attenuated with detention and that the outlet be restricted to the 10-year existing storm event *under the 10% escalation scenario*. Storage of this storm will be provided within the onsite stormwater detention areas. At the 25-year storm event the stormwater drainage system will allow discharge of 11.47 cfs, which is below the existing peak 10-year runoff of 21.51 cfs.

See attached "Storm Sewer Drainage Calculations" for additional information.

Appendix A

Location Maps

Erie County On-Line Mapping Application



Legend

- Parcels

0 0.14 0.3 Miles

WGS_1984_Web_Mercator_Auxiliary_Sphere

THIS MAP IS NOT TO BE USED FOR NAVIGATION

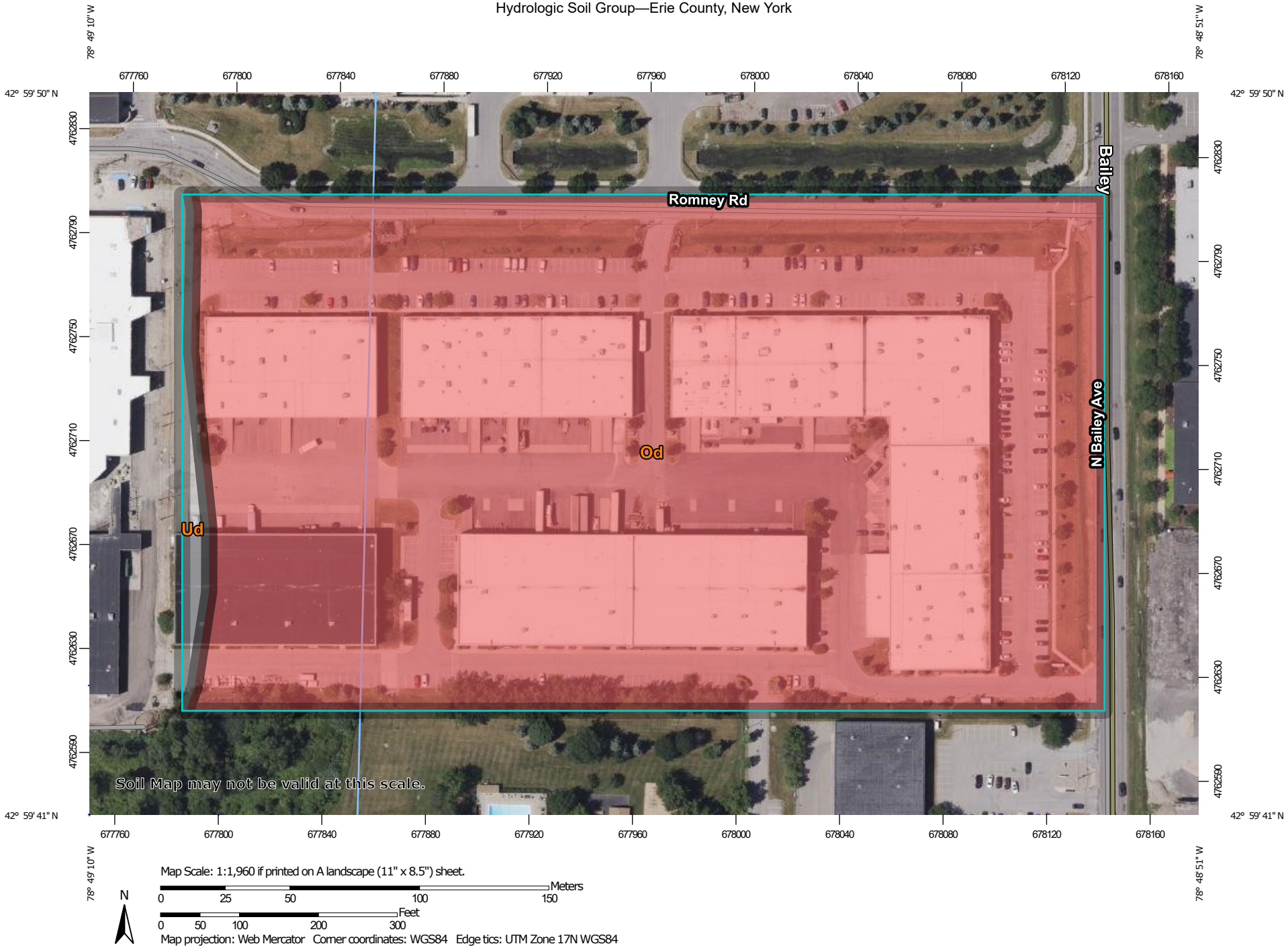
ERIE COUNTY
DEPARTMENT OF ENVIRONMENT & PLANNING
OFFICE OF GIS

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

1: 9,028

Appendix B

Web Soil Survey – Hydrologic Soils Group


78° 49' 10" W
78° 48' 51" W
42° 59' 50" N
42° 59' 41" N
677760
677800
677840
677880
677920
677960
678000
678040
678080
678120
678160
4762830
4762790
4762750
4762710
4762670
4762630
4762590
Romney Rd
Bailey
N Bailey Ave
Od
Ud
Soil Map may not be valid at this scale.
Map Scale: 1:1,960 if printed on A landscape (11" x 8.5") sheet.
N
Meters
0 25 50 100 150
Feet
0 50 100 200 300
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N 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: Erie County, New York
Survey Area Data: Version 23, Sep 5, 2023

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

Date(s) aerial images were photographed: May 9, 2022—Aug 15, 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
Od	Odessa silt loam, 0 to 3 percent slopes	D	17.2	98.2%
Ud	Urban land		0.3	1.8%
Totals for Area of Interest			**17.6**	**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

Appendix C

Storm Sewer Drainage Calculations

Water Quality and Runoff Reduction Calculations

Manning Formula Uniform Trapezoidal Channel Flow at Given Slope and Depth

Existing Drainage Ditch - North Bailey Road

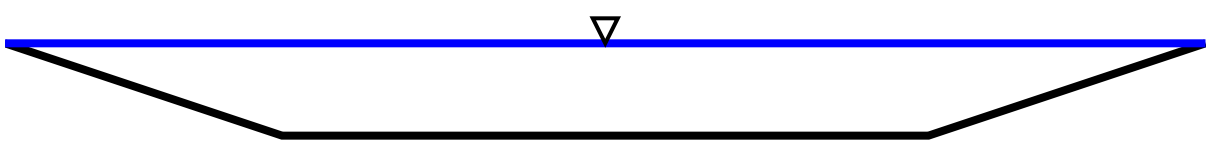
Max Flow

Inputs

Bottom width, b	7	ft
Side slope 1 (horiz./vert.)	3	
Side slope 2 (horiz./vert.)	3	
Manning roughness, n ? ○Strickler ○B/B (See notes)	0.03	
Channel slope, S	0.0012	rise/run
Flow depth, y	1.0	ft
Bend Angle ? (for riprap sizing)	0	
Rock specific gravity (2.65)	2.65	
Design rock size, D50 ○Isbash ○Maynord ○Searcy * 1.25 (See notes)	0.1	ft

Results

Flow area, a	10.0003	ft^2
Wetted perimeter, P_w	13.3246	ft
Hydraulic radius, R_h	9.0060	in
Velocity, v	1.4170	ft/sec
Flow, Q	14.1696	cfs
Velocity head, h_v	0.0312	ft
Top width, T	13.0000	ft
Froude number, F	0.28	
Average shear stress (tractive force), tau	0.0562	psf
n for design rock size per Strickler	0.0265	
n for design rock size per Blodgett	0.0364	
n for design rock size per Bathurst	0.0265	
Blodgett vs. Bathurst	Blodgett	
Required bottom angular rock size, D50 (Isbash & MC) ?	0.0232	ft
Required side slope 1 angular rock size, D50 (Isbash & MC) ?	0.0245	ft
Required side slope 2 angular rock size, D50 (Isbash & MC) ?	0.0245	ft
Required angular rock size, D50 (Maynord, Ruff, and Abt 1989)	0.0148	ft
Required angular rock size, D50 (Searcy 1967)	0.0135	ft



Notes:

Automated rock size and roughness design iteration
Choose a roughness radio button (BB recommended) and a design rock size radio button (Isbash recommended). Fine-tune depth and rock size safety factor to get your desired flow with an even rock size. Every time you change any input value, the following iteration cycle happens: 1. Roughness is calculated from design rock size. 2. The requested roughness calculation is copied to input roughness. 3. Channel flow and required rock size are calculated. 4. Design rock size is adjusted. 5. Repeat until error in the design rock size is very small.

Basic calculator (no iteration)
Enter your desired roughness value. Ignore the design rock size input area.

Manning Formula Uniform Pipe Flow at Given Slope and Depth

Proposed North Bailey Road 36" HDPE

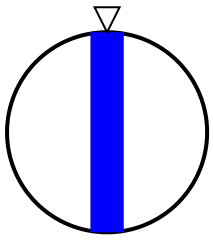
Max Flow

Inputs

Pipe diameter, d_0	36	in
Manning roughness, n	0.012	
Pressure slope (possibly ? equal to pipe slope), S_0	.002	rise/run
Relative flow depth, y/d_0	100	%

Results

Flow depth, y	36.0000	in
Flow area, a	7.0687	ft^2
Pipe area, a0	1017.8781	sq. in.
Relative area, a/a0	1.0000	fraction
Wetted perimeter, P_w	113.0973	in
Hydraulic radius, R_h	9.0000	in
Top width, T	0.0000	in
Velocity, v	4.5712	ft/sec
Velocity head, h_v	3.8972	in H2O
Froude number, F	0.00	
Average shear stress (tractive force), tau	0.0936	psf
Flow, Q (See notes)	32.3110	cfs
Full flow, Q0	14501.6605	gpm
Ratio to full flow, Q/Q0	1.0000	fraction



Notes:

This is the flow and depth inside an *infinitely long* pipe.
Getting the flow into the pipe may require significantly higher headwater depth. Add at least 1.5 times the velocity head to get the headwater depth or see my 2-minute tutorial for standard culvert headwater calculations using HY-8.

Manning Formula Uniform Trapezoidal Channel Flow at Given Slope and Depth

Existing Drainage Ditch - SW Corner to Arch Pipes

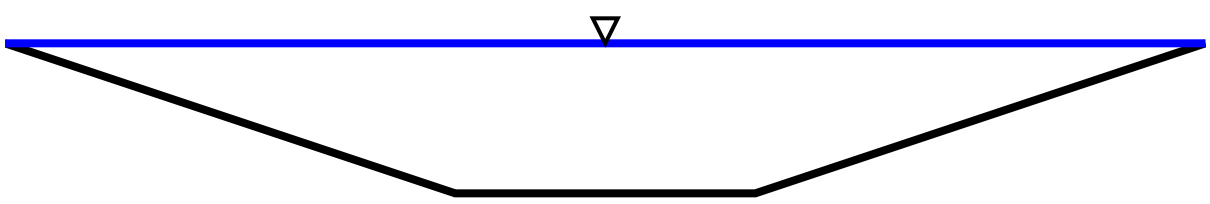
Max Flow

Inputs

Bottom width, b	2	ft
Side slope 1 (horiz./vert.)	3	
Side slope 2 (horiz./vert.)	3	
Manning roughness, n ? ○Strickler ○B/B (See notes)	0.03	
Channel slope, S	0.006	rise/run
Flow depth, y	1	ft
Bend Angle ? (for riprap sizing)	0	
Rock specific gravity (2.65)	2.65	
Design rock size, D50 ○Isbash ○Maynord ○Searcy * 1.25 (See notes)	0.1	ft

Results

Flow area, a	5.0002	ft^2
Wetted perimeter, P_w	8.3246	ft
Hydraulic radius, R_h	7.2077	in
Velocity, v	2.7312	ft/sec
Flow, Q	13.6559	cfs
Velocity head, h_v	0.1159	ft
Top width, T	8.0000	ft
Froude number, F	0.61	
Average shear stress (tractive force), tau	0.2250	psf
n for design rock size per Strickler	0.0265	
n for design rock size per Blodgett	0.0377	
n for design rock size per Bathurst	0.0241	
Blodgett vs. Bathurst	Blodgett	
Required bottom angular rock size, D50 (Isbash & MC) ?	0.0863	ft
Required side slope 1 angular rock size, D50 (Isbash & MC) ?	0.0910	ft
Required side slope 2 angular rock size, D50 (Isbash & MC) ?	0.0910	ft
Required angular rock size, D50 (Maynord, Ruff, and Abt 1989)	0.0764	ft
Required angular rock size, D50 (Searcy 1967)	0.0500	ft



Notes:

Automated rock size and roughness design iteration

Choose a roughness radio button (BB recommended) and a design rock size radio button (Isbash recommended). Fine-tune depth and rock size safety factor to get your desired flow with an even rock size. Every time you change any input value, the following iteration cycle happens: 1. Roughness is calculated from design rock size. 2. The requested roughness calculation is copied to input roughness. 3. Channel flow and required rock size are calculated. 4. Design rock size is adjusted. 5. Repeat until error in the design rock size is very small.

Basic calculator (no iteration)

Enter your desired roughness value. Ignore the design rock size input area.

Manning Formula Uniform Pipe Flow at Given Slope and Depth

Proposed SW Corner 36" HDPE

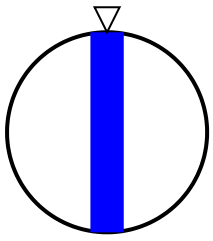
Max Flow

Inputs

Pipe diameter, d_0	36	in
Manning roughness, n	0.012	
Pressure slope (possibly ? equal to pipe slope), S_0	.004	rise/run
Relative flow depth, y/d_0	100	%

Results

Flow depth, y	36.0000	in
Flow area, a	7.0687	ft^2
Pipe area, a0	1017.8781	sq. in.
Relative area, a/a0	1.0000	fraction
Wetted perimeter, P_w	113.0973	in
Hydraulic radius, R_h	9.0000	in
Top width, T	0.0000	in
Velocity, v	6.4647	ft/sec
Velocity head, h_v	7.7943	in H2O
Froude number, F	0.00	
Average shear stress (tractive force), tau	0.1873	psf
Flow, Q (See notes)	45.6947	cfs
Full flow, Q0	20508.4450	gpm
Ratio to full flow, Q/Q0	1.0000	fraction



Notes:

This is the flow and depth inside an *infinitely long* pipe.
Getting the flow into the pipe may require significantly higher headwater depth. Add at least 1.5 times the velocity head to get the headwater depth or see my 2-minute tutorial for standard culvert headwater calculations using HY-8.

WATER QUALITY REQUIRED FOR PROPOSED DEVELOPMENT AREA

Area, Acres = 7.29

"Redevelopment Activity", Acres = 4.35 (existing, disturbed impervious area)

**Adjusted "Redevelopment Area", Acres = 3.26

Total proposed impervious, Acres = 5.52

"New development", Acres = 2.94

"New" impervious, Acres = 1.17

Water Quality Volume (WQv)

Enhanced Phosphorus Removal: WQv Required = 1-yr 24-hr Design Storm per NYSDEC SWMDM Section 4.3 (See attached worksheets, P = 1.80)

	Water Quality	SMP Description
Drainage Area #1: New Development Area, cf =	7,841	Filtration Bioretention*
Drainage Area #2: Redevelopment Area, cf =	20,236	Flow Based Alt. Practices**
Total WQv Required, cf =	28,077	
Total WQv Required, ac-ft =	0.645	

Per NYSDEC SWMDM Section 9.2.1.B: Runoff Reduction Volume (RRv) sizing criteria not required for "Redevelopment Activity" portion of project.

****Per NYSDEC SWMDM Section 9.2.1.A.IV*** : The plan proposes that 100% WQv is captured and treated, for a minimum of 75% of the disturbed, redevelopment impervious area, by implementation of a flow-through alternative SMP sized to treat the peak rate of runoff from the WQv design storm.

RRv PROVIDED FOR PROPOSED DEVELOPMENT AREA (See NYSDEC worksheets)

Min. RRv Req'd, cf = 1,437

Min. RRv Req'd, ac-ft = 0.033

	WQv, cf	RRv, cf
Filtration Bioretention	7,841	3,136
Flow Based Alt. Practices	20,236	N/A
TOTAL, cf	28077	3136
TOTAL, ac-ft	0.645	0.072

WQ & RR SUMMARY (ac-ft):

TOTAL WATER QUALITY PROVIDED FOR PROPOSED DEVELOPMENT AREA 0.645

IS WATER QUALITY VOLUME REQUIREMENT MET? Yes
(WQv provided equal to or greater than WQv required)

IS RUNOFF REDUCTION VOLUME REQUIREMENT MET? Yes
(RRv provided equal to or greater than Min. RRv required)

Revised_/_/_

Step 1 - Site Planning

	Practice	Description	Applicable	Project Specific Evaluation
Preservation of Natural Features and Conservation Design	**Preservation of Undisturbed Areas**	Delineate and protect undisturbed forests, native vegetated areas, riparian corridors, water bodies, wetlands, and natural terrain.	N/A	EXAMPLES - Approximately XX+/- Acres of land will remain undisturbed, in its natural state, which accounts for XX% of the total project parcel. **OR** The project does not propose permanent conservation of this area at this time.
	Preservation of Buffers	Delineate and protect naturally vegetated buffers along perennial streams, rivers, shorelines, and wetlands.	N/A	EXAMPLES - There is a stream/river/shorline/wetland located on the project site. For the area adjacent to this water body, a XX-ft naturally vegetated buffer will be applied. No disturbance will occur within this buffer. **OR** The only disturbance that will occur within this buffer will include XX. This disturbance is necessary because XX. **OR** There are no water bodies located on or adjacent to the project site.
	Reduction of Clearing and Grading	Limit clearing and grading to the minimum amount needed for roads, driveways, foundations, utilities and stormwater management facilities.	N/A	EXAMPLES - Clearing and grading will be limited to the area of disturbance and will be minimized to the greatest extent practical. The limits of all proposed clearing will be demarcated in the field with orange construction fencing, prior to construction, to prevent unnecessary removal of trees.
	Locating Development in Less Sensitive Areas	Avoid sensitive resource areas such as floodplains, steep slopes, erodible soils, wetlands, mature forests and critical habitats by locating development to fit the terrain in areas that will create the least impact.	Yes	EXAMPLES - The site has been designed to avoid sensitive resource areas to the greatest extent practical. Include project specific information for the various sensitive resources. **OR** There are no floodplains, steep slopes, erodible soils, wetlands, mature forests or critical habitats located on the project site.
	Open Space Design	Use clustering, conservation design or open space design to reduce impervious cover, preserve more open space and protect water resources.	N/A	EXAMPLES - The site layout has been designed to maximize open space. Impervious surfaces have been minimized to the greatest extent practical and approximately XX+/- Acres will be maintained as vegetated open space.
	Soil Restoration	Restore the original properties and porosity of the soil by deep till and amendment with compost to reduce the generation of runoff and enhance the runoff reduction performance of post construction practices.	Yes	EXAMPLES - All disturbed areas will be restored in accordance with the Soil Restoration requirements in Table 5.3 of the Design Manual. **OR** Compacted areas were considered as impervious cover when calculating the WQv Required and the compacted areas were assigned a post-construction HSG designation that is one level less permeable than existing conditions for the hydrology analysis.

Step 1 - Site Planning

Reduction of Impervious Cover	**Roadway Reduction**	Minimize roadway widths and lengths, below local requirements, to reduce site impervious area	N/A	EXAMPLES - Proposed roadways will be constructed with a porous XX surface, in order to minimize the overall impervious surface. **OR** The project proposes to reduce the roadway width to XX-ft, from the required XX-ft. **OR** Reducing the roadway width is not feasible for the project's intended use. **OR** No new roadways are proposed as part of this project.
	Sidewalk Reduction	Minimize sidewalk lengths and widths, below local requirements, to reduce site impervious area	N/A	EXAMPLES - All pedestrian walkways will be constructed with a porous XX surface. **OR** Sidewalk widths have been minimized to X-ft and quantity of sidewalk has been reduced to that required to ensure safe pedestrian access throughout the site. **OR** Reducing the sidewalk width/length is not feasible for the project's intended use. **OR** No new sidewalks are proposed as part of this project.
	Driveway Reduction	Minimize driveway lengths and widths, below local requirements, to reduce site impervious area	N/A	EXAMPLES - All driveways on-site will be constructed with a permeable XX surface, where feasible, in order to minimize the overall impervious surface. **OR** The project proposes to reduce the driveway width to XX-ft, instead of the required XX-ft. **OR** Reducing the driveway width is not feasible for the intended use. **OR** No new driveways are proposed as part of this project.
	Cul-de-sac Reduction	Minimize the number of cul-de-sacs and incorporate landscaped areas to reduce their impervious cover.	N/A	EXAMPLES - Proposed cul-de-sacs will utilize a landscaped island to reduce impervious cover. **OR** No cul-de-sacs are proposed as part of this project.
	Building Footprint Reduction	Reduce the impervious footprint of residences and commercial buildings by using alternate or taller buildings while maintaining the same floor to area ratio.	N/A	EXAMPLES - All new building area has been allocated to efficiently implement the intended use. **OR** No new buildings are proposed as part of this project. **OR** The current proposal involves the renovation and reuse of XX existing buildings on-site.
	Parking Reduction	Reduce imperviousness on parking lots by eliminating unneeded spaces, providing compact car spaces and efficient parking lanes, reducing stall dimensions below local requirements, using porous pavement surfaces in overflow parking areas, and using multi-storied parking decks where appropriate.	N/A	EXAMPLES - All parking lots will be constructed of a porous XX surface, to reduce overall impervious surfaces. **OR** The project proposes to reduce the parking stall dimensions to X-ft wide by XX-ft long, instead of the required XX-ft by XX-ft stall. **OR** The project proposes to reduce the number of parking stalls proposed to XX, instead of the required XX, resulting in an approximate XX% reduction in impervious. **OR** Reducing the parking stall dimensions or number of stalls is not feasible for the intended use. **OR** No new parking stalls are proposed as part of this project.

Step 2 - Calculate Water Quality Volume

Is this project subject to Section 4.3 of the NYS Design Manual for Enhanced Phosphorus Removal?	Yes
What is the nature of this construction project?	

Design Point:			
P=	1.80	inches	*Enter 1 Year 24 Hour Design Storm as P*

Calculate Required WQv

Drainage Area Number	Contributing Area (Acres)	Impervious Area (Acres)	Percent Impervious %	Rv	WQv (cf)	SMP Description
1	2.94	1.17	40	0.41	7,841	Filtration Bioretention
2	3.26	3.26	100	0.95	20,236	Flow Based Alternative Practice
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
Total	6.20	4.43	71	0.69	**28077**	**Required WQv**

Step 3 - Evaluation of RR Techniques and Standard SMPs with RRv Capacity

	Practice	Description	Applicable	Project Specific Evaluation
RR Techniques	**Conservation of Natural Areas (RR-1)**	Retain the pre-development hydrologic and water quality characteristics of undisturbed natural areas by permanently conserving these areas on a site. Undisturbed natural areas include: forest retention areas; reforestation areas; stream and river corridors; shorelines; wetlands, vernal pools, and associated vegetated buffers; and undisturbed open space.	N/A	EXAMPLES - The project site does not contain any significant natural resources. **OR** As a Redevelopment Project, the proposed site layout has been designed to limit land disturbance to the greatest extent practical. **OR** Approximately XX+/- Acres will be placed into permanent conservation, which accounts for XX% of the total property. **OR** The project does not propose permanent conservation of these areas at this time.
	Sheet Flow to Riparian Buffer/Filter Strip (RR-2)	Undisturbed natural areas such as forested conservation areas and stream buffers or vegetated filter strips and riparian buffers can be used to treat and control stormwater runoff from some areas of a development project.	N/A	EXAMPLES - The project site does not contain any riparian buffers. **OR** Sheet flow to riparian buffers or grass filter strips is not proposed at this time. The project proposes treatment by RR techniques, Standard SMPs with RRv capacity, or Standard SMPs without RRv capacity. **OR** The project proposes sheet flow to riparian buffers to reduce runoff from XX. Calculations have been provided in the SWPPP. **OR** The project proposes sheet flow to grass filter strips to reduce runoff from XX. Calculations have been provided in the SWPPP.
	Tree Planting/Tree Pit/Tree Trench (RR-3)	Plant or conserve trees to reduce stormwater runoff, increase nutrient uptake, and provide bank stabilization. Trees can be used for applications such as landscaping, stormwater management practice areas, conservation areas and erosion and sediment control.	N/A	EXAMPLES - The project proposes the preservation of existing mature trees, as well as the planting of numerous trees throughout the site, in order to reduce stormwater runoff, increase nutrient uptake, and provide bank stabilization. **OR** The project proposes new tree plantings/tree pits/tree trenches, adjacent to impervious surfaces, Calculations have been provided in the SWPPP. **OR** Tree plantings/tree pits/tree trenches are proposed on site. However, credit for these trees will not be taken toward area reduction/volume reduction in the RRv calculations.
	Disconnection of Rooftop Runoff (RR-4)	Direct runoff from rooftop areas and upland overland runoff flow to designated pervious areas to reduce runoff volumes and rates.	N/A	EXAMPLES - The building roof(s) will be directed to downspouts with splash blocks and discharge over a grassed filter. Calculations have been provided in the SWPPP. **OR** The building roof(s) will be directed to downspouts with splash blocks and vegetated areas, which will promote sheet flow and filtering. However, credit for rooftop disconnect will not be taken toward an impervious area reduction in the RRv calculations. **OR** Due to the size/use/layout of the proposed building(s), rooftop disconnect is not proposed at this time.

Step 3 - Evaluation of RR Techniques and Standard SMPs with RRv Capacity

RR Techniques	**Vegetated Swale (RR-5)**	The natural drainage paths, or properly designed vegetated channels, can be used instead of constructing underground storm sewers or concrete open channels to increase time of concentration, reduce the peak discharge, and provide infiltration.	N/A	EXAMPLES - Due to flat topography/steep topography/etc., vegetated swales are not feasible for use on the project site. **OR** Vegetated swale(s) will be used to treat XX. Calculations have been provided in the SWPPP.
	Rain Garden (RR-6)	Manage and treat small volumes of stormwater runoff using a conditioned planting soil bed and planting materials to filter runoff stored within a shallow depression.	N/A	EXAMPLES - Due to the size of contributing area/tributary driveway/tributary roadway, a bioretention facility will be implemented instead of rain gardens. **OR** Due to XXX,rain gardens are not feasible for use on the project site. **OR** Rain gardens will be used to treat roof runoff at the source for the building(s). Calculations have been provided in the SWPPP.
	Stormwater Planter (RR-7)	Small landscaped stormwater treatment devices that can be designed as infiltration or filtering practices. Stormwater planters use soil infiltration and biogeochemical processes to decrease stormwater quantity and improve water quality.	N/A	EXAMPLES - Due to XXX, a bioretention facility will be implemented instead of stormwater planter(s). **OR** Due to XXX,stormwater planters are not feasible for use on the project site. **OR** Stormwater planters will be used to treat roof runoff at the source for the building(s). Calculations have been provided in the SWPPP.
	Rainwater Harvesting System (RR-8)	Capture and store stormwater runoff to be used for irrigation systems or filtered and reused for non-contact activities.	N/A	EXAMPLES - Rainwater harvesting is not proposed on-site due to XXX. **OR** A below-grade cistern will be implemented for reuse as XXX. The system has been sized to provide adequate storage capacity for the entire WQv & RRv calculated for the tributary area. Calculations have been provided in the SWPPP. An above-grade rain barrel/cistern will be implemented for reuse as XXX. The system has been sized to provide adequate storage capacity for the entire WQv & RRv calculated for the tributary area. Calculations have been provided in the SWPPP.
	Porous Pavement (RR-9)	Pervious types of pavements that provide an alternative to conventional paved surfaces, designed to infiltrate rainfall through the surface, thereby reducing stormwater runoff from a site and providing some pollutant uptake in the underlying soils.	N/A	EXAMPLES - Due to XXX, porous pavement is not feasible for use on the project site. **OR** Porous asphalt will be used, in place of XX, for the proposed XX. Calculations have been provided in the SWPPP. **OR** Porous concrete will be used, in place of XX, for the proposed XX. Calculations have been provided in the SWPPP. **OR** Porous pavers will be used, in place of XX, for the proposed XX. Calculations have been provided in the SWPPP.

Step 3 - Evaluation of RR Techniques and Standard SMPs with RRv Capacity

	Green Roof (RR-10)	Capture runoff by a layer of vegetation and soil installed on top of a conventional flat or sloped roof. The rooftop vegetation allows evaporation and evapotranspiration processes to reduce volume and discharge rate of runoff entering conveyance system.	N/A	EXAMPLES - Due to XX, a green roof is not feasible for use on the project site. **OR** An extensive/intensive green roof is proposed on-site. Calculations have been provided in the SWPPP.
	Stream Daylighting (RR-11)	Stream Daylight previously-culverted/piped streams to restore natural habitats, better attenuate runoff by increasing the storage size, promoting infiltration, and help reduce pollutant loads.	N/A	EXAMPLES - No stream daylighting opportunities are present on the site. **OR** Although stream daylighting opportunities are present, due to XX, stream daylighting is not proposed on this site. **OR** The project proposes stream daylighting for an XX-ft length of stream.
Standard SMPs with RRv Capacity	**Infiltration Trench (I-1)**	An infiltration practice that stores the water quality volume in the void spaces of a gravel trench before it is infiltrated into the ground.	N/A	EXAMPLES - Due to XX, infiltration trenches are not feasible for use on the project site. **OR** Infiltration trench(es) are proposed on-site to treat XX. Calculations have been provided in the SWPPP.
	Infiltration Basin (I-2)	An infiltration practice that stores the water quality volume in a shallow depression, before it is infiltrated it into the ground.	N/A	EXAMPLES - Due to XX, infiltration basins are not feasible for use on the project site. **OR** An infiltration basin(s) is proposed on-site to treat XX. Calculations have been provided in the SWPPP.
	Dry Well (I-3)	An infiltration practice similar in design to the infiltration trench, and best suited for treatment of rooftop runoff.	N/A	EXAMPLES - Due to XX, dry wells are not feasible for use on the project site. **OR** Dry well(s) are proposed on-site to treat XX. Calculations have been provided in the SWPPP.
	Underground Infiltration System (I-4)	An infiltration practice below grade that stores the water quality volume in pre-manufactured pipes, vaults or other modular structures, before it is infiltrated into the ground.	N/A	EXAMPLES - Due to XX, underground infiltration systems are not feasible for use on the project site. **OR** An underground infiltration system(s) is proposed on-site to treat XX. Calculations have been provided in the SWPPP.
	Infiltration Bioretention (F-4)	A shallow depression that treats stormwater as it flows through a soil matrix, before it is infiltrated into the ground.	N/A	EXAMPLES - Due to XXX, a filtration bioretention will be implemented, instead of an infiltration bioretention. **OR** Due to XXX, bioretention is not feasible for use on the project site. **OR** Infiltration bioretention will be used to treat XX. Calculations have been provided in the SWPPP.
	Filtration Bioretention (F-5)	A shallow depression that treats stormwater as it flows through a soil matrix and is returned to the storm drain system.	Yes	EXAMPLES - Due to XXX, an infiltration bioretention will be implemented, instead of a filtration bioretention. **OR** Due to XXX, bioretention is not feasible for use on the project site. **OR** Filtration bioretention will be used to treat XX. Calculations have been provided in the SWPPP.

Step 3 - Evaluation of RR Techniques and Standard SMPs with RRv Capacity

	Bioslope (F-6)	Permeable engineered soil media that is installed along embankments or other slopes, designed to capture and treat stormwater runoff from adjacent paved areas.	N/A	EXAMPLES - Due to XXX, bioslopes are not feasible for use on the project site. **OR** Bioslope(s) will be used to treat XX. Calculations have been provided in the SWPPP.
	Dry Swale (O-1)	An open drainage channel or depression explicitly designed to detain and promote the filtration of stormwater runoff into the soil media.	N/A	EXAMPLES - Due to XXX, dry swales are not feasible for use on the project site. **OR** A dry swale(s) will be used to treat XX. Calculations have been provided in the SWPPP.

Step 4 - Calcuate Minimum RRv Required

Enter the Soils Data for the site		
Hydrologic Soil Group	Acres	S
A		55%
B		40%
C		30%
D	1.17	20%
Total Area	1.17	

Calculate the Minimum RRv		
S =	**0.20**	
Impervious =	1.17	*acres*
Precipitation	1.80	*inches*
Rv	0.95	
Minimum RRv	**0.033**	***af***
	1437	cf

Steps 3 and 5 - Apply RR Techniques and Standard SMPs

Runoff Reduction Volume and Treated Volumes						
	Runoff Reduction Techiques/Standard SMPs		**Total Contributing Area**	**Total Contributing Impervious Area**	**WQv Reduced (RRv)**	**WQv Treated**
			(acres)	**(acres)**	**(cf)**	**(cf)**
RR Techniques	Conservation of Natural Areas	RR-1	0.00		0	
	Sheet Flow to Riparian Buffer/Filter Strip	RR-2	0.00	0.00	0	
	Tree Planting/Tree Pit/Tree Trench	RR-3	0.00	0.00	0	
	Disconnection of Rooftop Runoff	RR-4		0.00	0	
	Vegetated Swale	RR-5	0.00	0.00	0	
	Rain Garden	RR-6	0.00	0.00	0	
	Stormwater Planter	RR-7	0.00	0.00	0	
	Rainwater Harvesting Systems	RR-8	0.00	0.00	0	
	Porous Pavement	RR-9	0.00	0.00	0	
	Green Roof (Extensive & Intensive)	RR-10	0.00	0.00	0	
	Stream Daylighting	RR-11				
Standard SMPs w/ RRv Capacity	Infiltration Trench	I-1	0.00	0.00	0	0
	Infiltration Basin	I-2	0.00	0.00	0	0
	Dry Well	I-3	0.00	0.00	0	0
	Underground Infiltration System	I-4	0.00	0.00	0	0
	Infiltration Bioretention	F-4	0.00	0.00	0	0
	Filtration Bioretention	F-5	2.94	1.17	3,136	4,705
	Bioslope	F-6	0.00	0.00	0	0
	Dry swale	O-1	0.00	0.00	0	0
Standard SMPs	Micropool Extended Detention	P-1	0.00	0.00		0
	Wet Pond	P-2	0.00	0.00		0
	Wet Extended Detention	P-3	0.00	0.00		0
	Multiple Pond System	P-4	0.00	0.00		0
	Shallow Wetland	W-1	0.00	0.00		0
	Extended Detention Shallow Wetland	W-2	0.00	0.00		0
	Pond/Wetland System	W-3	0.00	0.00		0
	Pocket Wetland	W-4	0.00	0.00		0
	Gravel Wetland	W-5	0.00	0.00		0
	Surface Sand Filter	F-1	0.00	0.00		0
	Underground Sand Filter	F-2	0.00	0.00		0
	Perimeter Sand Filter	F-3	0.00	0.00		0
	Wet Swale	O-2	0.00	0.00		0
Alt. SMPs	Flow Based Alternative Practice	-	3.26	3.26		20,236
	Volume Based Alternative Practice	-				
	Totals by RR Technique	→	0.00	0.00	0	
	Totals by Standard SMP w/RRV	→	2.94	1.17	3,136	4,705
	Totals by Standard SMP	→	0.00	0.00		0
	Totals by Alternative SMP	→	3.26	3.26		20,236
	Totals (RR Techniques + all SMPs)	→	6.20	4.43	3,136	24,941

NOI QUESTIONS

#	NOI Question	Reported Value	
		cf	af
28	Total Water Quality Volume (WQv) Required	28077	0.645
30	Total RRV Provided	3136	0.072
31	Is RRv Provided ≥WQv Required?	No	
32	Minimum RRv	1437	0.033
32a	Is RRv Provided ≥ Minimum RRv Required?	Yes	
33a	Total WQv Treated	24941	0.573
34	Sum of Volume Reduced & Treated	28077	0.645
35	Is Sum RRv Provided and WQv Provided ≥WQv Required?	Yes	

Filtration Bioretention (F-5)

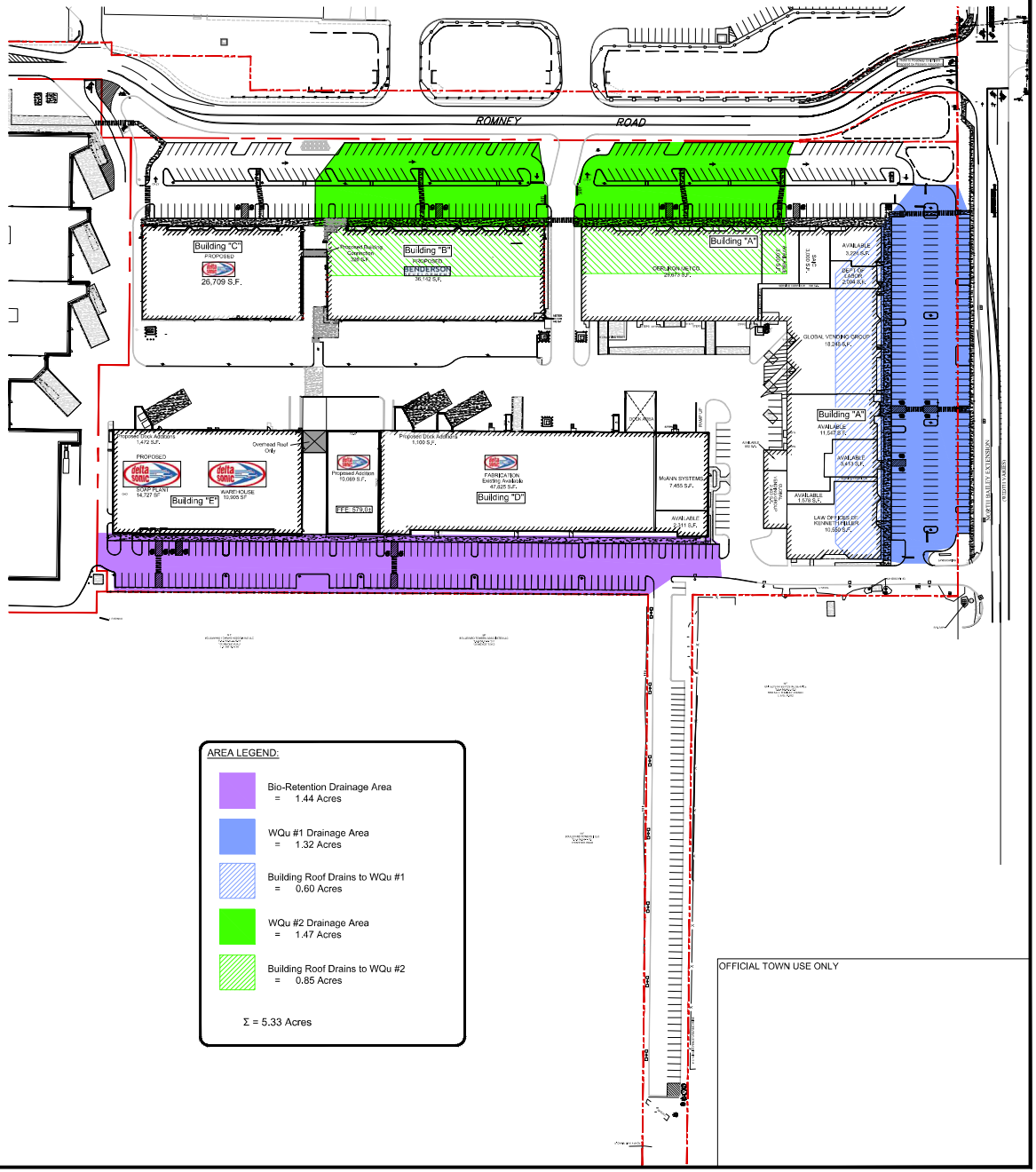
Design Point:	

Enter Site Data For Drainage Area to be Treated by Practice							
Drainage Area Number	**Contributing Area** (Acres)	**Impervious Area** (Acres)	**Percent Impervious** %	**Rv**	**WQv** (cf)	**Precipitation** (in)	**Description**
1	2.94	1.17	40	0.41	7,841	1.80	Filtration Bioretention

Design Criteria		
Enter underlying soil infiltration rate (based on geotechnical testing, refer to Appendix D)	0.05	Underdrains required
Is the contributing area to the practice a stormwater hotspot?	No	
Is the practice the first in series for treatment of a Level 1 (Infiltration Restricted) hotspot?	No	
Is contributing area greater than max. contributing area?	No	
Enter depth to seasonal high water table (ft)	7	
Enter depth to bedrock (ft)	10	
Is pretreatment provided, in conformance with Section 6.4.3.1	Yes	
Enter average height of ponding (ft)	0.25	
Enter depth of surface layer (inches)	3	
Enter depth of filter media (ft)	2.5	
Enter depth of drainage layer (inches)	10	
Enter slope of maintenance access (%)	1	
Enter width of maintenance access (ft)	12	

Sizing Criteria				
		Value	Units	Notes
Permeability Flow Rate	k	1	ft/day	
Filter Time	tf	2	days	
Required Filter Area	Af	3564	sf	
Enter Provided Filter Area	Af	3564	sf	
Recalculated Water Quality Volume (based on provided filter area)	WQv calc	7840.8	cf	

Calculate Runoff Reduction			
RRv Provided	**3,136**	***cf***	
WQv Treated	4705	cf	This is the portion of the WQv that is not reduced in the practice.



DRAWING REVISIONS:

No.	DATE	BY	REMARKS

SPECIAL INFORMATION:

ALL CONTRACTORS SHALL GUARANTEE THEIR WORK FOR A PERIOD OF ONE YEAR FROM THE DATE OF OWNERS ACCEPTANCE.

SHOP DRAWING SUBMITTALS ARE REQUIRED FOR ANY AND ALL STRUCTURES.

NOTICE

UNAUTHORIZED ALTERATIONS OF THIS DOCUMENT ARE IN VIOLATION OF SECTION 7209 OF THE STATE EDUCATION LAW.

Know what's below. Call before you dig.

PROPERTY NUMBER: #1723

AREA: -

Amherst Development Park
6000 - 6040 North Bailey Ave
Amherst, NY 14226

PROPOSED SITE MODIFICATIONS

CONSULTANT

JAMES ALLEN RUMSEY
ARCHITECT
PREPARED FOR
BENDERSON DEVELOPMENT
570 DELAWARE AVE., BUFFALO, NY 14202
(716) 886-0211

SEAL

TITLE:
Water Quality Delineation Map

SCALE: 1:70

DRAWN BY: DMZ

CHECKED BY: MAO

DATE: 01.30.2025

DRAWING NO.: C5.12

Filtration Bioretention (F-5)

Design Point:	

Enter Site Data For Drainage Area to be Treated by Practice							
Drainage Area Number	**Contributing Area** (Acres)	**Impervious Area** (Acres)	**Percent Impervious** %	**Rv**	**WQv** (cf)	**Precipitation** (in)	**Description**
1	1.44	1.20	83	0.80	7,527	1.80	Filtration Bioretention

Design Criteria		
Enter underlying soil infiltration rate (based on geotechnical testing, refer to Appendix D)	0.05	Underdrains required
Is the contributing area to the practice a stormwater hotspot?	No	
Is the practice the first in series for treatment of a Level 1 (Infiltration Restricted) hotspot?	No	
Is contributing area greater than max. contributing area?	No	
Enter depth to seasonal high water table (ft)	7	
Enter depth to bedrock (ft)	10	
Is pretreatment provided, in conformance with Section 6.4.3.1	Yes	
Enter average height of ponding (ft)	0.25	
Enter depth of surface layer (inches)	3	
Enter depth of filter media (ft)	2.5	
Enter depth of drainage layer (inches)	10	
Enter slope of maintenance access (%)	1	
Enter width of maintenance access (ft)	12	

WORKSHEET PROVIDED TO REFLECT DELINEATION MAP:

AREA TRIBUTARY TO BIORETENTION = 1.44 AC.

RRv PROVIDED = 3,136 CF

WQv PROVIDED = 7,841 CF

Sizing Criteria				
		Value	Units	Notes
Permeability Flow Rate	k	1	ft/day	
Filter Time	tf	2	days	
Required Filter Area	Af	3421	sf	
Enter Provided Filter Area	Af	3564	sf	
Recalculated Water Quality Volume (based on provided filter area)	WQv calc	7840.8	cf	

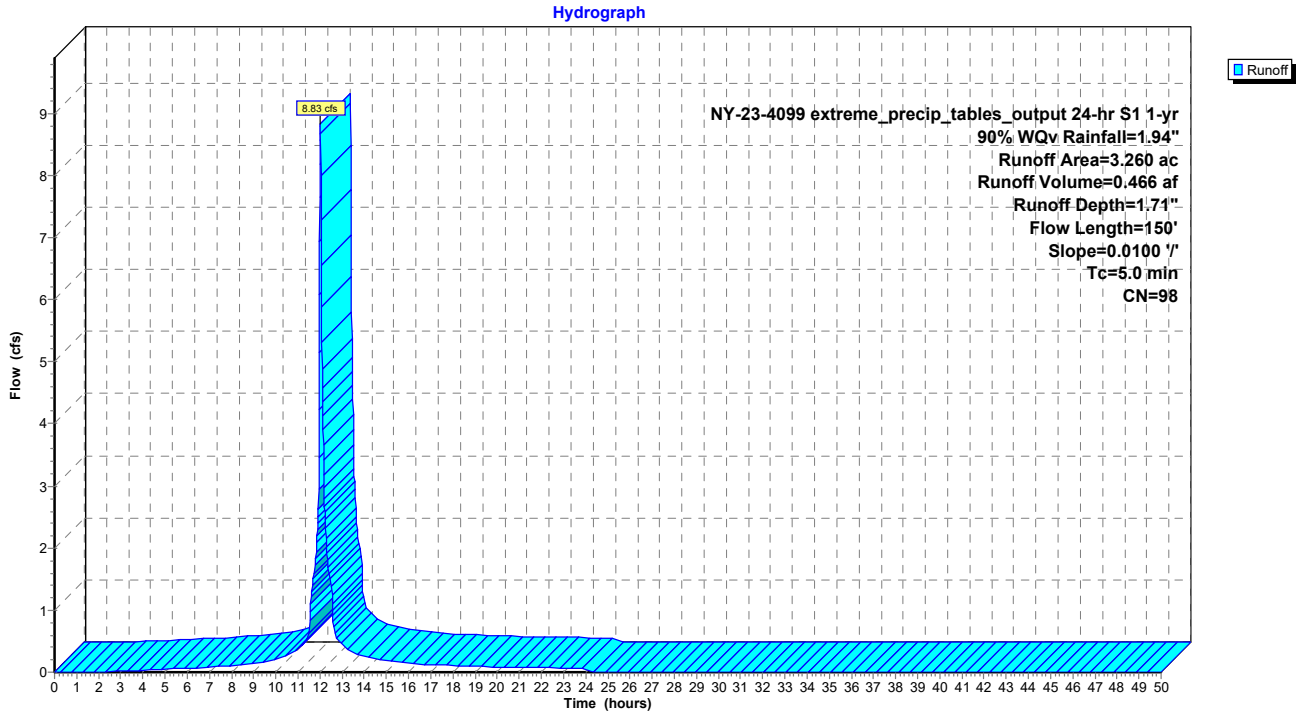
Calculate Runoff Reduction			
RRv Provided	**3,136**	***cf***	
WQv Treated	4391	cf	This is the portion of the WQv that is not reduced in the practice.

Water Quality Peak Flow Rate

Step 2 - Determine the Water Quality Treatment Volume				
		Value	Units	Notes
Water Quality Volume Required	WQv	0.4646	af	

Step 3 - Solve for the Calculated P90 Value				
		Value	Units	Notes
Subcatchment Area - 1	A1	3.26	acres	
Area 1 Curve Number	CN1	98		
Subcatchment Area - 2	A2		acres	
Area 2 Curve Number	CN2			
Subcatchment Area - 3	A3		acres	
Area 3 Curve Number	CN3			
Subcatchment Area - 4	A4		acres	
Area 4 Curve Number	CN4			
Subcatchment Area - 5	A5		acres	
Area 5 Curve Number	CN5			
Subcatchment Area - 6	A6		acres	
Area 6 Curve Number	CN6			
Subcatchment Area - 7	A7		acres	
Area 7 Curve Number	CN7			
Subcatchment Area - 8	A8		acres	
Area 8 Curve Number	CN8			
Subcatchment Area - 9	A9		acres	
Area 9 Curve Number	CN9			
Subcatchment Area - 10	A10		acres	
Area 10 Curve Number	CN10			
Weighted Curve Number	CNw	98.00		
Maximum Basin Retention	S	0.20	inches	
Runoff	Q	0.14	ft	
	Q	1.71	inches	
Calculated Rainfall Value	**P90**	**1.94**	**inches**	

Subcatchment WQ: Drainage Area #2 - Redevelopment Area - WQ Peak Flow Rate



Flow Based Alternative Practice

Design Point:	

Enter Site Data For Drainage Area to be Treated by Practice							
Drainage Area Number	**Contributing Area** (Acres)	**Impervious Area** (Acres)	**Percent Impervious** %	**Rv**	**WQv** (ft^3)	**Precipitation** (in)	**Description**
2	3.26	3.26	100	0.95	20,236	1.80	Flow Based Alternative Practice

Design Criteria		
Is the alternative practice included in the NJCAT Verification Database, NJDEP list of approved Manufactured Treatment Devices or TAPE list of Approved Technologies for General Use Level?	Yes	
Is the flow based practice proposed for area of new development?	No	
If proposed for new development, is the practice included on NYSDEC list for Verified Proprietary Practices for New Development?		
Is the practice being designed off-line?	No	Practice must have adequate bypass capacity
If designed off-line, has flow diversion been included?		Not applicable
Enter Extreme Flood peak flow rate (cfs)		
Enter alternative practice bypass capacity (cfs)		
Enter name and manufacturer of alternative practice		

Sizing Criteria				
		Value	Units	Notes
Water Quality Peak Flow Rate	WQf	8.83	cfs	Taken from hydrologic modeling
Enter Maximum Treatment Flow Rate (MTFR) of Alternative Practice	Q	8.83	cfs	

Determine the Water Quality Volume Treated			
Water Quality Volume Treated	**20,236**	**cf**	

Stormwater Runoff Summaries and Runoff Delineation Maps

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Metadata for Point	
Smoothing	Yes
State	New York
Location	New York, United States
Latitude	42.996 degrees North
Longitude	78.817 degrees West
Elevation	170 feet
Date/Time	Mon Nov 13 2023 09:29:03 GMT-0500 (Eastern Standard Time)

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.41	0.50	0.66	0.82	1.00	**1yr**	0.71	0.93	1.13	1.34	1.56	1.80	2.09	**1yr**	1.60	2.01	2.42	2.91	3.39	**1yr**
2yr	0.30	0.47	0.58	0.77	0.96	1.18	**2yr**	0.83	1.08	1.34	1.59	1.87	2.18	2.46	**2yr**	1.93	2.36	2.78	3.31	3.80	**2yr**
5yr	0.36	0.56	0.70	0.94	1.20	1.48	**5yr**	1.03	1.35	1.67	1.98	2.30	2.65	3.00	**5yr**	2.34	2.89	3.37	3.97	4.54	**5yr**
10yr	0.40	0.63	0.80	1.09	1.42	1.76	**10yr**	1.22	1.61	1.98	2.34	2.70	3.07	3.49	**10yr**	2.72	3.36	3.90	4.56	5.19	**10yr**
25yr	0.48	0.76	0.96	1.33	1.77	2.20	**25yr**	1.53	2.01	2.48	2.90	3.32	3.73	4.27	**25yr**	3.30	4.10	4.74	5.48	6.20	**25yr**
50yr	0.54	0.87	1.11	1.55	2.09	2.60	**50yr**	1.81	2.39	2.94	3.42	3.88	4.33	4.97	**50yr**	3.83	4.78	5.49	6.30	7.10	**50yr**
100yr	0.61	0.99	1.28	1.82	2.48	3.10	**100yr**	2.14	2.84	3.49	4.04	4.55	5.03	5.79	**100yr**	4.45	5.57	6.36	7.24	8.13	**100yr**
200yr	0.71	1.15	1.49	2.14	2.95	3.68	**200yr**	2.54	3.39	4.14	4.77	5.33	5.84	6.75	**200yr**	5.17	6.49	7.37	8.32	9.31	**200yr**
500yr	0.85	1.39	1.82	2.64	3.70	4.62	**500yr**	3.19	4.27	5.19	5.93	6.57	7.13	8.26	**500yr**	6.31	7.95	8.96	10.01	11.14	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.35	0.42	0.57	0.70	0.87	**1yr**	0.61	0.85	0.86	1.15	1.44	1.62	1.90	**1yr**	1.44	1.83	2.08	2.63	3.10	**1yr**
2yr	0.29	0.45	0.55	0.75	0.92	1.06	**2yr**	0.80	1.04	1.16	1.42	1.71	2.10	2.35	**2yr**	1.86	2.26	2.67	3.19	3.66	**2yr**
5yr	0.33	0.51	0.63	0.86	1.10	1.26	**5yr**	0.95	1.23	1.38	1.67	2.01	2.43	2.71	**5yr**	2.15	2.60	3.03	3.61	4.08	**5yr**
10yr	0.36	0.55	0.68	0.95	1.23	1.42	**10yr**	1.06	1.39	1.56	1.87	2.26	2.71	3.01	**10yr**	2.40	2.89	3.32	3.95	4.41	**10yr**
25yr	0.41	0.62	0.77	1.10	1.45	1.67	**25yr**	1.25	1.64	1.81	2.18	2.64	3.12	3.44	**25yr**	2.76	3.31	3.73	4.42	4.84	**25yr**
50yr	0.45	0.68	0.84	1.21	1.63	1.88	**50yr**	1.41	1.84	2.02	2.43	2.95	3.47	3.82	**50yr**	3.07	3.67	4.05	4.82	5.18	**50yr**
100yr	0.49	0.74	0.92	1.33	1.83	2.12	**100yr**	1.58	2.07	2.25	2.70	3.31	3.88	4.21	**100yr**	3.43	4.05	4.39	5.25	5.53	**100yr**
200yr	0.53	0.80	1.02	1.47	2.06	2.40	**200yr**	1.77	2.34	2.49	2.99	3.69	4.34	4.65	**200yr**	3.84	4.47	4.74	5.69	5.88	**200yr**
500yr	0.60	0.90	1.16	1.68	2.39	2.81	**500yr**	2.06	2.74	2.83	3.40	4.23	5.08	5.31	**500yr**	4.50	5.11	5.18	6.32	6.32	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.30	0.46	0.56	0.75	0.93	1.07	**1yr**	0.80	1.05	1.20	1.41	1.70	1.93	2.33	**1yr**	1.71	2.24	2.61	3.09	3.63	**1yr**
2yr	0.31	0.49	0.60	0.81	1.00	1.16	**2yr**	0.86	1.13	1.28	1.56	1.86	2.28	2.58	**2yr**	2.02	2.48	2.95	3.48	4.03	**2yr**
5yr	0.39	0.60	0.74	1.02	1.30	1.53	**5yr**	1.12	1.50	1.68	2.06	2.44	2.88	3.31	**5yr**	2.55	3.18	3.75	4.36	5.04	**5yr**
10yr	0.46	0.71	0.88	1.22	1.58	1.89	**10yr**	1.37	1.84	2.09	2.55	3.01	3.45	4.01	**10yr**	3.05	3.86	4.52	5.17	6.02	**10yr**
25yr	0.58	0.89	1.10	1.58	2.07	2.51	**25yr**	1.79	2.45	2.79	3.39	3.98	4.40	5.18	**25yr**	3.89	4.98	5.84	6.52	7.63	**25yr**
50yr	0.69	1.05	1.31	1.88	2.53	3.11	**50yr**	2.18	3.04	3.47	4.22	4.91	5.28	6.28	**50yr**	4.68	6.04	7.10	7.79	9.17	**50yr**
100yr	0.83	1.25	1.56	2.26	3.10	3.85	**100yr**	2.68	3.77	4.33	5.24	6.07	6.33	7.62	**100yr**	5.60	7.33	8.59	9.30	10.98	**100yr**
200yr	0.99	1.48	1.88	2.72	3.80	4.78	**200yr**	3.28	4.67	5.42	6.54	7.50	7.57	9.24	**200yr**	6.70	8.88	10.46	11.13	13.20	**200yr**
500yr	1.25	1.87	2.40	3.49	4.96	6.37	**500yr**	4.28	6.22	7.30	8.75	9.94	9.62	11.94	**500yr**	8.52	11.48	13.59	14.13	16.77	**500yr**

Powered by ACIS Northeast Regional Climate Center

STORMWATER DRAINAGE ANALYSIS - Boulevard Central Special Stormwater Design Conditions

PROJECTED GROWTH REDEVELOPMENT SCENARIO

Use Median Curve Number (CN) for Existing Runoff Areas:
50% Runoff Rate Existing Land Cover
50% Prior to Development (1958 Historic Aerial: Meadow/Farm Field)

Overall Existing Runoff Area = 17.34 ac.
Greenspace = 3.65 ac
Impervious = 13.69 ac

Project Disturbance Area = 7.29 ac (42%)
Greenspace = 2.94 ac
Impervious = 4.35 ac

Apply Median CN to Project Disturbance Area:
Meadow/Farm Field = 3.64 ac
Greenspace = 1.47 ac
Impervious = 2.18 ac

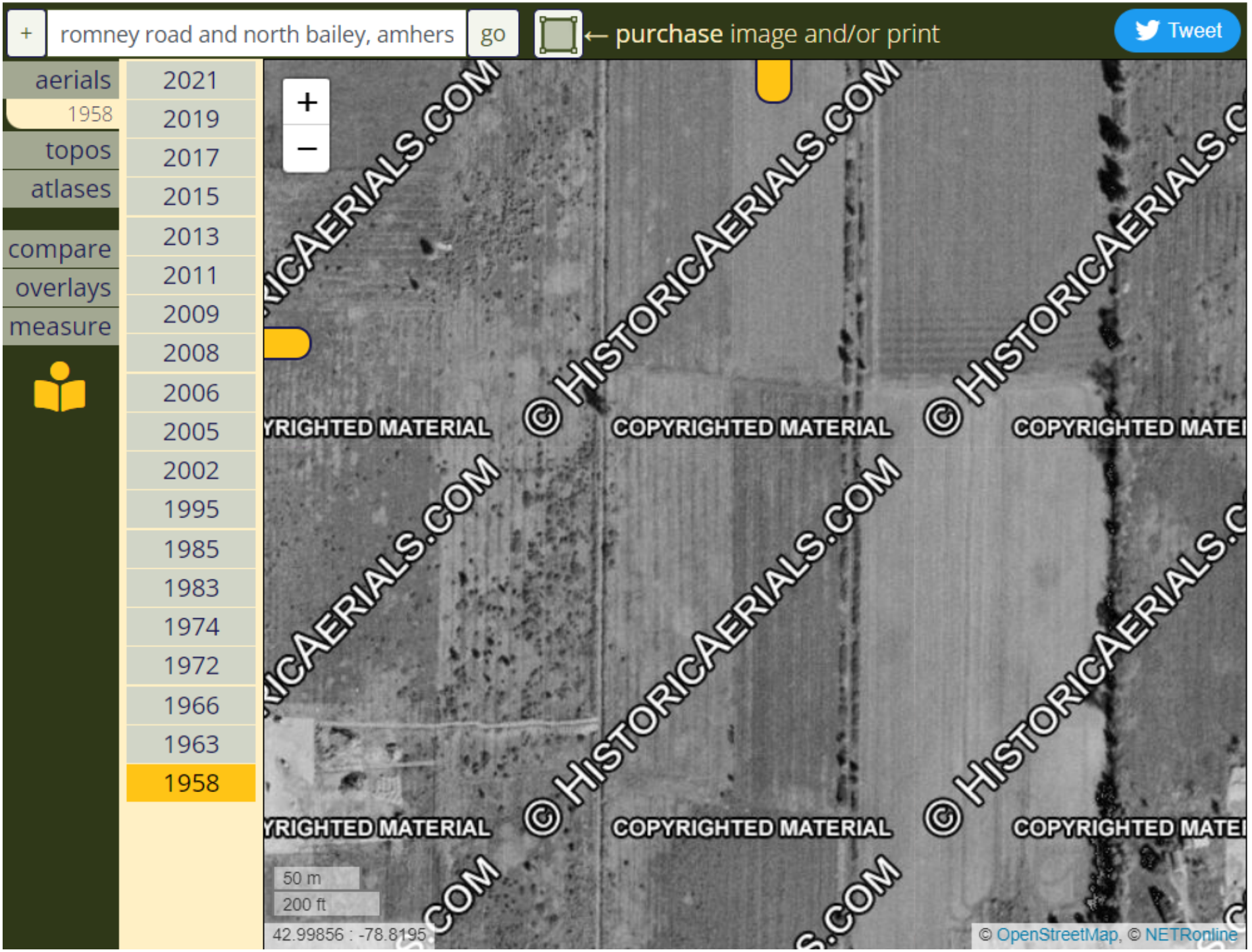
Non-Disturbance Area = 10.05 ac (58%)
Greenspace = 0.71 ac
Impervious = 9.34 ac

Adjusted Overall Existing Runoff Area: 17.34 ac
Meadow/Farm Field = 3.64 ac
Greenspace = 1.47 ac + 0.71 ac = 2.18 ac
Impervious = 2.18 ac + 9.34 ac = 11.52 ac

10% ESCALATION OF PROPOSED PEAK FLOW

Storm Event	Existing Runoff (cfs)	Proposed Runoff (cfs)
1-Year	32.88	28.94
2-Year	42.30	36.19
5-Year	54.15	44.72
10-Year	64.87	52.15
25-Year	81.82	63.59
50-Year	97.29	73.71
100-Year	115.36	85.32

Storm Event	Ex. Runoff "Non-Disturbance Area" (cfs)	Adjusted Proposed Runoff (cfs)	10% Escalation (cfs)	Ex. Runoff "Disturbance Area" (cfs)
1-Year	24.42	4.52	4.97	8.52
2-Year	30.14	6.05	6.66	12.21
5-Year	37.16	7.56	8.32	17.04
10-Year	43.40	8.75	9.63	21.51
25-Year	53.16	10.43	11.47	28.70
50-Year	62.00	11.71	12.88	35.33
100-Year	72.28	13.04	14.34	43.11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Events for Link 1L: Overall Existing Site

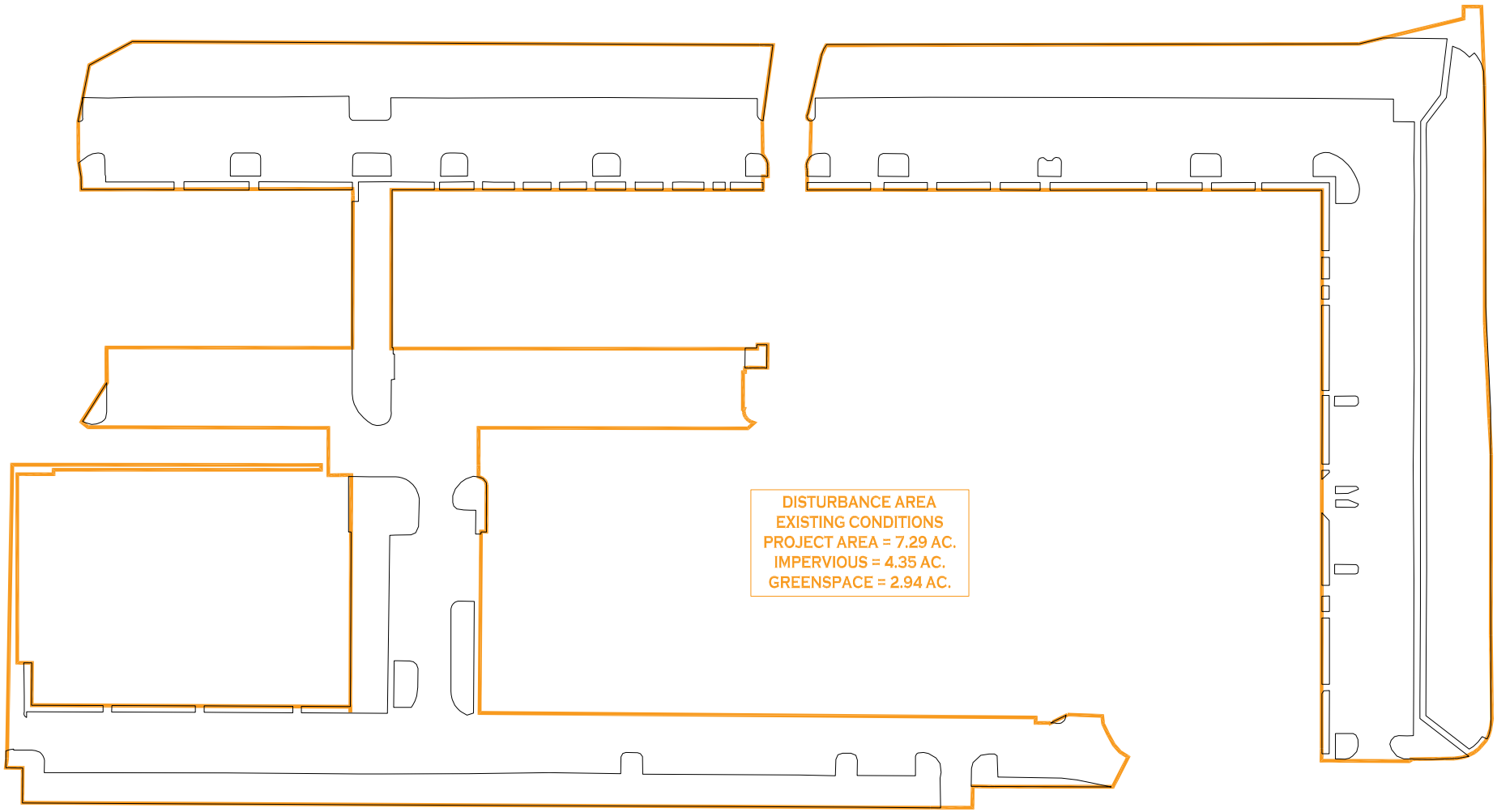
Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)
1-Year	32.88	32.88	**0.00**
2-Year	42.30	42.30	0.00
5-Year	54.15	54.15	0.00
10-Year	64.87	64.87	0.00
25-Year	81.82	81.82	0.00
50-Year	97.29	97.29	0.00
100-Year	**115.36**	**115.36**	0.00

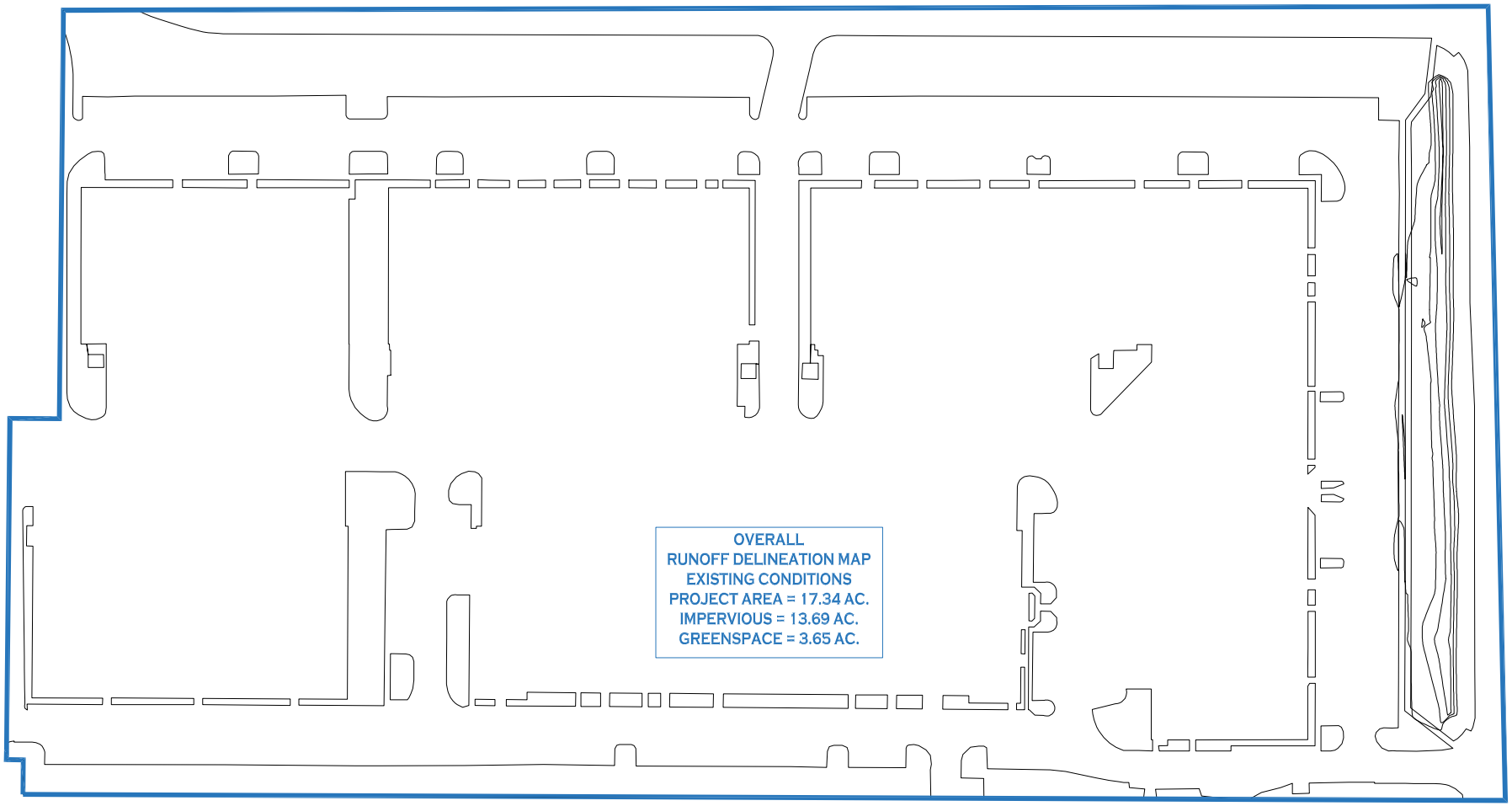
Events for Subcatchment 1S: Existing Site (Disturbance Area with Median CN)

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-Year	1.80	8.52	0.396	0.65
2-Year	2.18	12.21	0.565	0.93
5-Year	2.65	17.04	0.789	1.30
10-Year	3.07	21.51	1.001	1.65
25-Year	3.73	28.70	1.347	2.22
50-Year	4.33	35.33	1.673	2.75
100-Year	**5.03**	**43.11**	**2.063**	**3.40**

Events for Subcatchment 2S: Existing Site (Non-Disturbance Area)

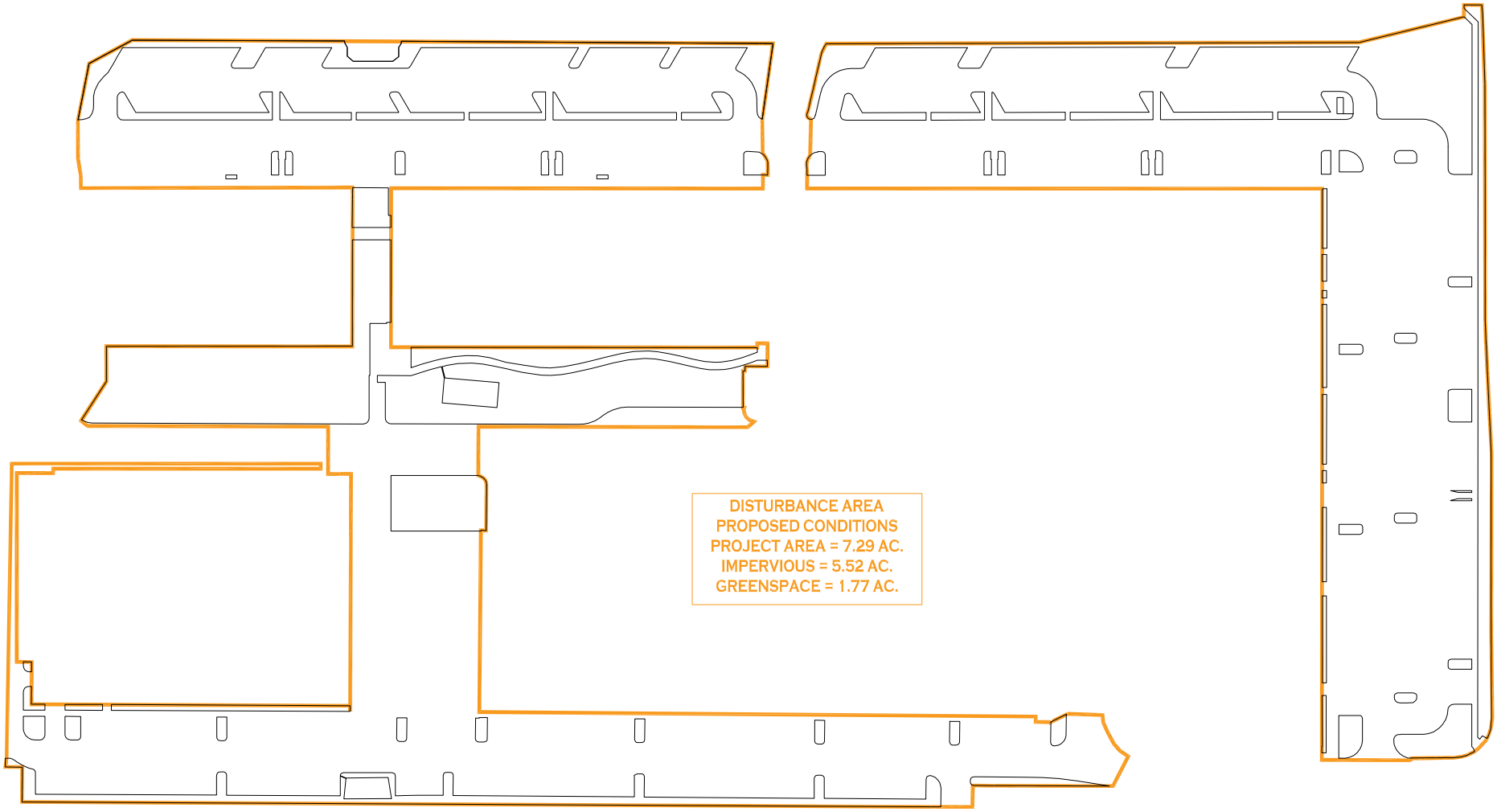
Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-Year	1.80	24.42	1.236	1.48
2-Year	2.18	30.14	1.548	1.85
5-Year	2.65	37.16	1.936	2.31
10-Year	3.07	43.40	2.284	2.73
25-Year	3.73	53.16	2.833	3.38
50-Year	4.33	62.00	3.333	3.98
100-Year	**5.03**	**72.28**	**3.917**	**4.68**

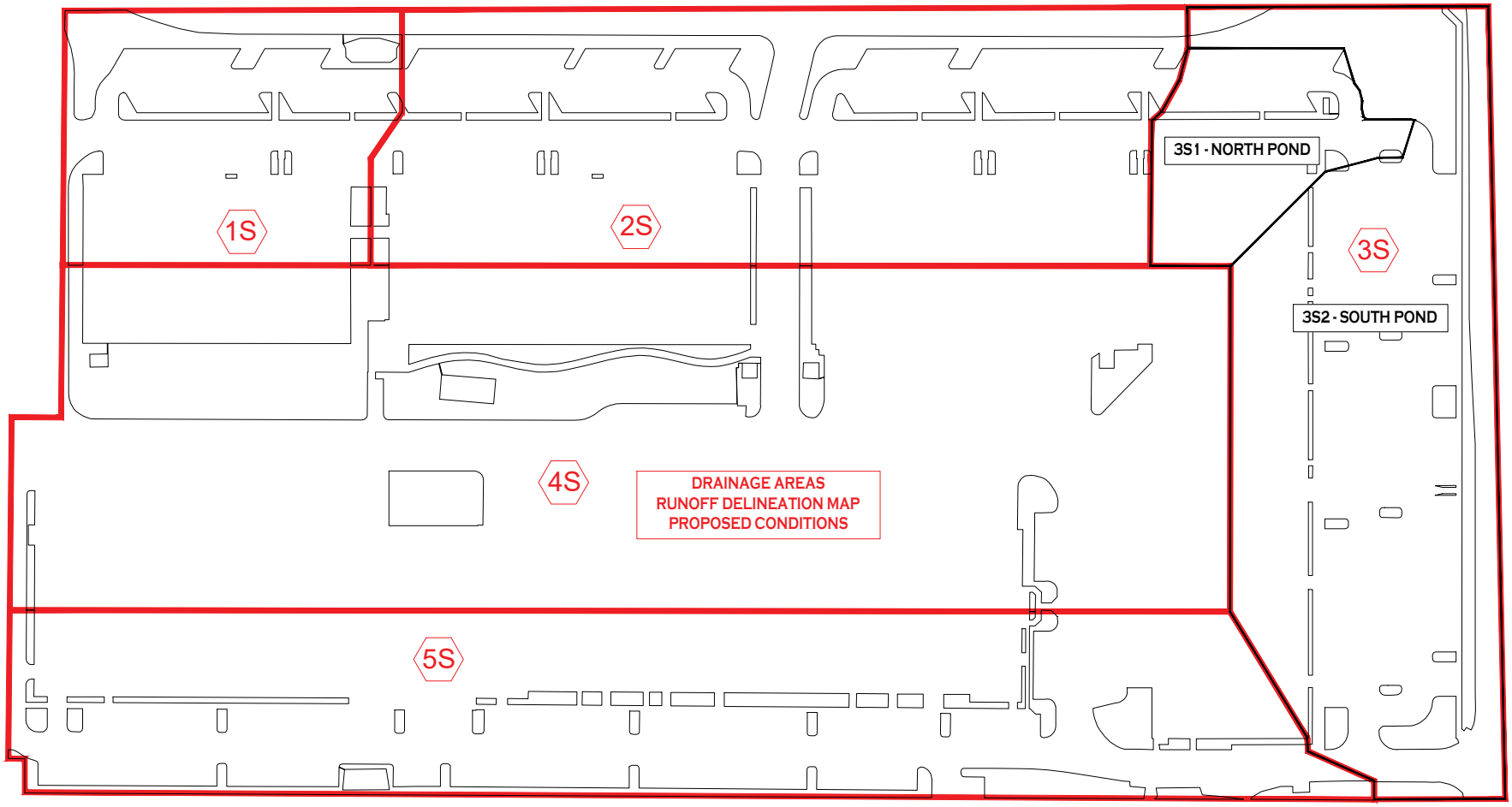

DISTURBANCE AREA
EXISTING CONDITIONS
PROJECT AREA = 7.29 AC.
IMPERVIOUS = 4.35 AC.
GREENSPACE = 2.94 AC.

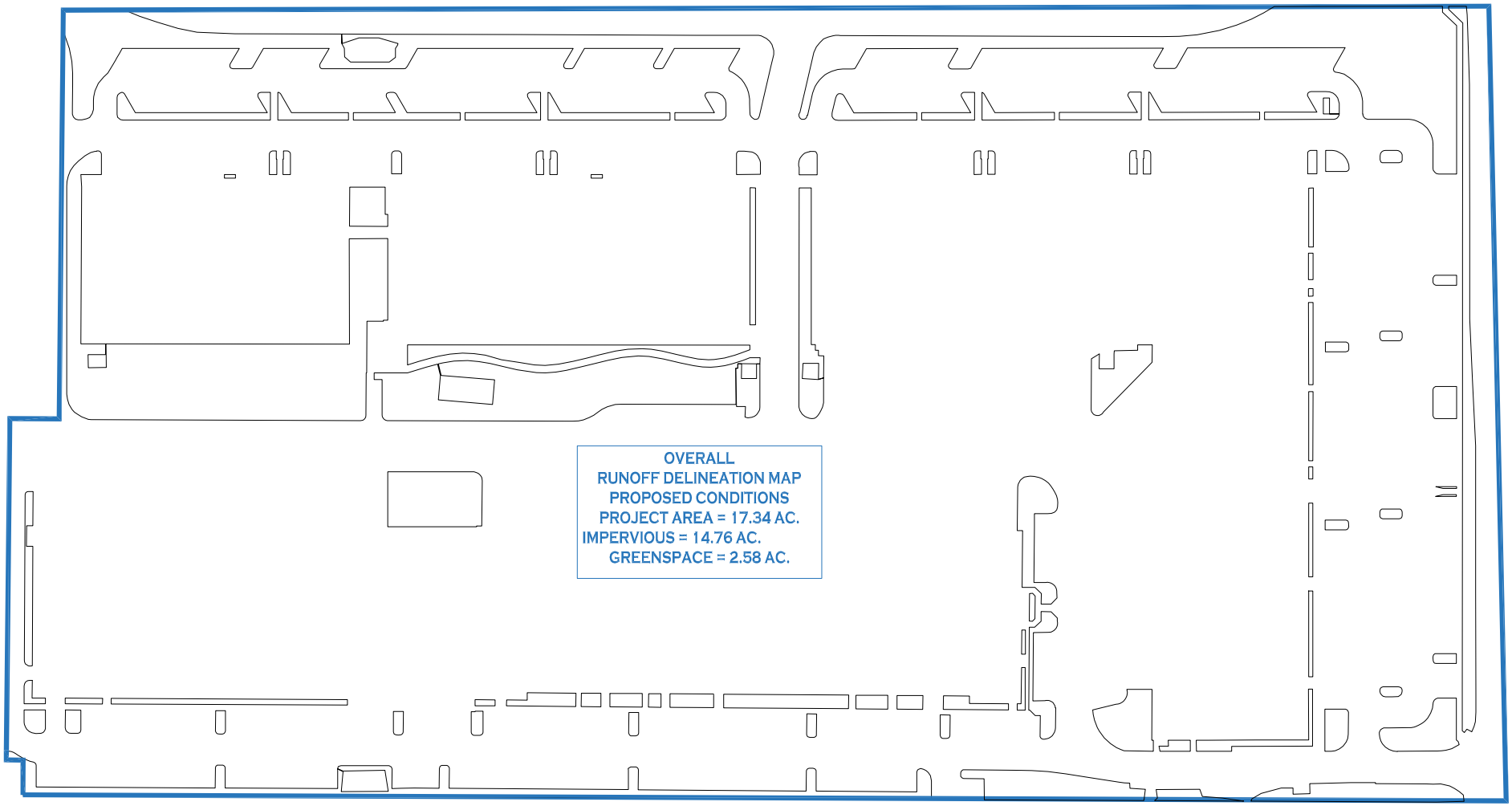

OVERALL
RUNOFF DELINEATION MAP
EXISTING CONDITIONS
PROJECT AREA = 17.34 AC.
IMPERVIOUS = 13.69 AC.
GREENSPACE = 3.65 AC.

Events for Link 1L: Romney Rd Drainage System

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)
1-Year	28.94	28.94	**0.00**
2-Year	36.19	36.19	0.00
5-Year	44.72	44.72	0.00
10-Year	52.15	52.15	0.00
25-Year	63.59	63.59	0.00
50-Year	73.71	73.71	0.00
100-Year	**85.32**	**85.32**	0.00


DISTURBANCE AREA
PROPOSED CONDITIONS
PROJECT AREA = 7.29 AC.
IMPERVIOUS = 5.52 AC.
GREENSPACE = 1.77 AC.


1S
2S
3S
4S
5S
3S1 - NORTH POND
3S2 - SOUTH POND
DRAINAGE AREAS
RUNOFF DELINEATION MAP
PROPOSED CONDITIONS


OVERALL
RUNOFF DELINEATION MAP
PROPOSED CONDITIONS
PROJECT AREA = 17.34 AC.
IMPERVIOUS = 14.76 AC.
GREENSPACE = 2.58 AC.

PROPOSED STORM DRAINAGE PIPE SIZING:

*Assume Time of Concentration ≤ 5.0 min.
and i=5.5 in/hr per Intensity/Duration/Frequency curve
**Assume C=0.8 for typical commercial development area

CB10-Pond	Drainage Area, A (ac) =	2.33
	*10-Yr Rainfall Intensity, i (in/hr) =	5.50
	**Runoff Coefficient,c =	0.80
	Peak Discharge (cfs), Q=ciA =	10.25
	Per Mannings Equation:	use 24" HDPE @ 0.2% = 13.19 cfs

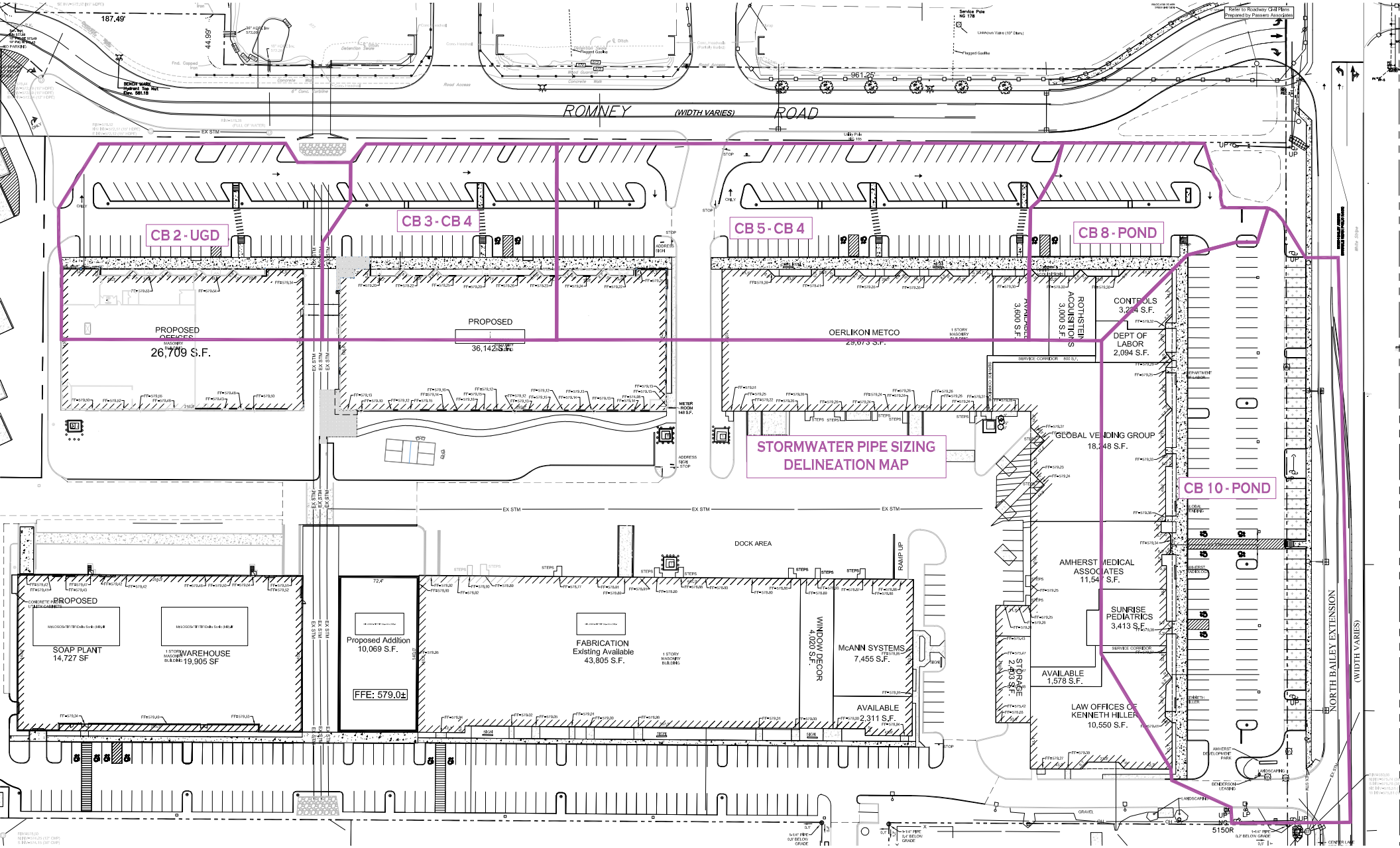
CB8-Pond	Drainage Area, A (ac) =	0.57
	*10-Yr Rainfall Intensity, i (in/hr) =	5.50
	**Runoff Coefficient,c =	0.80
	Peak Discharge (cfs), Q=ciA =	2.51
	Mannings Equation:	use 12" HDPE @ 0.5% = 3.28 cfs

CB4-UGD	Drainage Area, A (ac) =	2.53
	*10-Yr Rainfall Intensity, i (in/hr) =	5.50
	**Runoff Coefficient,c =	0.80
	Peak Discharge (cfs), Q=ciA =	11.13
	Mannings Equation:	use 24" HDPE @ 0.5% = 20.85 cfs

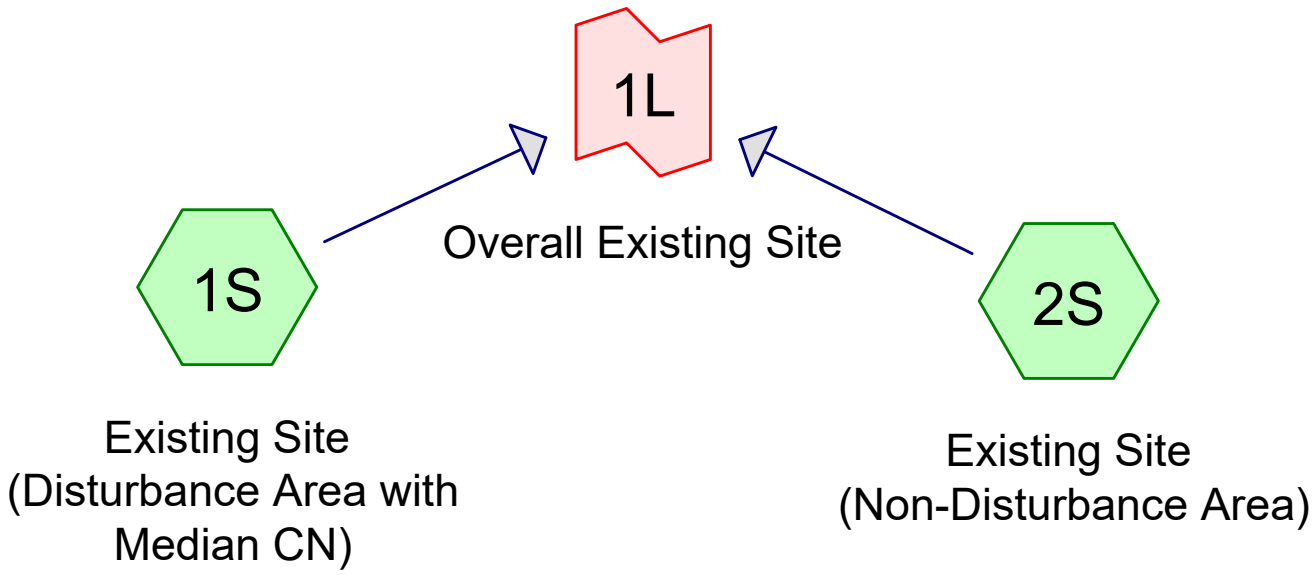
CB3-CB4	Drainage Area, A (ac) =	0.80
	*10-Yr Rainfall Intensity, i (in/hr) =	5.50
	**Runoff Coefficient,c =	0.80
	Peak Discharge (cfs), Q=ciA =	3.52
	Mannings Equation:	use 15" HDPE @ 0.5% = 5.95 cfs

CB5-CB4	Drainage Area, A (ac) =	1.73
	*10-Yr Rainfall Intensity, i (in/hr) =	5.50
	**Runoff Coefficient,c =	0.80
	Peak Discharge (cfs), Q=ciA =	7.61
	Mannings Equation:	use 18" HDPE @ 0.5% = 9.68 cfs

CB2-UGD	Drainage Area, A (ac) =	0.94
	*10-Yr Rainfall Intensity, i (in/hr) =	5.50
	**Runoff Coefficient,c =	0.80
	Peak Discharge (cfs), Q=ciA =	4.14
	Mannings Equation:	use 12" HDPE @ 1.0% = 4.64 cfs


ROMNEY (WIDTH VARIES) ROAD
961.25'
187.49'
44.99'
CB 2 - UGD
CB 3 - CB 4
CB 5 - CB 4
CB 8 - POND
CB 10 - POND
STORMWATER PIPE SIZING DELINEATION MAP
PROPOSED OFFICES 26,709 S.F.
PROPOSED 36,142 S.F.
OERLIKON METCO 29,673 S.F.
CONTROLS 3,214 S.F.
DEPT OF LABOR 2,094 S.F.
GLOBAL VENDING GROUP 18,248 S.F.
DOCK AREA
SOAP PLANT 14,727 SF
WAREHOUSE 19,905 SF
Proposed Addition 10,069 S.F.
FFE: 579.0±
FABRICATION Existing Available 43,805 S.F.
WINDOW DECOR 4,020 S.F.
McANN SYSTEMS 7,455 S.F.
AVAILABLE 2,311 S.F.
AMHERST MEDICAL ASSOCIATES 11,547 S.F.
SUNRISE PEDIATRICS 3,413 S.F.
AVAILABLE 1,578 S.F.
LAW OFFICES OF KENNETH HILLER 10,550 S.F.
NORTH BAILEY EXTENSION (WIDTH VARIES)
EX STM
Refer to Roadway Grid Plans Prepared by Passero Associates

HydroCAD Analysis



Subcat Reach Pond Link

Routing Diagram for 23-4099 Existing
Prepared by Carmina Wood Morris, PC, Printed 11/15/2024

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-Year	Type II 24-hr		Default	24.00	1	1.80	2
2	10-Year	Type II 24-hr		Default	24.00	1	3.07	2
3	25-Year	Type II 24-hr		Default	24.00	1	3.73	2
4	100-Year	Type II 24-hr		Default	24.00	1	5.03	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.180	84	50-75% Grass cover, Fair, HSG D (1S, 2S)
11.520	98	Impervious (1S, 2S)
3.640	78	Meadow, non-grazed, HSG D (1S)
17.340	**92**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
5.820	HSG D	1S, 2S
11.520	Other	1S, 2S
17.340		**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
0.000	0.000	0.000	2.180	0.000	2.180	50-75% Grass cover, Fair	1S, 2S
0.000	0.000	0.000	0.000	11.520	11.520	Impervious	1S, 2S
0.000	0.000	0.000	3.640	0.000	3.640	Meadow, non-grazed	1S
0.000	**0.000**	**0.000**	**5.820**	**11.520**	**17.340**	**TOTAL AREA**	

Time span=0.00-50.00 hrs, dt=0.05 hrs, 1001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Existing Site Runoff Area=7.290 ac 29.90% Impervious Runoff Depth=0.65"
Flow Length=150' Slope=0.0100 '/' Tc=5.0 min CN=85 Runoff=8.52 cfs 0.396 af

Subcatchment2S: Existing Site Runoff Area=10.050 ac 92.94% Impervious Runoff Depth=1.48"
Flow Length=150' Slope=0.0100 '/' Tc=5.0 min CN=97 Runoff=24.42 cfs 1.236 af

Link 1L: Overall Existing Site Inflow=32.88 cfs 1.632 af
Primary=32.88 cfs 1.632 af

Total Runoff Area = 17.340 ac Runoff Volume = 1.632 af Average Runoff Depth = 1.13"
33.56% Pervious = 5.820 ac 66.44% Impervious = 11.520 ac

Summary for Subcatchment 1S: Existing Site (Disturbance Area with Median CN)

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

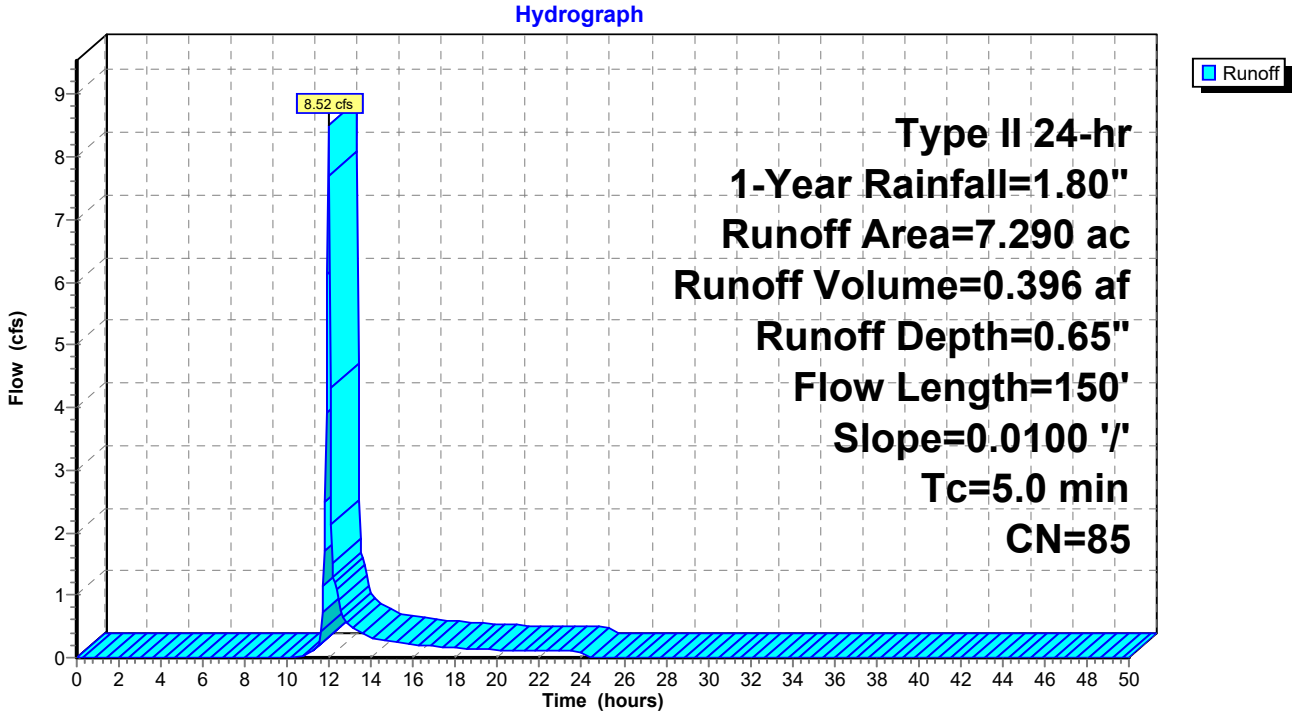
Runoff = 8.52 cfs @ 11.96 hrs, Volume= 0.396 af, Depth= 0.65"
Routed to Link 1L : Overall Existing Site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=1.80"

	Area (ac)	CN	Description
	3.640	78	Meadow, non-grazed, HSG D
	1.470	84	50-75% Grass cover, Fair, HSG D
*	2.180	98	Impervious
	7.290	85	Weighted Average
	5.110		70.10% Pervious Area
	2.180		29.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	150	0.0100	1.00		**Sheet Flow, Overland - Pvmt.** Smooth surfaces n= 0.011 P2= 2.50"
2.5	150	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 1S: Existing Site (Disturbance Area with Median CN)



Summary for Subcatchment 2S: Existing Site (Non-Disturbance Area)

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

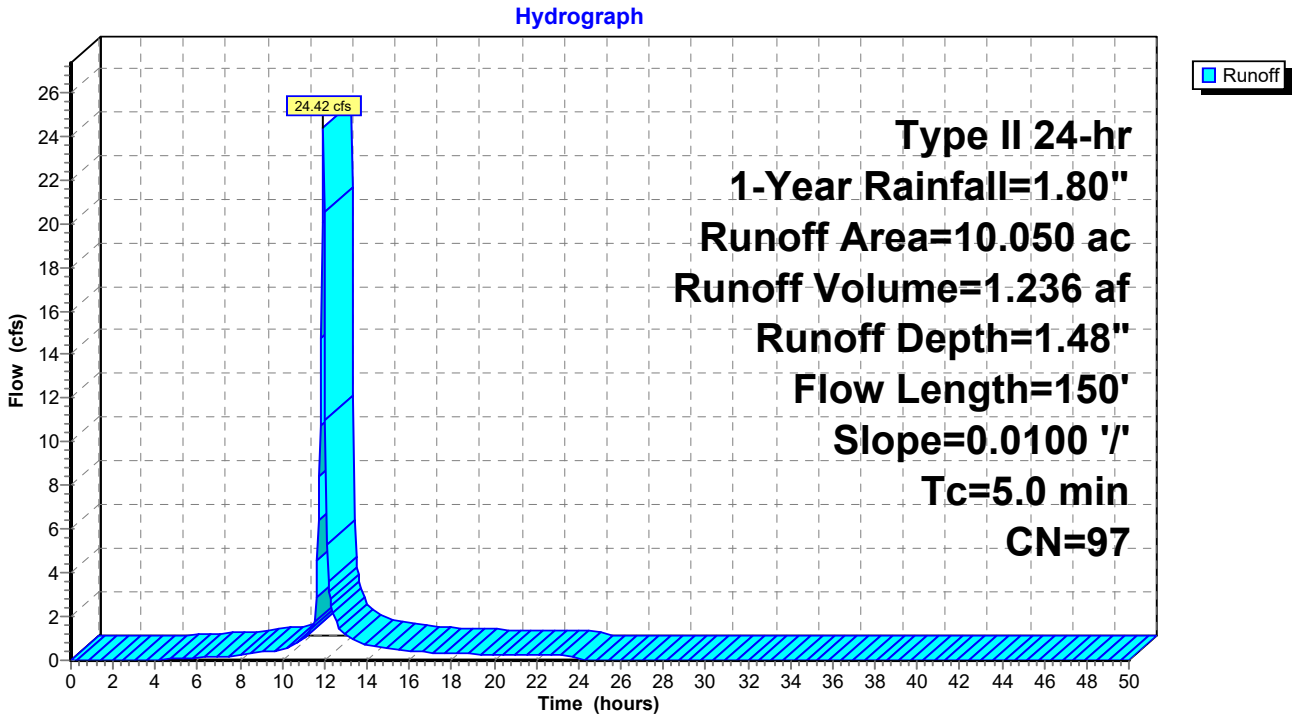
Runoff = 24.42 cfs @ 11.95 hrs, Volume= 1.236 af, Depth= 1.48"
Routed to Link 1L : Overall Existing Site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=1.80"

	Area (ac)	CN	Description
	0.710	84	50-75% Grass cover, Fair, HSG D
*	9.340	98	Impervious
	10.050	97	Weighted Average
	0.710		7.06% Pervious Area
	9.340		92.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	150	0.0100	1.00		**Sheet Flow, Overland - Pvmt.** Smooth surfaces n= 0.011 P2= 2.50"
2.5	150	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 2S: Existing Site (Non-Disturbance Area)

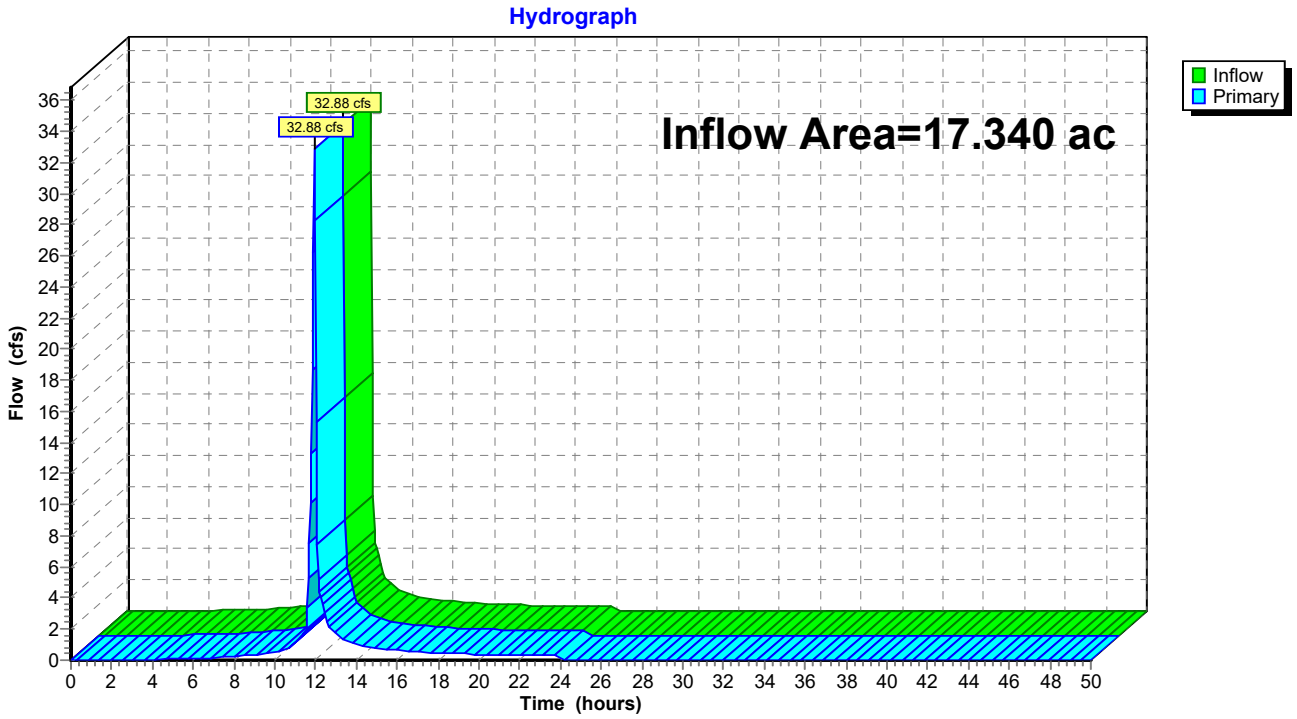


Summary for Link 1L: Overall Existing Site

Inflow Area = 17.340 ac, 66.44% Impervious, Inflow Depth = 1.13" for 1-Year event
Inflow = 32.88 cfs @ 11.95 hrs, Volume= 1.632 af
Primary = 32.88 cfs @ 11.95 hrs, Volume= 1.632 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Link 1L: Overall Existing Site



Time span=0.00-50.00 hrs, dt=0.05 hrs, 1001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Existing Site Runoff Area=7.290 ac 29.90% Impervious Runoff Depth=1.65"
Flow Length=150' Slope=0.0100 '/' Tc=5.0 min CN=85 Runoff=21.51 cfs 1.001 af

Subcatchment2S: Existing Site Runoff Area=10.050 ac 92.94% Impervious Runoff Depth=2.73"
Flow Length=150' Slope=0.0100 '/' Tc=5.0 min CN=97 Runoff=43.40 cfs 2.284 af

Link 1L: Overall Existing Site Inflow=64.87 cfs 3.285 af
Primary=64.87 cfs 3.285 af

Total Runoff Area = 17.340 ac Runoff Volume = 3.285 af Average Runoff Depth = 2.27"
33.56% Pervious = 5.820 ac 66.44% Impervious = 11.520 ac

Summary for Subcatchment 1S: Existing Site (Disturbance Area with Median CN)

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

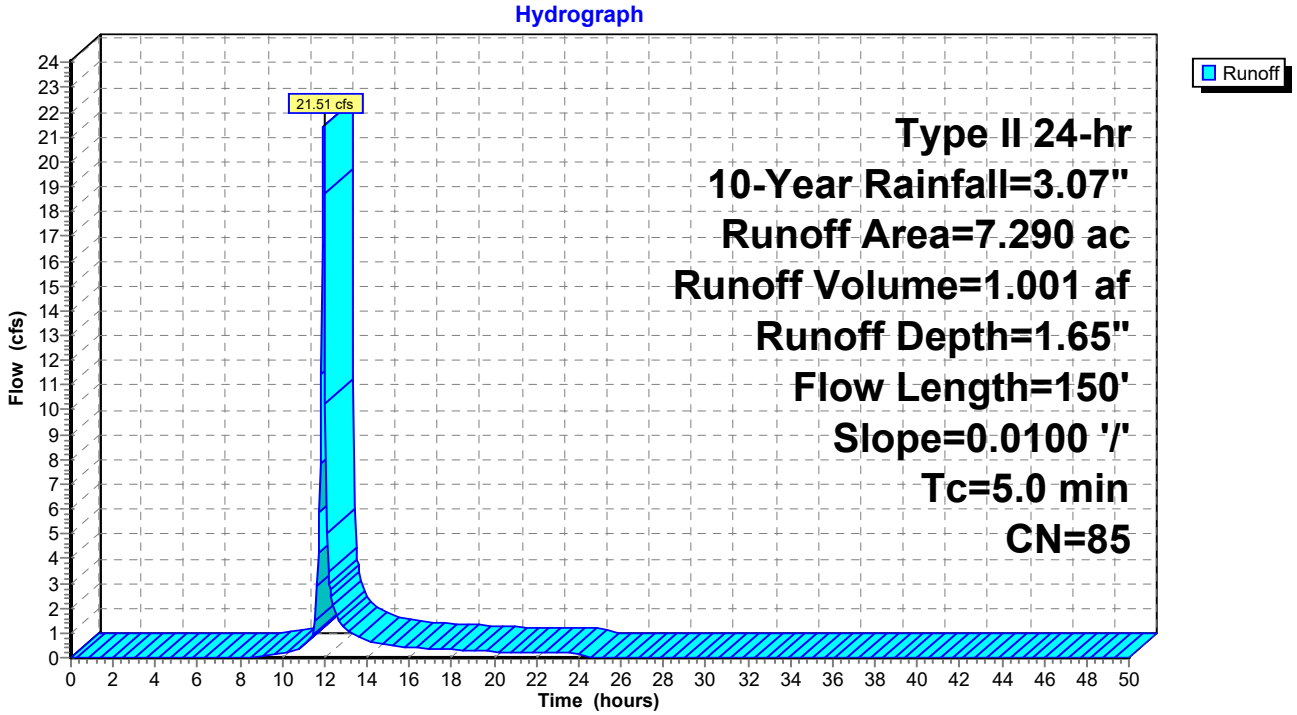
Runoff = 21.51 cfs @ 11.96 hrs, Volume= 1.001 af, Depth= 1.65"
Routed to Link 1L : Overall Existing Site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=3.07"

	Area (ac)	CN	Description
	3.640	78	Meadow, non-grazed, HSG D
	1.470	84	50-75% Grass cover, Fair, HSG D
*	2.180	98	Impervious
	7.290	85	Weighted Average
	5.110		70.10% Pervious Area
	2.180		29.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	150	0.0100	1.00		**Sheet Flow, Overland - Pvmt.** Smooth surfaces n= 0.011 P2= 2.50"
2.5	150	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 1S: Existing Site (Disturbance Area with Median CN)



Summary for Subcatchment 2S: Existing Site (Non-Disturbance Area)

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

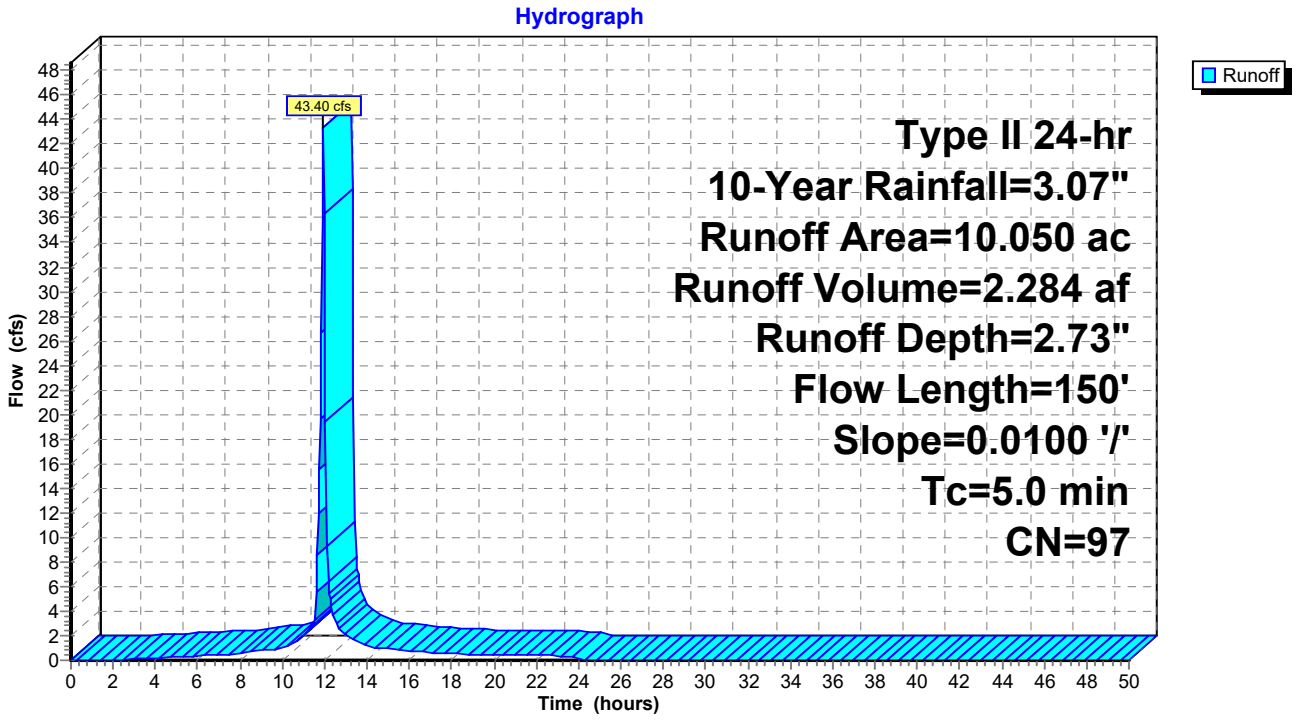
Runoff = 43.40 cfs @ 11.95 hrs, Volume= 2.284 af, Depth= 2.73"
Routed to Link 1L : Overall Existing Site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=3.07"

	Area (ac)	CN	Description
	0.710	84	50-75% Grass cover, Fair, HSG D
*	9.340	98	Impervious
	10.050	97	Weighted Average
	0.710		7.06% Pervious Area
	9.340		92.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	150	0.0100	1.00		**Sheet Flow, Overland - Pvmt.** Smooth surfaces n= 0.011 P2= 2.50"
2.5	150	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 2S: Existing Site (Non-Disturbance Area)

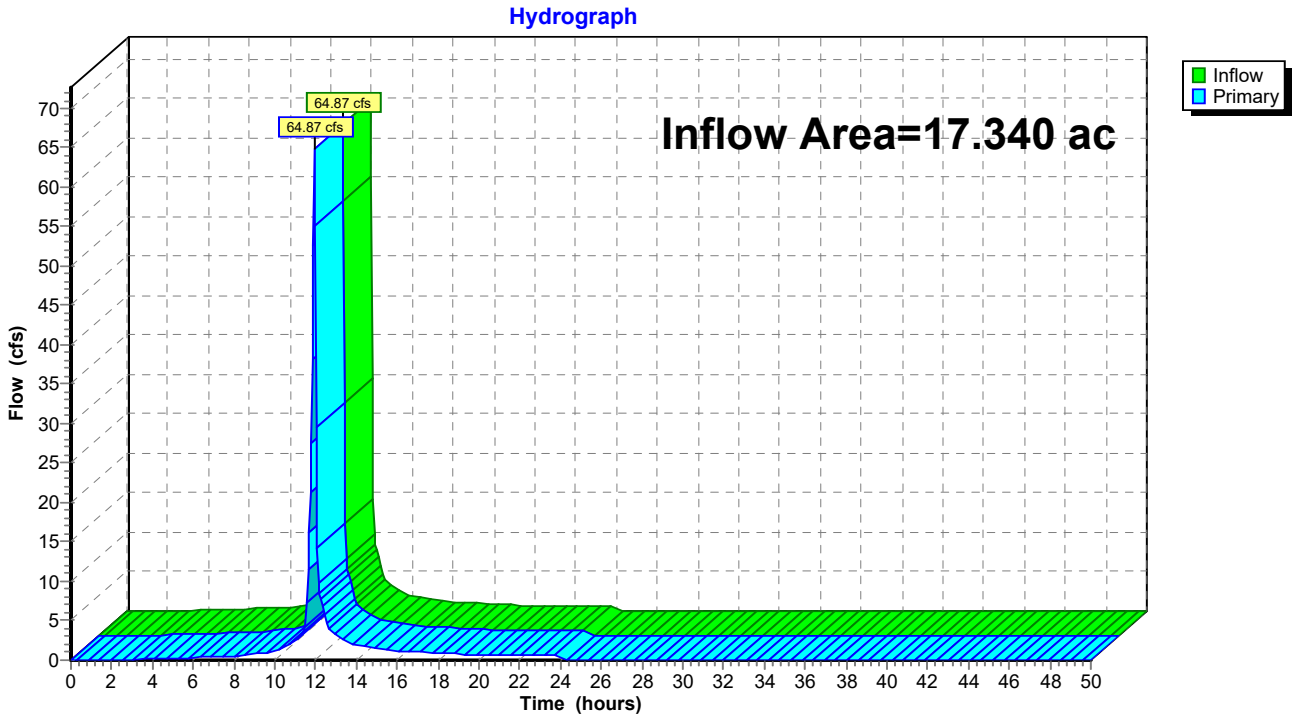


Summary for Link 1L: Overall Existing Site

Inflow Area = 17.340 ac, 66.44% Impervious, Inflow Depth = 2.27" for 10-Year event
Inflow = 64.87 cfs @ 11.95 hrs, Volume= 3.285 af
Primary = 64.87 cfs @ 11.95 hrs, Volume= 3.285 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Link 1L: Overall Existing Site



Time span=0.00-50.00 hrs, dt=0.05 hrs, 1001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Existing Site Runoff Area=7.290 ac 29.90% Impervious Runoff Depth=2.22"
Flow Length=150' Slope=0.0100 '/' Tc=5.0 min CN=85 Runoff=28.70 cfs 1.347 af

Subcatchment2S: Existing Site Runoff Area=10.050 ac 92.94% Impervious Runoff Depth=3.38"
Flow Length=150' Slope=0.0100 '/' Tc=5.0 min CN=97 Runoff=53.16 cfs 2.833 af

Link 1L: Overall Existing Site Inflow=81.82 cfs 4.181 af
Primary=81.82 cfs 4.181 af

Total Runoff Area = 17.340 ac Runoff Volume = 4.181 af Average Runoff Depth = 2.89"
33.56% Pervious = 5.820 ac 66.44% Impervious = 11.520 ac

Summary for Subcatchment 1S: Existing Site (Disturbance Area with Median CN)

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

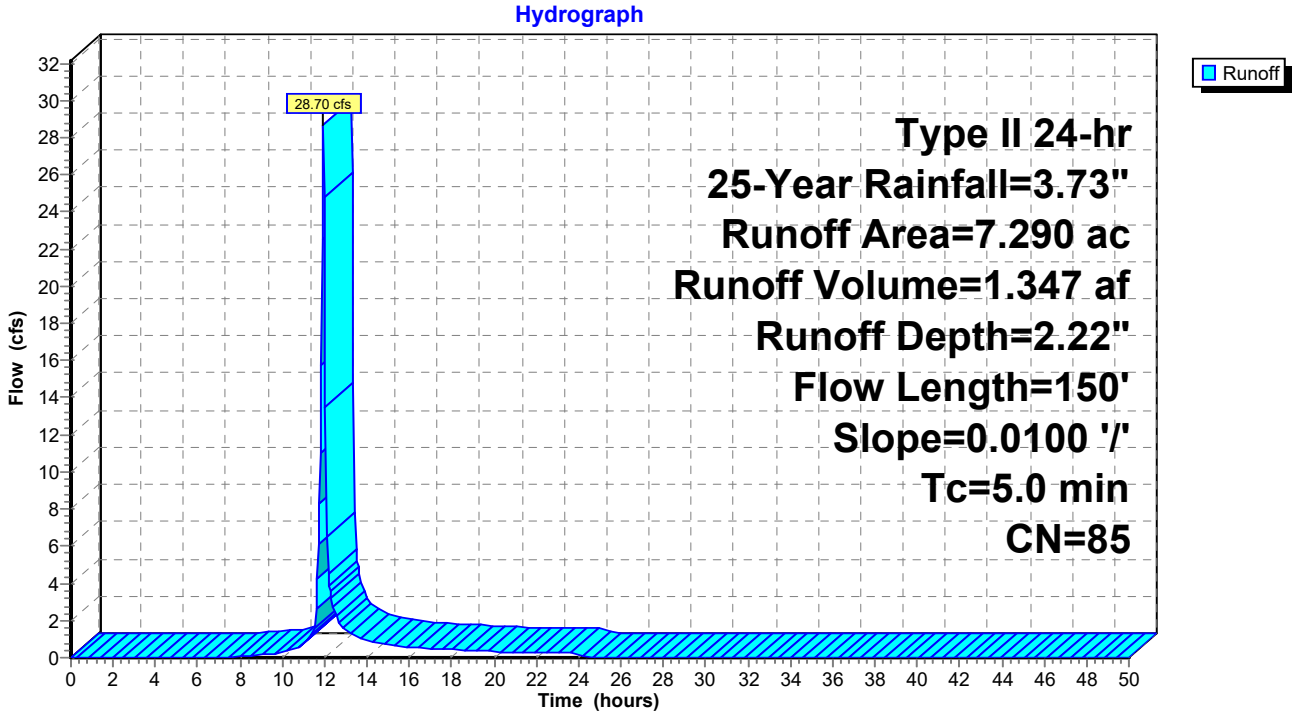
Runoff = 28.70 cfs @ 11.96 hrs, Volume= 1.347 af, Depth= 2.22"
Routed to Link 1L : Overall Existing Site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=3.73"

	Area (ac)	CN	Description
	3.640	78	Meadow, non-grazed, HSG D
	1.470	84	50-75% Grass cover, Fair, HSG D
*	2.180	98	Impervious
	7.290	85	Weighted Average
	5.110		70.10% Pervious Area
	2.180		29.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	150	0.0100	1.00		**Sheet Flow, Overland - Pvmt.** Smooth surfaces n= 0.011 P2= 2.50"
2.5	150	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 1S: Existing Site (Disturbance Area with Median CN)



Summary for Subcatchment 2S: Existing Site (Non-Disturbance Area)

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

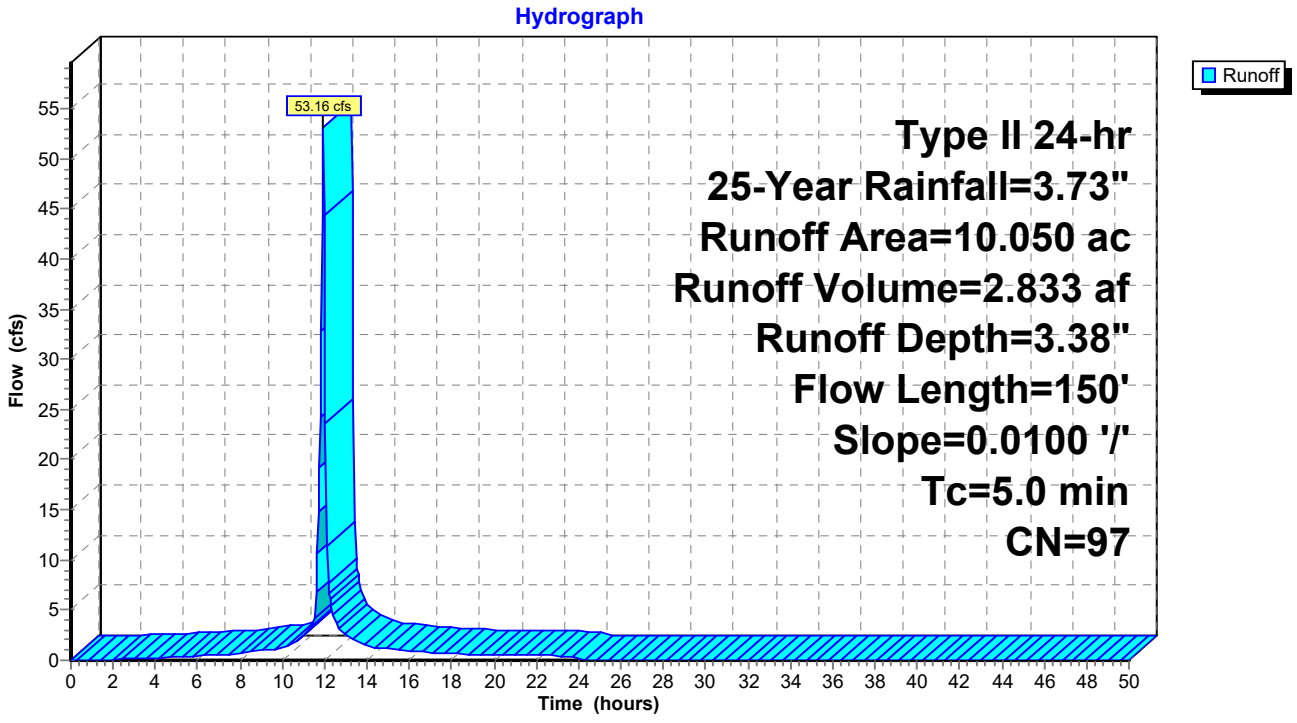
Runoff = 53.16 cfs @ 11.95 hrs, Volume= 2.833 af, Depth= 3.38"
Routed to Link 1L : Overall Existing Site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=3.73"

	Area (ac)	CN	Description
	0.710	84	50-75% Grass cover, Fair, HSG D
*	9.340	98	Impervious
	10.050	97	Weighted Average
	0.710		7.06% Pervious Area
	9.340		92.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	150	0.0100	1.00		**Sheet Flow, Overland - Pvmt.** Smooth surfaces n= 0.011 P2= 2.50"
2.5	150	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 2S: Existing Site (Non-Disturbance Area)

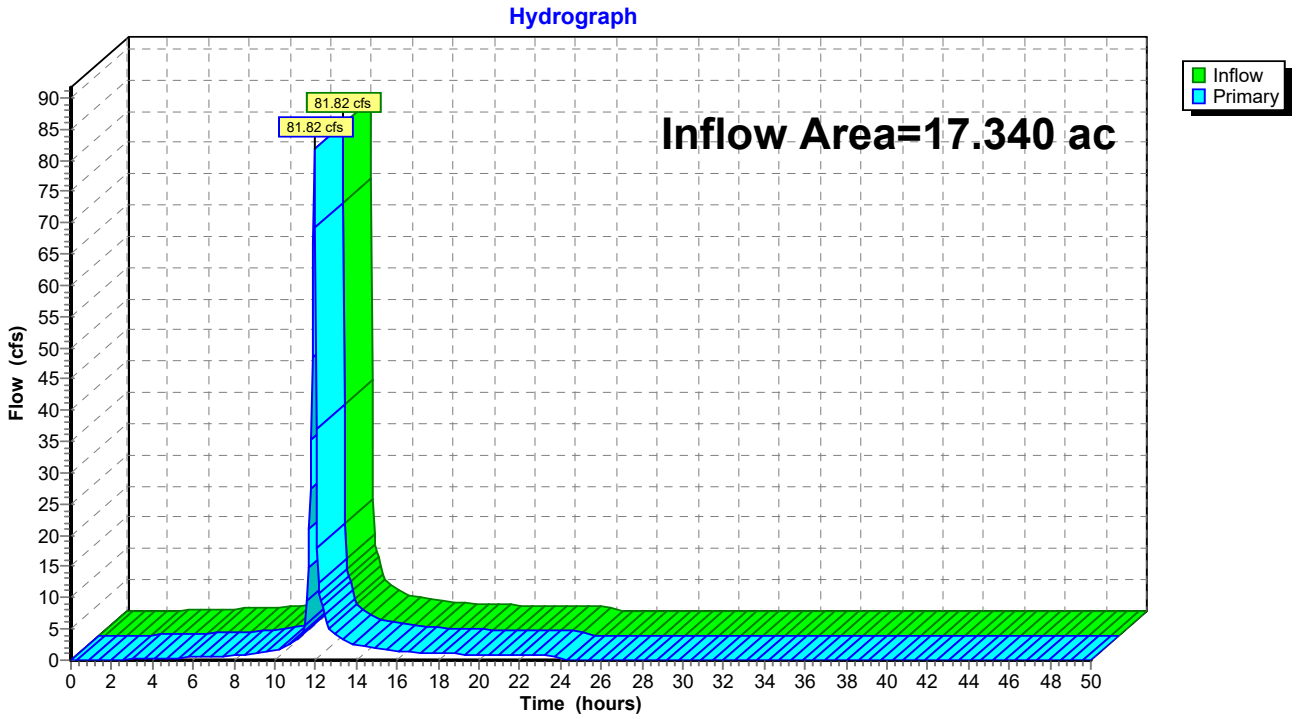


Summary for Link 1L: Overall Existing Site

Inflow Area = 17.340 ac, 66.44% Impervious, Inflow Depth = 2.89" for 25-Year event
Inflow = 81.82 cfs @ 11.95 hrs, Volume= 4.181 af
Primary = 81.82 cfs @ 11.95 hrs, Volume= 4.181 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Link 1L: Overall Existing Site



Time span=0.00-50.00 hrs, dt=0.05 hrs, 1001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Existing Site Runoff Area=7.290 ac 29.90% Impervious Runoff Depth=3.40"
Flow Length=150' Slope=0.0100 '/' Tc=5.0 min CN=85 Runoff=43.11 cfs 2.063 af

Subcatchment2S: Existing Site Runoff Area=10.050 ac 92.94% Impervious Runoff Depth=4.68"
Flow Length=150' Slope=0.0100 '/' Tc=5.0 min CN=97 Runoff=72.28 cfs 3.917 af

Link 1L: Overall Existing Site Inflow=115.36 cfs 5.980 af
Primary=115.36 cfs 5.980 af

Total Runoff Area = 17.340 ac Runoff Volume = 5.980 af Average Runoff Depth = 4.14"
33.56% Pervious = 5.820 ac 66.44% Impervious = 11.520 ac

Summary for Subcatchment 1S: Existing Site (Disturbance Area with Median CN)

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

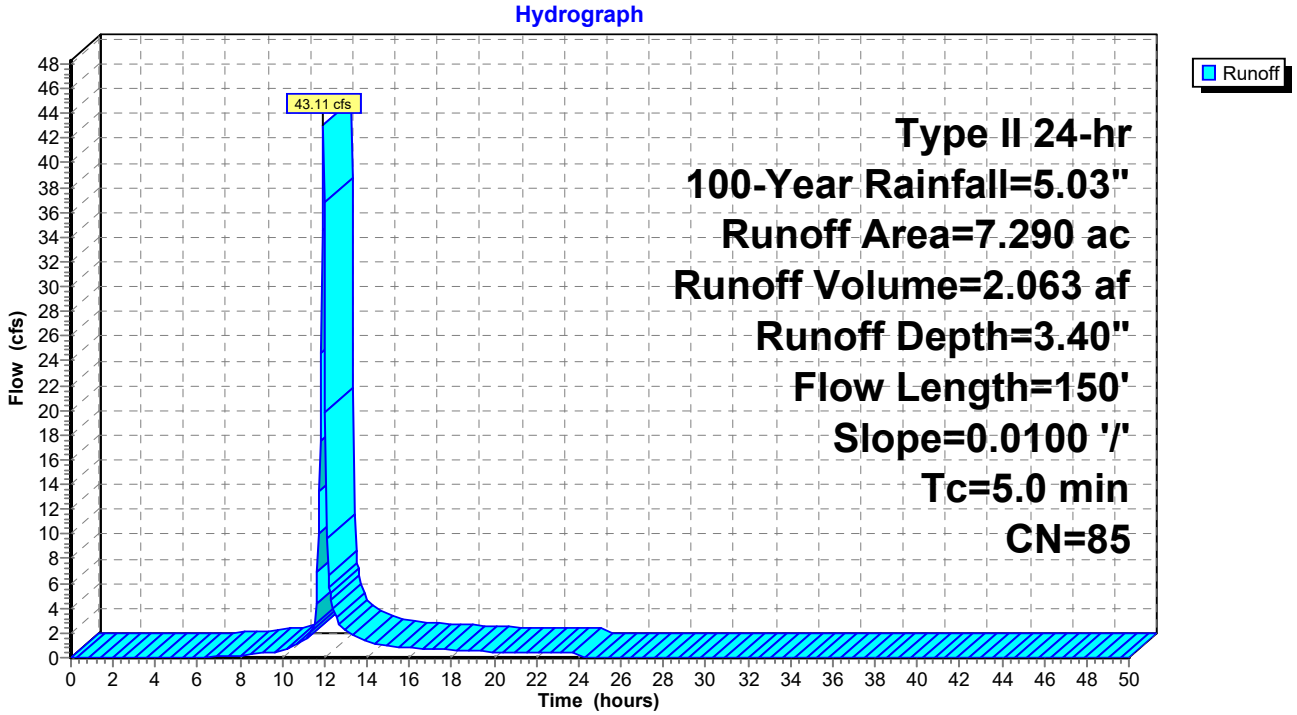
Runoff = 43.11 cfs @ 11.95 hrs, Volume= 2.063 af, Depth= 3.40"
Routed to Link 1L : Overall Existing Site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.03"

	Area (ac)	CN	Description
	3.640	78	Meadow, non-grazed, HSG D
	1.470	84	50-75% Grass cover, Fair, HSG D
*	2.180	98	Impervious
	7.290	85	Weighted Average
	5.110		70.10% Pervious Area
	2.180		29.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	150	0.0100	1.00		**Sheet Flow, Overland - Pvmt.** Smooth surfaces n= 0.011 P2= 2.50"
2.5	150	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 1S: Existing Site (Disturbance Area with Median CN)



Summary for Subcatchment 2S: Existing Site (Non-Disturbance Area)

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

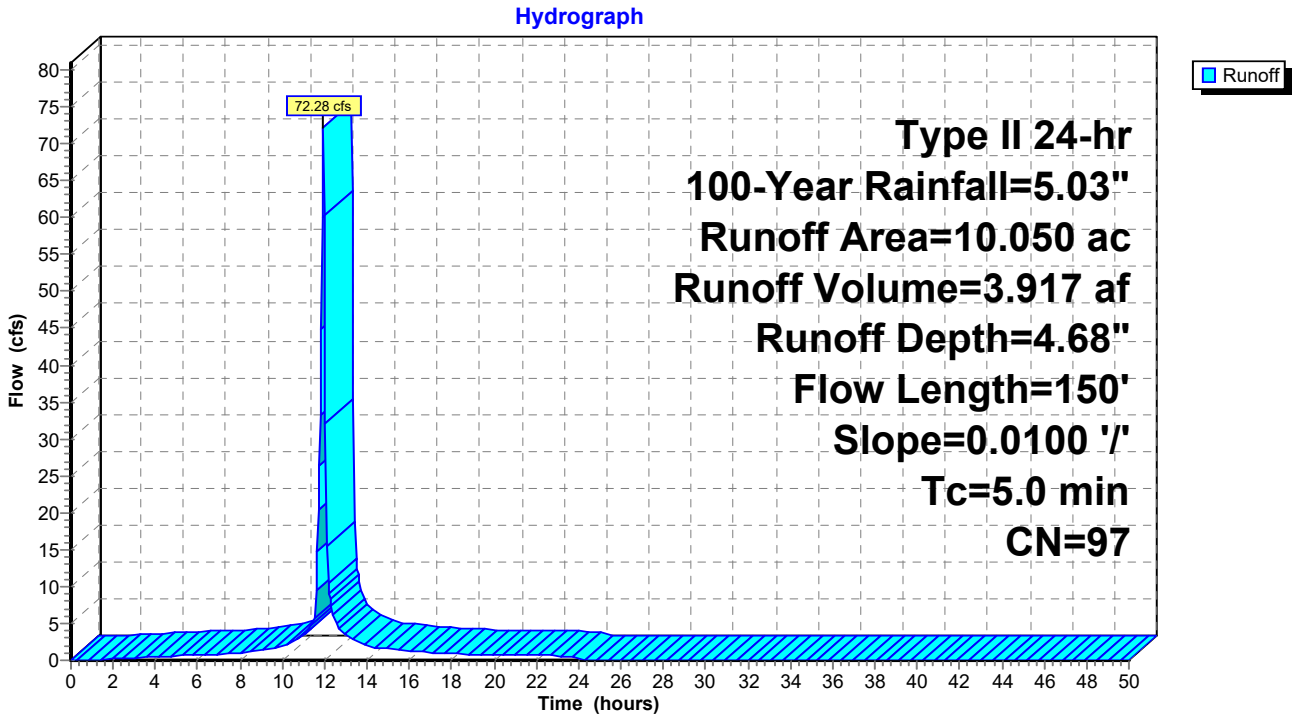
Runoff = 72.28 cfs @ 11.95 hrs, Volume= 3.917 af, Depth= 4.68"
Routed to Link 1L : Overall Existing Site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.03"

	Area (ac)	CN	Description
	0.710	84	50-75% Grass cover, Fair, HSG D
*	9.340	98	Impervious
	10.050	97	Weighted Average
	0.710		7.06% Pervious Area
	9.340		92.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	150	0.0100	1.00		**Sheet Flow, Overland - Pvmt.** Smooth surfaces n= 0.011 P2= 2.50"
2.5	150	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 2S: Existing Site (Non-Disturbance Area)

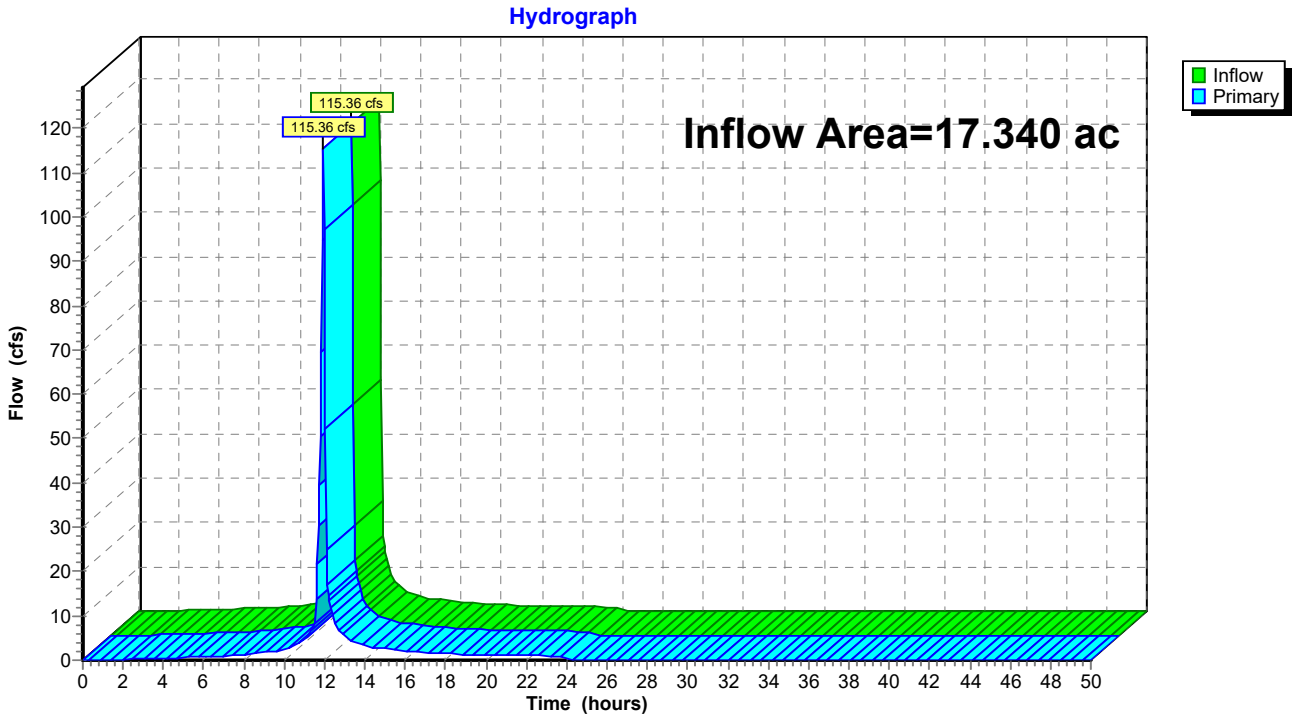


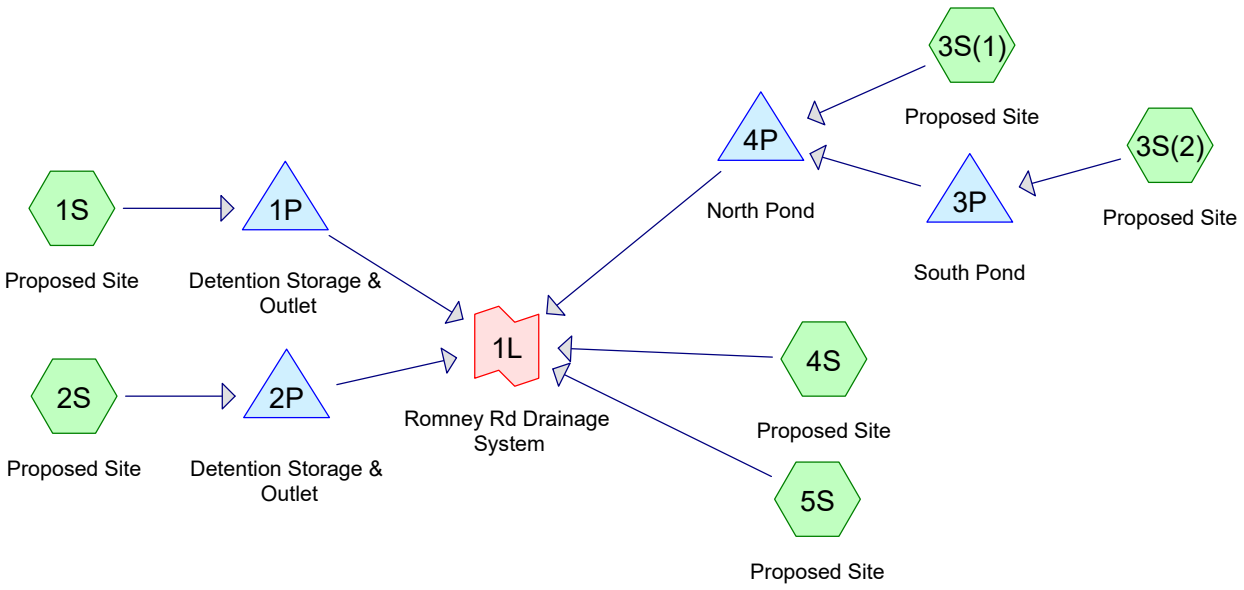
Summary for Link 1L: Overall Existing Site

Inflow Area = 17.340 ac, 66.44% Impervious, Inflow Depth = 4.14" for 100-Year event
Inflow = 115.36 cfs @ 11.95 hrs, Volume= 5.980 af
Primary = 115.36 cfs @ 11.95 hrs, Volume= 5.980 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Link 1L: Overall Existing Site





Subcat Reach Pond Link

Routing Diagram for 23-4099 Proposed
Prepared by Carmina Wood Morris, PC, Printed 2/11/2025

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-Year	Type II 24-hr		Default	24.00	1	1.80	2
2	10-Year	Type II 24-hr		Default	24.00	1	3.07	2
3	25-Year	Type II 24-hr		Default	24.00	1	3.73	2
4	100-Year	Type II 24-hr		Default	24.00	1	5.03	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.580	80	>75% Grass cover, Good, HSG D (1S, 2S, 3S(1), 3S(2), 4S, 5S)
14.750	98	Impervious, HSG D (1S, 2S, 3S(1), 3S(2), 4S, 5S)
17.330	**95**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
17.330	HSG D	1S, 2S, 3S(1), 3S(2), 4S, 5S
0.000	Other	
17.330		**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
0.000	0.000	0.000	2.580	0.000	2.580	>75% Grass cover, Good	1S, 2S, 3S(1), 3S(2), 4S, 5S
0.000	0.000	0.000	14.750	0.000	14.750	Impervious	1S, 2S, 3S(1), 3S(2), 4S, 5S
0.000	**0.000**	**0.000**	**17.330**	**0.000**	**17.330**	**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)
1	1P	572.25	572.00	25.0	0.0100	0.013	0.0	6.0	0.0
2	2P	572.25	572.00	25.0	0.0100	0.013	0.0	8.0	0.0
3	3P	574.15	574.00	33.0	0.0045	0.013	0.0	30.0	0.0
4	4P	573.50	572.25	95.0	0.0132	0.013	0.0	18.0	0.0

Time span=0.00-50.00 hrs, dt=0.01 hrs, 5001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Proposed Site Runoff Area=1.240 ac 79.84% Impervious Runoff Depth=1.21"
Flow Length=100' Slope=0.0100 '/' Tc=5.0 min CN=94 Runoff=2.68 cfs 0.125 af

Subcatchment2S: Proposed Site Runoff Area=3.010 ac 87.38% Impervious Runoff Depth=1.38"
Flow Length=100' Slope=0.0100 '/' Tc=5.0 min CN=96 Runoff=7.18 cfs 0.346 af

Subcatchment3S(1): Proposed Site Runoff Area=0.560 ac 82.14% Impervious Runoff Depth=1.29"
Flow Length=100' Slope=0.0100 '/' Tc=5.0 min CN=95 Runoff=1.27 cfs 0.060 af

Subcatchment3S(2): Proposed Site Runoff Area=2.710 ac 83.03% Impervious Runoff Depth=1.29"
Flow Length=100' Slope=0.0100 '/' Tc=5.0 min CN=95 Runoff=6.17 cfs 0.292 af

Subcatchment4S: Proposed Site Runoff Area=6.240 ac 85.26% Impervious Runoff Depth=1.29"
Flow Length=100' Slope=0.0100 '/' Tc=5.0 min CN=95 Runoff=14.21 cfs 0.672 af

Subcatchment5S: Proposed Site Runoff Area=3.570 ac 86.83% Impervious Runoff Depth=1.38"
Flow Length=100' Slope=0.0100 '/' Tc=5.0 min CN=96 Runoff=8.51 cfs 0.411 af

Pond 1P: Detention Storage & Outlet Peak Elev=572.99' Storage=2,104 cf Inflow=2.68 cfs 0.125 af
6.0" Round Culvert n=0.013 L=25.0' S=0.0100 '/' Outflow=0.59 cfs 0.125 af

Pond 2P: Detention Storage & Outlet Peak Elev=573.06' Storage=6,904 cf Inflow=7.18 cfs 0.346 af
8.0" Round Culvert n=0.013 L=25.0' S=0.0100 '/' Outflow=1.13 cfs 0.344 af

Pond 3P: South Pond Peak Elev=575.31' Storage=1,010 cf Inflow=6.17 cfs 0.292 af
30.0" Round Culvert n=0.013 L=33.0' S=0.0045 '/' Outflow=5.81 cfs 0.290 af

Pond 4P: North Pond Peak Elev=574.71' Storage=2,116 cf Inflow=7.02 cfs 0.350 af
18.0" Round Culvert n=0.013 L=95.0' S=0.0132 '/' Outflow=5.74 cfs 0.350 af

Link 1L: Romney Rd Drainage System Inflow=28.94 cfs 1.902 af
Primary=28.94 cfs 1.902 af

Total Runoff Area = 17.330 ac Runoff Volume = 1.907 af Average Runoff Depth = 1.32"
14.89% Pervious = 2.580 ac 85.11% Impervious = 14.750 ac

Summary for Subcatchment 1S: Proposed Site

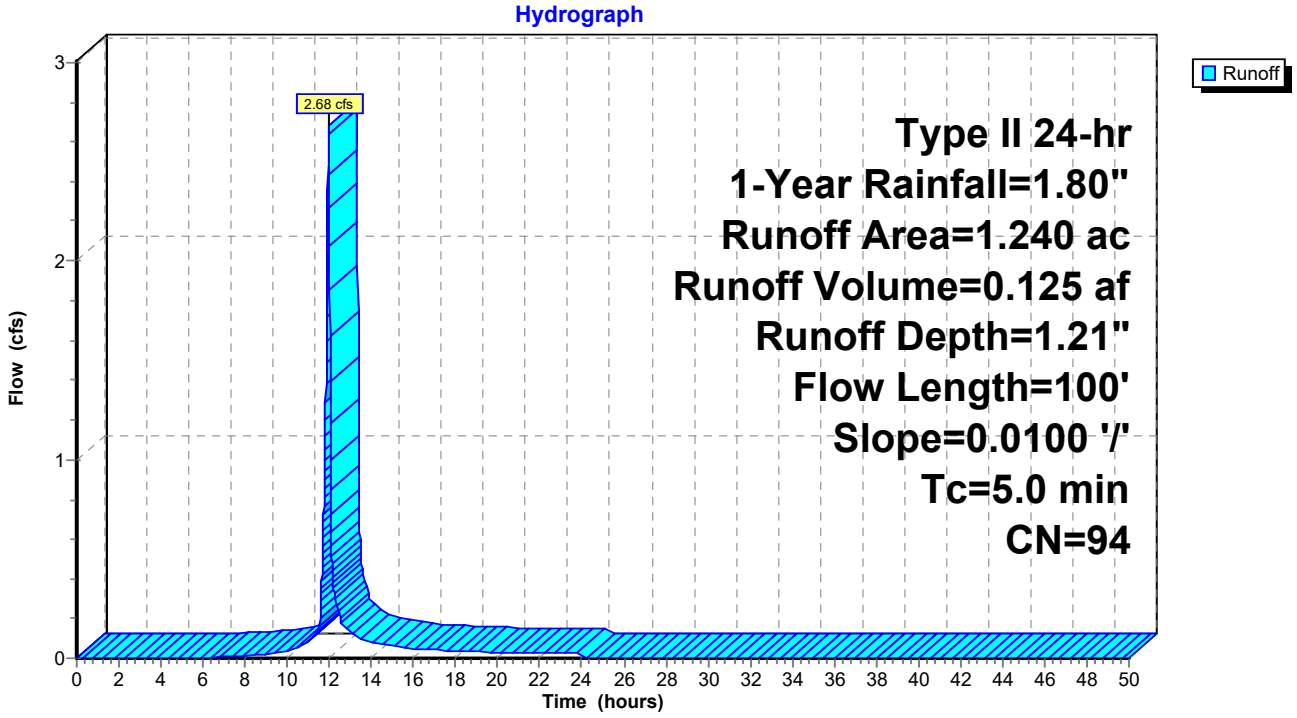
Runoff = 2.68 cfs @ 11.96 hrs, Volume= 0.125 af, Depth= 1.21"
Routed to Pond 1P : Detention Storage & Outlet

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-Year Rainfall=1.80"

	Area (ac)	CN	Description
	0.250	80	>75% Grass cover, Good, HSG D
*	0.990	98	Impervious, HSG D
	1.240	94	Weighted Average
	0.250		20.16% Pervious Area
	0.990		79.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	100	0.0100	0.92		**Sheet Flow, Overland - Pvmt.** Smooth surfaces n= 0.011 P2= 2.50"
1.8	100	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 1S: Proposed Site



Summary for Subcatchment 2S: Proposed Site

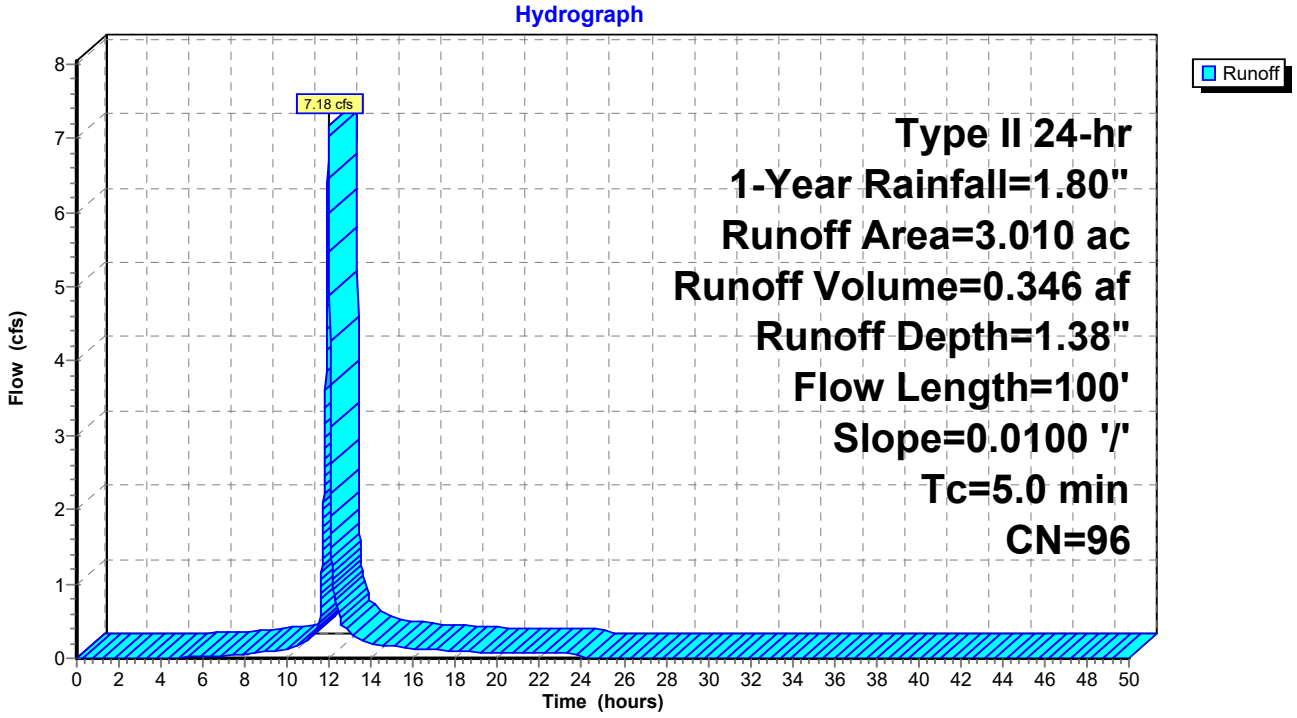
Runoff = 7.18 cfs @ 11.96 hrs, Volume= 0.346 af, Depth= 1.38"
Routed to Pond 2P : Detention Storage & Outlet

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-Year Rainfall=1.80"

	Area (ac)	CN	Description
	0.380	80	>75% Grass cover, Good, HSG D
*	2.630	98	Impervious, HSG D
	3.010	96	Weighted Average
	0.380		12.62% Pervious Area
	2.630		87.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	100	0.0100	0.92		**Sheet Flow, Overland - Pvmt.** Smooth surfaces n= 0.011 P2= 2.50"
1.8	100	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 2S: Proposed Site



Summary for Subcatchment 3S(1): Proposed Site

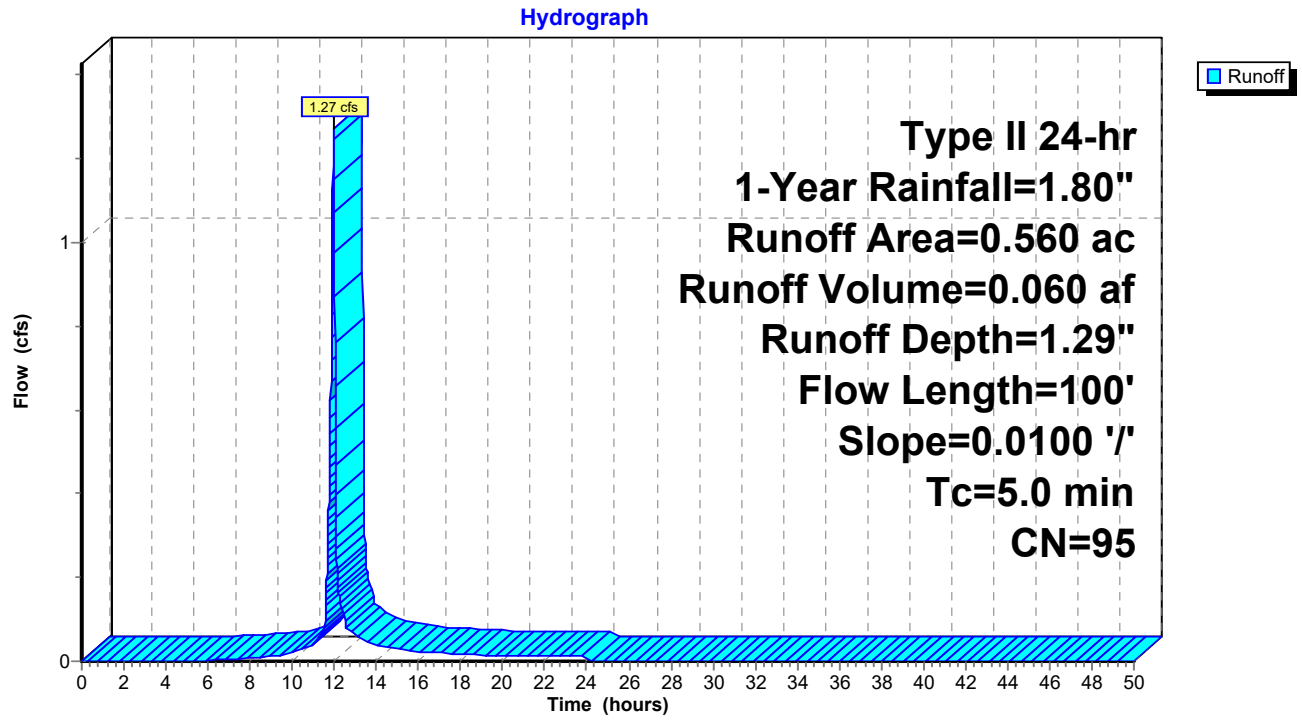
Runoff = 1.27 cfs @ 11.96 hrs, Volume= 0.060 af, Depth= 1.29"
Routed to Pond 4P : North Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-Year Rainfall=1.80"

	Area (ac)	CN	Description
	0.100	80	>75% Grass cover, Good, HSG D
*	0.460	98	Impervious, HSG D
	0.560	95	Weighted Average
	0.100		17.86% Pervious Area
	0.460		82.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	100	0.0100	0.92		**Sheet Flow, Overland - Pvmt.** Smooth surfaces n= 0.011 P2= 2.50"
1.8	100	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 3S(1): Proposed Site



Summary for Subcatchment 3S(2): Proposed Site

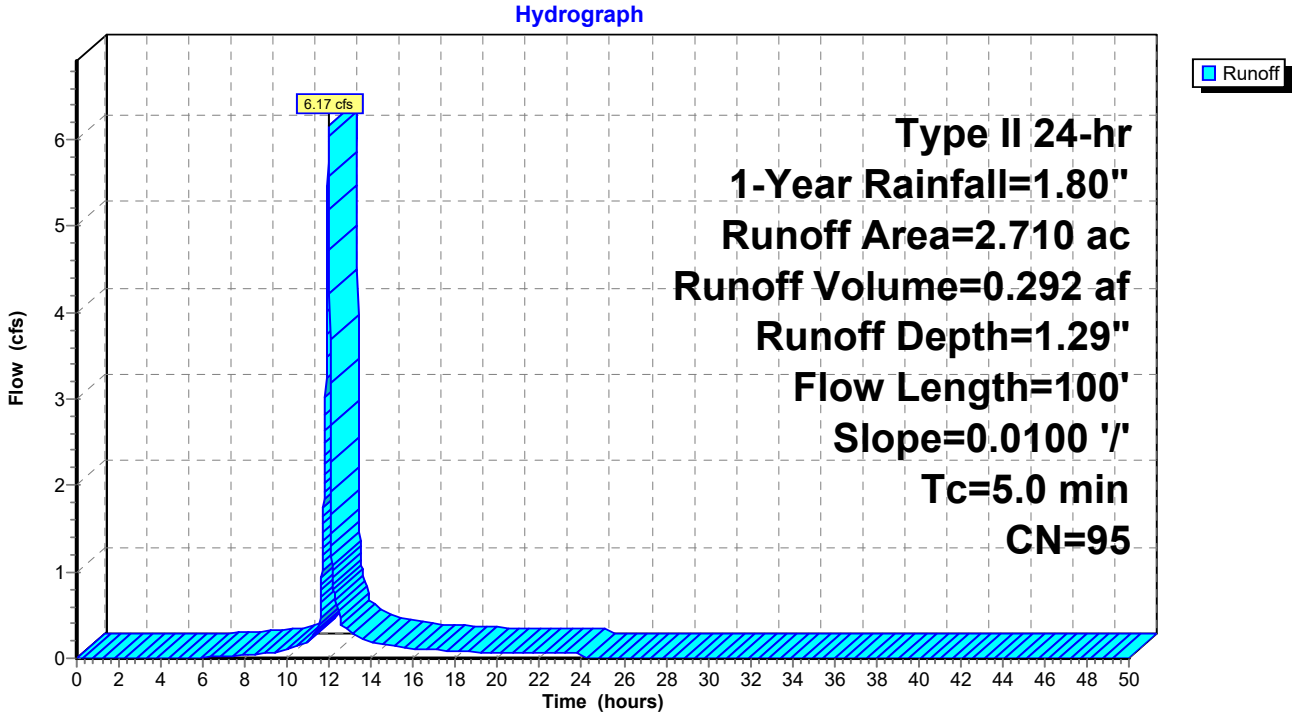
Runoff = 6.17 cfs @ 11.96 hrs, Volume= 0.292 af, Depth= 1.29"
Routed to Pond 3P : South Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-Year Rainfall=1.80"

	Area (ac)	CN	Description
	0.460	80	>75% Grass cover, Good, HSG D
*	2.250	98	Impervious, HSG D
	2.710	95	Weighted Average
	0.460		16.97% Pervious Area
	2.250		83.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	100	0.0100	0.92		**Sheet Flow, Overland - Pvmt.** Smooth surfaces n= 0.011 P2= 2.50"
1.8	100	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 3S(2): Proposed Site



Summary for Subcatchment 4S: Proposed Site

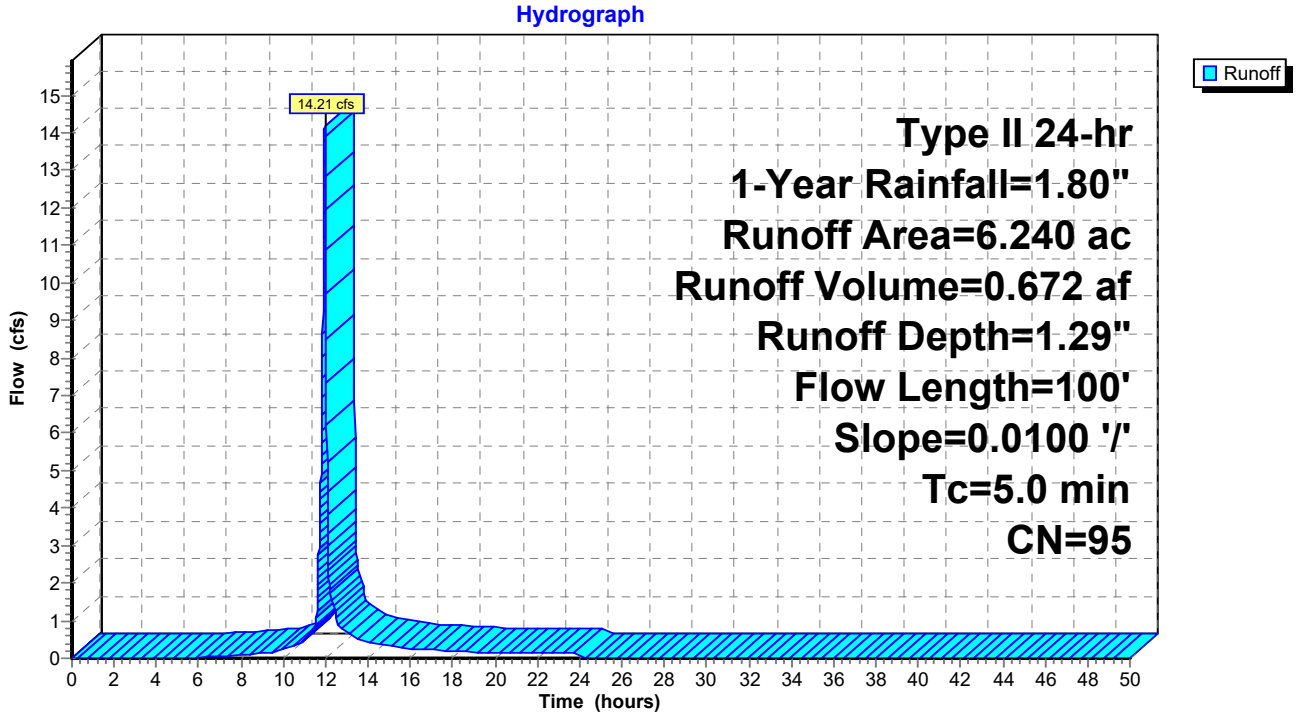
Runoff = 14.21 cfs @ 11.96 hrs, Volume= 0.672 af, Depth= 1.29"
Routed to Link 1L : Romney Rd Drainage System

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-Year Rainfall=1.80"

	Area (ac)	CN	Description
	0.920	80	>75% Grass cover, Good, HSG D
*	5.320	98	Impervious, HSG D
	6.240	95	Weighted Average
	0.920		14.74% Pervious Area
	5.320		85.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	100	0.0100	0.92		**Sheet Flow, Overland - Pvmt.** Smooth surfaces n= 0.011 P2= 2.50"
1.8	100	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 4S: Proposed Site



Summary for Subcatchment 5S: Proposed Site

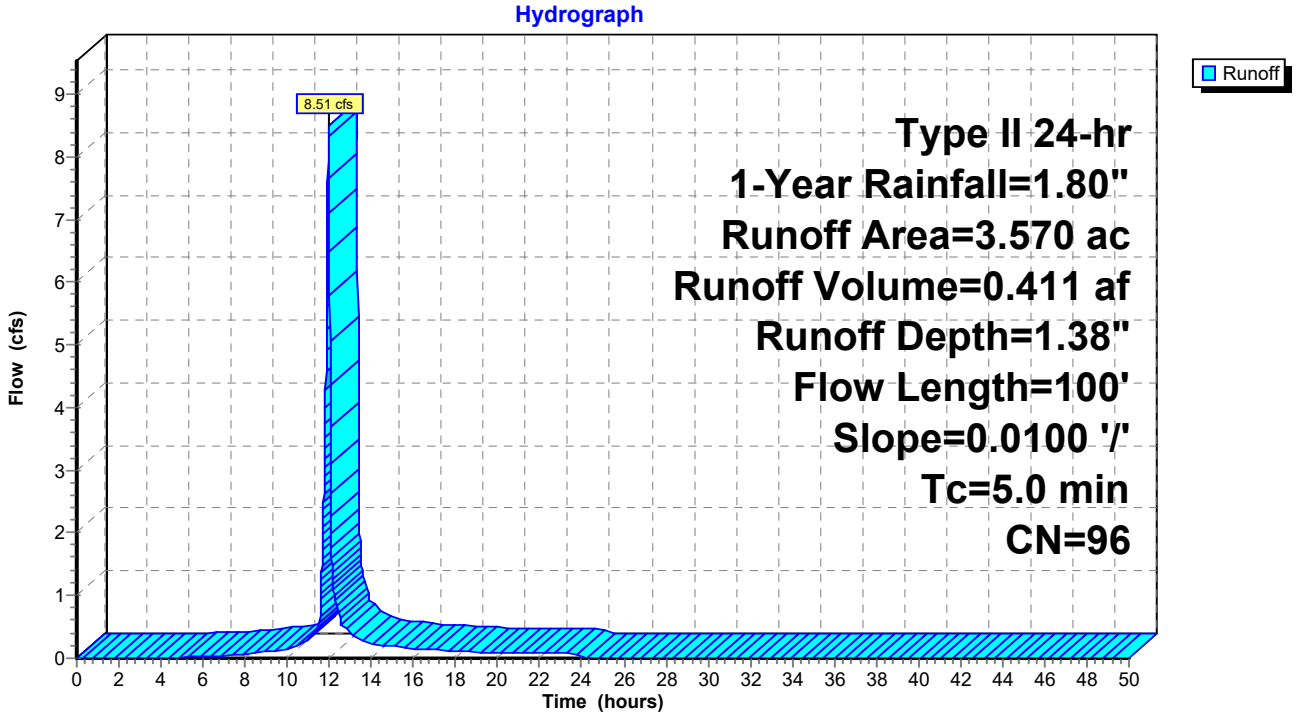
Runoff = 8.51 cfs @ 11.96 hrs, Volume= 0.411 af, Depth= 1.38"
Routed to Link 1L : Romney Rd Drainage System

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-Year Rainfall=1.80"

	Area (ac)	CN	Description
	0.470	80	>75% Grass cover, Good, HSG D
*	3.100	98	Impervious, HSG D
	3.570	96	Weighted Average
	0.470		13.17% Pervious Area
	3.100		86.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	100	0.0100	0.92		**Sheet Flow, Overland - Pvmt.** Smooth surfaces n= 0.011 P2= 2.50"
1.8	100	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 5S: Proposed Site



Summary for Pond 1P: Detention Storage & Outlet

Inflow Area = 1.240 ac, 79.84% Impervious, Inflow Depth = 1.21" for 1-Year event
Inflow = 2.68 cfs @ 11.96 hrs, Volume= 0.125 af
Outflow = 0.59 cfs @ 12.10 hrs, Volume= 0.125 af, Atten= 78%, Lag= 8.2 min
Primary = 0.59 cfs @ 12.10 hrs, Volume= 0.125 af
Routed to Link 1L : Romney Rd Drainage System

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Peak Elev= 572.99' @ 12.10 hrs Surf.Area= 5,289 sf Storage= 2,104 cf

Plug-Flow detention time= 76.0 min calculated for 0.125 af (100% of inflow)
Center-of-Mass det. time= 73.7 min (877.4 - 803.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	572.25'	3,736 cf	**50.25'W x 105.25'L x 2.54'H Field A** 13,442 cf Overall - 4,103 cf Embedded = 9,340 cf x 40.0% Voids
#2A	572.75'	4,103 cf	**Cultec R-150XLHD** x 150 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 15 rows
		7,839 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	572.25'	**6.0" Round Outlet Pipe** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 572.25' / 572.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.59 cfs @ 12.10 hrs HW=572.99' TW=0.00' (Dynamic Tailwater)
↑—**1=Outlet Pipe** (Barrel Controls 0.59 cfs @ 3.02 fps)

Pond 1P: Detention Storage & Outlet - Chamber Wizard Field A

Chamber Model = Cultec R-150XLHD (Cultec Recharger® 150XLHD)
Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf
Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap
Row Length Adjustment= +0.75' x 2.65 sf x 15 rows

33.0" Wide + 6.0" Spacing = 39.0" C-C Row Spacing

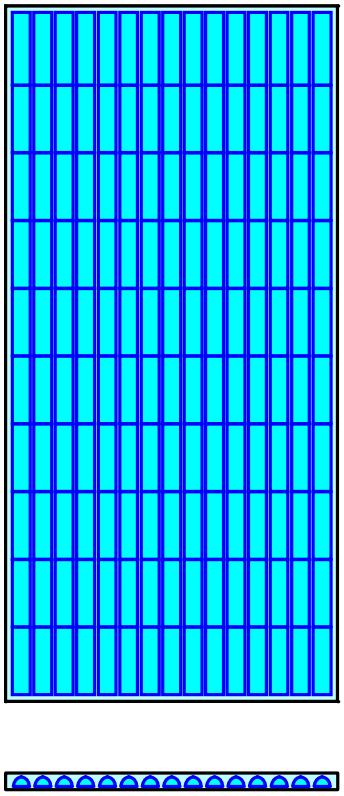
10 Chambers/Row x 10.25' Long +0.75' Row Adjustment = 103.25' Row Length +12.0" End Stone x 2 = 105.25' Base Length
15 Rows x 33.0" Wide + 6.0" Spacing x 14 + 12.0" Side Stone x 2 = 50.25' Base Width
6.0" Stone Base + 18.5" Chamber Height + 6.0" Stone Cover = 2.54' Field Height

150 Chambers x 27.2 cf +0.75' Row Adjustment x 2.65 sf x 15 Rows = 4,102.6 cf Chamber Storage

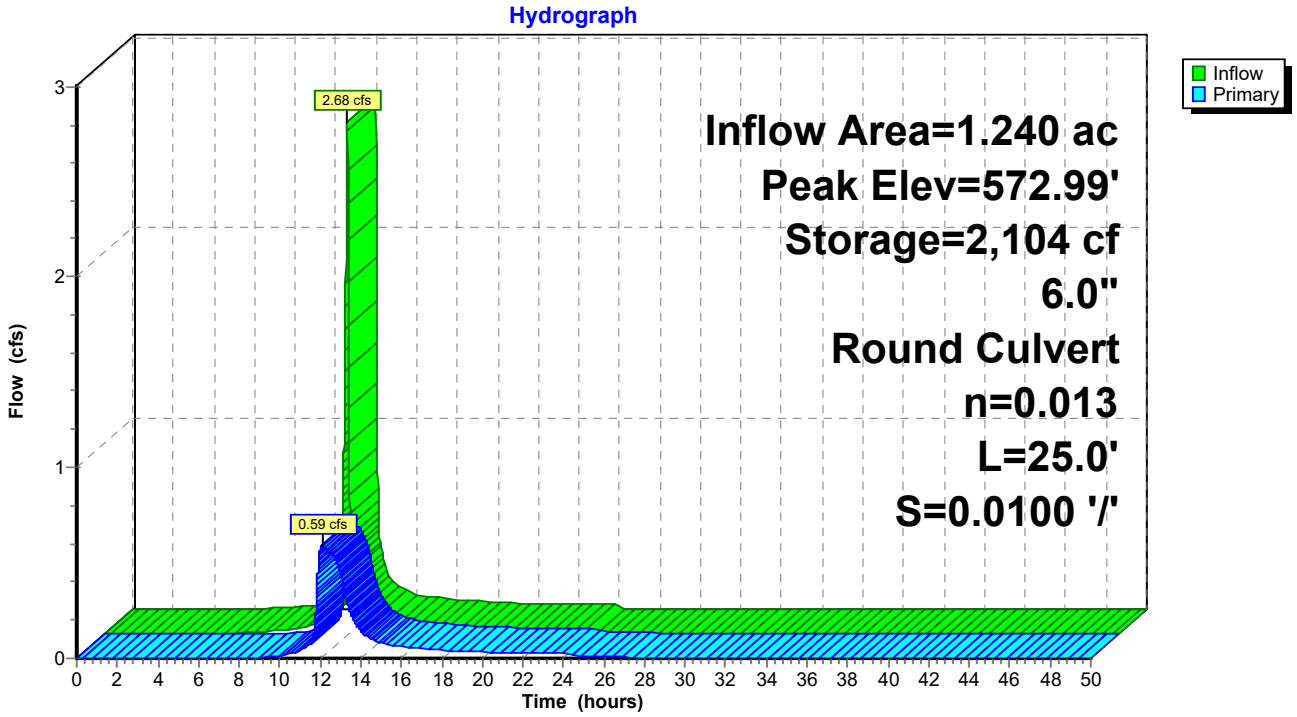
13,442.4 cf Field - 4,102.6 cf Chambers = 9,339.8 cf Stone x 40.0% Voids = 3,735.9 cf Stone Storage

Chamber Storage + Stone Storage = 7,838.5 cf = 0.180 af
Overall Storage Efficiency = 58.3%
Overall System Size = 105.25' x 50.25' x 2.54'

150 Chambers
497.9 cy Field
345.9 cy Stone



Pond 1P: Detention Storage & Outlet



Summary for Pond 2P: Detention Storage & Outlet

Inflow Area = 3.010 ac, 87.38% Impervious, Inflow Depth = 1.38" for 1-Year event
Inflow = 7.18 cfs @ 11.96 hrs, Volume= 0.346 af
Outflow = 1.13 cfs @ 12.14 hrs, Volume= 0.344 af, Atten= 84%, Lag= 10.6 min
Primary = 1.13 cfs @ 12.14 hrs, Volume= 0.344 af
Routed to Link 1L : Romney Rd Drainage System

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Peak Elev= 573.06' @ 12.14 hrs Surf.Area= 15,085 sf Storage= 6,904 cf

Plug-Flow detention time= 130.1 min calculated for 0.344 af (99% of inflow)
Center-of-Mass det. time= 125.3 min (913.3 - 788.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	572.25'	10,575 cf	**63.25'W x 238.50'L x 2.54'H Field A** 38,341 cf Overall - 11,903 cf Embedded = 26,438 cf x 40.0% Voids
#2A	572.75'	11,903 cf	**Cultec R-150XLHD** x 437 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 19 rows
		22,479 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	572.25'	**8.0" Round Outlet Pipe** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 572.25' / 572.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=1.13 cfs @ 12.14 hrs HW=573.06' TW=0.00' (Dynamic Tailwater)
↑—**1=Outlet Pipe** (Barrel Controls 1.13 cfs @ 3.36 fps)

Pond 2P: Detention Storage & Outlet - Chamber Wizard Field A

Chamber Model = Cultec R-150XLHD (Cultec Recharger® 150XLHD)
Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf
Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap
Row Length Adjustment= +0.75' x 2.65 sf x 19 rows

33.0" Wide + 6.0" Spacing = 39.0" C-C Row Spacing

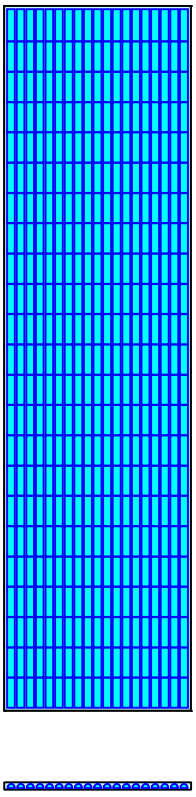
23 Chambers/Row x 10.25' Long +0.75' Row Adjustment = 236.50' Row Length +12.0" End Stone x 2 = 238.50' Base Length
19 Rows x 33.0" Wide + 6.0" Spacing x 18 + 12.0" Side Stone x 2 = 63.25' Base Width
6.0" Stone Base + 18.5" Chamber Height + 6.0" Stone Cover = 2.54' Field Height

437 Chambers x 27.2 cf +0.75' Row Adjustment x 2.65 sf x 19 Rows = 11,903.3 cf Chamber Storage

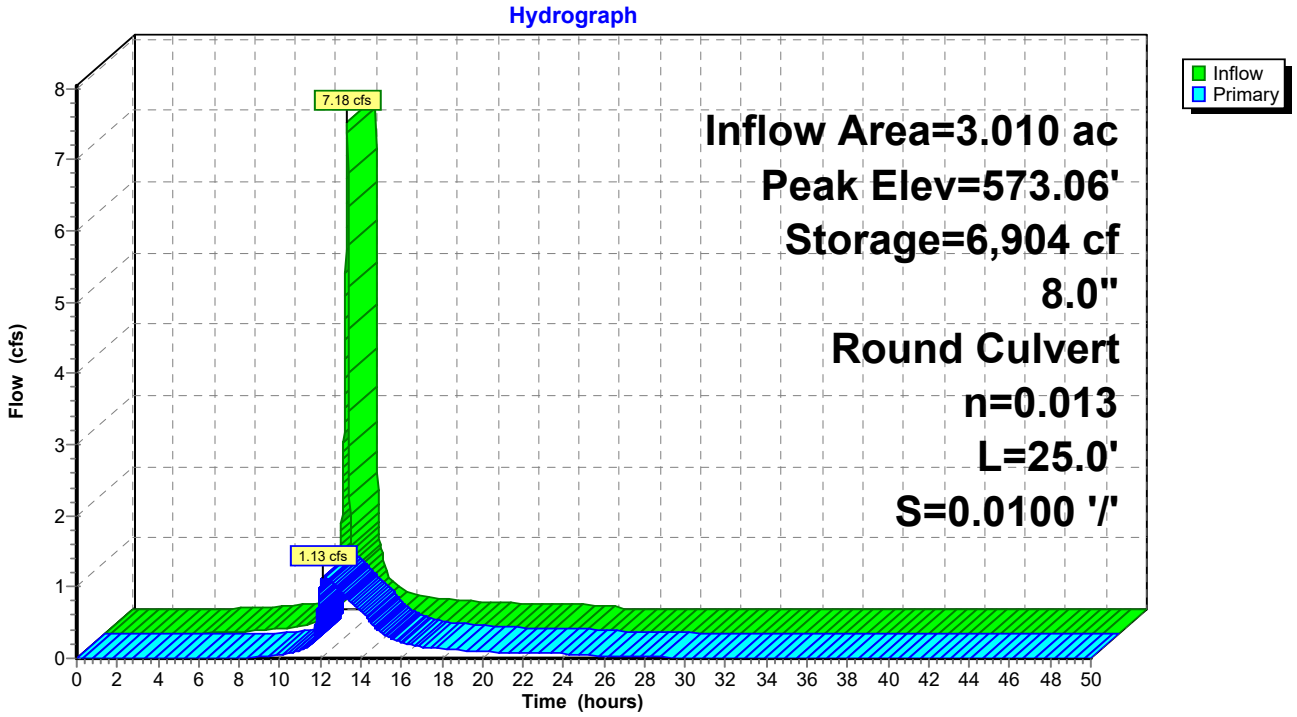
38,341.4 cf Field - 11,903.3 cf Chambers = 26,438.1 cf Stone x 40.0% Voids = 10,575.2 cf Stone Storage

Chamber Storage + Stone Storage = 22,478.5 cf = 0.516 af
Overall Storage Efficiency = 58.6%
Overall System Size = 238.50' x 63.25' x 2.54'

437 Chambers
1,420.1 cy Field
979.2 cy Stone



Pond 2P: Detention Storage & Outlet



Summary for Pond 3P: South Pond

Inflow Area = 2.710 ac, 83.03% Impervious, Inflow Depth = 1.29" for 1-Year event
Inflow = 6.17 cfs @ 11.96 hrs, Volume= 0.292 af
Outflow = 5.81 cfs @ 11.98 hrs, Volume= 0.290 af, Atten= 6%, Lag= 1.5 min
Primary = 5.81 cfs @ 11.98 hrs, Volume= 0.290 af
Routed to Pond 4P : North Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Peak Elev= 575.31' @ 11.98 hrs Surf.Area= 1,005 sf Storage= 1,010 cf

Plug-Flow detention time= 16.2 min calculated for 0.290 af (99% of inflow)
Center-of-Mass det. time= 11.9 min (808.3 - 796.4)

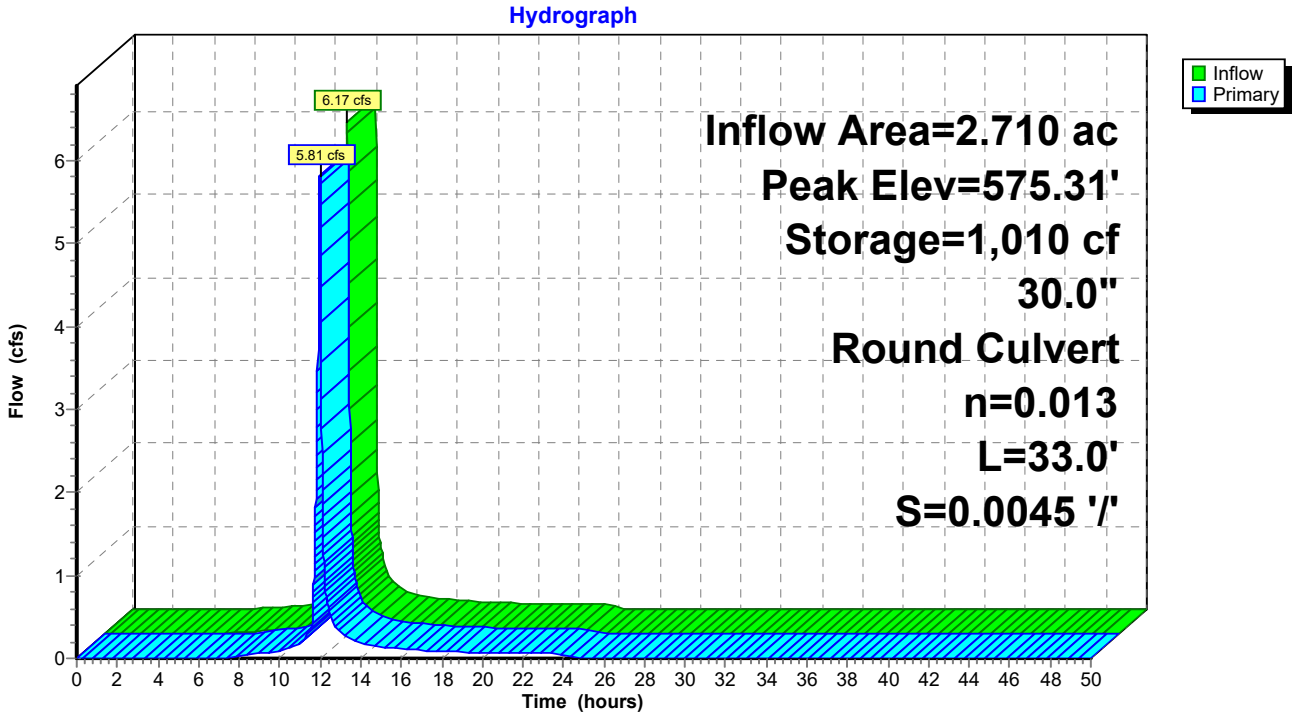
Volume	Invert	Avail.Storage	Storage Description
#1	574.00'	5,327 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
574.00	556	0	0
575.00	881	719	719
576.00	1,281	1,081	1,800
577.00	1,749	1,515	3,315
578.00	2,275	2,012	5,327

Device	Routing	Invert	Outlet Devices
#1	Primary	574.15'	**30.0" Round Outlet Pipe** L= 33.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 574.15' / 574.00' S= 0.0045 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=5.80 cfs @ 11.98 hrs HW=575.31' TW=574.64' (Dynamic Tailwater)
↳**1=Outlet Pipe** (Barrel Controls 5.80 cfs @ 3.83 fps)

Pond 3P: South Pond



Summary for Pond 4P: North Pond

Inflow Area = 3.270 ac, 82.87% Impervious, Inflow Depth = 1.29" for 1-Year event
Inflow = 7.02 cfs @ 11.98 hrs, Volume= 0.350 af
Outflow = 5.74 cfs @ 12.03 hrs, Volume= 0.350 af, Atten= 18%, Lag= 3.0 min
Primary = 5.74 cfs @ 12.03 hrs, Volume= 0.350 af
Routed to Link 1L : Romney Rd Drainage System

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Peak Elev= 574.71' @ 12.03 hrs Surf.Area= 2,148 sf Storage= 2,116 cf

Plug-Flow detention time= 17.8 min calculated for 0.350 af (100% of inflow)
Center-of-Mass det. time= 17.6 min (823.8 - 806.2)

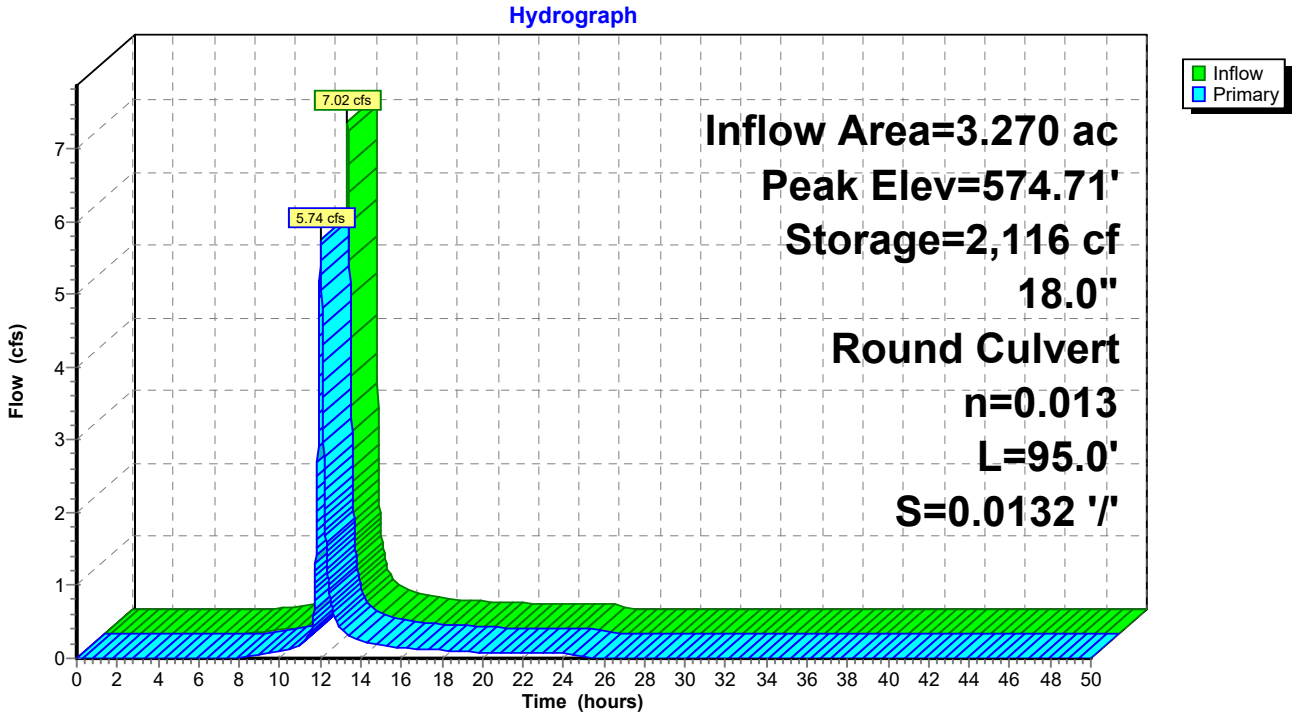
Volume	Invert	Avail.Storage	Storage Description
#1	573.50'	13,861 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
573.50	1,340	0	0
574.00	1,675	754	754
575.00	2,339	2,007	2,761
576.00	3,184	2,762	5,522
577.00	4,147	3,666	9,188
578.00	5,199	4,673	13,861

Device	Routing	Invert	Outlet Devices
#1	Primary	573.50'	**18.0" Round Outlet Pipe** L= 95.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 573.50' / 572.25' S= 0.0132 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=5.73 cfs @ 12.03 hrs HW=574.71' TW=0.00' (Dynamic Tailwater)
1=Outlet Pipe (Inlet Controls 5.73 cfs @ 3.75 fps)

Pond 4P: North Pond

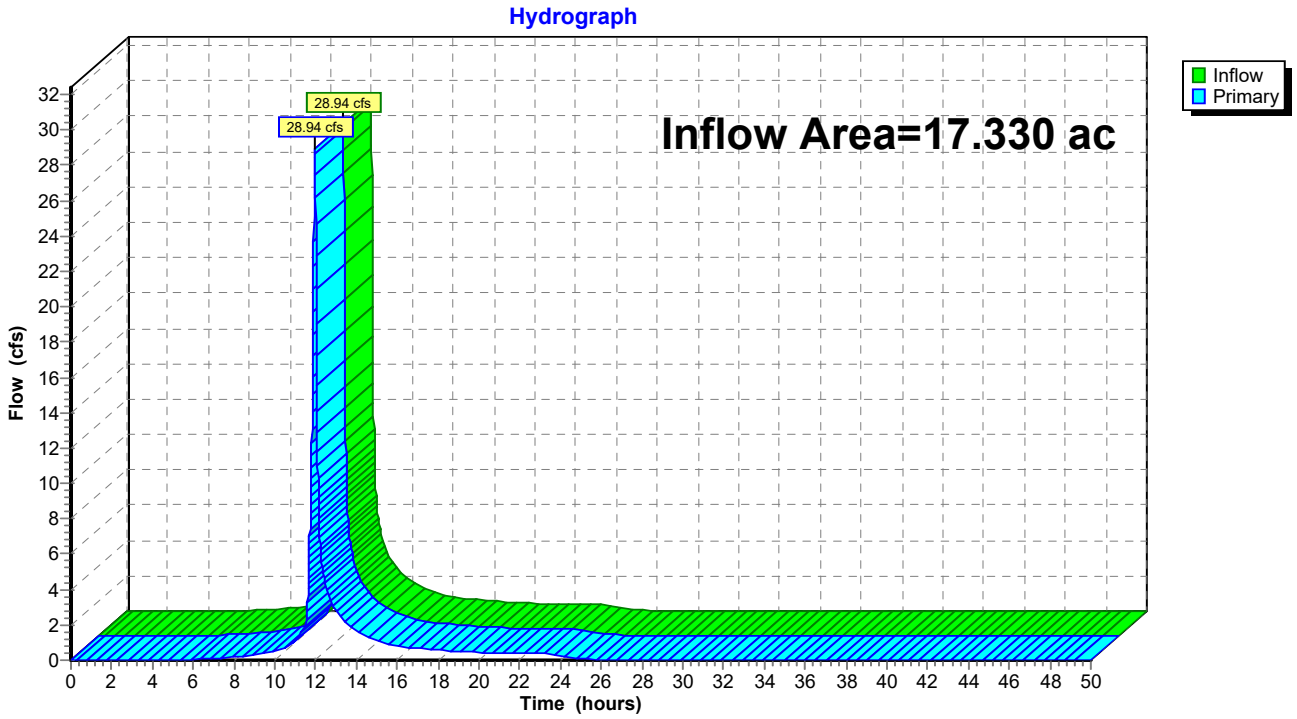


Summary for Link 1L: Romney Rd Drainage System

Inflow Area = 17.330 ac, 85.11% Impervious, Inflow Depth = 1.32" for 1-Year event
Inflow = 28.94 cfs @ 11.96 hrs, Volume= 1.902 af
Primary = 28.94 cfs @ 11.96 hrs, Volume= 1.902 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Link 1L: Romney Rd Drainage System



Time span=0.00-50.00 hrs, dt=0.01 hrs, 5001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Proposed Site Runoff Area=1.240 ac 79.84% Impervious Runoff Depth=2.42"
Flow Length=100' Slope=0.0100 '/' Tc=5.0 min CN=94 Runoff=5.13 cfs 0.250 af

Subcatchment2S: Proposed Site Runoff Area=3.010 ac 87.38% Impervious Runoff Depth=2.62"
Flow Length=100' Slope=0.0100 '/' Tc=5.0 min CN=96 Runoff=13.04 cfs 0.657 af

Subcatchment3S(1): Proposed Site Runoff Area=0.560 ac 82.14% Impervious Runoff Depth=2.52"
Flow Length=100' Slope=0.0100 '/' Tc=5.0 min CN=95 Runoff=2.37 cfs 0.117 af

Subcatchment3S(2): Proposed Site Runoff Area=2.710 ac 83.03% Impervious Runoff Depth=2.52"
Flow Length=100' Slope=0.0100 '/' Tc=5.0 min CN=95 Runoff=11.49 cfs 0.569 af

Subcatchment4S: Proposed Site Runoff Area=6.240 ac 85.26% Impervious Runoff Depth=2.52"
Flow Length=100' Slope=0.0100 '/' Tc=5.0 min CN=95 Runoff=26.46 cfs 1.309 af

Subcatchment5S: Proposed Site Runoff Area=3.570 ac 86.83% Impervious Runoff Depth=2.62"
Flow Length=100' Slope=0.0100 '/' Tc=5.0 min CN=96 Runoff=15.47 cfs 0.780 af

Pond 1P: Detention Storage & Outlet Peak Elev=573.52' Storage=4,303 cf Inflow=5.13 cfs 0.250 af
6.0" Round Culvert n=0.013 L=25.0' S=0.0100 '/' Outflow=0.85 cfs 0.249 af

Pond 2P: Detention Storage & Outlet Peak Elev=573.57' Storage=12,975 cf Inflow=13.04 cfs 0.657 af
8.0" Round Culvert n=0.013 L=25.0' S=0.0100 '/' Outflow=1.58 cfs 0.655 af

Pond 3P: South Pond Peak Elev=575.81' Storage=1,561 cf Inflow=11.49 cfs 0.569 af
30.0" Round Culvert n=0.013 L=33.0' S=0.0045 '/' Outflow=10.88 cfs 0.567 af

Pond 4P: North Pond Peak Elev=575.45' Storage=3,907 cf Inflow=13.15 cfs 0.684 af
18.0" Round Culvert n=0.013 L=95.0' S=0.0132 '/' Outflow=9.33 cfs 0.684 af

Link 1L: Romney Rd Drainage System Inflow=52.15 cfs 3.677 af
Primary=52.15 cfs 3.677 af

Total Runoff Area = 17.330 ac Runoff Volume = 3.682 af Average Runoff Depth = 2.55"
14.89% Pervious = 2.580 ac 85.11% Impervious = 14.750 ac

Summary for Subcatchment 1S: Proposed Site

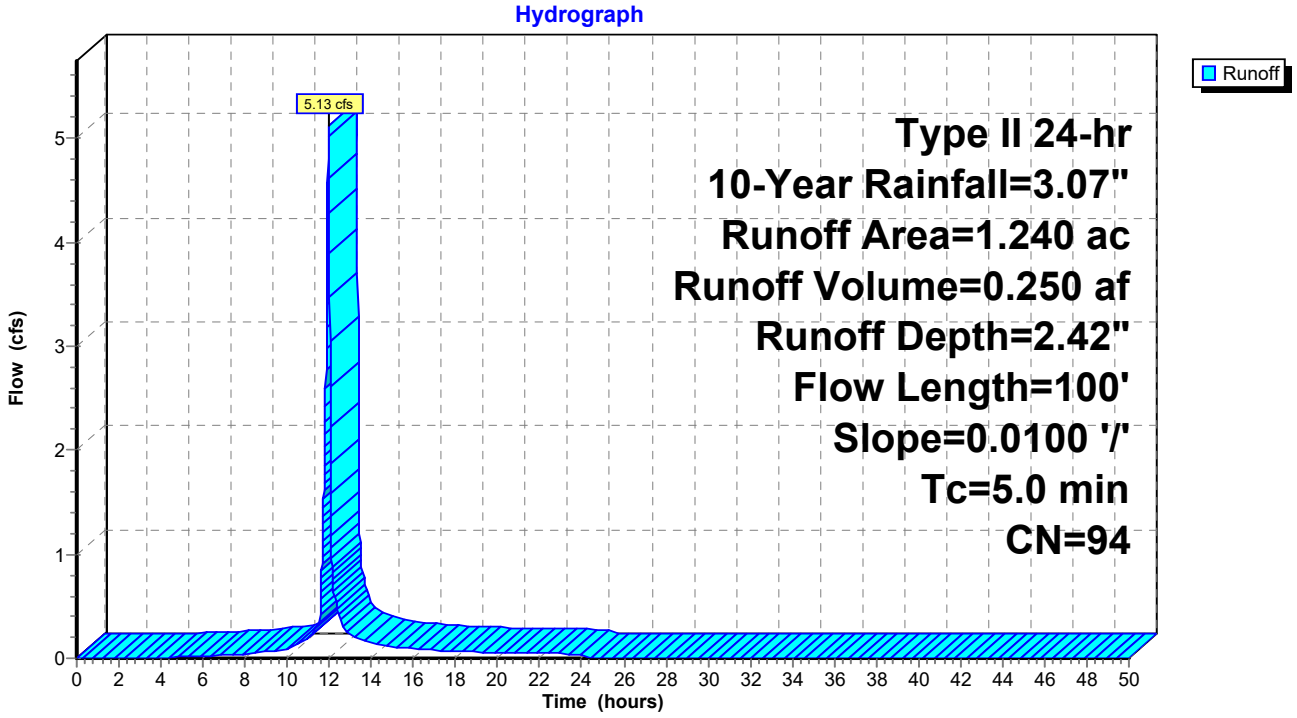
Runoff = 5.13 cfs @ 11.96 hrs, Volume= 0.250 af, Depth= 2.42"
Routed to Pond 1P : Detention Storage & Outlet

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Rainfall=3.07"

	Area (ac)	CN	Description
	0.250	80	>75% Grass cover, Good, HSG D
*	0.990	98	Impervious, HSG D
	1.240	94	Weighted Average
	0.250		20.16% Pervious Area
	0.990		79.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	100	0.0100	0.92		**Sheet Flow, Overland - Pvmt.** Smooth surfaces n= 0.011 P2= 2.50"
1.8	100	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 1S: Proposed Site



Summary for Subcatchment 2S: Proposed Site

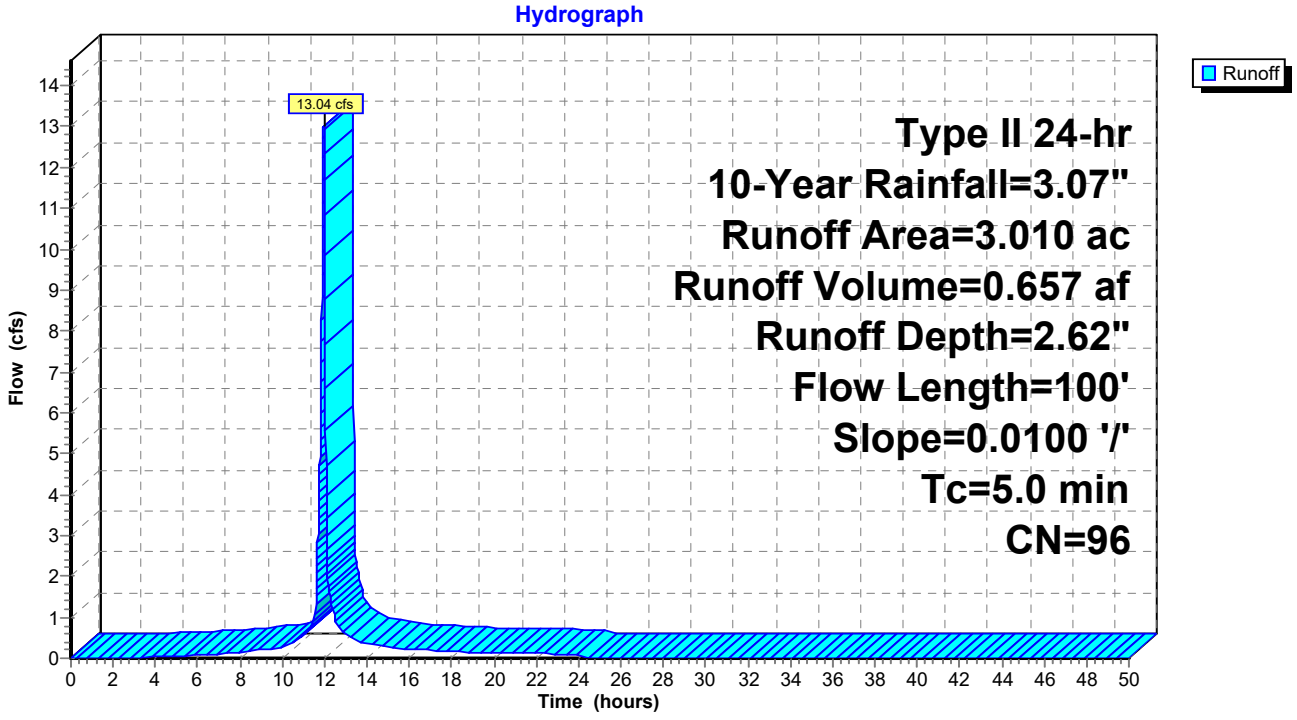
Runoff = 13.04 cfs @ 11.96 hrs, Volume= 0.657 af, Depth= 2.62"
Routed to Pond 2P : Detention Storage & Outlet

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Rainfall=3.07"

	Area (ac)	CN	Description
	0.380	80	>75% Grass cover, Good, HSG D
*	2.630	98	Impervious, HSG D
	3.010	96	Weighted Average
	0.380		12.62% Pervious Area
	2.630		87.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	100	0.0100	0.92		**Sheet Flow, Overland - Pvmt.** Smooth surfaces n= 0.011 P2= 2.50"
1.8	100	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 2S: Proposed Site



Summary for Subcatchment 3S(1): Proposed Site

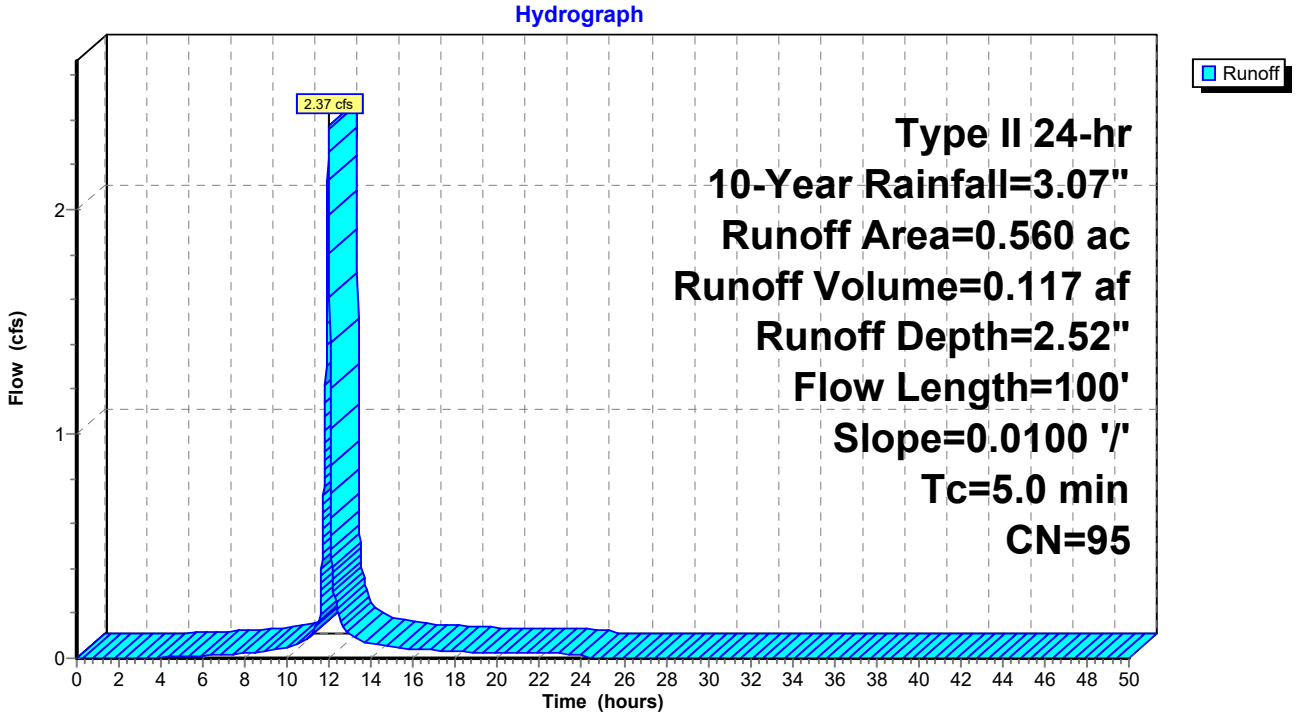
Runoff = 2.37 cfs @ 11.96 hrs, Volume= 0.117 af, Depth= 2.52"
Routed to Pond 4P : North Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Rainfall=3.07"

	Area (ac)	CN	Description
	0.100	80	>75% Grass cover, Good, HSG D
*	0.460	98	Impervious, HSG D
	0.560	95	Weighted Average
	0.100		17.86% Pervious Area
	0.460		82.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	100	0.0100	0.92		**Sheet Flow, Overland - Pvmt.** Smooth surfaces n= 0.011 P2= 2.50"
1.8	100	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 3S(1): Proposed Site



Summary for Subcatchment 3S(2): Proposed Site

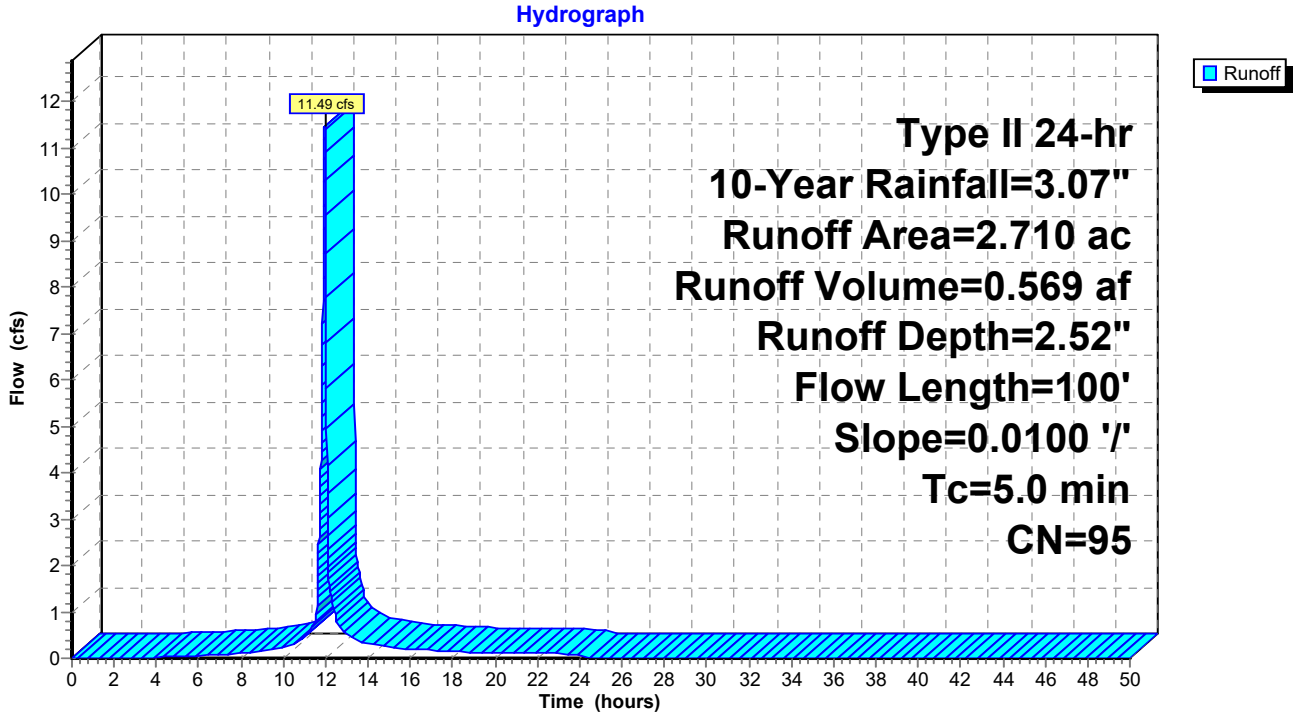
Runoff = 11.49 cfs @ 11.96 hrs, Volume= 0.569 af, Depth= 2.52"
Routed to Pond 3P : South Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Rainfall=3.07"

	Area (ac)	CN	Description
	0.460	80	>75% Grass cover, Good, HSG D
*	2.250	98	Impervious, HSG D
	2.710	95	Weighted Average
	0.460		16.97% Pervious Area
	2.250		83.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	100	0.0100	0.92		**Sheet Flow, Overland - Pvmt.** Smooth surfaces n= 0.011 P2= 2.50"
1.8	100	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 3S(2): Proposed Site



Summary for Subcatchment 4S: Proposed Site

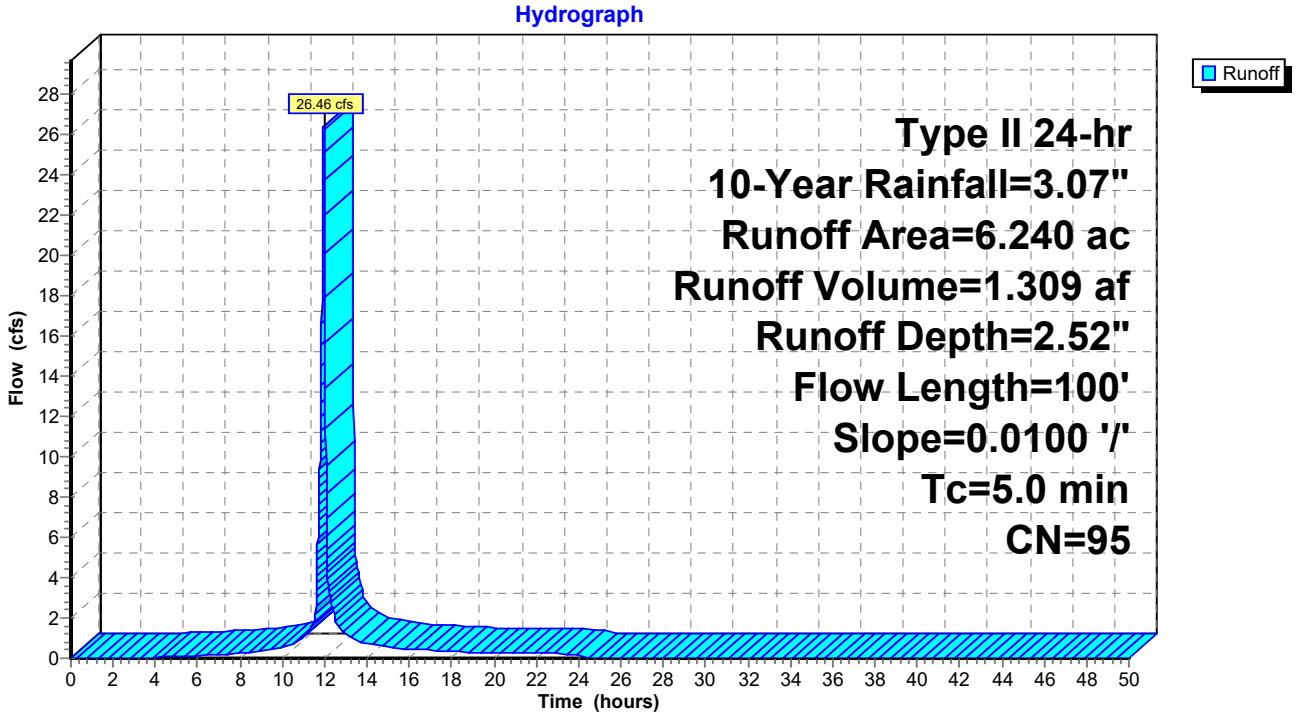
Runoff = 26.46 cfs @ 11.96 hrs, Volume= 1.309 af, Depth= 2.52"
Routed to Link 1L : Romney Rd Drainage System

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Rainfall=3.07"

	Area (ac)	CN	Description
	0.920	80	>75% Grass cover, Good, HSG D
*	5.320	98	Impervious, HSG D
	6.240	95	Weighted Average
	0.920		14.74% Pervious Area
	5.320		85.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	100	0.0100	0.92		**Sheet Flow, Overland - Pvmt.** Smooth surfaces n= 0.011 P2= 2.50"
1.8	100	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 4S: Proposed Site



Summary for Subcatchment 5S: Proposed Site

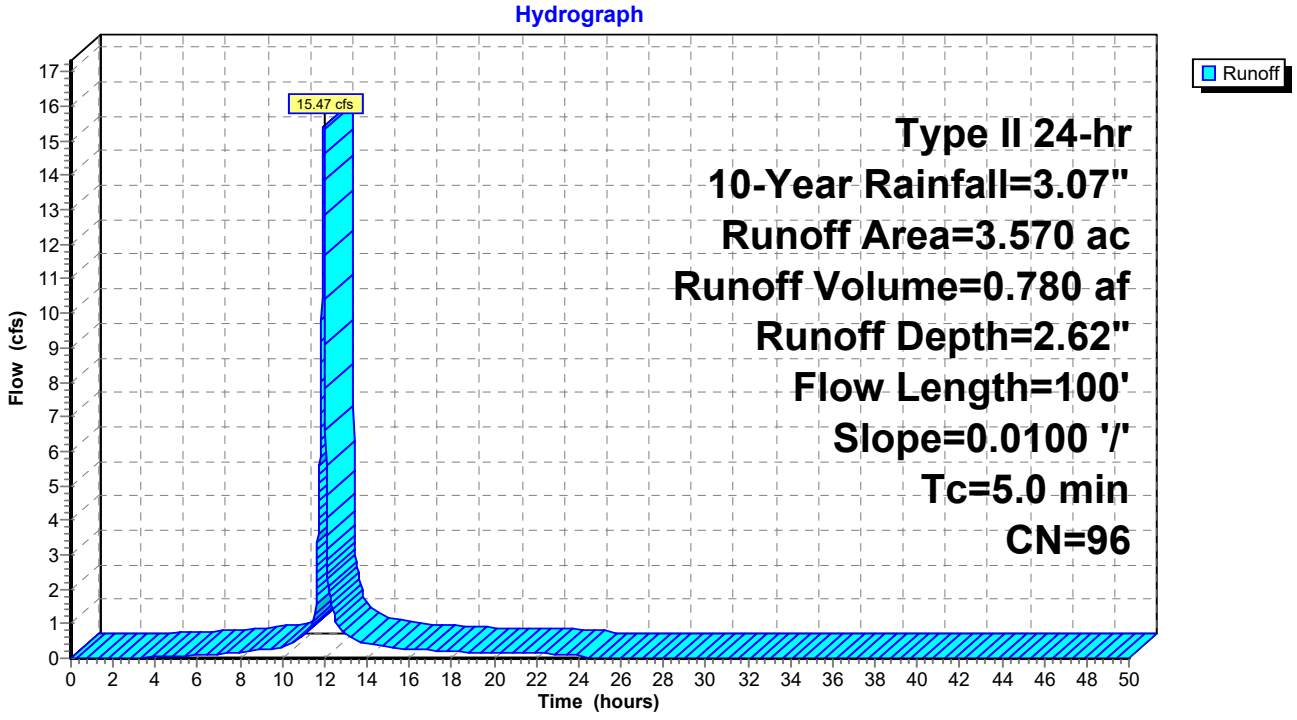
Runoff = 15.47 cfs @ 11.96 hrs, Volume= 0.780 af, Depth= 2.62"
Routed to Link 1L : Romney Rd Drainage System

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Rainfall=3.07"

	Area (ac)	CN	Description
	0.470	80	>75% Grass cover, Good, HSG D
*	3.100	98	Impervious, HSG D
	3.570	96	Weighted Average
	0.470		13.17% Pervious Area
	3.100		86.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	100	0.0100	0.92		**Sheet Flow, Overland - Pvmt.** Smooth surfaces n= 0.011 P2= 2.50"
1.8	100	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 5S: Proposed Site



Summary for Pond 1P: Detention Storage & Outlet

Inflow Area = 1.240 ac, 79.84% Impervious, Inflow Depth = 2.42" for 10-Year event
Inflow = 5.13 cfs @ 11.96 hrs, Volume= 0.250 af
Outflow = 0.85 cfs @ 12.13 hrs, Volume= 0.249 af, Atten= 83%, Lag= 10.1 min
Primary = 0.85 cfs @ 12.13 hrs, Volume= 0.249 af
Routed to Link 1L : Romney Rd Drainage System

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Peak Elev= 573.52' @ 12.13 hrs Surf.Area= 5,289 sf Storage= 4,303 cf

Plug-Flow detention time= 73.5 min calculated for 0.249 af (100% of inflow)
Center-of-Mass det. time= 72.6 min (856.9 - 784.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	572.25'	3,736 cf	**50.25'W x 105.25'L x 2.54'H Field A** 13,442 cf Overall - 4,103 cf Embedded = 9,340 cf x 40.0% Voids
#2A	572.75'	4,103 cf	**Cultec R-150XLHD** x 150 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 15 rows
		7,839 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	572.25'	**6.0" Round Outlet Pipe** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 572.25' / 572.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.85 cfs @ 12.13 hrs HW=573.52' TW=0.00' (Dynamic Tailwater)
↑—**1=Outlet Pipe** (Barrel Controls 0.85 cfs @ 4.34 fps)

Pond 1P: Detention Storage & Outlet - Chamber Wizard Field A

Chamber Model = Cultec R-150XLHD (Cultec Recharger® 150XLHD)
Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf
Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap
Row Length Adjustment= +0.75' x 2.65 sf x 15 rows

33.0" Wide + 6.0" Spacing = 39.0" C-C Row Spacing

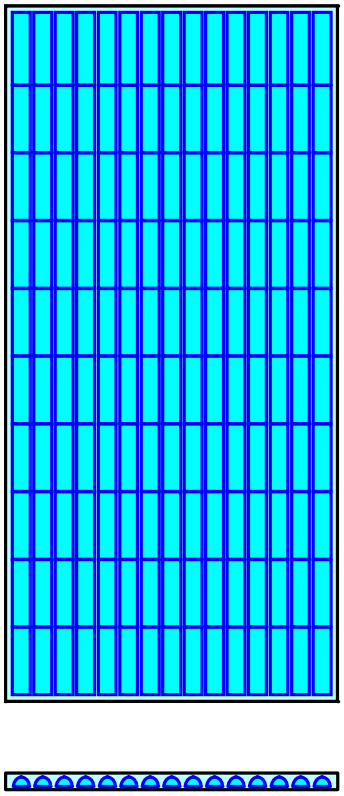
10 Chambers/Row x 10.25' Long +0.75' Row Adjustment = 103.25' Row Length +12.0" End Stone x 2 = 105.25' Base Length
15 Rows x 33.0" Wide + 6.0" Spacing x 14 + 12.0" Side Stone x 2 = 50.25' Base Width
6.0" Stone Base + 18.5" Chamber Height + 6.0" Stone Cover = 2.54' Field Height

150 Chambers x 27.2 cf +0.75' Row Adjustment x 2.65 sf x 15 Rows = 4,102.6 cf Chamber Storage

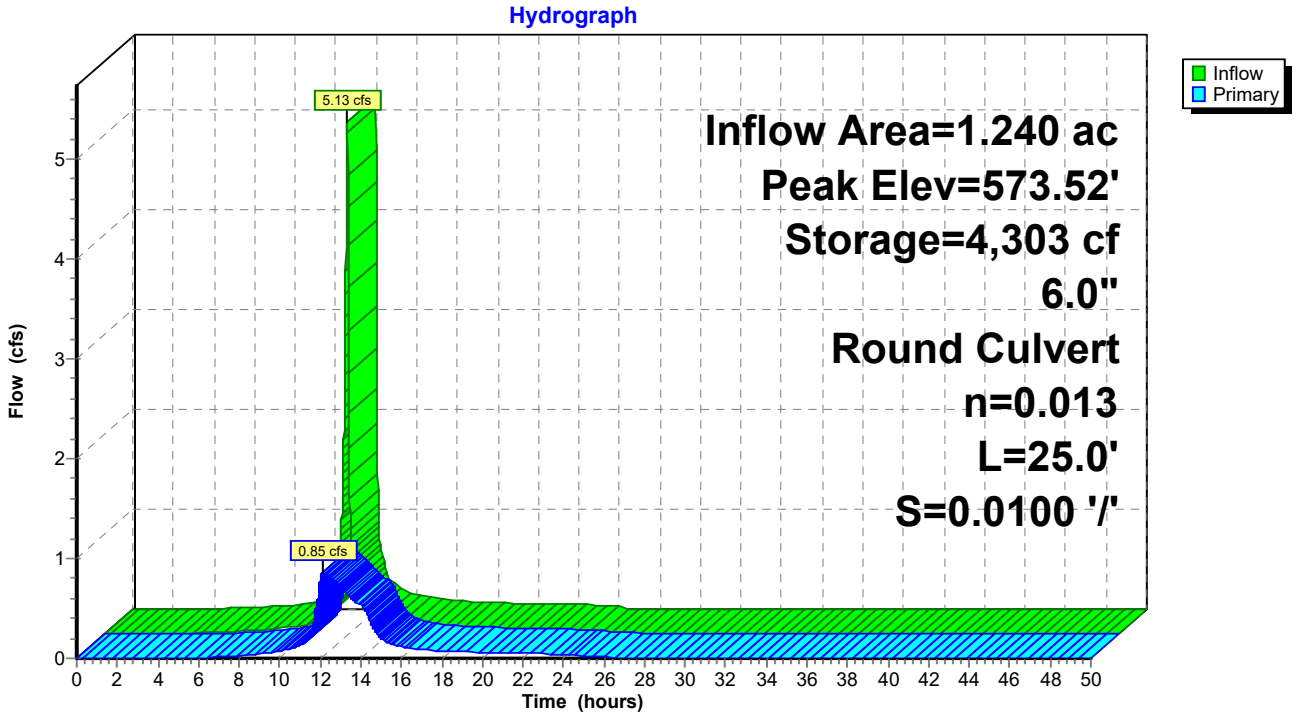
13,442.4 cf Field - 4,102.6 cf Chambers = 9,339.8 cf Stone x 40.0% Voids = 3,735.9 cf Stone Storage

Chamber Storage + Stone Storage = 7,838.5 cf = 0.180 af
Overall Storage Efficiency = 58.3%
Overall System Size = 105.25' x 50.25' x 2.54'

150 Chambers
497.9 cy Field
345.9 cy Stone



Pond 1P: Detention Storage & Outlet



Summary for Pond 2P: Detention Storage & Outlet

Inflow Area = 3.010 ac, 87.38% Impervious, Inflow Depth = 2.62" for 10-Year event
Inflow = 13.04 cfs @ 11.96 hrs, Volume= 0.657 af
Outflow = 1.58 cfs @ 12.21 hrs, Volume= 0.655 af, Atten= 88%, Lag= 14.9 min
Primary = 1.58 cfs @ 12.21 hrs, Volume= 0.655 af
Routed to Link 1L : Romney Rd Drainage System

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Peak Elev= 573.57' @ 12.21 hrs Surf.Area= 15,085 sf Storage= 12,975 cf

Plug-Flow detention time= 126.4 min calculated for 0.654 af (100% of inflow)
Center-of-Mass det. time= 123.8 min (894.6 - 770.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	572.25'	10,575 cf	**63.25'W x 238.50'L x 2.54'H Field A** 38,341 cf Overall - 11,903 cf Embedded = 26,438 cf x 40.0% Voids
#2A	572.75'	11,903 cf	**Cultec R-150XLHD** x 437 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 19 rows
		22,479 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	572.25'	**8.0" Round Outlet Pipe** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 572.25' / 572.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=1.58 cfs @ 12.21 hrs HW=573.57' TW=0.00' (Dynamic Tailwater)
↑—**1=Outlet Pipe** (Barrel Controls 1.58 cfs @ 4.53 fps)

Pond 2P: Detention Storage & Outlet - Chamber Wizard Field A

Chamber Model = Cultec R-150XLHD (Cultec Recharger® 150XLHD)
Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf
Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap
Row Length Adjustment= +0.75' x 2.65 sf x 19 rows

33.0" Wide + 6.0" Spacing = 39.0" C-C Row Spacing

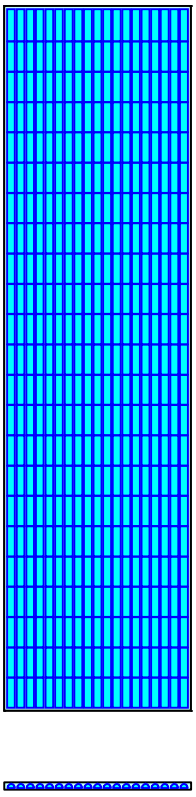
23 Chambers/Row x 10.25' Long +0.75' Row Adjustment = 236.50' Row Length +12.0" End Stone x 2 = 238.50' Base Length
19 Rows x 33.0" Wide + 6.0" Spacing x 18 + 12.0" Side Stone x 2 = 63.25' Base Width
6.0" Stone Base + 18.5" Chamber Height + 6.0" Stone Cover = 2.54' Field Height

437 Chambers x 27.2 cf +0.75' Row Adjustment x 2.65 sf x 19 Rows = 11,903.3 cf Chamber Storage

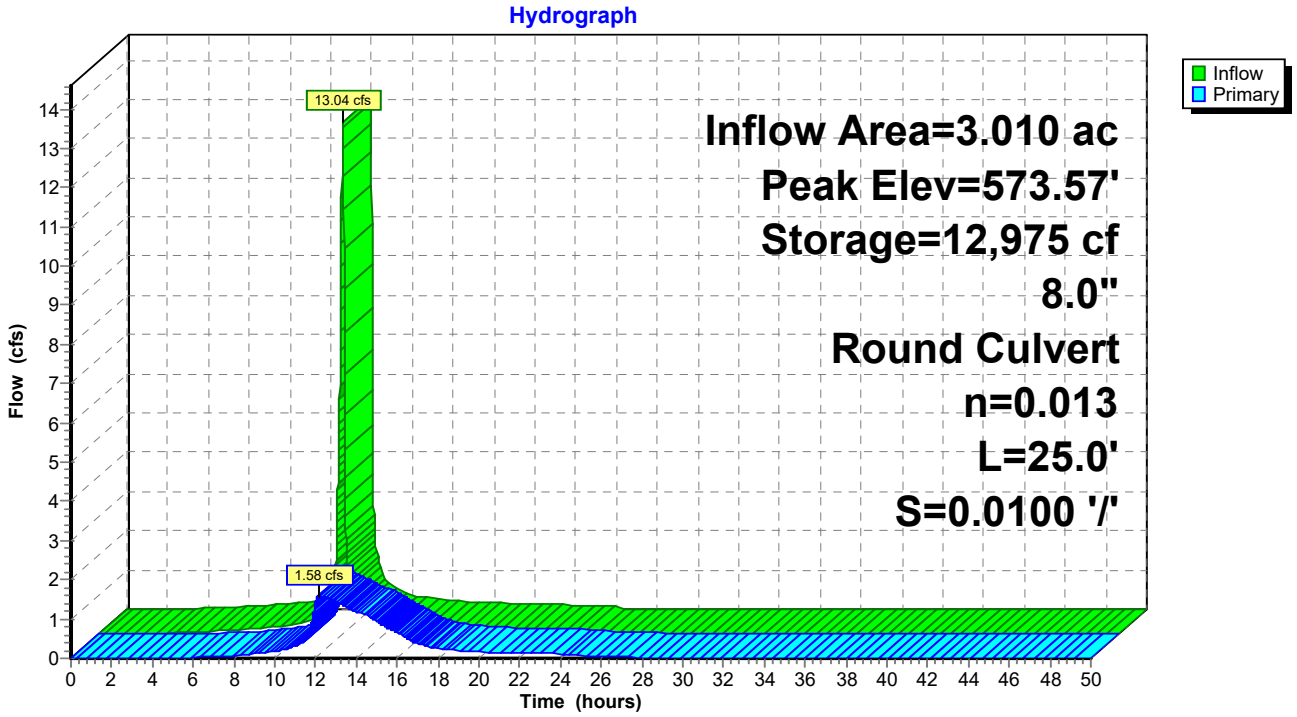
38,341.4 cf Field - 11,903.3 cf Chambers = 26,438.1 cf Stone x 40.0% Voids = 10,575.2 cf Stone Storage

Chamber Storage + Stone Storage = 22,478.5 cf = 0.516 af
Overall Storage Efficiency = 58.6%
Overall System Size = 238.50' x 63.25' x 2.54'

437 Chambers
1,420.1 cy Field
979.2 cy Stone



Pond 2P: Detention Storage & Outlet



Summary for Pond 3P: South Pond

Inflow Area = 2.710 ac, 83.03% Impervious, Inflow Depth = 2.52" for 10-Year event
Inflow = 11.49 cfs @ 11.96 hrs, Volume= 0.569 af
Outflow = 10.88 cfs @ 11.98 hrs, Volume= 0.567 af, Atten= 5%, Lag= 1.1 min
Primary = 10.88 cfs @ 11.98 hrs, Volume= 0.567 af
Routed to Pond 4P : North Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Peak Elev= 575.81' @ 11.99 hrs Surf.Area= 1,204 sf Storage= 1,561 cf

Plug-Flow detention time= 11.2 min calculated for 0.566 af (100% of inflow)
Center-of-Mass det. time= 8.9 min (786.9 - 778.0)

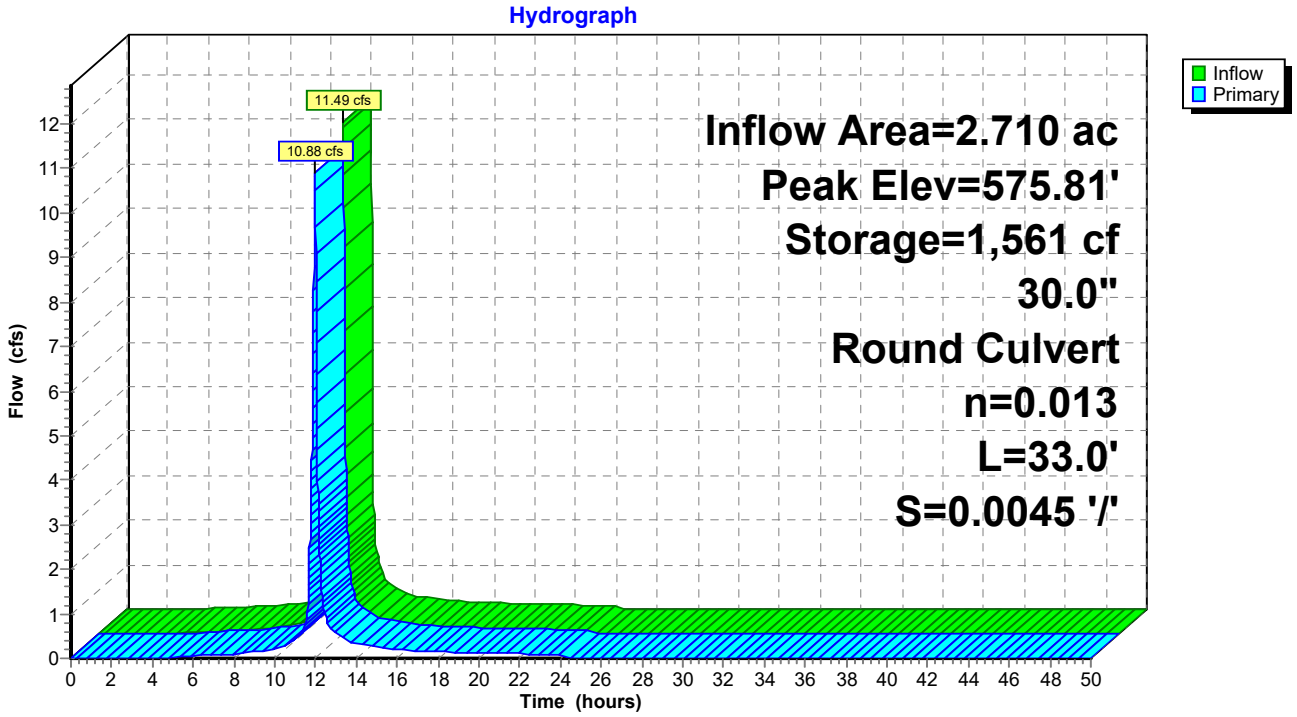
Volume	Invert	Avail.Storage	Storage Description
#1	574.00'	5,327 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
574.00	556	0	0
575.00	881	719	719
576.00	1,281	1,081	1,800
577.00	1,749	1,515	3,315
578.00	2,275	2,012	5,327

Device	Routing	Invert	Outlet Devices
#1	Primary	574.15'	**30.0" Round Outlet Pipe** L= 33.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 574.15' / 574.00' S= 0.0045 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=10.42 cfs @ 11.98 hrs HW=575.80' TW=575.28' (Dynamic Tailwater)
↑—**1=Outlet Pipe** (Outlet Controls 10.42 cfs @ 4.30 fps)

Pond 3P: South Pond



Summary for Pond 4P: North Pond

Inflow Area = 3.270 ac, 82.87% Impervious, Inflow Depth = 2.51" for 10-Year event
Inflow = 13.15 cfs @ 11.97 hrs, Volume= 0.684 af
Outflow = 9.33 cfs @ 12.03 hrs, Volume= 0.684 af, Atten= 29%, Lag= 3.4 min
Primary = 9.33 cfs @ 12.03 hrs, Volume= 0.684 af
Routed to Link 1L : Romney Rd Drainage System

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Peak Elev= 575.45' @ 12.03 hrs Surf.Area= 2,722 sf Storage= 3,907 cf

Plug-Flow detention time= 14.2 min calculated for 0.684 af (100% of inflow)
Center-of-Mass det. time= 14.0 min (799.4 - 785.4)

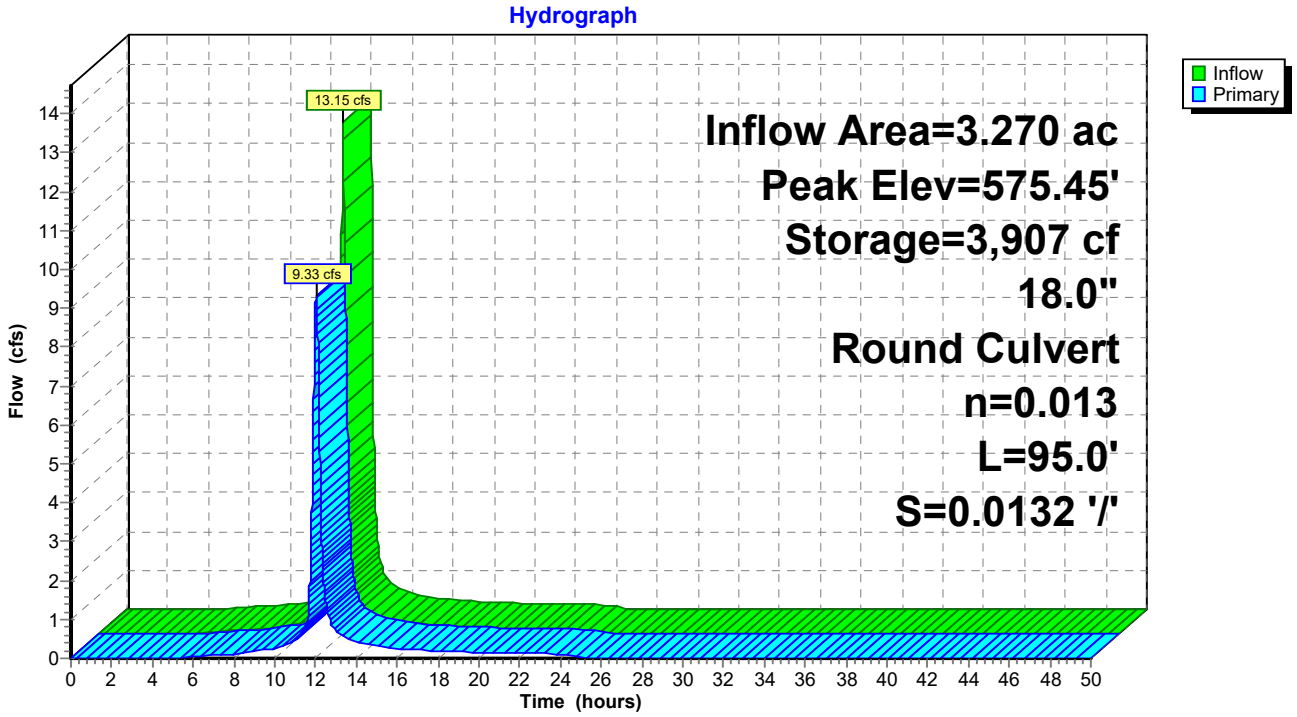
Volume	Invert	Avail.Storage	Storage Description
#1	573.50'	13,861 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
573.50	1,340	0	0
574.00	1,675	754	754
575.00	2,339	2,007	2,761
576.00	3,184	2,762	5,522
577.00	4,147	3,666	9,188
578.00	5,199	4,673	13,861

Device	Routing	Invert	Outlet Devices
#1	Primary	573.50'	**18.0" Round Outlet Pipe** L= 95.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 573.50' / 572.25' S= 0.0132 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=9.33 cfs @ 12.03 hrs HW=575.45' TW=0.00' (Dynamic Tailwater)
1=Outlet Pipe (Inlet Controls 9.33 cfs @ 5.28 fps)

Pond 4P: North Pond

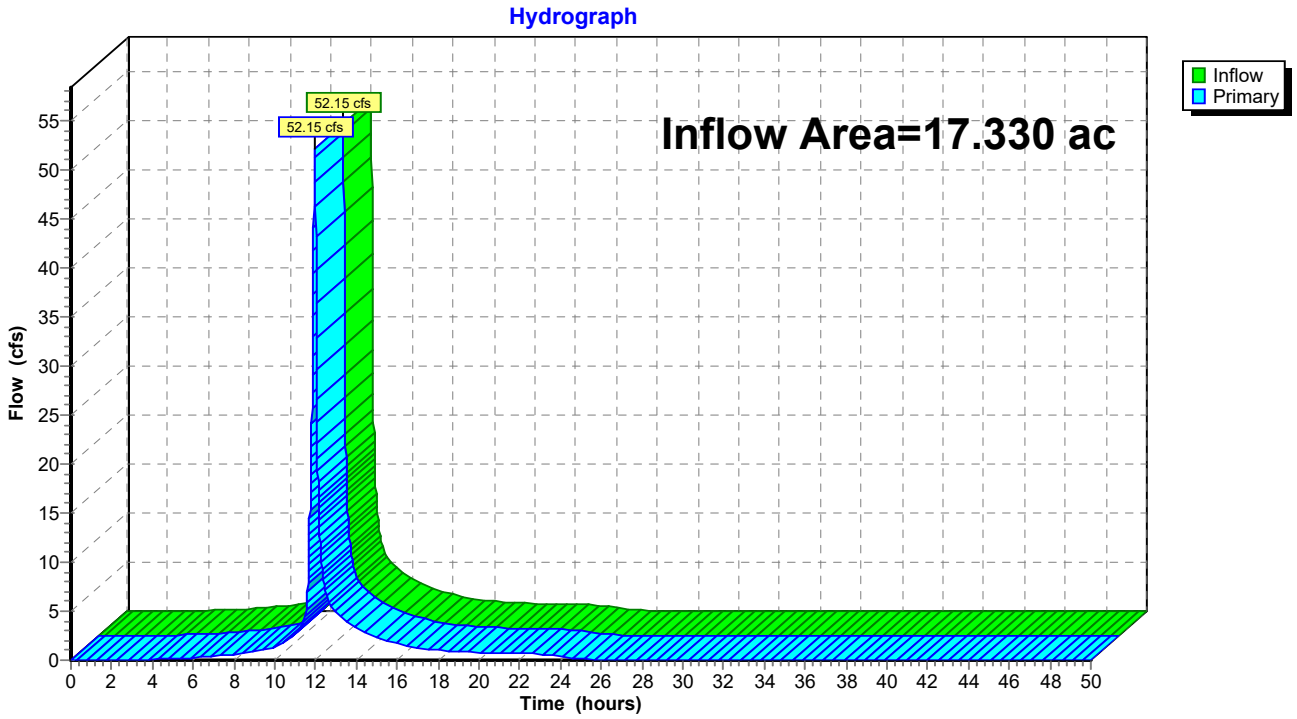


Summary for Link 1L: Romney Rd Drainage System

Inflow Area = 17.330 ac, 85.11% Impervious, Inflow Depth = 2.55" for 10-Year event
Inflow = 52.15 cfs @ 11.96 hrs, Volume= 3.677 af
Primary = 52.15 cfs @ 11.96 hrs, Volume= 3.677 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Link 1L: Romney Rd Drainage System



Time span=0.00-50.00 hrs, dt=0.01 hrs, 5001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Proposed Site Runoff Area=1.240 ac 79.84% Impervious Runoff Depth=3.06"
Flow Length=100' Slope=0.0100 '/' Tc=5.0 min CN=94 Runoff=6.39 cfs 0.316 af

Subcatchment2S: Proposed Site Runoff Area=3.010 ac 87.38% Impervious Runoff Depth=3.27"
Flow Length=100' Slope=0.0100 '/' Tc=5.0 min CN=96 Runoff=16.05 cfs 0.821 af

Subcatchment3S(1): Proposed Site Runoff Area=0.560 ac 82.14% Impervious Runoff Depth=3.17"
Flow Length=100' Slope=0.0100 '/' Tc=5.0 min CN=95 Runoff=2.94 cfs 0.148 af

Subcatchment3S(2): Proposed Site Runoff Area=2.710 ac 83.03% Impervious Runoff Depth=3.17"
Flow Length=100' Slope=0.0100 '/' Tc=5.0 min CN=95 Runoff=14.22 cfs 0.715 af

Subcatchment4S: Proposed Site Runoff Area=6.240 ac 85.26% Impervious Runoff Depth=3.17"
Flow Length=100' Slope=0.0100 '/' Tc=5.0 min CN=95 Runoff=32.75 cfs 1.646 af

Subcatchment5S: Proposed Site Runoff Area=3.570 ac 86.83% Impervious Runoff Depth=3.27"
Flow Length=100' Slope=0.0100 '/' Tc=5.0 min CN=96 Runoff=19.04 cfs 0.974 af

Pond 1P: Detention Storage & Outlet Peak Elev=573.83' Storage=5,481 cf Inflow=6.39 cfs 0.316 af
6.0" Round Culvert n=0.013 L=25.0' S=0.0100 '/' Outflow=0.97 cfs 0.316 af

Pond 2P: Detention Storage & Outlet Peak Elev=573.87' Storage=16,140 cf Inflow=16.05 cfs 0.821 af
8.0" Round Culvert n=0.013 L=25.0' S=0.0100 '/' Outflow=1.82 cfs 0.818 af

Pond 3P: South Pond Peak Elev=576.12' Storage=1,950 cf Inflow=14.22 cfs 0.715 af
30.0" Round Culvert n=0.013 L=33.0' S=0.0045 '/' Outflow=12.76 cfs 0.713 af

Pond 4P: North Pond Peak Elev=575.83' Storage=4,987 cf Inflow=15.70 cfs 0.860 af
18.0" Round Culvert n=0.013 L=95.0' S=0.0132 '/' Outflow=10.69 cfs 0.860 af

Link 1L: Romney Rd Drainage System Inflow=63.59 cfs 4.614 af
Primary=63.59 cfs 4.614 af

Total Runoff Area = 17.330 ac Runoff Volume = 4.619 af Average Runoff Depth = 3.20"
14.89% Pervious = 2.580 ac 85.11% Impervious = 14.750 ac

Summary for Subcatchment 1S: Proposed Site

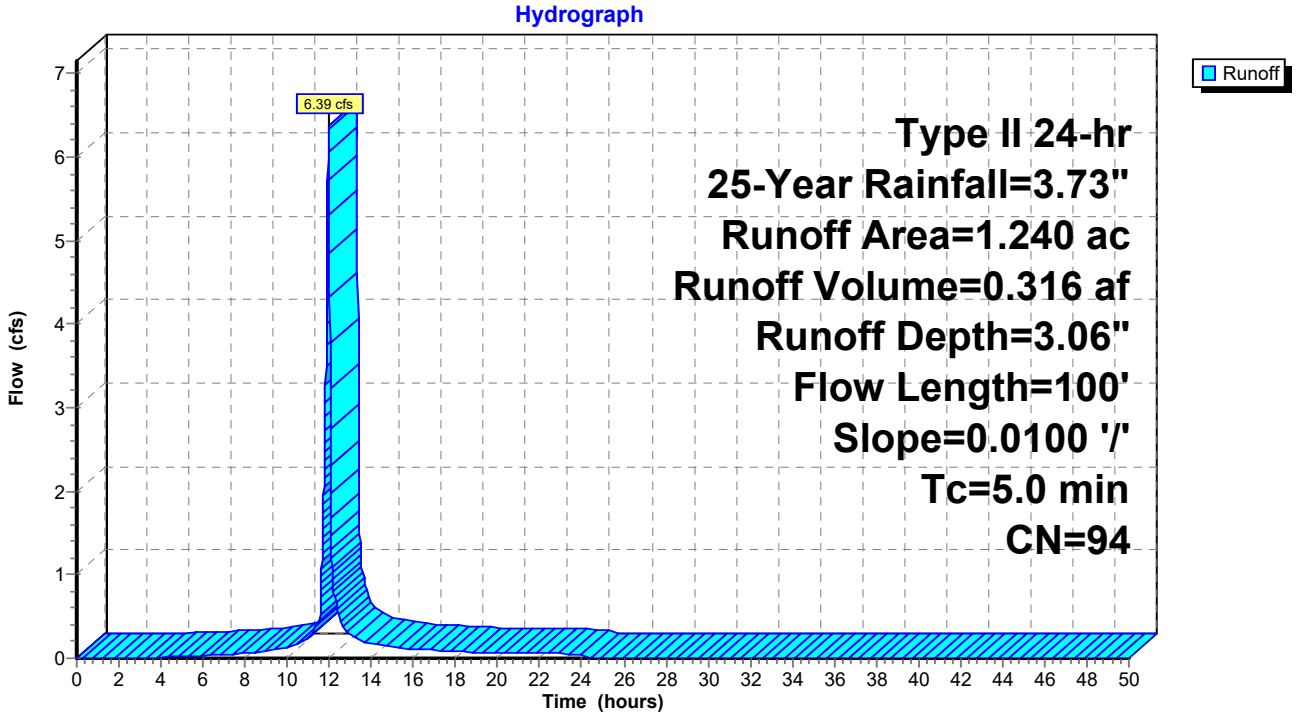
Runoff = 6.39 cfs @ 11.96 hrs, Volume= 0.316 af, Depth= 3.06"
Routed to Pond 1P : Detention Storage & Outlet

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Rainfall=3.73"

	Area (ac)	CN	Description
	0.250	80	>75% Grass cover, Good, HSG D
*	0.990	98	Impervious, HSG D
	1.240	94	Weighted Average
	0.250		20.16% Pervious Area
	0.990		79.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	100	0.0100	0.92		**Sheet Flow, Overland - Pvmt.** Smooth surfaces n= 0.011 P2= 2.50"
1.8	100	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 1S: Proposed Site



Summary for Subcatchment 2S: Proposed Site

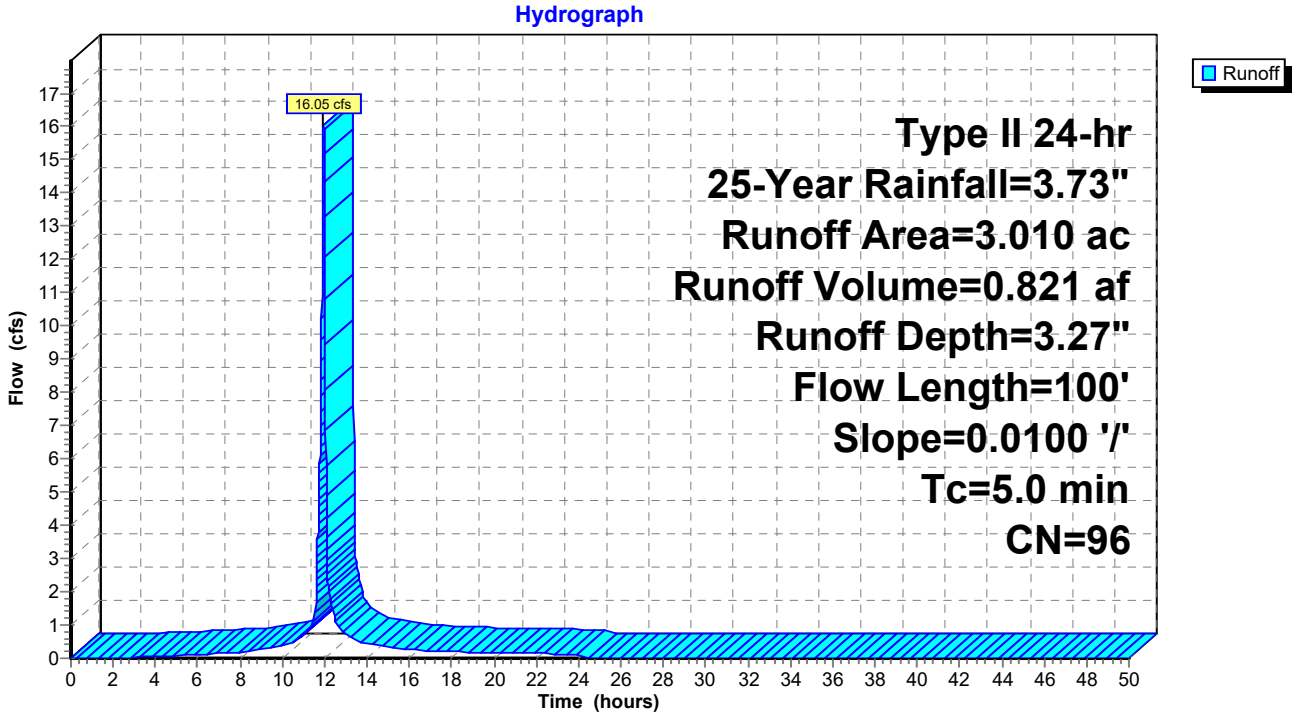
Runoff = 16.05 cfs @ 11.96 hrs, Volume= 0.821 af, Depth= 3.27"
Routed to Pond 2P : Detention Storage & Outlet

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Rainfall=3.73"

	Area (ac)	CN	Description
	0.380	80	>75% Grass cover, Good, HSG D
*	2.630	98	Impervious, HSG D
	3.010	96	Weighted Average
	0.380		12.62% Pervious Area
	2.630		87.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	100	0.0100	0.92		**Sheet Flow, Overland - Pvmt.** Smooth surfaces n= 0.011 P2= 2.50"
1.8	100	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 2S: Proposed Site



Summary for Subcatchment 3S(1): Proposed Site

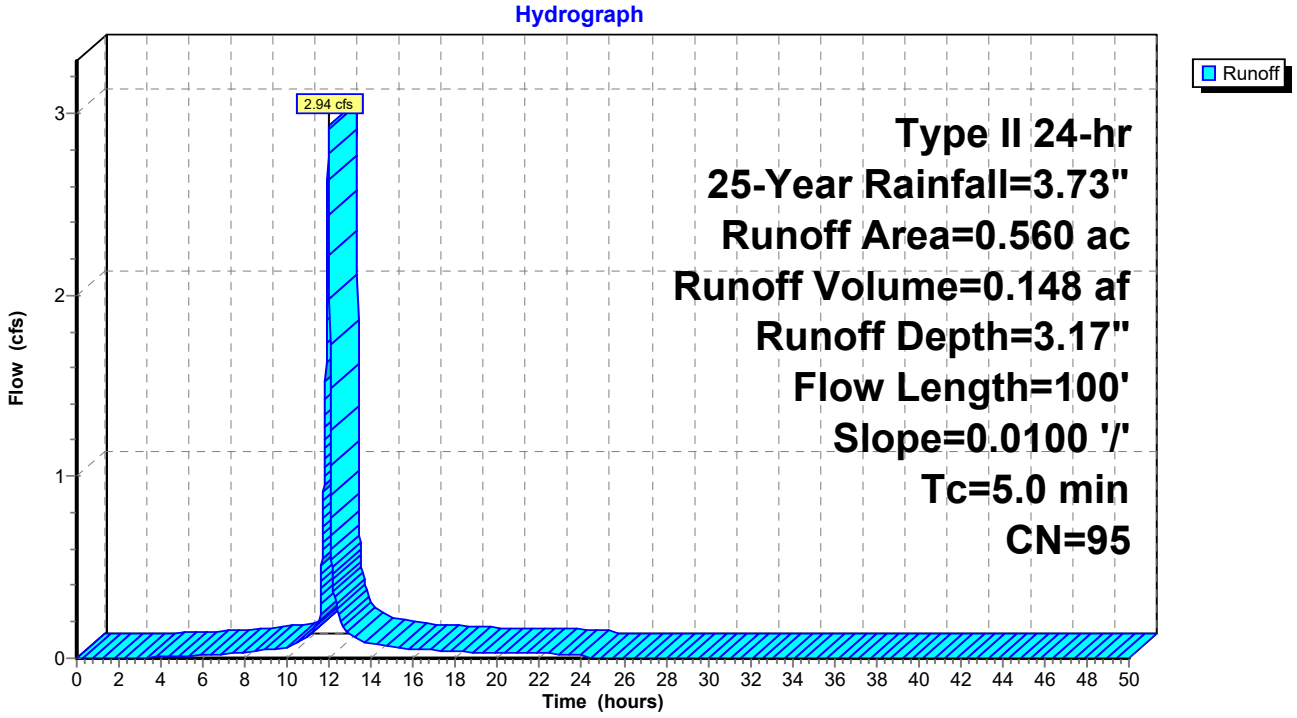
Runoff = 2.94 cfs @ 11.96 hrs, Volume= 0.148 af, Depth= 3.17"
Routed to Pond 4P : North Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Rainfall=3.73"

	Area (ac)	CN	Description
	0.100	80	>75% Grass cover, Good, HSG D
*	0.460	98	Impervious, HSG D
	0.560	95	Weighted Average
	0.100		17.86% Pervious Area
	0.460		82.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	100	0.0100	0.92		**Sheet Flow, Overland - Pvmt.** Smooth surfaces n= 0.011 P2= 2.50"
1.8	100	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 3S(1): Proposed Site



Summary for Subcatchment 3S(2): Proposed Site

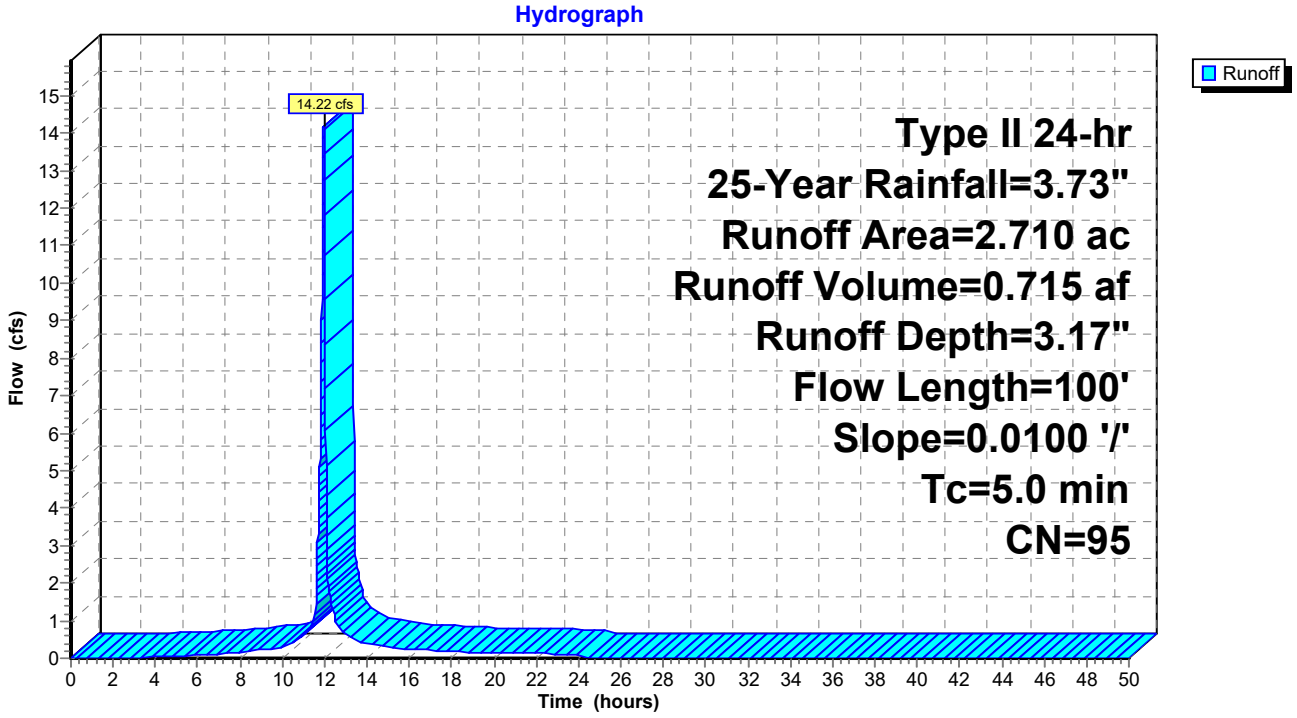
Runoff = 14.22 cfs @ 11.96 hrs, Volume= 0.715 af, Depth= 3.17"
Routed to Pond 3P : South Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Rainfall=3.73"

	Area (ac)	CN	Description
	0.460	80	>75% Grass cover, Good, HSG D
*	2.250	98	Impervious, HSG D
	2.710	95	Weighted Average
	0.460		16.97% Pervious Area
	2.250		83.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	100	0.0100	0.92		**Sheet Flow, Overland - Pvmt.** Smooth surfaces n= 0.011 P2= 2.50"
1.8	100	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 3S(2): Proposed Site



Summary for Subcatchment 4S: Proposed Site

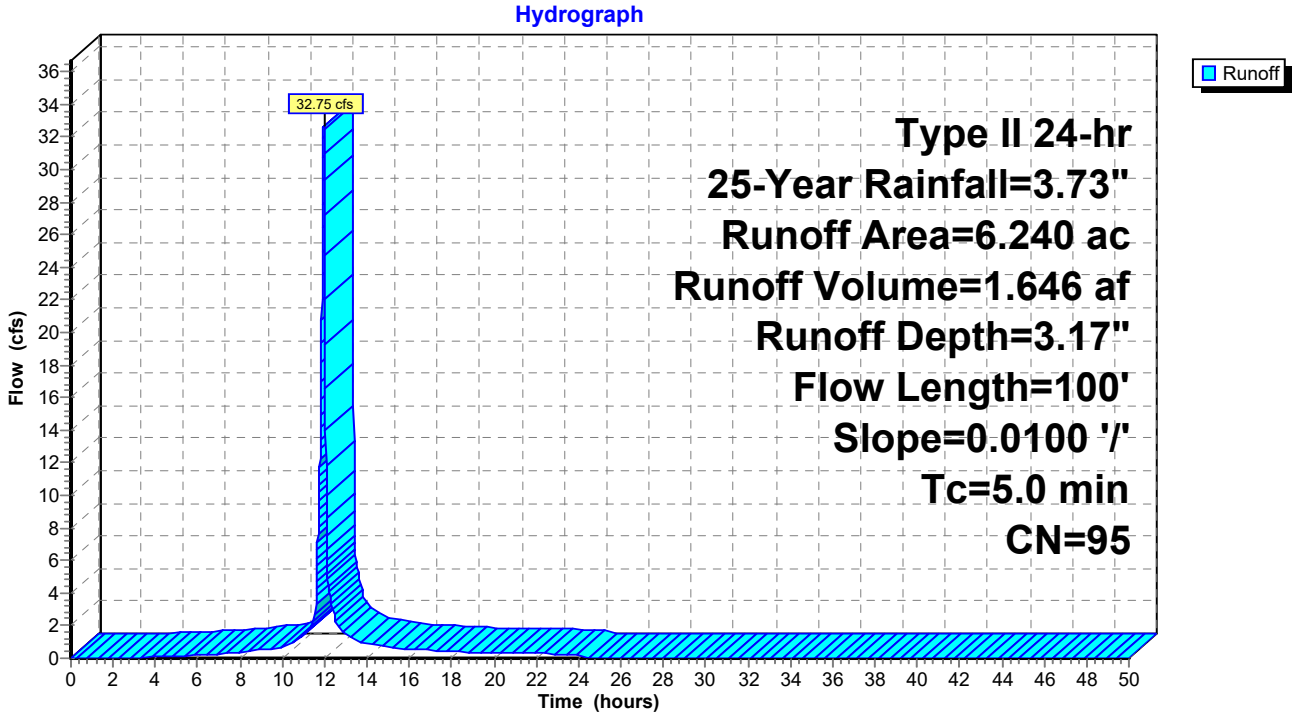
Runoff = 32.75 cfs @ 11.96 hrs, Volume= 1.646 af, Depth= 3.17"
Routed to Link 1L : Romney Rd Drainage System

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Rainfall=3.73"

	Area (ac)	CN	Description
	0.920	80	>75% Grass cover, Good, HSG D
*	5.320	98	Impervious, HSG D
	6.240	95	Weighted Average
	0.920		14.74% Pervious Area
	5.320		85.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	100	0.0100	0.92		**Sheet Flow, Overland - Pvmt.** Smooth surfaces n= 0.011 P2= 2.50"
1.8	100	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 4S: Proposed Site



Summary for Subcatchment 5S: Proposed Site

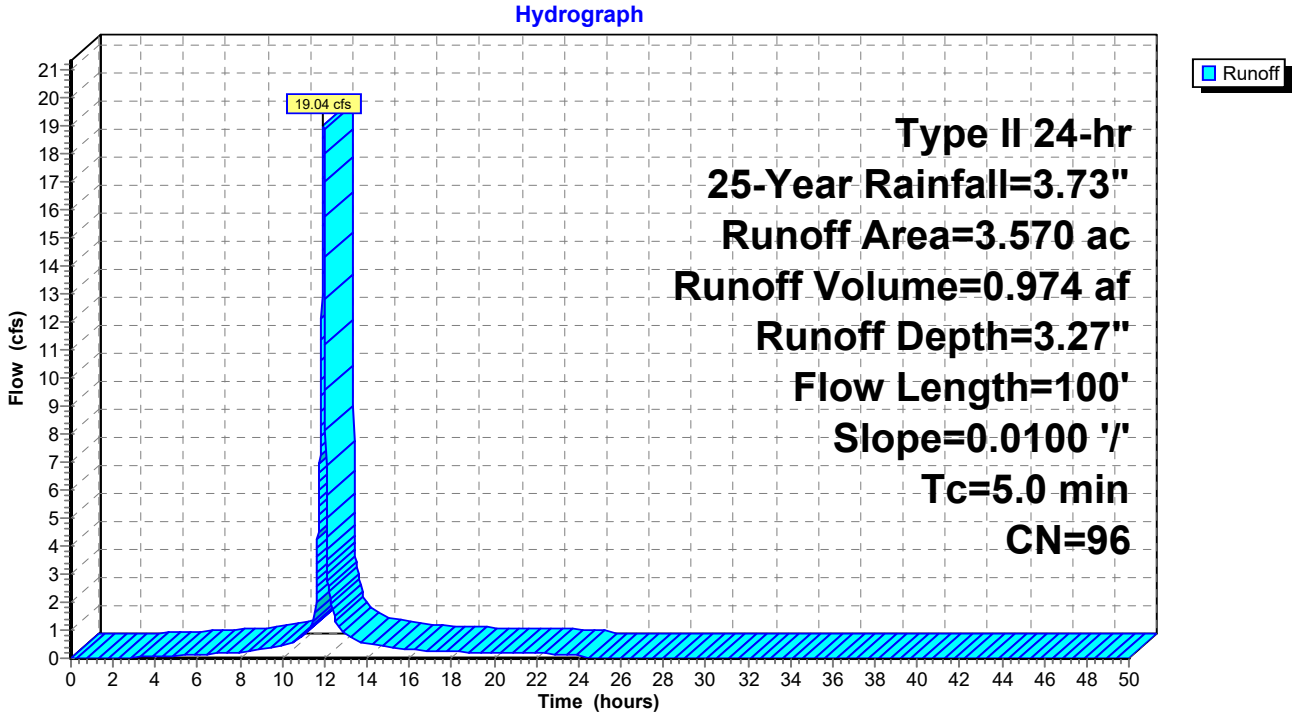
Runoff = 19.04 cfs @ 11.96 hrs, Volume= 0.974 af, Depth= 3.27"
Routed to Link 1L : Romney Rd Drainage System

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Rainfall=3.73"

	Area (ac)	CN	Description
	0.470	80	>75% Grass cover, Good, HSG D
*	3.100	98	Impervious, HSG D
	3.570	96	Weighted Average
	0.470		13.17% Pervious Area
	3.100		86.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	100	0.0100	0.92		**Sheet Flow, Overland - Pvmt.** Smooth surfaces n= 0.011 P2= 2.50"
1.8	100	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 5S: Proposed Site



Summary for Pond 1P: Detention Storage & Outlet

Inflow Area = 1.240 ac, 79.84% Impervious, Inflow Depth = 3.06" for 25-Year event
Inflow = 6.39 cfs @ 11.96 hrs, Volume= 0.316 af
Outflow = 0.97 cfs @ 12.14 hrs, Volume= 0.316 af, Atten= 85%, Lag= 10.9 min
Primary = 0.97 cfs @ 12.14 hrs, Volume= 0.316 af
Routed to Link 1L : Romney Rd Drainage System

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Peak Elev= 573.83' @ 12.14 hrs Surf.Area= 5,289 sf Storage= 5,481 cf

Plug-Flow detention time= 75.4 min calculated for 0.316 af (100% of inflow)
Center-of-Mass det. time= 74.5 min (852.4 - 777.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	572.25'	3,736 cf	**50.25'W x 105.25'L x 2.54'H Field A** 13,442 cf Overall - 4,103 cf Embedded = 9,340 cf x 40.0% Voids
#2A	572.75'	4,103 cf	**Cultec R-150XLHD** x 150 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 15 rows
		7,839 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	572.25'	**6.0" Round Outlet Pipe** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 572.25' / 572.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.97 cfs @ 12.14 hrs HW=573.83' TW=0.00' (Dynamic Tailwater)
↑—**1=Outlet Pipe** (Barrel Controls 0.97 cfs @ 4.96 fps)

Pond 1P: Detention Storage & Outlet - Chamber Wizard Field A

Chamber Model = Cultec R-150XLHD (Cultec Recharger® 150XLHD)
Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf
Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap
Row Length Adjustment= +0.75' x 2.65 sf x 15 rows

33.0" Wide + 6.0" Spacing = 39.0" C-C Row Spacing

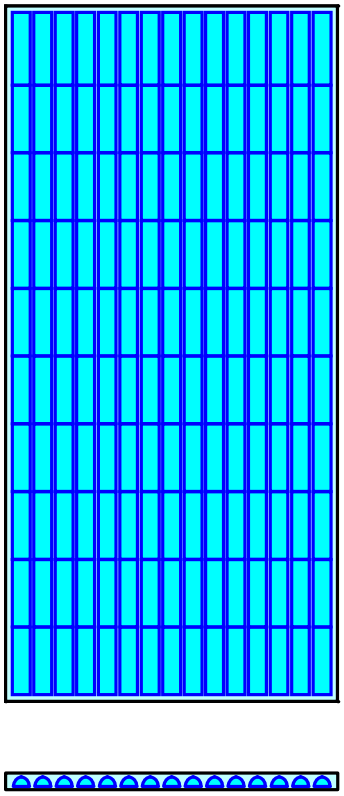
10 Chambers/Row x 10.25' Long +0.75' Row Adjustment = 103.25' Row Length +12.0" End Stone x 2 = 105.25' Base Length
15 Rows x 33.0" Wide + 6.0" Spacing x 14 + 12.0" Side Stone x 2 = 50.25' Base Width
6.0" Stone Base + 18.5" Chamber Height + 6.0" Stone Cover = 2.54' Field Height

150 Chambers x 27.2 cf +0.75' Row Adjustment x 2.65 sf x 15 Rows = 4,102.6 cf Chamber Storage

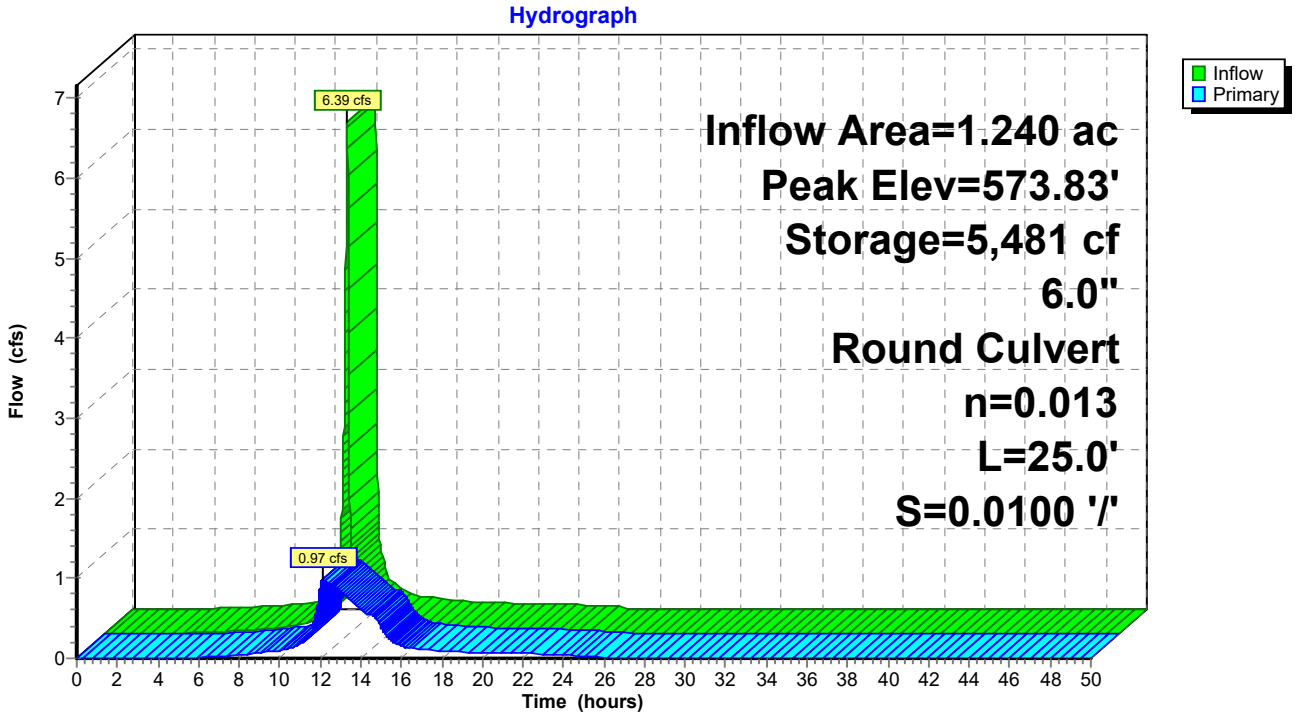
13,442.4 cf Field - 4,102.6 cf Chambers = 9,339.8 cf Stone x 40.0% Voids = 3,735.9 cf Stone Storage

Chamber Storage + Stone Storage = 7,838.5 cf = 0.180 af
Overall Storage Efficiency = 58.3%
Overall System Size = 105.25' x 50.25' x 2.54'

150 Chambers
497.9 cy Field
345.9 cy Stone



Pond 1P: Detention Storage & Outlet



Summary for Pond 2P: Detention Storage & Outlet

Inflow Area = 3.010 ac, 87.38% Impervious, Inflow Depth = 3.27" for 25-Year event
Inflow = 16.05 cfs @ 11.96 hrs, Volume= 0.821 af
Outflow = 1.82 cfs @ 12.24 hrs, Volume= 0.818 af, Atten= 89%, Lag= 17.1 min
Primary = 1.82 cfs @ 12.24 hrs, Volume= 0.818 af
Routed to Link 1L : Romney Rd Drainage System

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Peak Elev= 573.87' @ 12.24 hrs Surf.Area= 15,085 sf Storage= 16,140 cf

Plug-Flow detention time= 128.2 min calculated for 0.818 af (100% of inflow)
Center-of-Mass det. time= 125.8 min (891.1 - 765.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	572.25'	10,575 cf	**63.25'W x 238.50'L x 2.54'H Field A** 38,341 cf Overall - 11,903 cf Embedded = 26,438 cf x 40.0% Voids
#2A	572.75'	11,903 cf	**Cultec R-150XLHD** x 437 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 19 rows
		22,479 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	572.25'	**8.0" Round Outlet Pipe** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 572.25' / 572.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=1.82 cfs @ 12.24 hrs HW=573.87' TW=0.00' (Dynamic Tailwater)
↑—**1=Outlet Pipe** (Barrel Controls 1.82 cfs @ 5.22 fps)

Pond 2P: Detention Storage & Outlet - Chamber Wizard Field A

Chamber Model = Cultec R-150XLHD (Cultec Recharger® 150XLHD)
Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf
Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap
Row Length Adjustment= +0.75' x 2.65 sf x 19 rows

33.0" Wide + 6.0" Spacing = 39.0" C-C Row Spacing

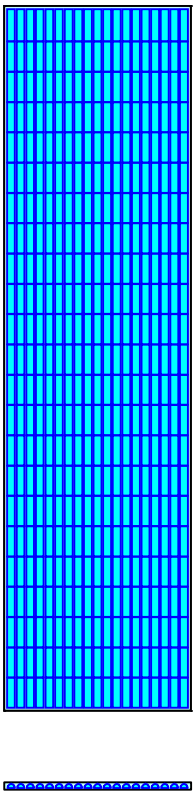
23 Chambers/Row x 10.25' Long +0.75' Row Adjustment = 236.50' Row Length +12.0" End Stone x 2 = 238.50' Base Length
19 Rows x 33.0" Wide + 6.0" Spacing x 18 + 12.0" Side Stone x 2 = 63.25' Base Width
6.0" Stone Base + 18.5" Chamber Height + 6.0" Stone Cover = 2.54' Field Height

437 Chambers x 27.2 cf +0.75' Row Adjustment x 2.65 sf x 19 Rows = 11,903.3 cf Chamber Storage

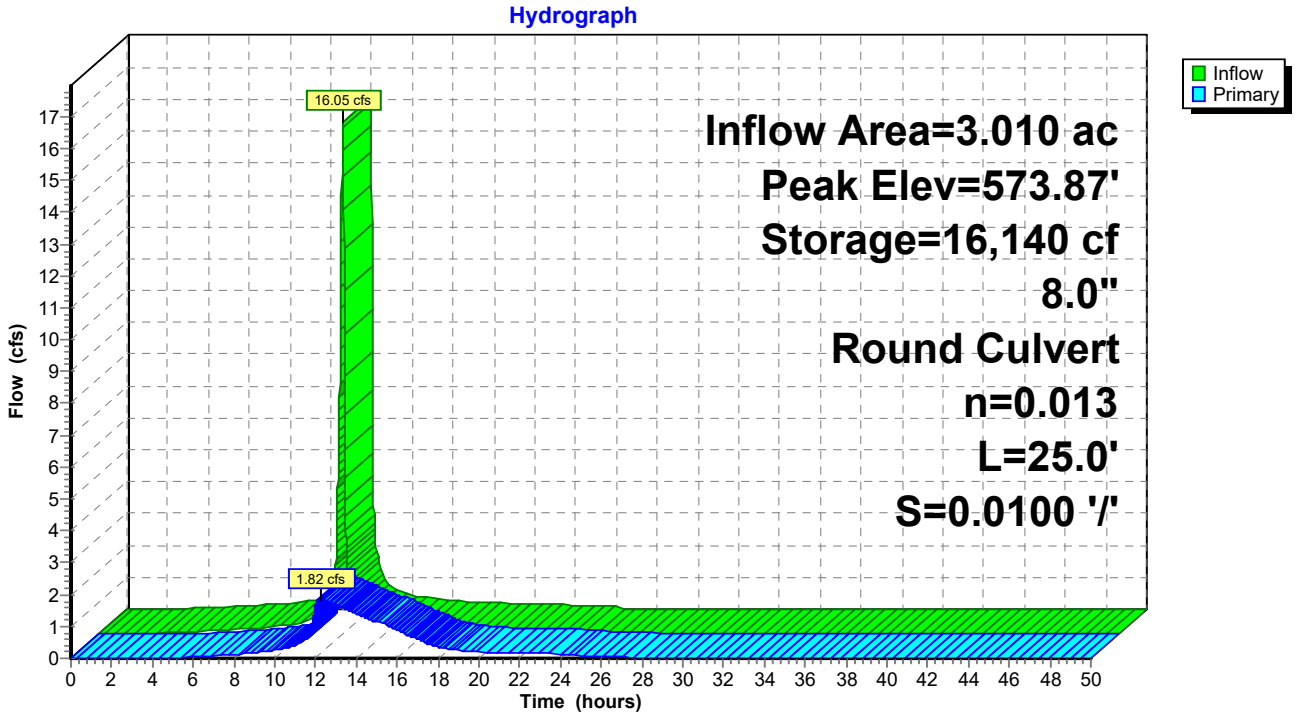
38,341.4 cf Field - 11,903.3 cf Chambers = 26,438.1 cf Stone x 40.0% Voids = 10,575.2 cf Stone Storage

Chamber Storage + Stone Storage = 22,478.5 cf = 0.516 af
Overall Storage Efficiency = 58.6%
Overall System Size = 238.50' x 63.25' x 2.54'

437 Chambers
1,420.1 cy Field
979.2 cy Stone



Pond 2P: Detention Storage & Outlet



Summary for Pond 3P: South Pond

Inflow Area = 2.710 ac, 83.03% Impervious, Inflow Depth = 3.17" for 25-Year event
Inflow = 14.22 cfs @ 11.96 hrs, Volume= 0.715 af
Outflow = 12.76 cfs @ 11.96 hrs, Volume= 0.713 af, Atten= 10%, Lag= 0.1 min
Primary = 12.76 cfs @ 11.96 hrs, Volume= 0.713 af
Routed to Pond 4P : North Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Peak Elev= 576.12' @ 12.01 hrs Surf.Area= 1,335 sf Storage= 1,950 cf

Plug-Flow detention time= 10.1 min calculated for 0.713 af (100% of inflow)
Center-of-Mass det. time= 8.1 min (780.1 - 772.0)

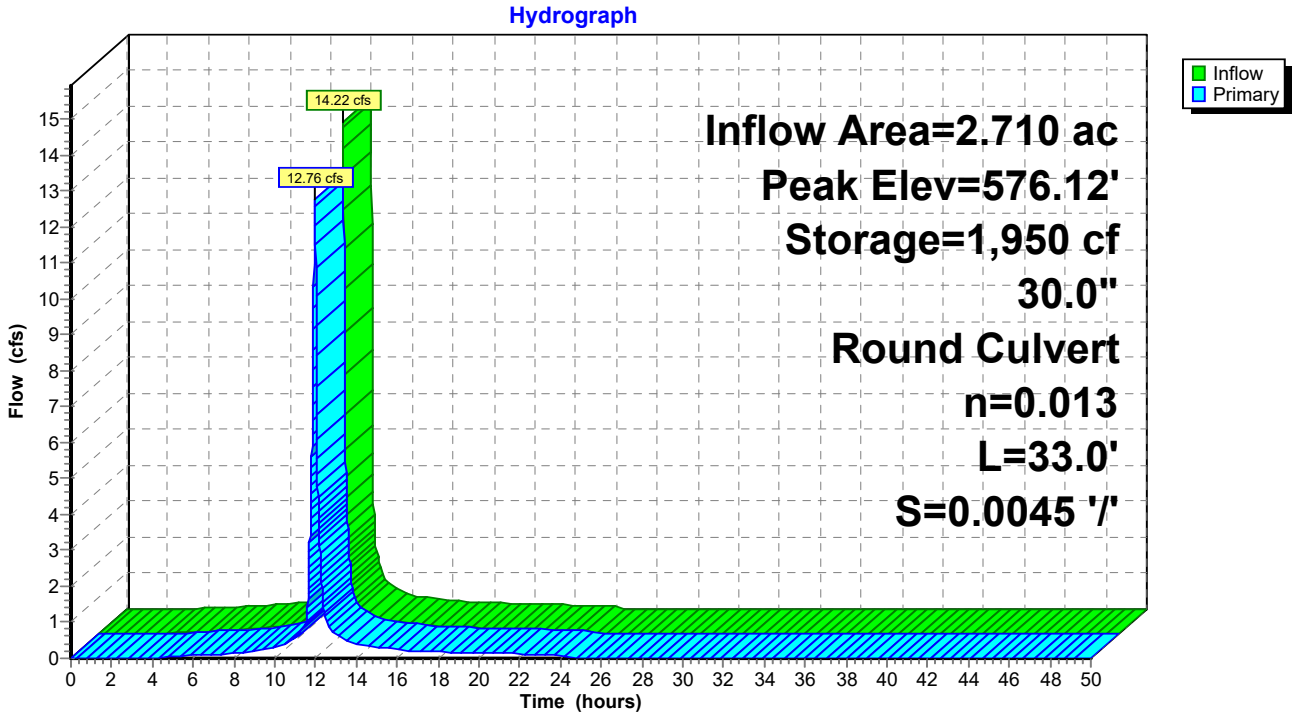
Volume	Invert	Avail.Storage	Storage Description
#1	574.00'	5,327 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
574.00	556	0	0
575.00	881	719	719
576.00	1,281	1,081	1,800
577.00	1,749	1,515	3,315
578.00	2,275	2,012	5,327

Device	Routing	Invert	Outlet Devices
#1	Primary	574.15'	**30.0" Round Outlet Pipe** L= 33.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 574.15' / 574.00' S= 0.0045 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=11.83 cfs @ 11.96 hrs HW=575.99' TW=575.49' (Dynamic Tailwater)
↑—**1=Outlet Pipe** (Outlet Controls 11.83 cfs @ 4.25 fps)

Pond 3P: South Pond



Summary for Pond 4P: North Pond

Inflow Area = 3.270 ac, 82.87% Impervious, Inflow Depth = 3.16" for 25-Year event
Inflow = 15.70 cfs @ 11.96 hrs, Volume= 0.860 af
Outflow = 10.69 cfs @ 12.03 hrs, Volume= 0.860 af, Atten= 32%, Lag= 4.5 min
Primary = 10.69 cfs @ 12.03 hrs, Volume= 0.860 af
Routed to Link 1L : Romney Rd Drainage System

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Peak Elev= 575.83' @ 12.03 hrs Surf.Area= 3,039 sf Storage= 4,987 cf

Plug-Flow detention time= 13.3 min calculated for 0.860 af (100% of inflow)
Center-of-Mass det. time= 13.1 min (791.8 - 778.7)

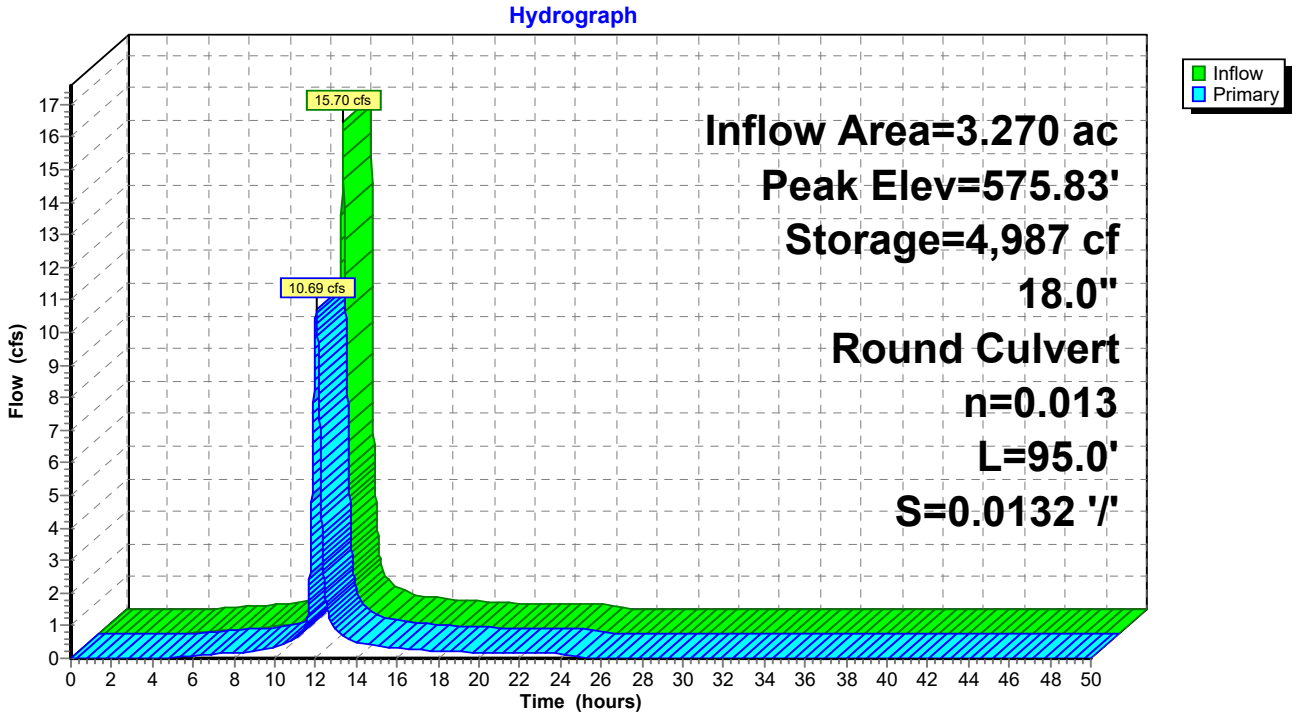
Volume	Invert	Avail.Storage	Storage Description
#1	573.50'	13,861 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
573.50	1,340	0	0
574.00	1,675	754	754
575.00	2,339	2,007	2,761
576.00	3,184	2,762	5,522
577.00	4,147	3,666	9,188
578.00	5,199	4,673	13,861

Device	Routing	Invert	Outlet Devices
#1	Primary	573.50'	**18.0" Round Outlet Pipe** L= 95.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 573.50' / 572.25' S= 0.0132 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=10.68 cfs @ 12.03 hrs HW=575.83' TW=0.00' (Dynamic Tailwater)
1=Outlet Pipe (Inlet Controls 10.68 cfs @ 6.05 fps)

Pond 4P: North Pond

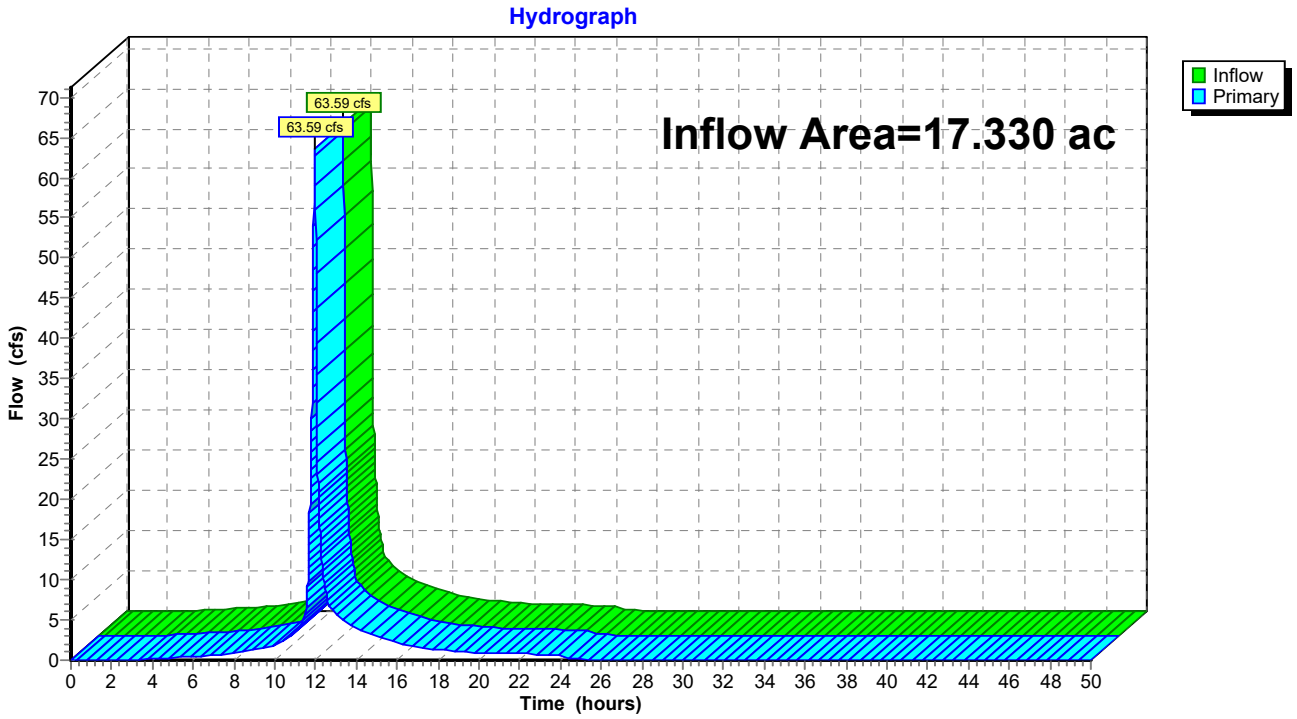


Summary for Link 1L: Romney Rd Drainage System

Inflow Area = 17.330 ac, 85.11% Impervious, Inflow Depth = 3.19" for 25-Year event
Inflow = 63.59 cfs @ 11.96 hrs, Volume= 4.614 af
Primary = 63.59 cfs @ 11.96 hrs, Volume= 4.614 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Link 1L: Romney Rd Drainage System



Time span=0.00-50.00 hrs, dt=0.01 hrs, 5001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Proposed Site Runoff Area=1.240 ac 79.84% Impervious Runoff Depth=4.34"
Flow Length=100' Slope=0.0100 '/' Tc=5.0 min CN=94 Runoff=8.85 cfs 0.448 af

Subcatchment2S: Proposed Site Runoff Area=3.010 ac 87.38% Impervious Runoff Depth=4.56"
Flow Length=100' Slope=0.0100 '/' Tc=5.0 min CN=96 Runoff=21.93 cfs 1.144 af

Subcatchment3S(1): Proposed Site Runoff Area=0.560 ac 82.14% Impervious Runoff Depth=4.45"
Flow Length=100' Slope=0.0100 '/' Tc=5.0 min CN=95 Runoff=4.04 cfs 0.208 af

Subcatchment3S(2): Proposed Site Runoff Area=2.710 ac 83.03% Impervious Runoff Depth=4.45"
Flow Length=100' Slope=0.0100 '/' Tc=5.0 min CN=95 Runoff=19.55 cfs 1.005 af

Subcatchment4S: Proposed Site Runoff Area=6.240 ac 85.26% Impervious Runoff Depth=4.45"
Flow Length=100' Slope=0.0100 '/' Tc=5.0 min CN=95 Runoff=45.03 cfs 2.314 af

Subcatchment5S: Proposed Site Runoff Area=3.570 ac 86.83% Impervious Runoff Depth=4.56"
Flow Length=100' Slope=0.0100 '/' Tc=5.0 min CN=96 Runoff=26.01 cfs 1.357 af

Pond 1P: Detention Storage & Outlet Peak Elev=574.77' Storage=7,797 cf Inflow=8.85 cfs 0.448 af
6.0" Round Culvert n=0.013 L=25.0' S=0.0100 '/' Outflow=1.27 cfs 0.448 af

Pond 2P: Detention Storage & Outlet Peak Elev=574.77' Storage=22,375 cf Inflow=21.93 cfs 1.144 af
8.0" Round Culvert n=0.013 L=25.0' S=0.0100 '/' Outflow=2.41 cfs 1.142 af

Pond 3P: South Pond Peak Elev=576.76' Storage=2,910 cf Inflow=19.55 cfs 1.005 af
30.0" Round Culvert n=0.013 L=33.0' S=0.0045 '/' Outflow=16.44 cfs 1.003 af

Pond 4P: North Pond Peak Elev=576.52' Storage=7,322 cf Inflow=20.43 cfs 1.210 af
18.0" Round Culvert n=0.013 L=95.0' S=0.0132 '/' Outflow=12.83 cfs 1.210 af

Link 1L: Romney Rd Drainage System Inflow=85.32 cfs 6.470 af
Primary=85.32 cfs 6.470 af

Total Runoff Area = 17.330 ac Runoff Volume = 6.476 af Average Runoff Depth = 4.48"
14.89% Pervious = 2.580 ac 85.11% Impervious = 14.750 ac

Summary for Subcatchment 1S: Proposed Site

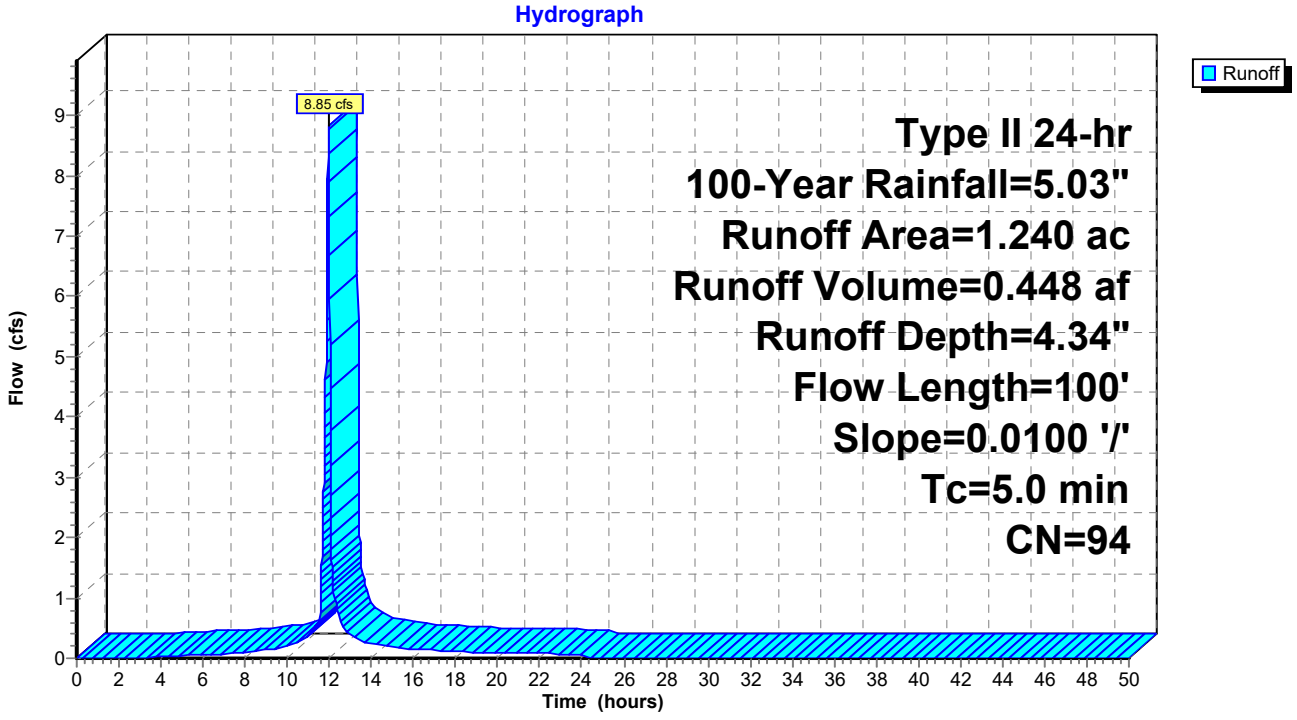
Runoff = 8.85 cfs @ 11.96 hrs, Volume= 0.448 af, Depth= 4.34"
Routed to Pond 1P : Detention Storage & Outlet

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Rainfall=5.03"

	Area (ac)	CN	Description
	0.250	80	>75% Grass cover, Good, HSG D
*	0.990	98	Impervious, HSG D
	1.240	94	Weighted Average
	0.250		20.16% Pervious Area
	0.990		79.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	100	0.0100	0.92		**Sheet Flow, Overland - Pvmt.** Smooth surfaces n= 0.011 P2= 2.50"
1.8	100	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 1S: Proposed Site



Summary for Subcatchment 2S: Proposed Site

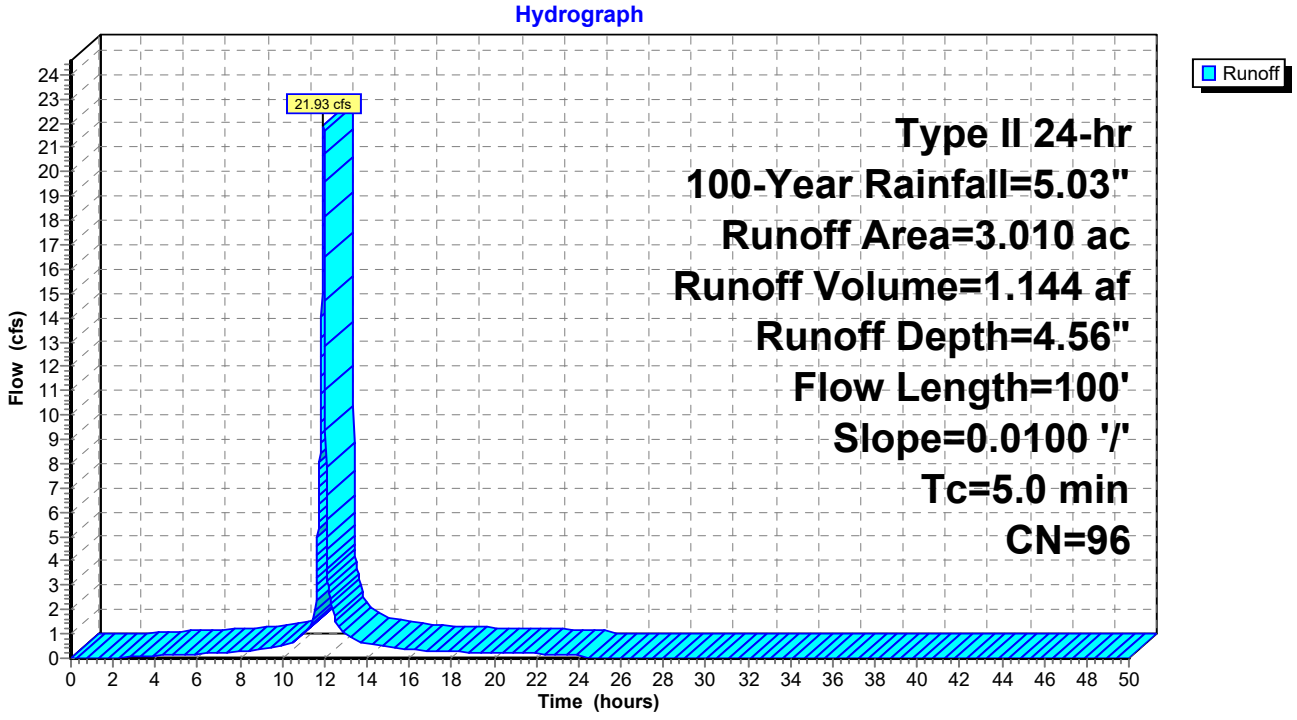
Runoff = 21.93 cfs @ 11.96 hrs, Volume= 1.144 af, Depth= 4.56"
Routed to Pond 2P : Detention Storage & Outlet

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Rainfall=5.03"

	Area (ac)	CN	Description
	0.380	80	>75% Grass cover, Good, HSG D
*	2.630	98	Impervious, HSG D
	3.010	96	Weighted Average
	0.380		12.62% Pervious Area
	2.630		87.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	100	0.0100	0.92		**Sheet Flow, Overland - Pvmt.** Smooth surfaces n= 0.011 P2= 2.50"
1.8	100	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 2S: Proposed Site



Summary for Subcatchment 3S(1): Proposed Site

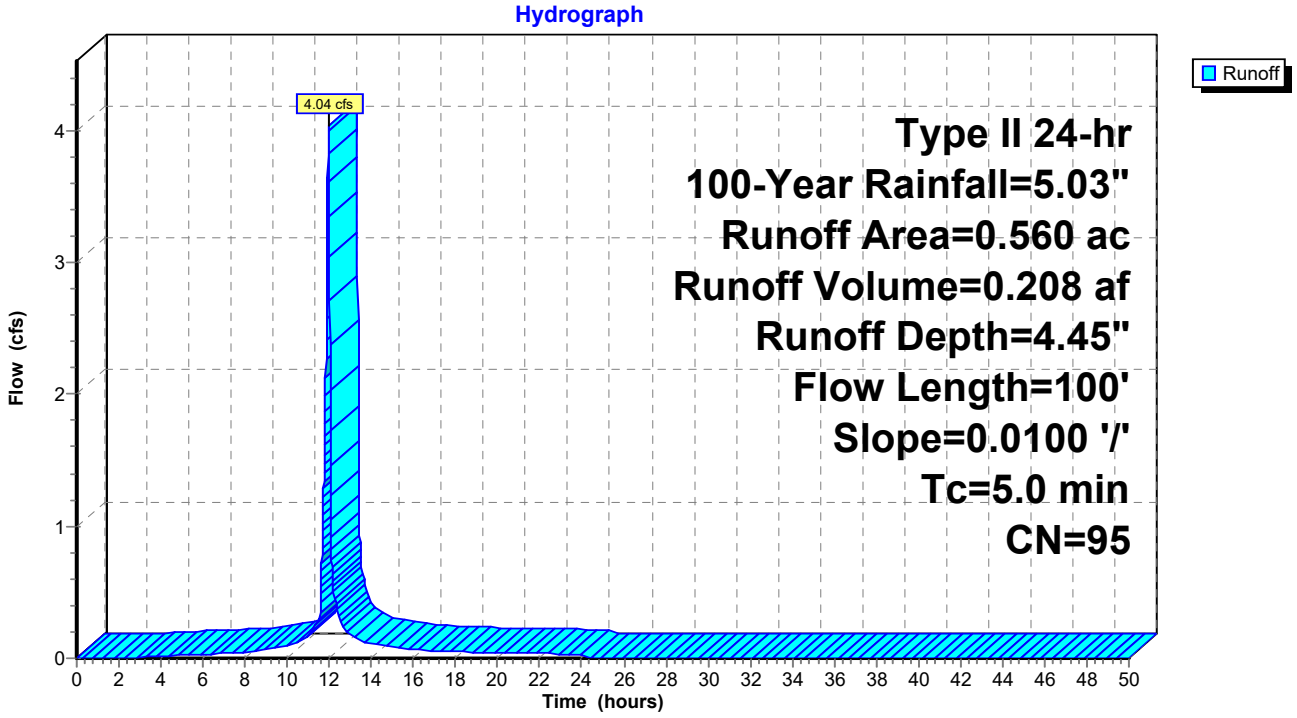
Runoff = 4.04 cfs @ 11.96 hrs, Volume= 0.208 af, Depth= 4.45"
Routed to Pond 4P : North Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Rainfall=5.03"

	Area (ac)	CN	Description
	0.100	80	>75% Grass cover, Good, HSG D
*	0.460	98	Impervious, HSG D
	0.560	95	Weighted Average
	0.100		17.86% Pervious Area
	0.460		82.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	100	0.0100	0.92		**Sheet Flow, Overland - Pvmt.** Smooth surfaces n= 0.011 P2= 2.50"
1.8	100	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 3S(1): Proposed Site



Summary for Subcatchment 3S(2): Proposed Site

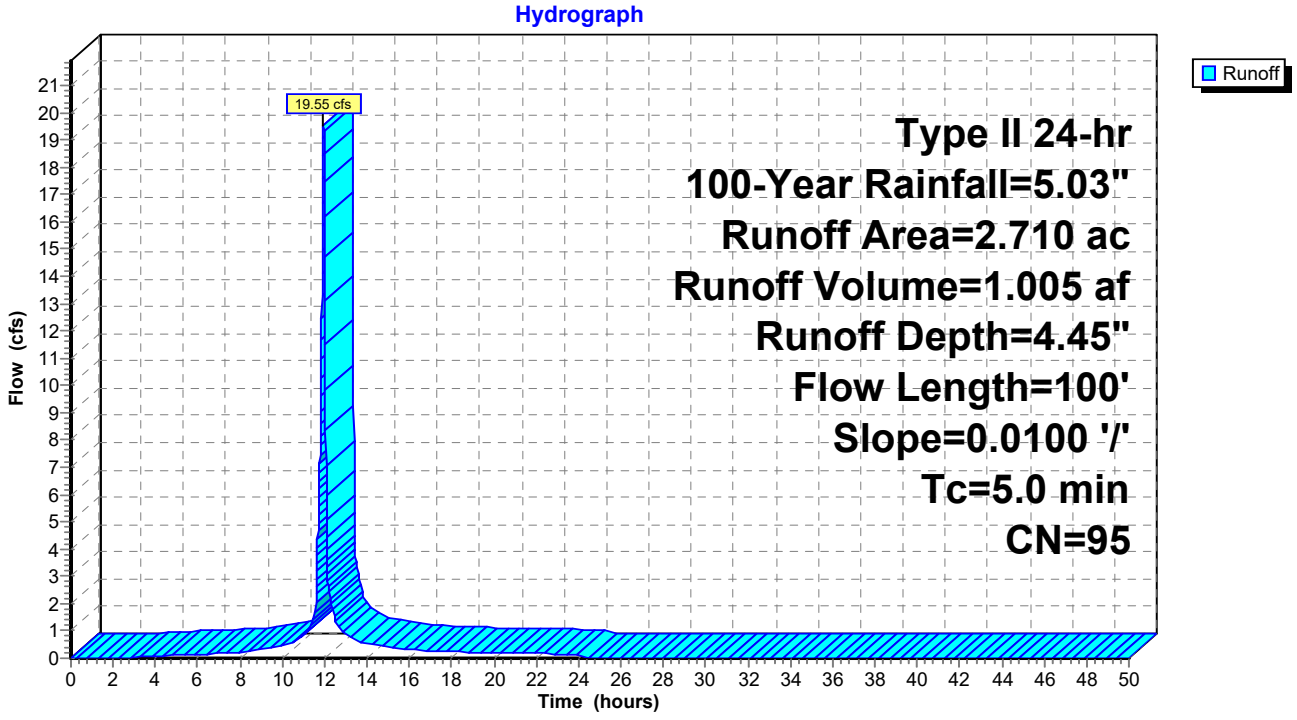
Runoff = 19.55 cfs @ 11.96 hrs, Volume= 1.005 af, Depth= 4.45"
Routed to Pond 3P : South Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Rainfall=5.03"

	Area (ac)	CN	Description
	0.460	80	>75% Grass cover, Good, HSG D
*	2.250	98	Impervious, HSG D
	2.710	95	Weighted Average
	0.460		16.97% Pervious Area
	2.250		83.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	100	0.0100	0.92		**Sheet Flow, Overland - Pvmt.** Smooth surfaces n= 0.011 P2= 2.50"
1.8	100	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 3S(2): Proposed Site



Summary for Subcatchment 4S: Proposed Site

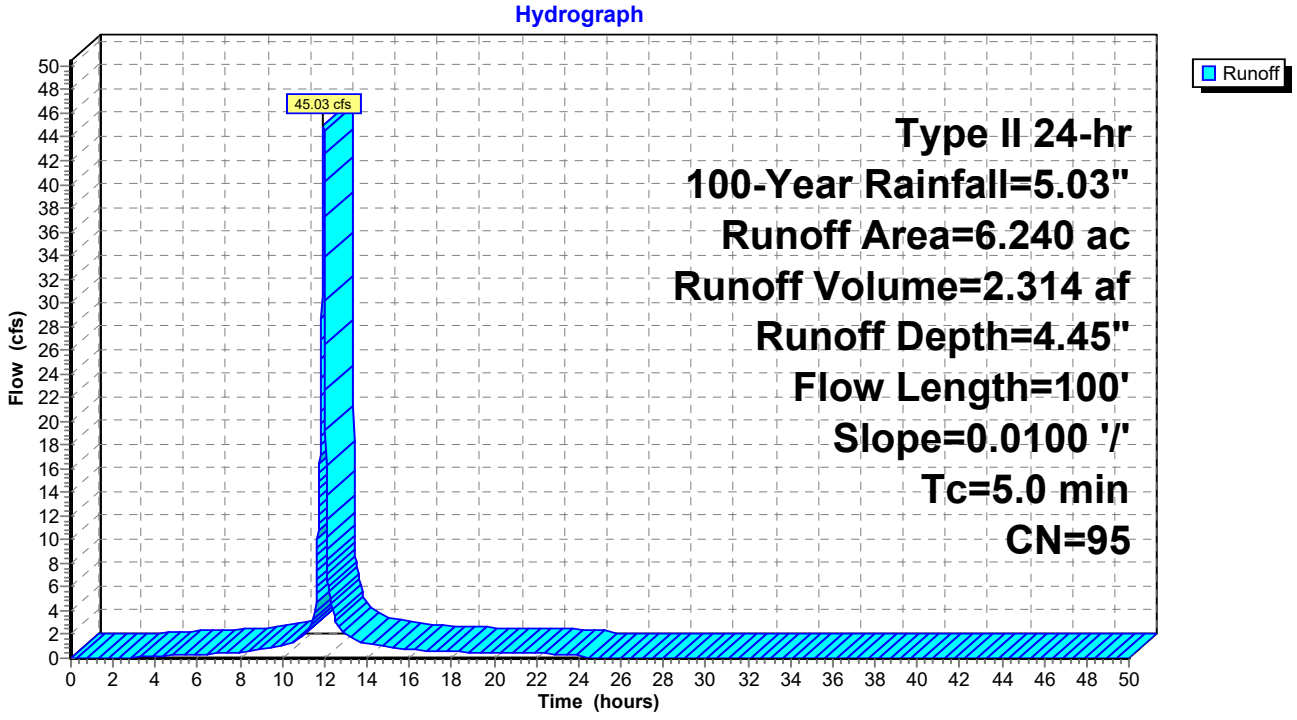
Runoff = 45.03 cfs @ 11.96 hrs, Volume= 2.314 af, Depth= 4.45"
Routed to Link 1L : Romney Rd Drainage System

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Rainfall=5.03"

	Area (ac)	CN	Description
	0.920	80	>75% Grass cover, Good, HSG D
*	5.320	98	Impervious, HSG D
	6.240	95	Weighted Average
	0.920		14.74% Pervious Area
	5.320		85.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	100	0.0100	0.92		**Sheet Flow, Overland - Pvmt.** Smooth surfaces n= 0.011 P2= 2.50"
1.8	100	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 4S: Proposed Site



Summary for Subcatchment 5S: Proposed Site

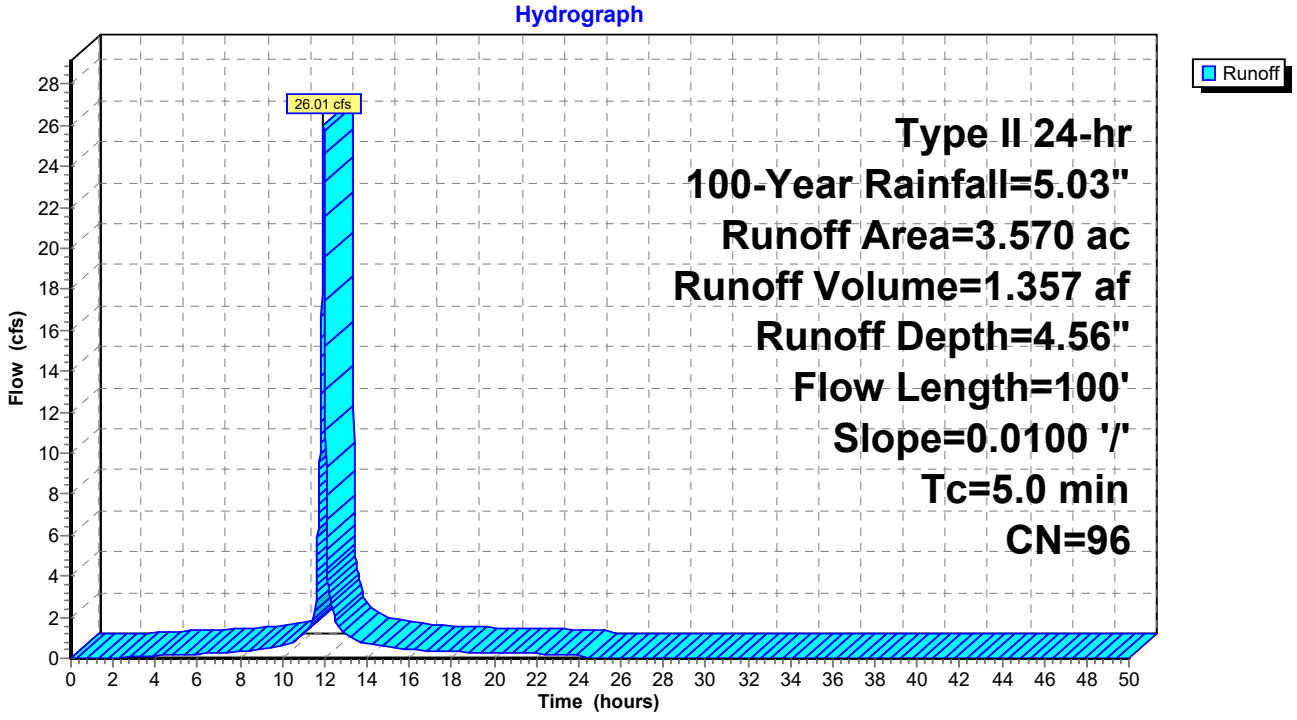
Runoff = 26.01 cfs @ 11.96 hrs, Volume= 1.357 af, Depth= 4.56"
Routed to Link 1L : Romney Rd Drainage System

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Rainfall=5.03"

	Area (ac)	CN	Description
	0.470	80	>75% Grass cover, Good, HSG D
*	3.100	98	Impervious, HSG D
	3.570	96	Weighted Average
	0.470		13.17% Pervious Area
	3.100		86.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	100	0.0100	0.92		**Sheet Flow, Overland - Pvmt.** Smooth surfaces n= 0.011 P2= 2.50"
1.8	100	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 5S: Proposed Site



Summary for Pond 1P: Detention Storage & Outlet

Inflow Area = 1.240 ac, 79.84% Impervious, Inflow Depth = 4.34" for 100-Year event
Inflow = 8.85 cfs @ 11.96 hrs, Volume= 0.448 af
Outflow = 1.27 cfs @ 12.15 hrs, Volume= 0.448 af, Atten= 86%, Lag= 11.5 min
Primary = 1.27 cfs @ 12.15 hrs, Volume= 0.448 af
Routed to Link 1L : Romney Rd Drainage System

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Peak Elev= 574.77' @ 12.15 hrs Surf.Area= 5,289 sf Storage= 7,797 cf

Plug-Flow detention time= 78.6 min calculated for 0.448 af (100% of inflow)
Center-of-Mass det. time= 77.9 min (846.8 - 768.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	572.25'	3,736 cf	**50.25'W x 105.25'L x 2.54'H Field A** 13,442 cf Overall - 4,103 cf Embedded = 9,340 cf x 40.0% Voids
#2A	572.75'	4,103 cf	**Cultec R-150XLHD** x 150 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 15 rows
		7,839 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	572.25'	**6.0" Round Outlet Pipe** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 572.25' / 572.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=1.27 cfs @ 12.15 hrs HW=574.77' TW=0.00' (Dynamic Tailwater)
↑—**1=Outlet Pipe** (Barrel Controls 1.27 cfs @ 6.49 fps)

Pond 1P: Detention Storage & Outlet - Chamber Wizard Field A

Chamber Model = Cultec R-150XLHD (Cultec Recharger® 150XLHD)
Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf
Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap
Row Length Adjustment= +0.75' x 2.65 sf x 15 rows

33.0" Wide + 6.0" Spacing = 39.0" C-C Row Spacing

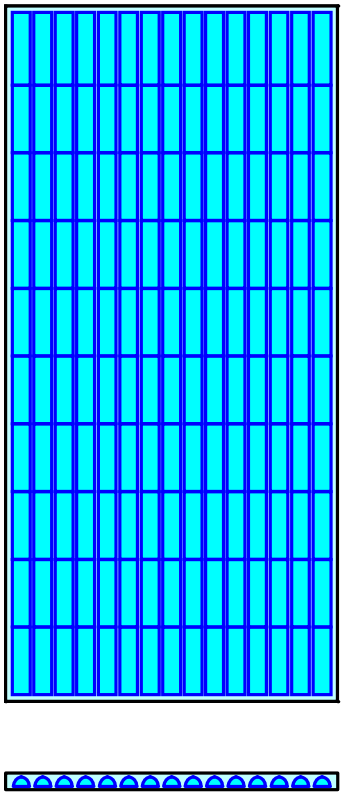
10 Chambers/Row x 10.25' Long +0.75' Row Adjustment = 103.25' Row Length +12.0" End Stone x 2 = 105.25' Base Length
15 Rows x 33.0" Wide + 6.0" Spacing x 14 + 12.0" Side Stone x 2 = 50.25' Base Width
6.0" Stone Base + 18.5" Chamber Height + 6.0" Stone Cover = 2.54' Field Height

150 Chambers x 27.2 cf +0.75' Row Adjustment x 2.65 sf x 15 Rows = 4,102.6 cf Chamber Storage

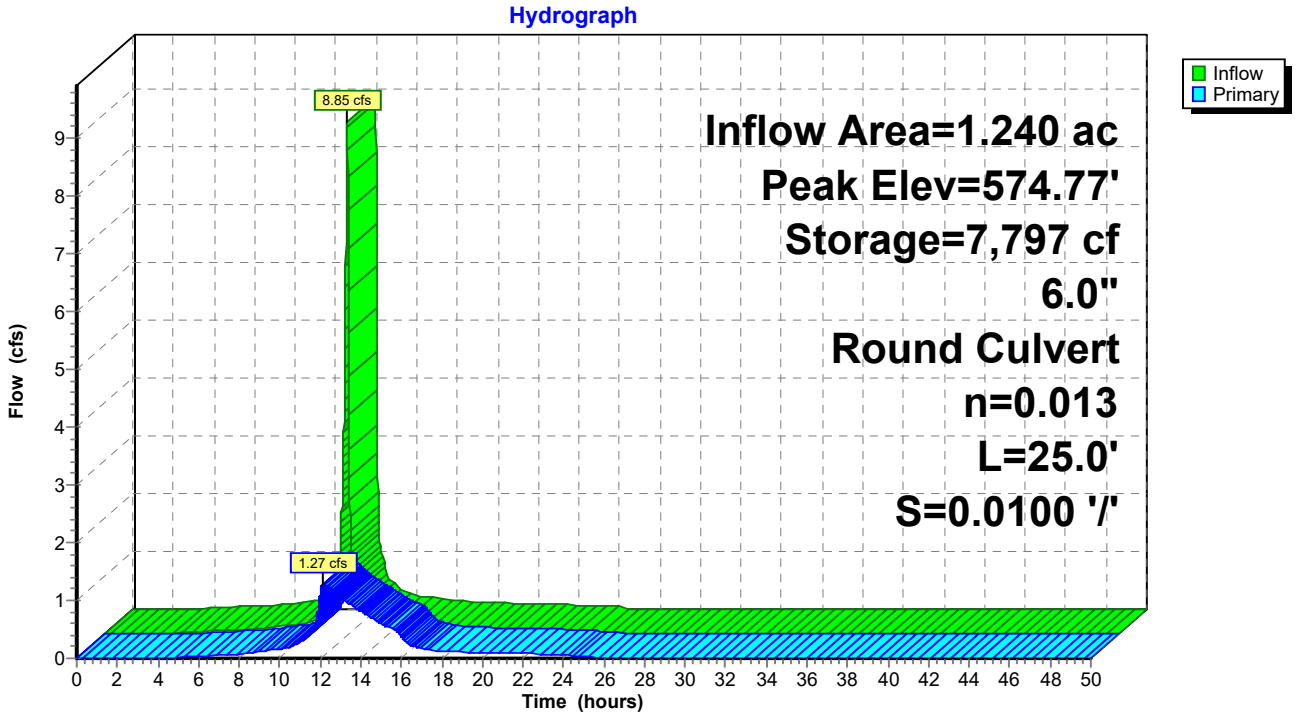
13,442.4 cf Field - 4,102.6 cf Chambers = 9,339.8 cf Stone x 40.0% Voids = 3,735.9 cf Stone Storage

Chamber Storage + Stone Storage = 7,838.5 cf = 0.180 af
Overall Storage Efficiency = 58.3%
Overall System Size = 105.25' x 50.25' x 2.54'

150 Chambers
497.9 cy Field
345.9 cy Stone



Pond 1P: Detention Storage & Outlet



Summary for Pond 2P: Detention Storage & Outlet

Inflow Area = 3.010 ac, 87.38% Impervious, Inflow Depth = 4.56" for 100-Year event
Inflow = 21.93 cfs @ 11.96 hrs, Volume= 1.144 af
Outflow = 2.41 cfs @ 12.26 hrs, Volume= 1.142 af, Atten= 89%, Lag= 18.2 min
Primary = 2.41 cfs @ 12.26 hrs, Volume= 1.142 af
Routed to Link 1L : Romney Rd Drainage System

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Peak Elev= 574.77' @ 12.26 hrs Surf.Area= 15,085 sf Storage= 22,375 cf

Plug-Flow detention time= 131.0 min calculated for 1.141 af (100% of inflow)
Center-of-Mass det. time= 129.6 min (887.1 - 757.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	572.25'	10,575 cf	**63.25'W x 238.50'L x 2.54'H Field A** 38,341 cf Overall - 11,903 cf Embedded = 26,438 cf x 40.0% Voids
#2A	572.75'	11,903 cf	**Cultec R-150XLHD** x 437 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 19 rows
		22,479 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	572.25'	**8.0" Round Outlet Pipe** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 572.25' / 572.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=2.41 cfs @ 12.26 hrs HW=574.77' TW=0.00' (Dynamic Tailwater)
↑—**1=Outlet Pipe** (Barrel Controls 2.41 cfs @ 6.90 fps)

Pond 2P: Detention Storage & Outlet - Chamber Wizard Field A

Chamber Model = Cultec R-150XLHD (Cultec Recharger® 150XLHD)
Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf
Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap
Row Length Adjustment= +0.75' x 2.65 sf x 19 rows

33.0" Wide + 6.0" Spacing = 39.0" C-C Row Spacing

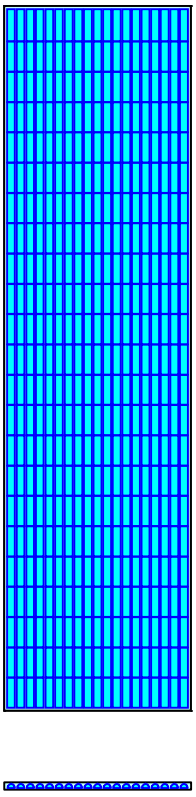
23 Chambers/Row x 10.25' Long +0.75' Row Adjustment = 236.50' Row Length +12.0" End Stone x 2 = 238.50' Base Length
19 Rows x 33.0" Wide + 6.0" Spacing x 18 + 12.0" Side Stone x 2 = 63.25' Base Width
6.0" Stone Base + 18.5" Chamber Height + 6.0" Stone Cover = 2.54' Field Height

437 Chambers x 27.2 cf +0.75' Row Adjustment x 2.65 sf x 19 Rows = 11,903.3 cf Chamber Storage

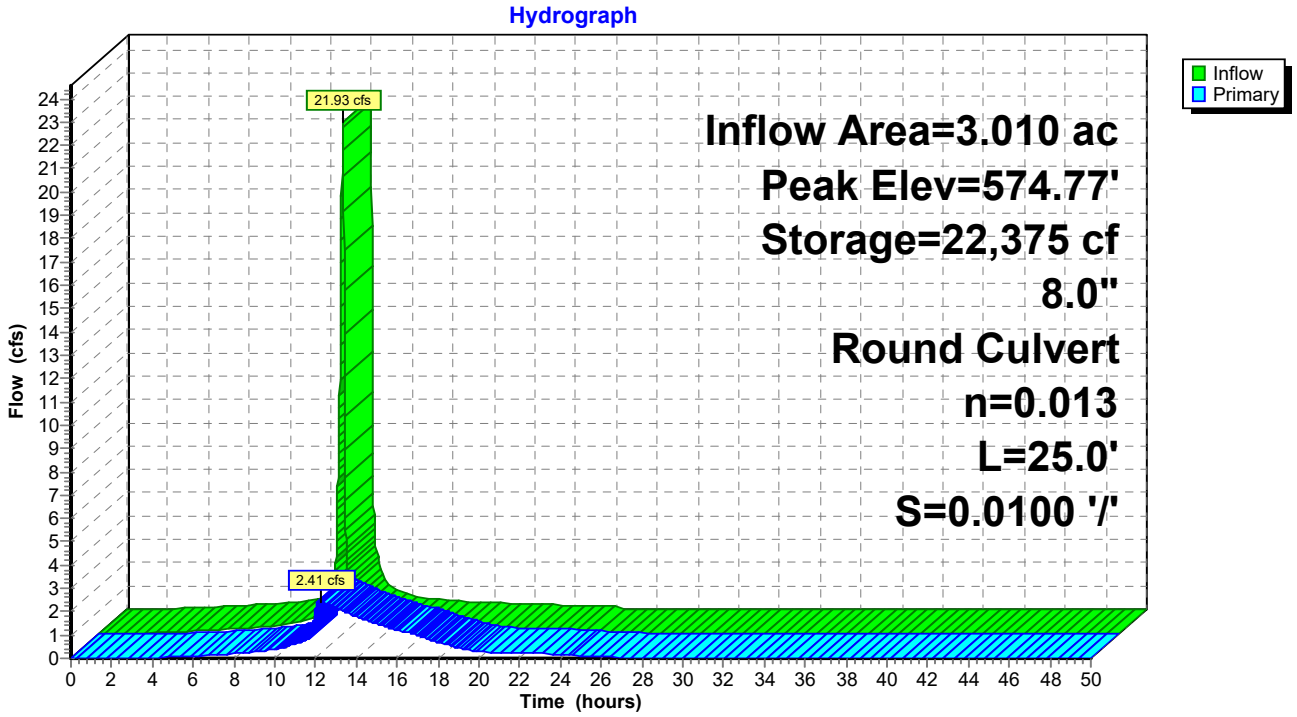
38,341.4 cf Field - 11,903.3 cf Chambers = 26,438.1 cf Stone x 40.0% Voids = 10,575.2 cf Stone Storage

Chamber Storage + Stone Storage = 22,478.5 cf = 0.516 af
Overall Storage Efficiency = 58.6%
Overall System Size = 238.50' x 63.25' x 2.54'

437 Chambers
1,420.1 cy Field
979.2 cy Stone



Pond 2P: Detention Storage & Outlet



Summary for Pond 3P: South Pond

Inflow Area = 2.710 ac, 83.03% Impervious, Inflow Depth = 4.45" for 100-Year event
Inflow = 19.55 cfs @ 11.96 hrs, Volume= 1.005 af
Outflow = 16.44 cfs @ 11.97 hrs, Volume= 1.003 af, Atten= 16%, Lag= 0.6 min
Primary = 16.44 cfs @ 11.97 hrs, Volume= 1.003 af
Routed to Pond 4P : North Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Peak Elev= 576.76' @ 12.02 hrs Surf.Area= 1,637 sf Storage= 2,910 cf

Plug-Flow detention time= 8.7 min calculated for 1.003 af (100% of inflow)
Center-of-Mass det. time= 7.2 min (770.8 - 763.5)

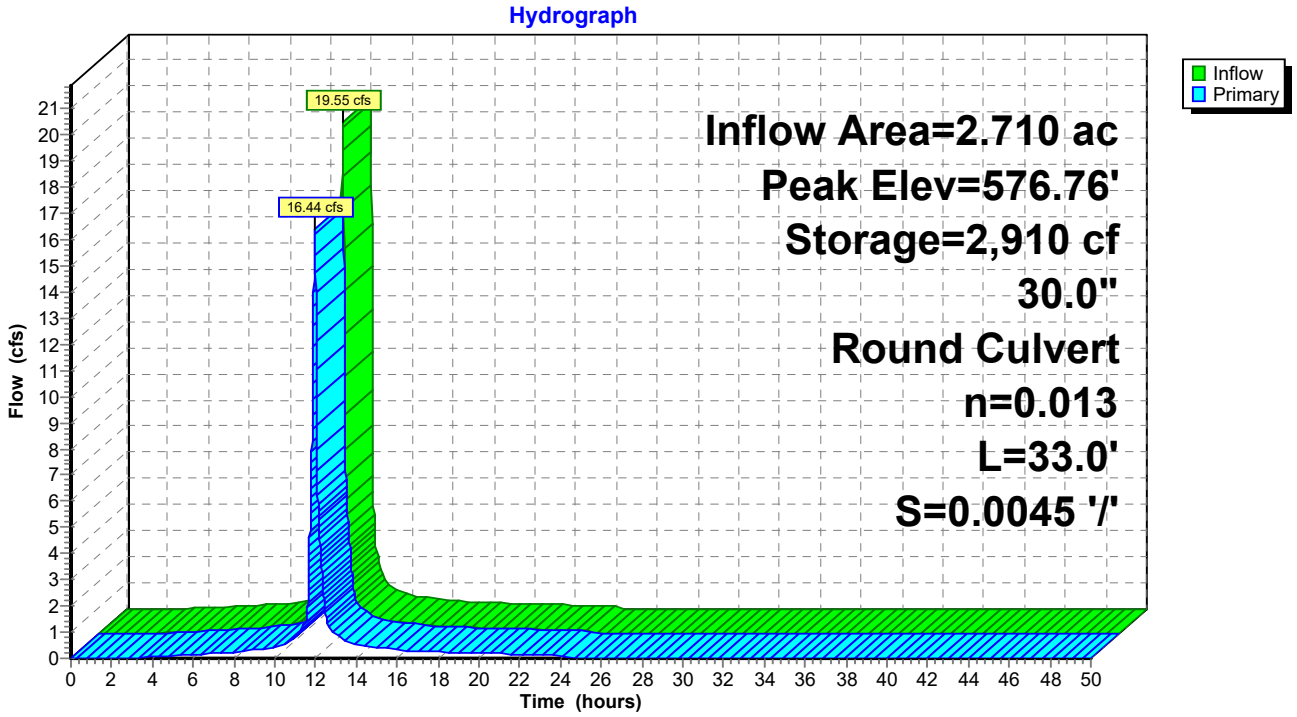
Volume	Invert	Avail.Storage	Storage Description
#1	574.00'	5,327 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
574.00	556	0	0
575.00	881	719	719
576.00	1,281	1,081	1,800
577.00	1,749	1,515	3,315
578.00	2,275	2,012	5,327

Device	Routing	Invert	Outlet Devices
#1	Primary	574.15'	**30.0" Round Outlet Pipe** L= 33.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 574.15' / 574.00' S= 0.0045 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=14.75 cfs @ 11.97 hrs HW=576.55' TW=576.14' (Dynamic Tailwater)
↑—**1=Outlet Pipe** (Outlet Controls 14.75 cfs @ 3.90 fps)

Pond 3P: South Pond



Summary for Pond 4P: North Pond

Inflow Area = 3.270 ac, 82.87% Impervious, Inflow Depth = 4.44" for 100-Year event
Inflow = 20.43 cfs @ 11.96 hrs, Volume= 1.210 af
Outflow = 12.83 cfs @ 12.04 hrs, Volume= 1.210 af, Atten= 37%, Lag= 4.7 min
Primary = 12.83 cfs @ 12.04 hrs, Volume= 1.210 af
Routed to Link 1L : Romney Rd Drainage System

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Peak Elev= 576.52' @ 12.04 hrs Surf.Area= 3,688 sf Storage= 7,322 cf

Plug-Flow detention time= 12.3 min calculated for 1.210 af (100% of inflow)
Center-of-Mass det. time= 12.2 min (781.7 - 769.5)

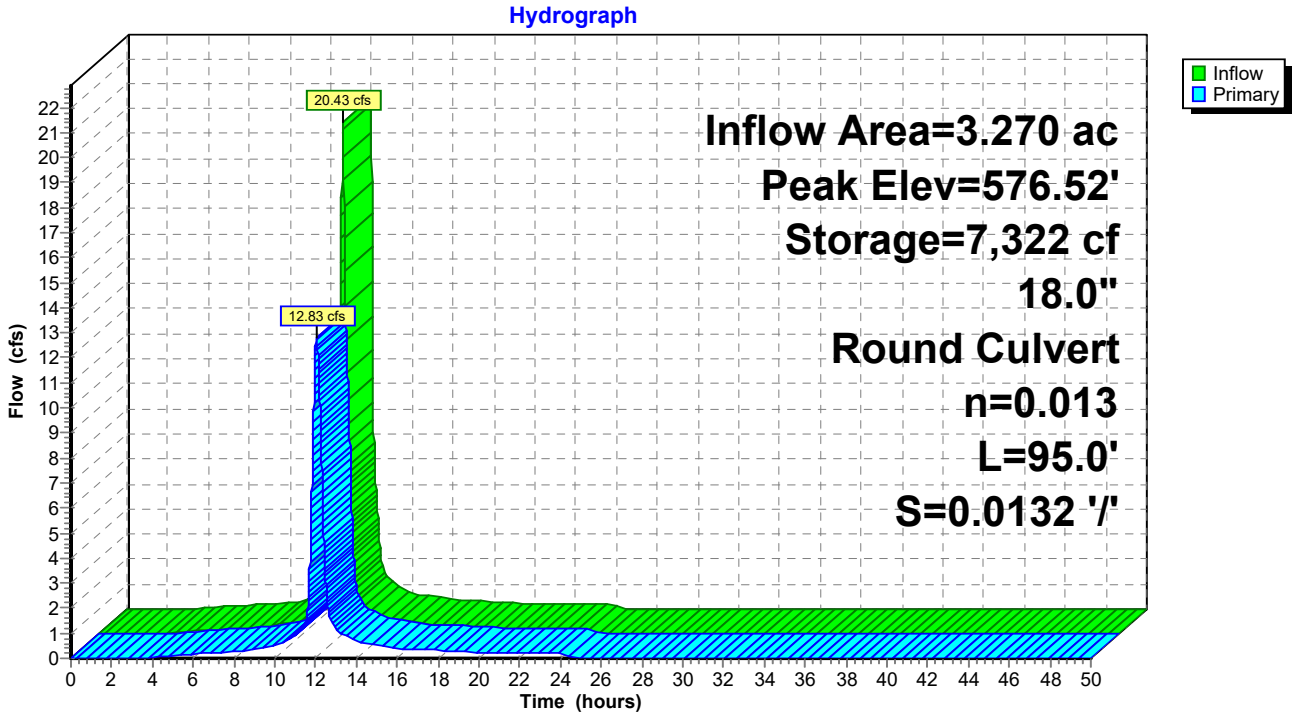
Volume	Invert	Avail.Storage	Storage Description
#1	573.50'	13,861 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
573.50	1,340	0	0
574.00	1,675	754	754
575.00	2,339	2,007	2,761
576.00	3,184	2,762	5,522
577.00	4,147	3,666	9,188
578.00	5,199	4,673	13,861

Device	Routing	Invert	Outlet Devices
#1	Primary	573.50'	**18.0" Round Outlet Pipe** L= 95.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 573.50' / 572.25' S= 0.0132 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=12.83 cfs @ 12.04 hrs HW=576.52' TW=0.00' (Dynamic Tailwater)
1=Outlet Pipe (Inlet Controls 12.83 cfs @ 7.26 fps)

Pond 4P: North Pond

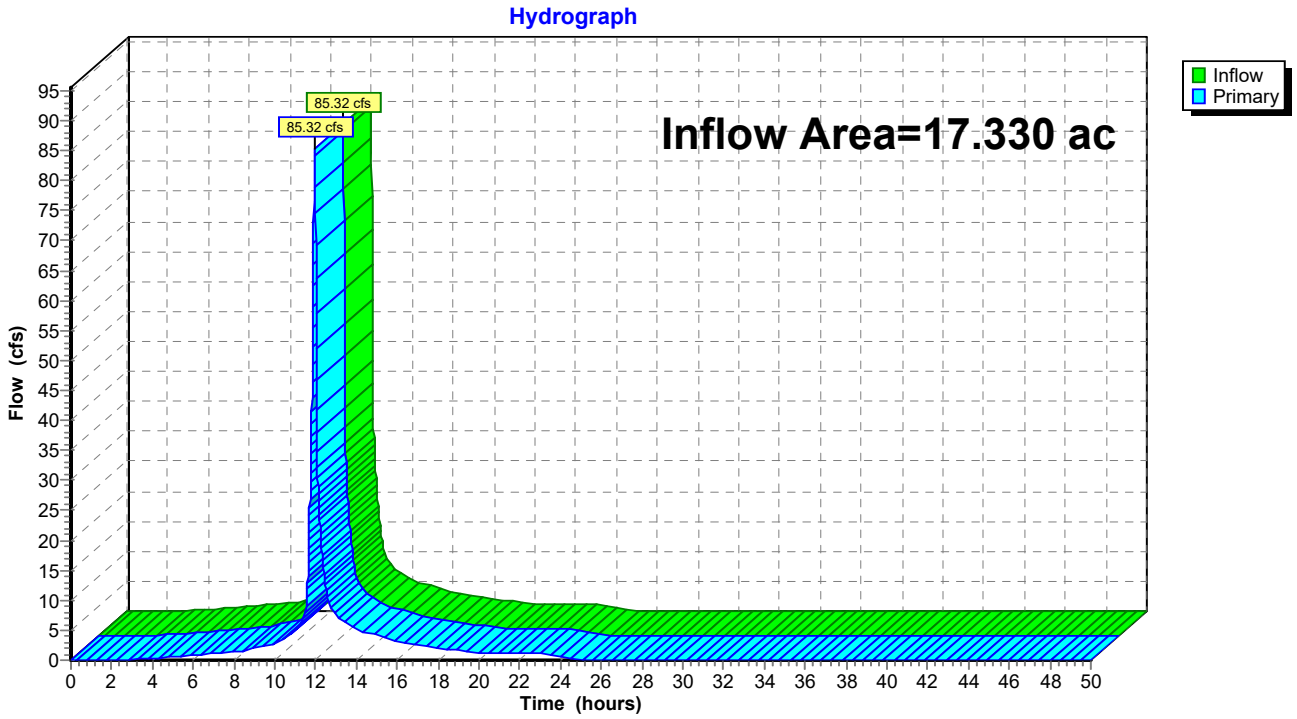


Summary for Link 1L: Romney Rd Drainage System

Inflow Area = 17.330 ac, 85.11% Impervious, Inflow Depth = 4.48" for 100-Year event
Inflow = 85.32 cfs @ 11.96 hrs, Volume= 6.470 af
Primary = 85.32 cfs @ 11.96 hrs, Volume= 6.470 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Link 1L: Romney Rd Drainage System



Appendix E

NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity Permit No. GP-0-20-001

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

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 *Discharges*.** 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 <u>not</u> 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 <u>not</u> 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

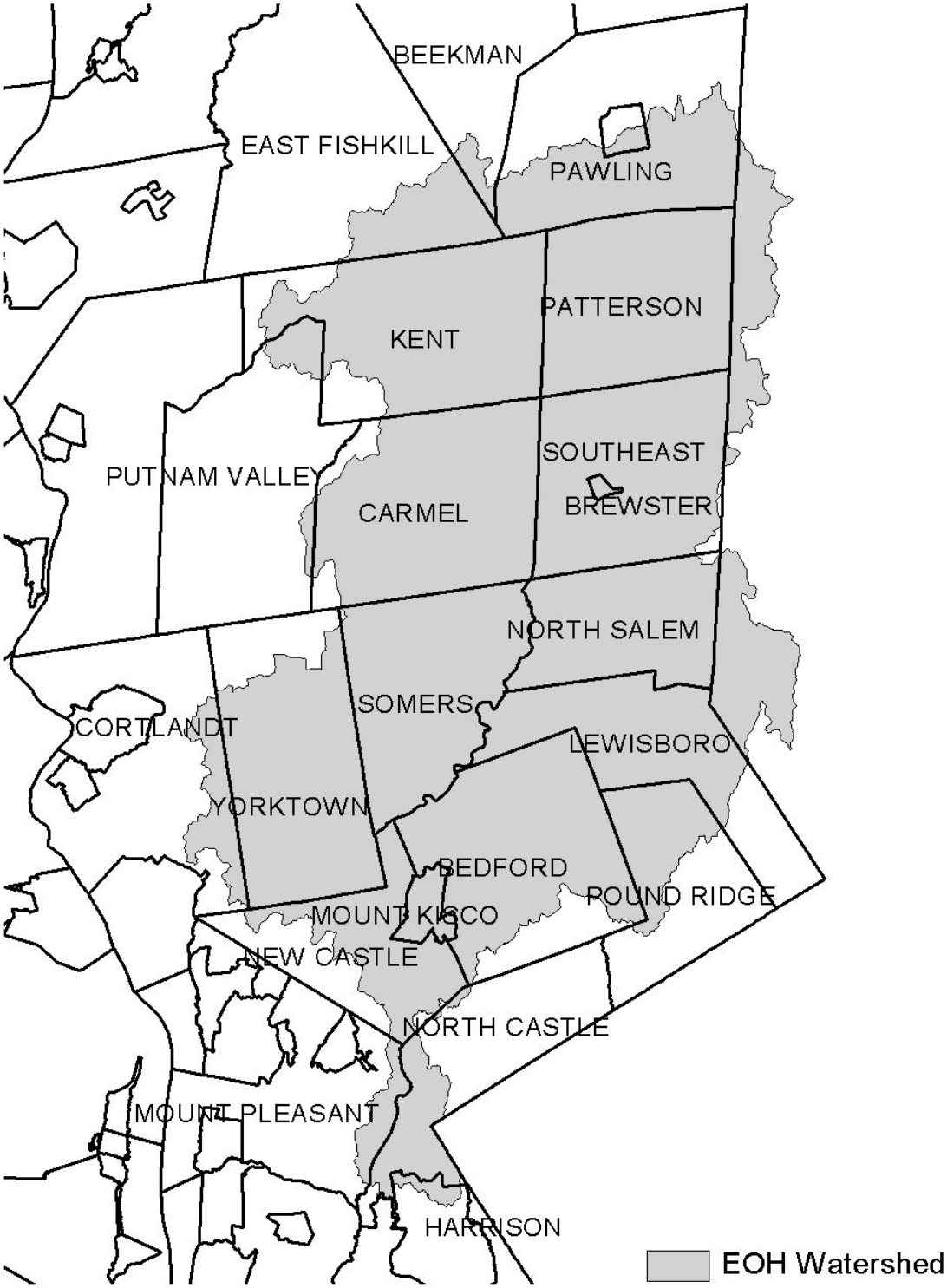


Figure 2 - Onondaga Lake Watershed

Figure 3 - Greenwood Lake Watershed

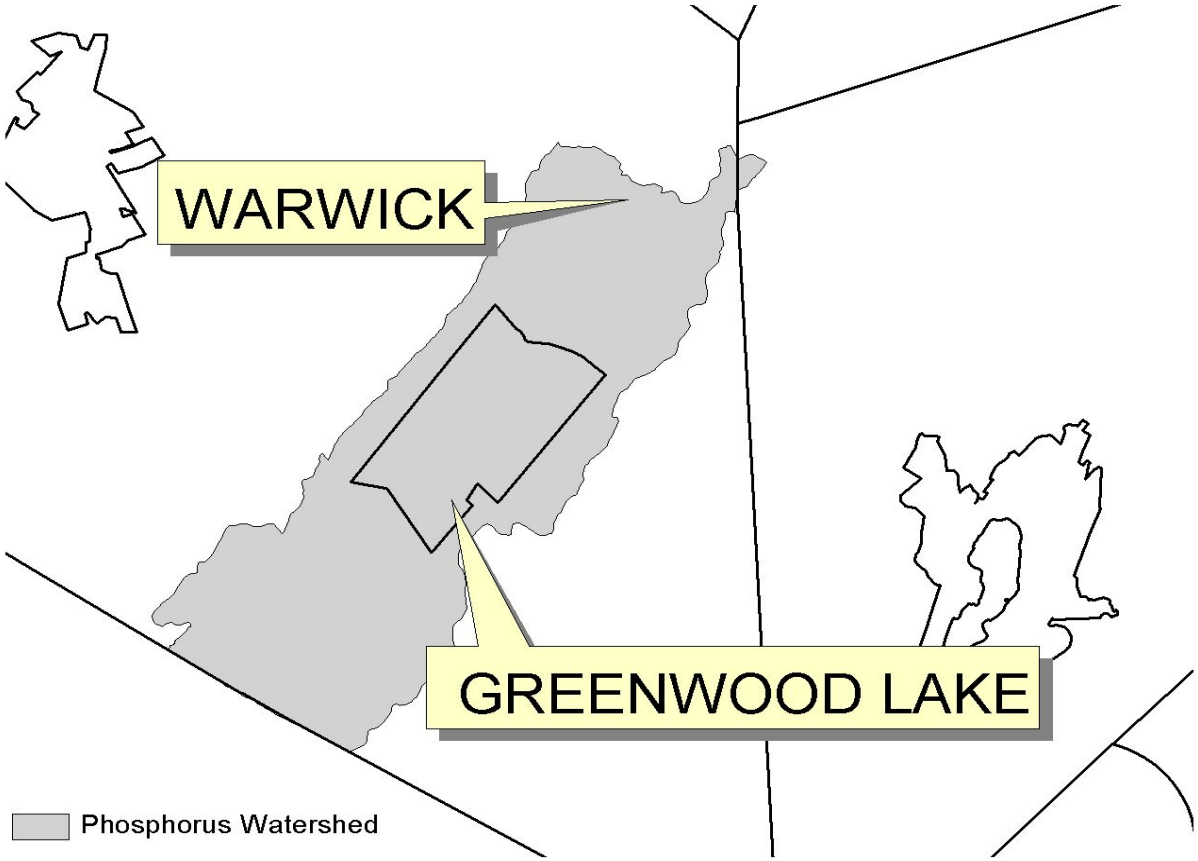


Figure 4 - Oscawana Lake Watershed

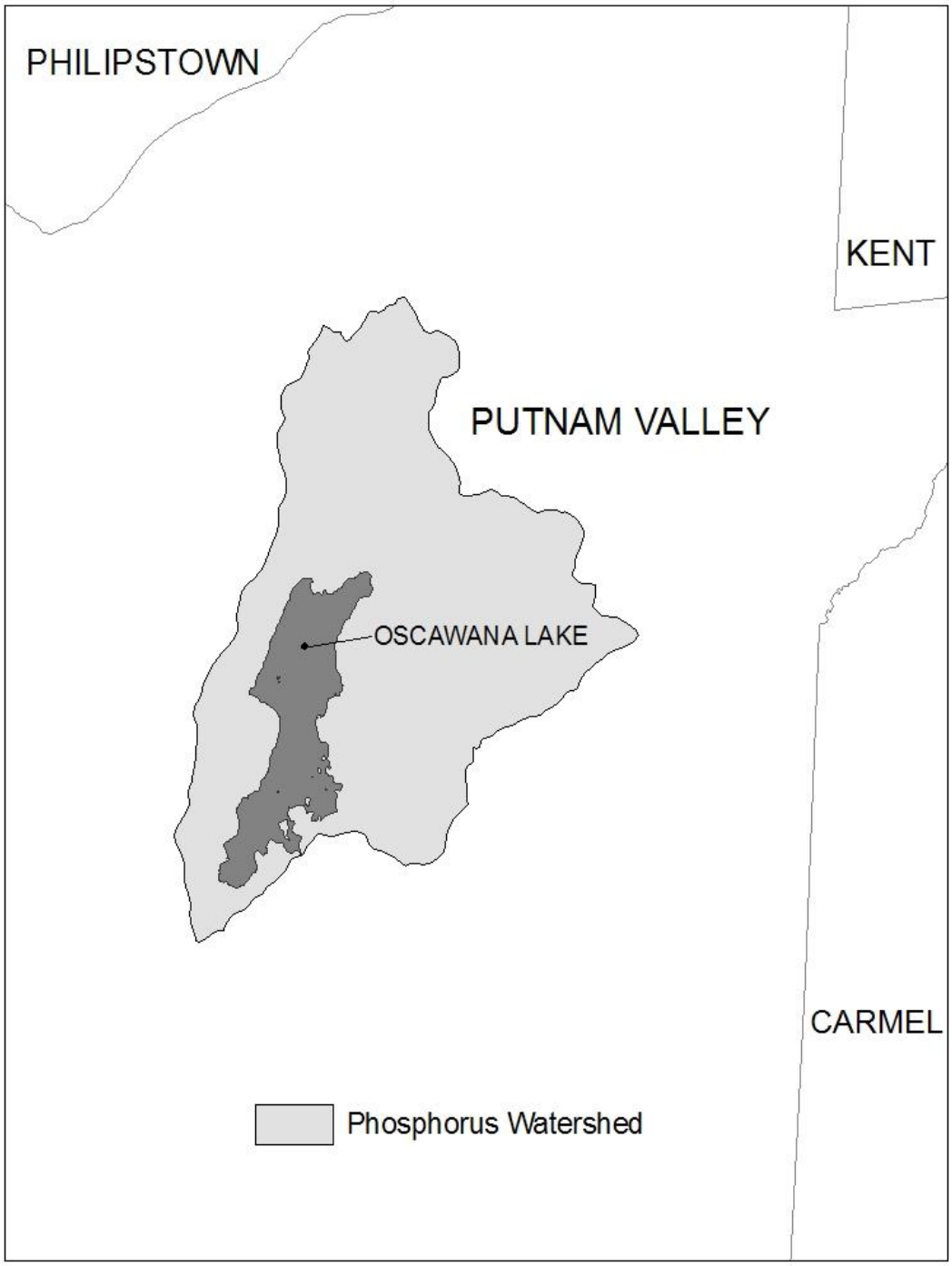
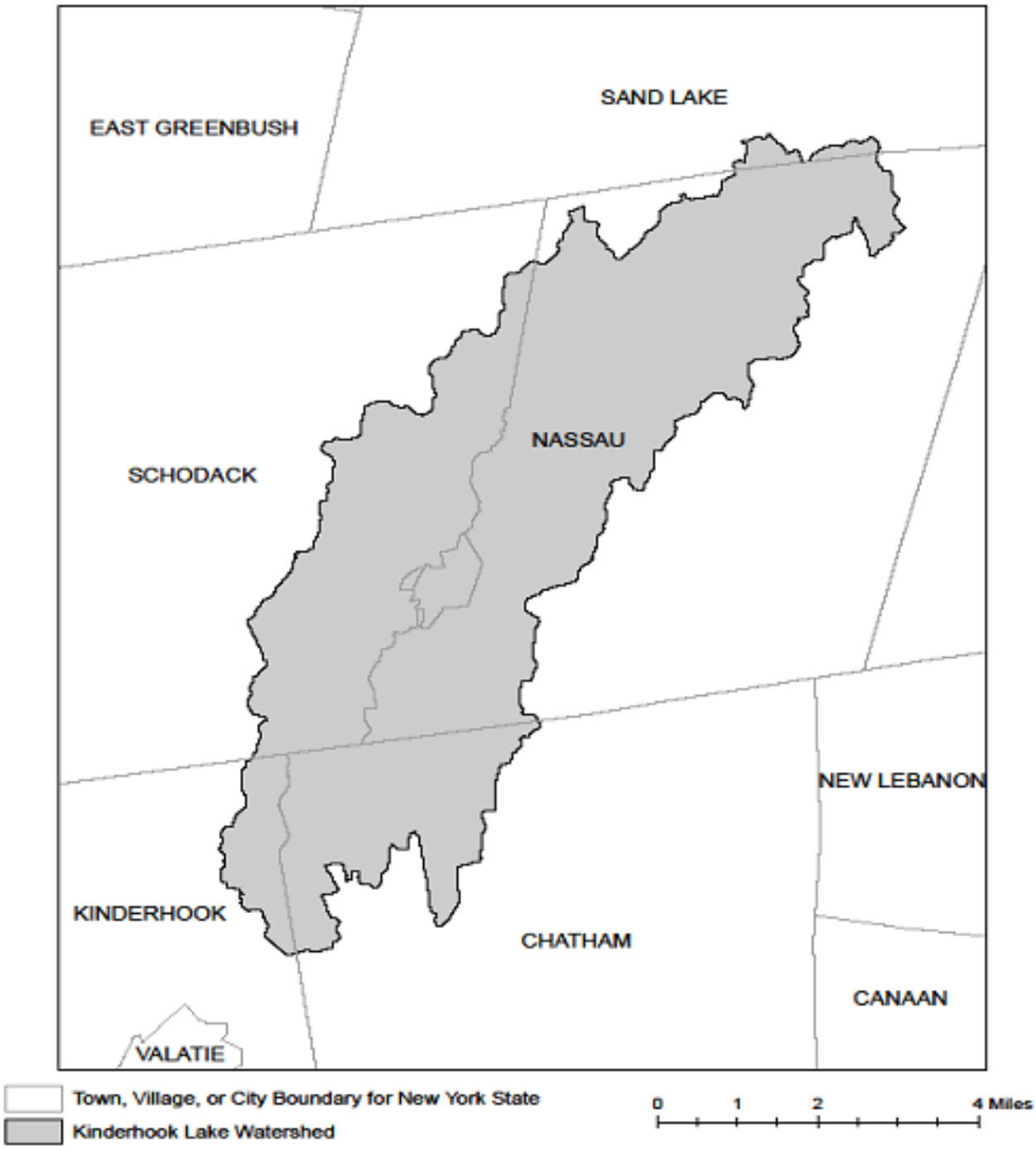


Figure 5 - Kinderhook Lake Watershed



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

Appendix F

Forms

STORM WATER POLLUTION PREVENTION PLAN
CONTRACTOR'S CERTIFICATION STATEMENT

Amherst Development Park
6000-6040 North Bailey Ave
Amherst, NY 14226

CONTRACTOR'S CERTIFICATION:

"I certify under penalty of law that I understand and agree to comply with the terms and conditions of the SWPPP for the construction site identified in such SWPPP as a condition of authorization to discharge storm water. I also understand that the operator must comply with the terms and conditions of the New York State Pollutant Discharge Elimination System (SPDES) general permit for storm water discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards."

Note: The contractor shall have at least one NYSDEC trained individual onsite at all times when earthwork and other SWPPP associated work is being performed from each contractor(s) and subcontractor(s). Each contractor(s) and subcontractor(s) shall provide copies of these individuals' certifications to the Town of Amherst.

Name: _____
(Print)

Signature: _____

Title: _____

Company Name: _____

Address: _____

Telephone Number: _____

Date: _____

Scope of Services: _____

Trained Individual(s) Responsible for Implementation: _____

This form must be signed by a responsible corporate officer or other party meeting the "Signatory Requirements" of the NYSDEC SPDES General Permit

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Owner/Operator Certification Form

SPDES General Permit For Stormwater Discharges From Construction Activity (GP-0-20-001)

Project/Site Name: Amherst Development Park - 6000-6040 North Bailey Ave, Amherst, NY 14226

eNOI Submission Number: _____

eNOI Submitted by: ☐ **Owner/Operator** ☑ **SWPPP Preparer** ☐ **Other**

Certification Statement - Owner/Operator

I have read or been advised of the permit conditions and believe that I understand them. I also understand that, under the terms of the permit, there may be reporting requirements. I hereby certify that this document and the corresponding documents were prepared under my direction or supervision. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further understand that coverage under the general permit will be identified in the acknowledgment that I will receive as a result of submitting this NOI and can be as long as sixty (60) business days as provided for in the general permit. I also understand that, by submitting this NOI, I am acknowledging that the SWPPP has been developed and will be implemented as the first element of construction, and agreeing to comply with all the terms and conditions of the general permit for which this NOI is being submitted.

Owner/Operator First Name M.I. Last Name

_____

Signature

_____

Date

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

SWPPP Preparer Certification Form

SPDES General Permit for Stormwater Discharges From Construction Activity (GP-0-20-001)

Project Site Information

Project/Site Name

Amherst Development Park - 6000-6040 North Bailey Ave, Amherst, NY 14226

Owner/Operator Information

Owner/Operator (Company Name/Private Owner/Municipality Name)

Benderson Development Company, LLC - 570 Delaware Ave - Buffalo, NY 14202

Certification Statement – SWPPP Preparer

I hereby certify that the Stormwater Pollution Prevention Plan (SWPPP) for this project has been prepared in accordance with the terms and conditions of the GP-0-20-001. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of this permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

Christopher		Wood
First name	MI	Last Name

Signature

12/4/2024

Date

Revised: January 2020

Appendix G

NYSDEC Notice of Termination (NOT)

New York State Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505
(NOTE: Submit completed form to address above)

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity

Please indicate your permit identification number: NYR ___ ___ ___ ___ ___ ___

I. Owner or Operator Information

1. Owner/Operator Name:

2. Street Address:

3. City/State/Zip:

4. Contact Person: | 4a.Telephone:

4b. Contact Person E-Mail:

II. Project Site Information

5. Project/Site Name:

6. Street Address:

7. City/Zip:

8. County:

III. Reason for Termination

9a. □ All disturbed areas have achieved final stabilization in accordance with the general permit and SWPPP. ***Date final stabilization completed** (month/year): _____

9b. □ Permit coverage has been transferred to new owner/operator. Indicate new owner/operator's permit identification number: NYR ___ ___ ___ ___ ___ ___
(Note: Permit coverage can not be terminated by owner identified in I.1. above until new owner/operator obtains coverage under the general permit)

9c. □ Other (Explain on Page 2)

IV. Final Site Information:

10a. Did this construction activity require the development of a SWPPP that includes post-construction stormwater management practices? □ yes □ no (If no, go to question 10f.)

10b. Have all post-construction stormwater management practices included in the final SWPPP been constructed? □ yes □ no (If no, explain on Page 2)

10c. Identify the entity responsible for long-term operation and maintenance of practice(s)?

_____

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity - continued

10d. Has the entity responsible for long-term operation and maintenance been given a copy of the operation and maintenance plan required by the general permit? □ yes □ no

10e. Indicate the method used to ensure long-term operation and maintenance of the post-construction stormwater management practice(s):

□ Post-construction stormwater management practice(s) and any right-of-way(s) needed to maintain practice(s) have been deeded to the municipality.

□ Executed maintenance agreement is in place with the municipality that will maintain the post-construction stormwater management practice(s).

□ For post-construction stormwater management practices that are privately owned, a mechanism is 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.

□ For post-construction stormwater management practices that are owned by a public or private institution (e.g. school, university or hospital), government agency or authority, or public utility; policy and procedures are in place that ensures operation and maintenance of the practice(s) in accordance with the operation and maintenance plan.

10f. Provide the total area of impervious surface (i.e. roof, pavement, concrete, gravel, etc.) constructed within the disturbance area? _____ (acres)

11. Is this project subject to the requirements of a regulated, traditional land use control MS4? □ yes □ no

(If Yes, complete section VI - "MS4 Acceptance" statement

V. Additional Information/Explanation:

(Use this section to answer questions 9c. and 10b., if applicable)

VI. MS4 Acceptance - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative (Note: Not required when 9b. is checked -transfer of coverage)

I have determined that it is acceptable for the owner or operator of the construction project identified in question 5 to submit the Notice of Termination at this time.

Printed Name:	
Title/Position:	
Signature:	Date:

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity - continued

VII. Qualified Inspector Certification - Final Stabilization:

I hereby certify that all disturbed areas have achieved final stabilization as defined in the current version of the general permit, and that all temporary, structural erosion and sediment control measures have been removed. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

Printed Name:	
Title/Position:	
Signature:	Date:

VIII. Qualified Inspector Certification - Post-construction Stormwater Management Practice(s):

I hereby certify that all post-construction stormwater management practices have been constructed in conformance with the SWPPP. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

Printed Name:	
Title/Position:	
Signature:	Date:

IX. Owner or Operator Certification

I hereby certify that this document was prepared by me or under my direction or supervision. My determination, based upon my inquiry of the person(s) who managed the construction activity, or those persons directly responsible for gathering the information, is that the information provided in this document is true, accurate and complete. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

Printed Name:	
Title/Position:	
Signature:	Date:

(NYS DEC Notice of Termination - January 2015)

Post Construction Stormwater Management

Facility Certification Form Cover Sheet

A. General Information

Use only one Cover Sheet per site with as many specific structural BMP Inspection Report attachments as needed. Please attach digital photographs of the site and structural BMPs as applicable.

Development Name:_____ Inspection Date:_____

BMP Owner:_____ Inspection Company:_____

Owner Address:_____ Company Address:_____

Owner Phone #:_____ Inspector Name:_____

Owner Email:_____ Inspector Phone #:_____

Inspector Email:_____

B. Inspection Report Attachments

The listed stormwater controls are the Structural BMPs who's Inspection Reports are to be completed per the NYS Stormwater Design Manual for this site. Please use one inspection report per BMP inspected and submit all forms together with this Cover Sheet as one single report. Also, please document the number of each structural BMP found at this site in the space below.

BMP	# of BMP	BMP	# of BMP
Micropool Extended Detention Pond (P-1)		Infiltration Basin (I-2)	
Wet Pond (P-2)		Dry Well (I-3)	
Wet Extended Detention Pond (P-3)		Surface Sand Filter (F-1)	
Multiple Pond System (P-4)		Underground Sand Filter (F-2)	
Shallow Wetland (W-1)		Perimeter Sand Filter (F-3)	
Extended Detention Wetland (W-2)		Organic Filter (F-4)	
Pond/ Wetland System (W-3)		Bioretention (F-5)	
Pocket Wetland (W-4)		Dry Swale (O-1)	
Infiltration Trench (I-1)		Wet Swale (O-2)	
Alternate Stormwater Management Practices			

Post Construction Stormwater Management

C. Inspection Results

FAIL*

*** If any one item on the inspection form is coded as "Work needed", then the entire BMP fails inspection.**

***If a site has multiple BMPs and on fails inspection, this cover sheet is marked as fail until all items on all BMPs pass inspection.**

NOTE: Applicable BMP Inspection Reports and confirmatory digital photographs summarizing required repairs must be submitted to the Town following completion of the preliminary inspection. A re-inspection and certification must be completed within 30 days of the failed preliminary report.

PASS

NOTE: A passing inspection form should be signed below by the appropriate professional and submitted to the Town on or before the established inspection due date. Attach all applicable BMP Inspection Reports and confirmatory digital photographs accordingly.

D. Professional Certification

To be completed only when all structural BMPs at this site are functional with no outstanding maintenance issues.

I,_____, as a duly registered _____ attest that a thorough inspection has been completed for all structural BMPsthat are associated with this particular site. All inspected structural BMPs are performing properly and are in compliance with the terms and conditions of the recorded maintenance agreement for the site.

Signature:_____

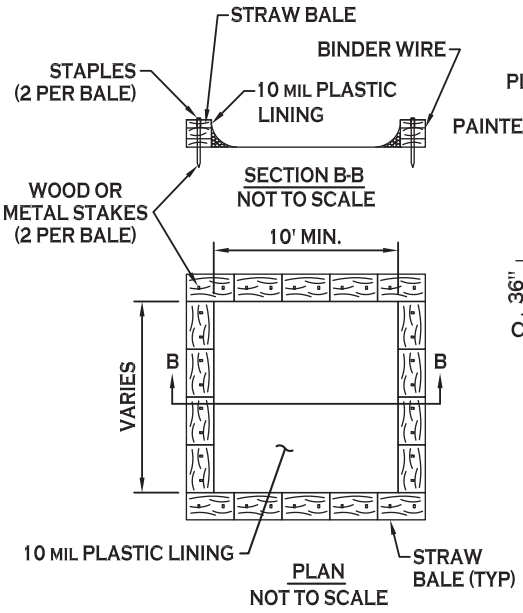
Date:_____

Appendix H

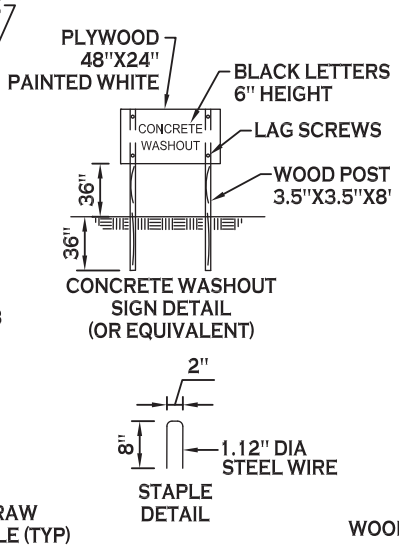
Construction Documents

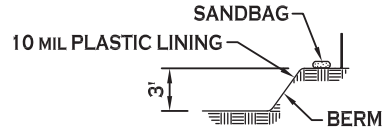
Appendix I

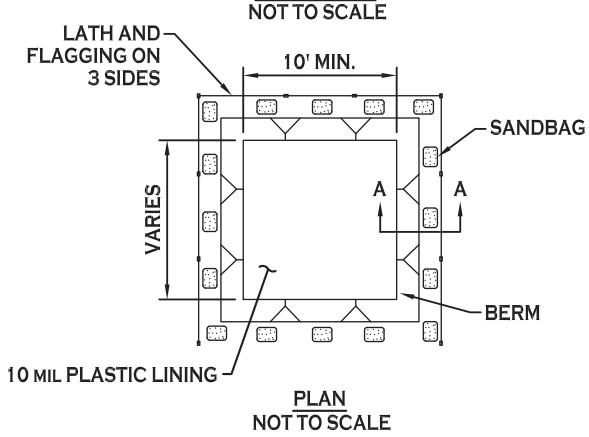
Standard Erosion Control Details



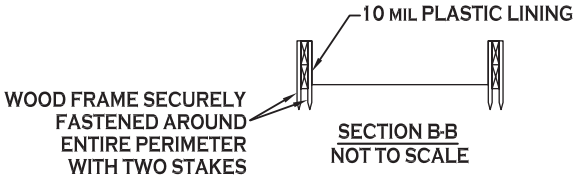
TYPE "ABOVE GRADE" WITH STRAW BALES

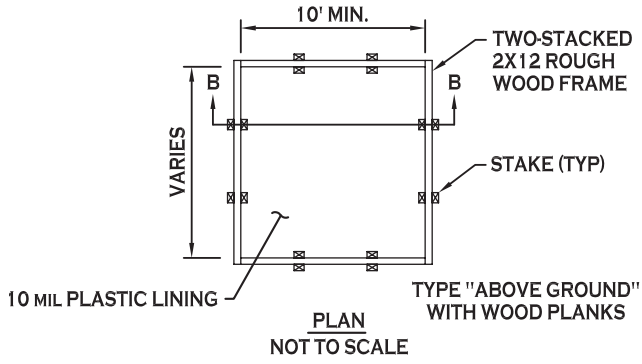






TYPE "BELOW GRADE"



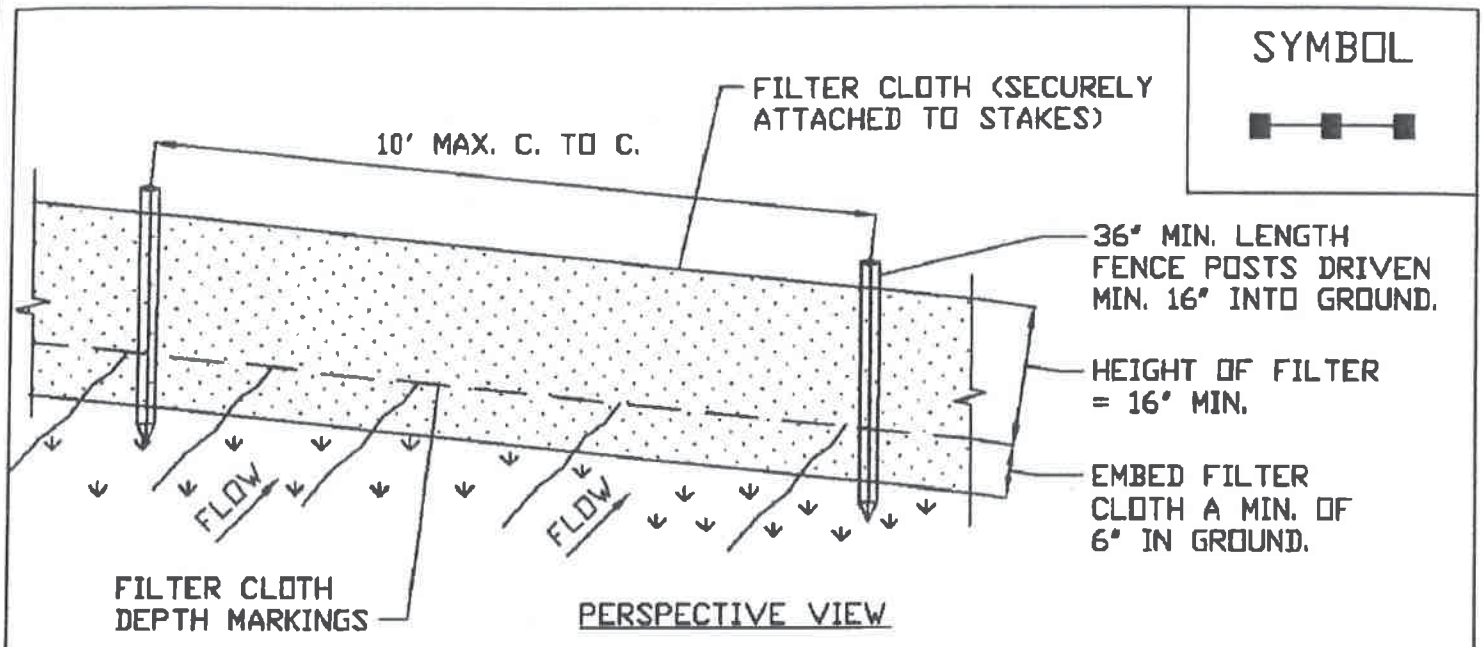


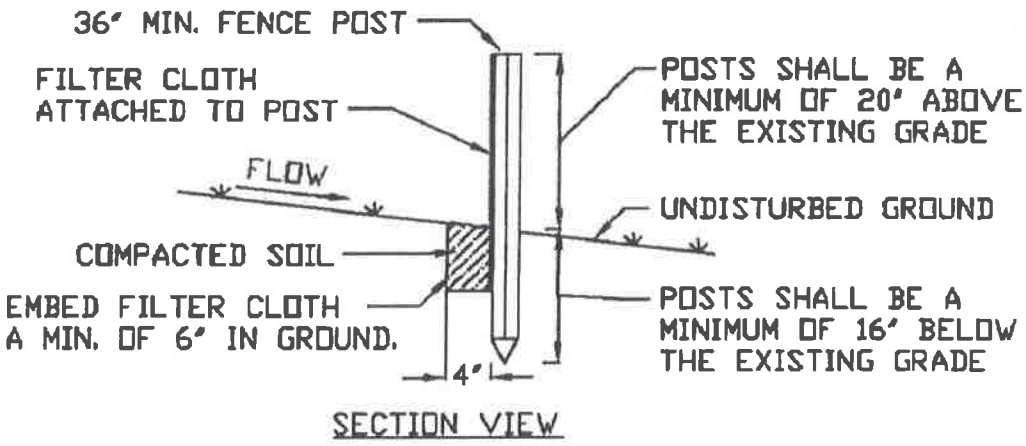
NOTES

1. ACTUAL LAYOUT TO BE DETERMINED IN THE FIELD.
2. A CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30' OF THE TEMPORARY CONCRETE WASHOUT FACILITY.
3. MATERIALS USED TO CONSTRUCT TEMPORARY CONCRETE WASHOUT FACILITIES SHALL BE REMOVED FROM THE SITE OF THE WORK AND DISPOSED OF OR RECYCLED.
4. HOLES, DEPRESSIONS OR OTHER GROUND DISTURBANCE CAUSED BY THE REMOVAL OF THE TEMPORARY CONCRETE WASHOUT FACILITIES SHALL BE BACKFILLED, REPAIRED, AND STABILIZED TO PREVENT EROSION.

CONCRETE WASHOUT DETAIL

NOT TO SCALE

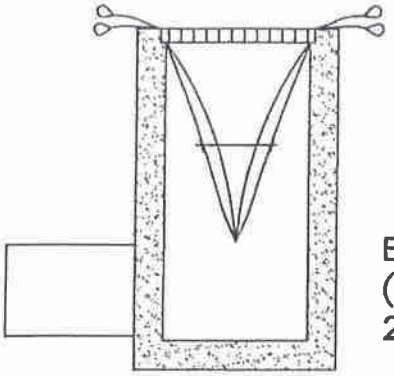




CONSTRUCTION SPECIFICATIONS

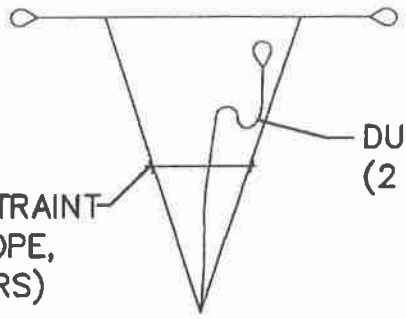
1. WOVEN FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. POSTS SHALL BE STEEL EITHER "T" OR "U" TYPE OR HARDWOOD.
2. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVER-LAPPED BY SIX INCHES AND FOLDED. FILTER CLOTH SHALL BE EITHER FILTER X, MIRAFI 100X, STABILINKA T140N, OR APPROVED EQUIVALENT.
3. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

SILT FENCE (WITHOUT WIRE MESH BACKING)

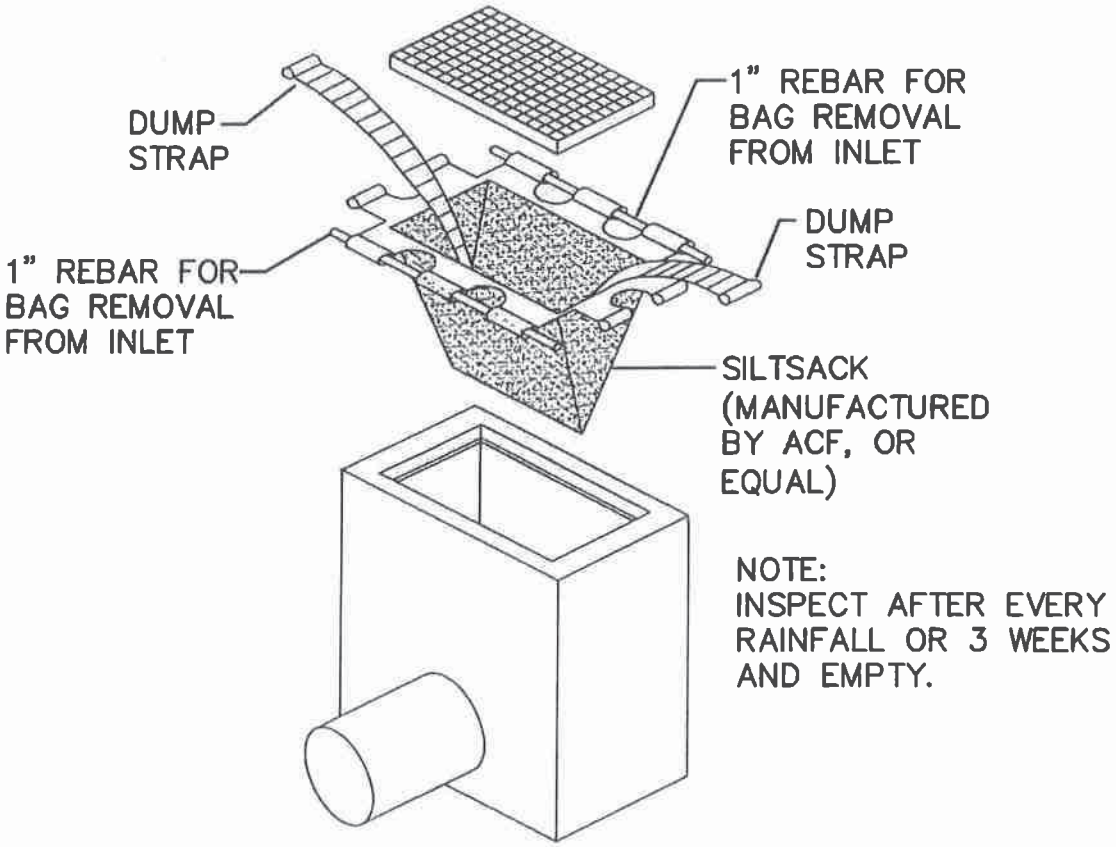


EXPANSION RESTRAINT
(1/4" NYLON ROPE,
2" FLAT WASHERS)

INSTALLATION DETAIL



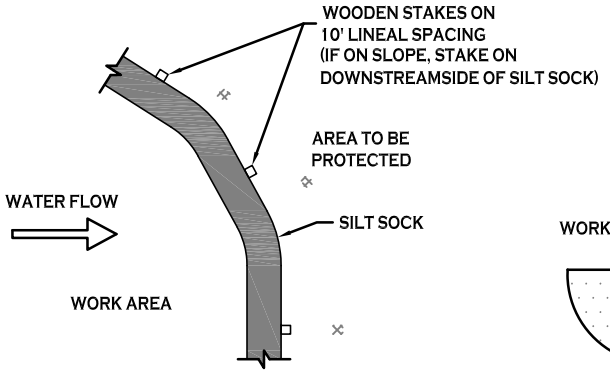
BAG DETAIL



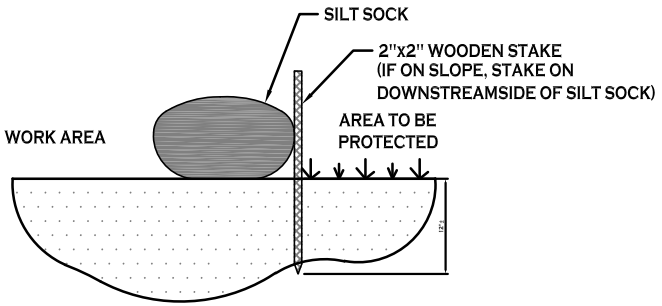
NOTE:
INSPECT AFTER EVERY
RAINFALL OR 3 WEEKS
AND EMPTY.

SILT SACK DETAIL

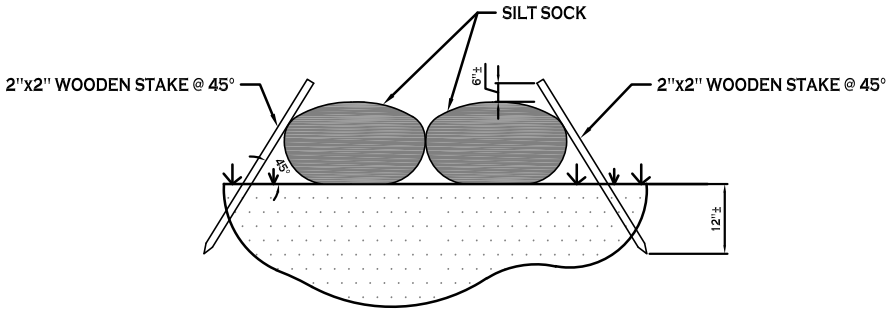
NOT TO SCALE



PLAN VIEW



SECTION VIEW



SECTION VIEW @ JOINT OVERLAP

NOTES:

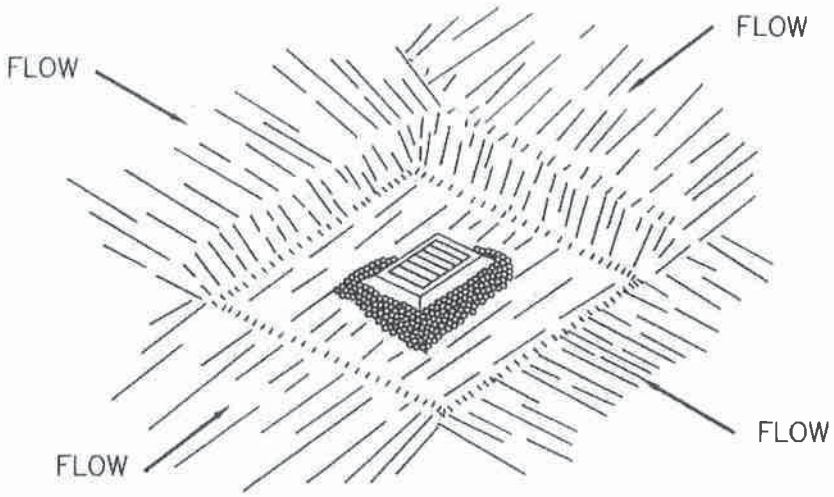
CONTRACTOR SHALL INSPECT AND MAINTAIN SILT SOCK AS NEEDED DURING THE DURATION OF CONSTRUCTION PROJECT.

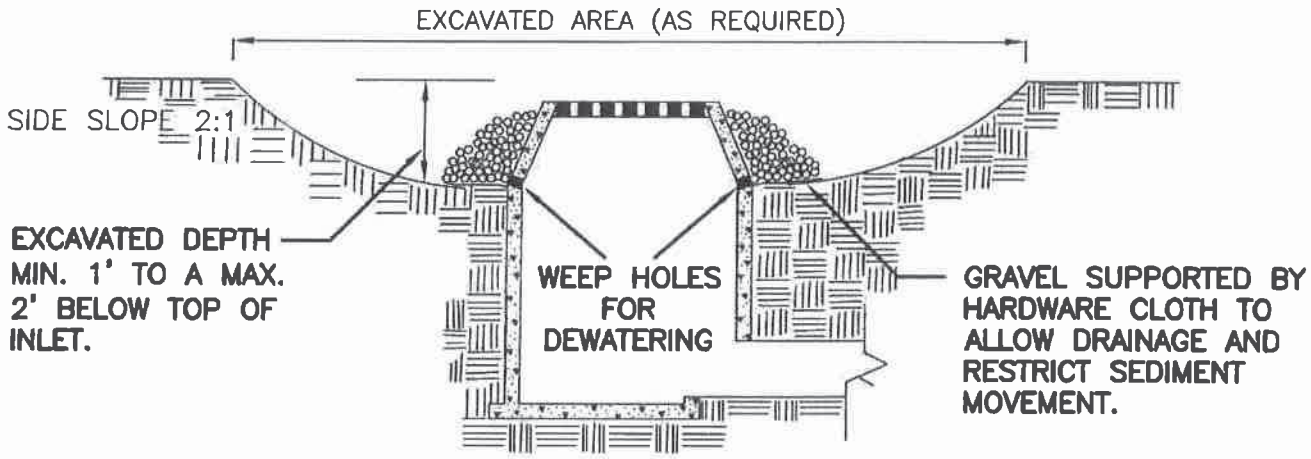
CONTRACTOR SHALL REMOVE SEDIMENT COLLECTED AT THE BASE OF THE SILT SOCK WHEN IT HAS REACHED $\frac{1}{2}$ OF THE EXPOSED HEIGHT OF THE SILT SOCK. ALTERNATIVELY, RATHER THAN CREATE A SOIL DISTURBING ACTIVITY, THE ENGINEER MAY CALL FOR ADDITIONAL SILT SOCK TO BE ADDED AT AREAS OF HIGH SEDIMENTATION, PLACED IMMEDIATELY ON TOP OF THE EXISTING SEDIMENT LADEN SILT SOCK.

SILT SOCK SHALL BE OVERLAPPED 12" AT JOINTS AND STAKED ON EACH SIDE OF THE SOCK AT A 45° ANGLE

SILT SOCK DETAIL

N.T.S.





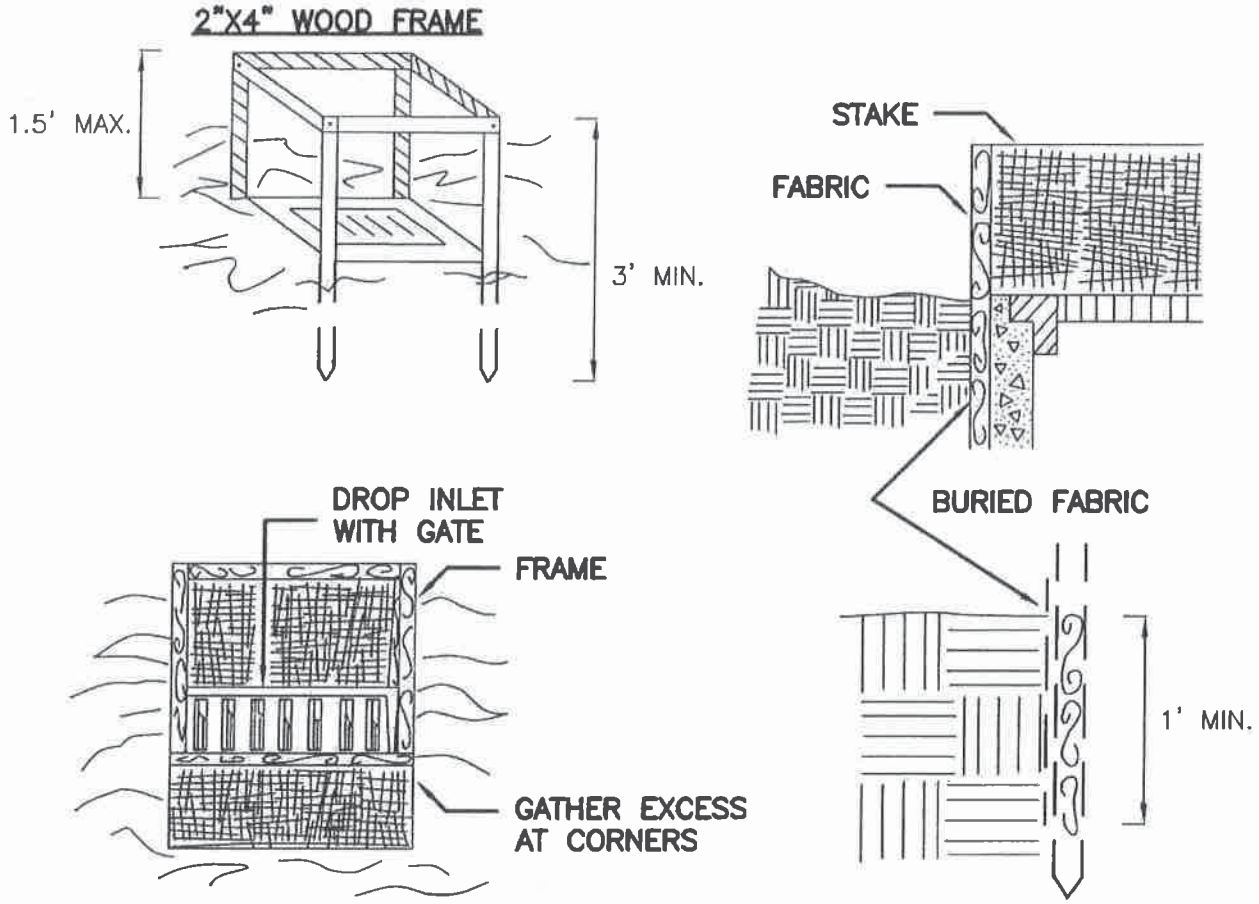
CONSTRUCTION SPECIFICATIONS

1. CLEAR THE AREA OF ALL DEBRIS THAT WILL HINDER EXCAVATION.
2. GRADE APPROACH TO THE INLET UNIFORMLY AROUND THE BASIN.
3. WEEP HOLES SHALL BE PROTECTED BY GRAVEL.
4. UPON STABILIZATION OF CONTRIBUTING DRAINAGE AREA, SEAL WEEP HOLES, FILL BASIN WITH STABLE SOIL TO FINAL GRADE, COMPACT IT PROPERLY AND STABILIZE WITH PERMANENT SEEDING.

MAXIMUM DRAINAGE AREA 1 ACRE

INLET PROTECTION DETAIL 1

NOT TO SCALE



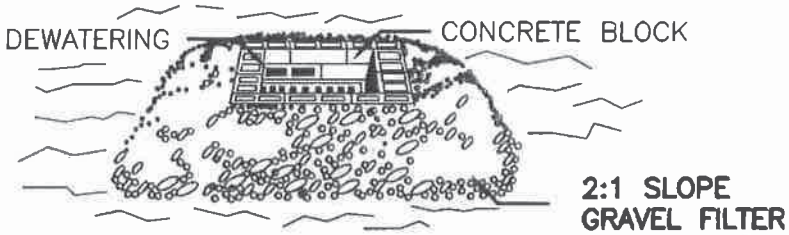
CONSTRUCTION SPECIFICATIONS

1. FILTER FABRIC SHALL HAVE AN EOS OF 40–85. BURLAP MAY BE USED FOR SHORT TERM APPLICATIONS.
2. CUT FABRIC FROM A CONTINUOUS ROLL TO ELIMINATE JOINTS. IF JOINTS ARE NEEDED THEY WILL BE OVERLAPPED TO THE NEXT STAKE.
3. STAKE MATERIALS WILL BE STANDARD 2" x 4" WOOD OR EQUIVALENT. METAL WITH A MINIMUM LENGTH OF 3 FEET.
4. SPACE STAKES EVENLY AROUND INLET 3 FEET APART AND DRIVE A MINIMUM 18 INCHES DEEP. SPANS GREATER THAN 3 FEET MAY BE BRIDGED WITH THE USE OF WIRE MESH BEHIND THE FILTER FABRIC FOR SUPPORT.
5. FABRIC SHALL BE EMBEDDED 1 FOOT MINIMUM BELOW GROUND AND BACKFILLED. IT SHALL BE SECURELY FASTENED TO THE STAKES AND FRAME.
6. A 2" x 4" WOOD FRAME SHALL BE COMPLETED AROUND THE CREST OF THE FABRIC FOR OVER FLOW STABILITY.

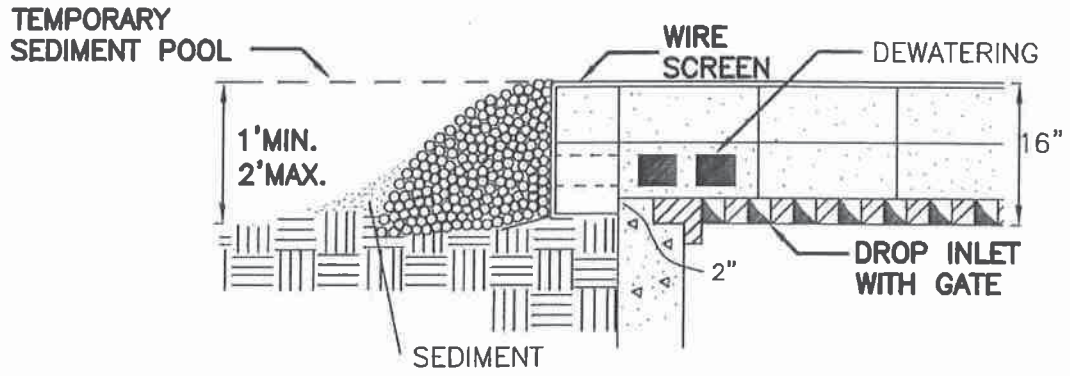
MAXIMUN DRAINAGE AREA 1 ACRE

INLET PROTECTION DETAIL 2

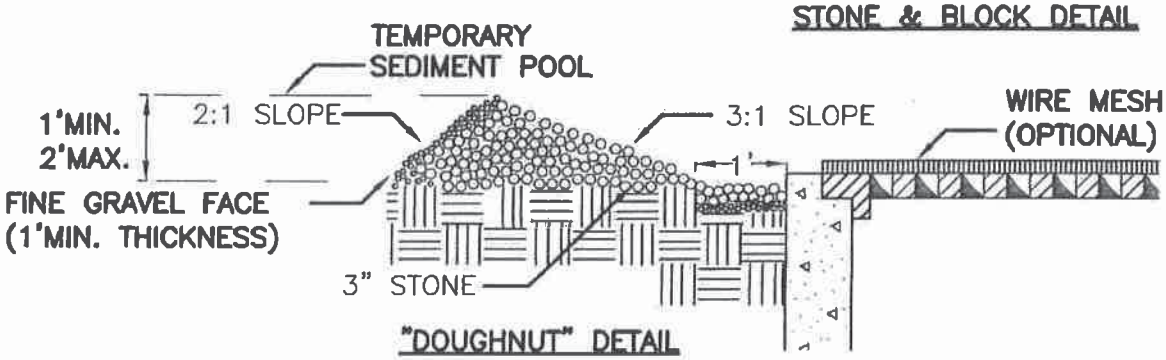
NOT TO SCALE



STONE & BLOCK PLAN VIEW



STONE & BLOCK DETAIL



"DOUGHNUT" DETAIL

WATER FL

W

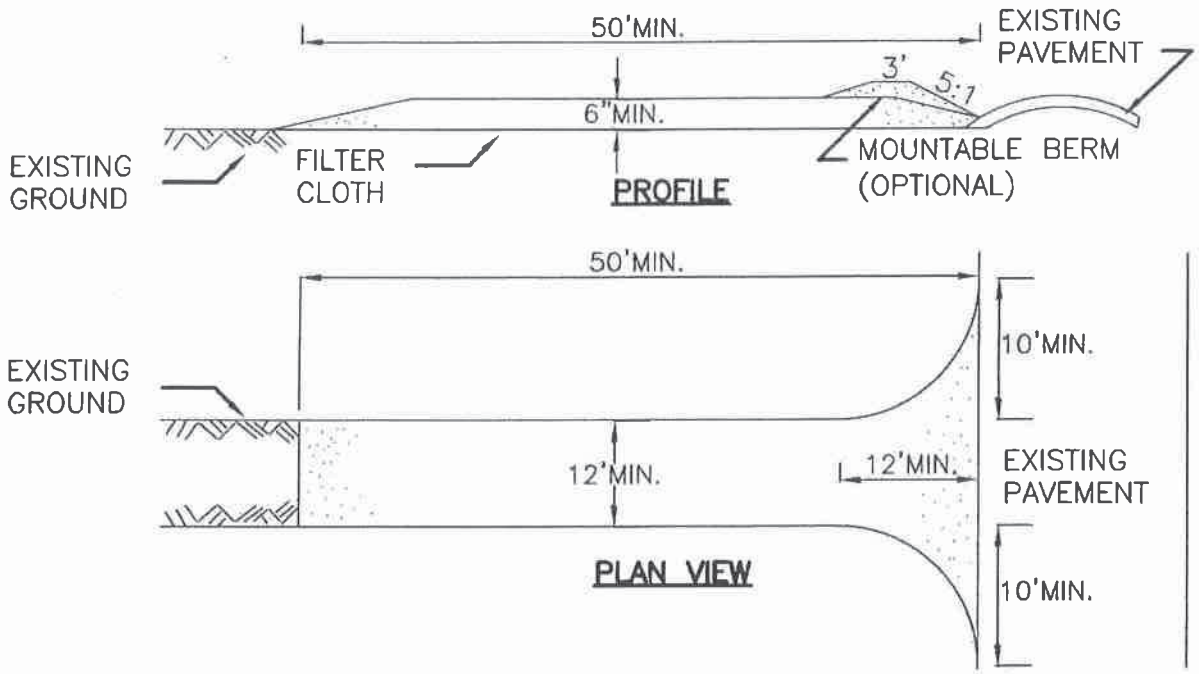
CONSTRUCTION SPECIFICATIONS

1. LAY ONE BLOCK ON EACH SIDE OF THE STRUCTURE ON ITS SIDE FOR DEWATERING. FOUNDATION SHALL BE 2 INCHES MINIMUM BELOW REST OF INLET AND BLOCKS SHALL BE PLACED AGAINST INLET FOR SUPPORT.
2. HARDWARE CLOTH OR 1/2" WIRE MESH SHALL BE PLACED OVER BLOCK OPENINGS TO SUPPORT STONE.
3. USE CLEAN STONE OR GRAVEL 1/2–3/4 INCH IN DIAMETER PLACED 2 INCHES BELOW TOP OF THE BLOCK ON A 2:1 SLOPE OR FLATTER.
4. FOR STONE STRUCTURES ONLY, A 1 FOOT THICK LAYER OF THE FILTER STONE WILL BE PLACED AGAINST THE 3 INCH STONE AS SHOWN ON THE DRAWINGS.

MAXIMUM DRAINAGE AREA 1 ACRE

INLET PROTECTION DETAIL 3

NOT TO SCALE

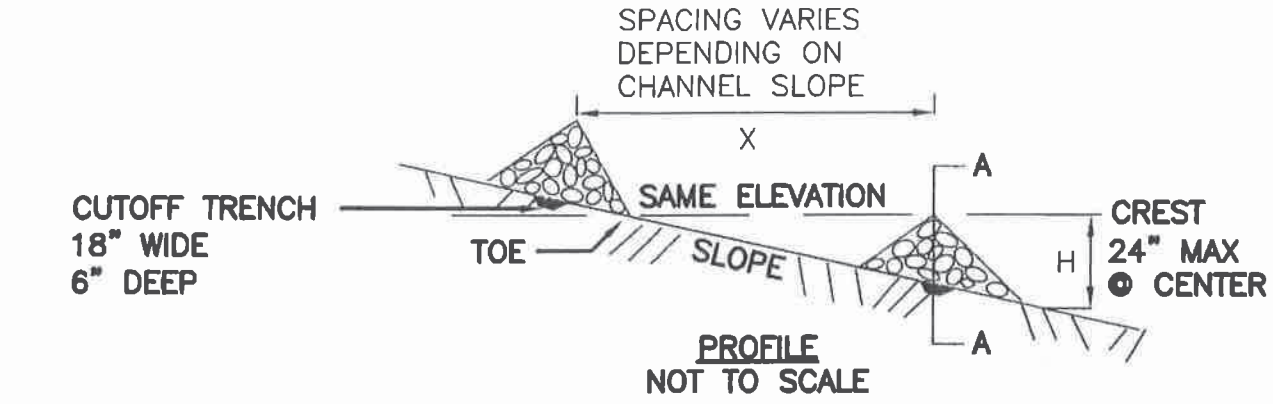


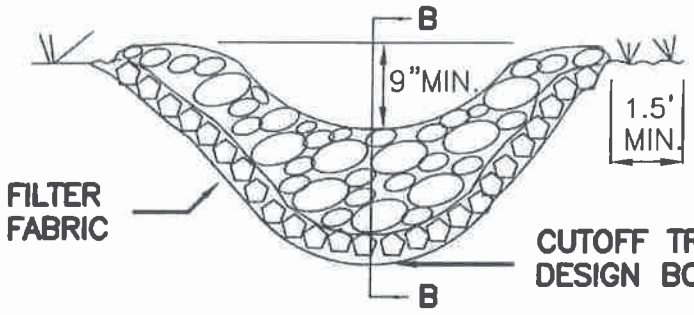
CONSTRUCTION SPECIFICATIONS

1. STONE SIZE – USE 2" STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH – NOT LESS THAN 50 FEET (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY).
3. THICKNESS – NOT LESS THAN SIX (6) INCHES.
4. WIDTH – TWELVE (12) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. TWENTY–FOUR (24) FOOT IF SINGLE ENTRANCE TO SITE.
5. FILTER CLOTH – WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER – ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CON–STRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE – THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS–OF–WAY, ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACTED ONTO PUBLIC RIGHTS–OF–WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON A AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

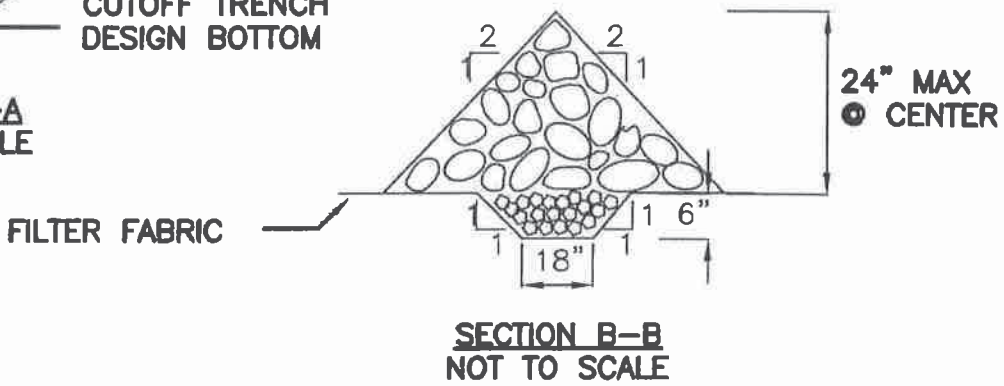
STABILIZED CONSTRUCTION ENTRANCE DETAIL

NOT TO SCALE





$$X = \frac{H\ (Ft)}{SLOPE\ (FT/FT)}$$



CONSTRUCTION SPECIFICATIONS

1. STONE WILL BE PLACED ON A FILTER FABRIC FOUNDATION TO THE LINES, GRADES AND LOCATIONS SHOWN IN THE PLAN.
2. SET SPACING OF CHECK DAMS TO ASSUME THAT THE ELEVATIONS OF THE CREST OF THE DOWNSTREAM DAM IS AT THE SAME ELEVATION OF THE TOE OF THE UPSTREAM DAM.
3. EXTEND THE STONE A MINIMUM OF 1.5 FEET BEYOND THE DITCH BANKS TO PREVENT CUTTING AROUND THE DAM.
4. PROTECT THE CHANNEL DOWNSTREAM OF THE LOWEST CHECK DAM FROM SCOUR AND EROSION WITH STONE OR LINER AS APPROPRIATE.
5. ENSURE THAT CHANNEL APPURTENANCES SUCH AS CULVERT ENTRANCES BELOW CHECK DAMS ARE NOT SUBJECT TO DAMAGE OR BLOCKAGE FROM DISPLACED STONE.

MAXIMUM DRAINAGE AREA 2 ACRES.

STONE CHECK DAM DETAIL

NOT TO SCALE

Appendix J

Stormwater Management Maintenance

STORMWATER CONTROL FACILITY
MAINTENANCE AGREEMENT

Stormwater Management Facility Inspection Procedures

Post Construction Operation & Maintenance:

1. On a quarterly basis, perform the following:
   a. Inspect catch basins, manholes and storm piping for debris and accumulation of sediment.
   b. Remove and properly dispose of any collected debris from structures.
   c. Flush storm sewers with water, if necessary, to remove accumulated sediment.
   d. Check all rip rap stone for erosion and re-stone, if necessary, to prevent further erosion.
   e. Inspect grass and landscaped areas for un-vegetated areas or areas with less than 80% healthy stand of grass and reseed and mulch as necessary. Water areas daily if reseeded between July and August.

2. Maintain all lawn areas by regular mowing, including the grass slopes of the detention basins. Any eroded areas shall be re-graded, seeded and mulched immediately.

3. Inspect detention basins for debris and sediment accumulation two times per year (spring and fall). Debris and sediment accumulation should be removed from the basin every five to six years or with sediment buildup over 6" in depth. Remove and properly dispose of any collected debris and sediment.

4. The bioretention area shall be maintained as required in the NYSDEC Stormwater Management Design Manual and as a component of the property landscaping and shall be maintained on a regular basis. Sediment must be removed when accumulation depth exceeds on inch. Any erosion of the bioretention berm must be repaired as soon as possible to prevent diversion around the bioretention area.

12.2.4 Bioretention

Includes: Tree Pits (RR-3), Tree Trench (RR-3), Rain Gardens (RR-6), Stormwater Planters (RR-7), Infiltration Bioretention (F-4), Filtration Bioretention (F-5), Bioslope (F-6), Dry Swales (O-1)

Note: For the purposes of this Chapter, the term "Bioretention" will be used to generally describe all of these practices.

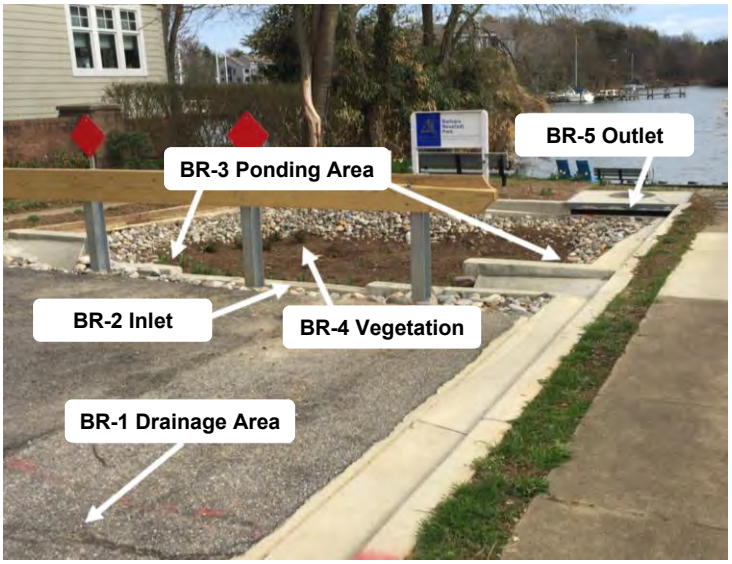


Figure 12.7 Key Areas for Level 1 Inspection of Bioretention

Components

Key components to inspect for Bioretention include the following:

- **BR-1 Drainage Area:** The drainage area sends runoff to and is uphill from the Bioretention. When it rains, water runs off and flows to the Bioretention and ponds within the filter temporarily (usually for no more than 48 hours). Sometimes, the runoff will contain dirt, grit, grass clippings, oil, or other substances that SHOULD NOT be directed to the practice.
- **BR-2 Inlets:** The inlets to a Bioretention are where water flows into the filter. Depending on the design, water can flow in through: curb cuts, pipes, ditches, or sheet flow.
- **BR-3 Ponding Area:** The ponding area fills up with water during a rainstorm. If you picture the Bioretention as a bathtub, there is the *bottom* (usually flat surface), *side slopes* (areas that slope down to the bottom from the surrounding ground), and *berms or structures that control the depth to which water ponds.*
- **BR-4 Vegetation:** The health of vegetation within the Bioretention is perhaps the most critical maintenance item for the Owner/Operator. Many Bioretention become overgrown, and "desirable" vegetation becomes choked out by weeds and invasive plants. Weeding and watering are essential the first year and can be minimized with the use of a weed-free mulch layer. It is important to know what the practice is supposed to look like, and what plants seem to be thriving or doing poorly.
- **BR-5 Outlets:** Outlets are where water leaves the Bioretention when stormwater exceeds the storage capacity.

Level 1 Inspections

Inspection Frequency: *4 times per year during the growing season. During the first 6 months of operation, it is recommended that bioretention practices be inspected at least twice, and after each storm event greater than 0.5".*

Maintenance Frequency: *At least 4 times during the growing season, bioretention should be pruned, weeded, and mowed around; have sediment, trash, and debris removed; and have dead and damaged plants replaced, as needed. In the spring and fall, the practices should have rills, gullies, dead or diseased trees and shrubs repaired or replaced; have bare areas reseeded if applicable; and have mulch replenished to required depth. In the winter months, planting material should be trimmed, and the practice should be inspected for snow accumulation. Once per year, soils should be tested for appropriate pH levels. Finally, every 2 to 3 years, damaged or compromised structures within the practice should be replaced, perennials should be trimmed and divided, and infiltration rates should be checked to ensure proper drainage.*

Maintenance Frequency (Design F-6): In addition to the above, Bioslopes should be inspected after snow events to ensure that the added weight from accumulated snow did not compact the filter media. On a monthly basis, stabilize eroded areas, ensure that flow is not bypassing the facility, and mow the slope using a retractable arm mower to a height of 6 to 15 inches. Recommend performing a flow test on the cleanouts annually to check for clogging, and to remove accumulated sediment that exceeds three inches in depth.

Curb Inlet #1: flow enters through curb channel.

Curb Inlet #2: flow enters through drop curb.

Pea Gravel Diaphragm: sheet flow enters and is evenly distributed along the practice length.

Grass filter strip: sheet flow enters and is evenly distributed along the practice length.

Figure 12.8 Bioretention Filter Inlets

Triggers for Level 2 Inspection

The most likely triggers for Level 2 Inspection of BR practices are:

- Water ponding on surface of practice for more than 72 hours after a storm event
- Bioslope does not drain properly
- Sparse or out of control vegetation
- Practice deviates from original design
- Erosion of inlets, filter bed or outlets
- Significant sediment accumulation

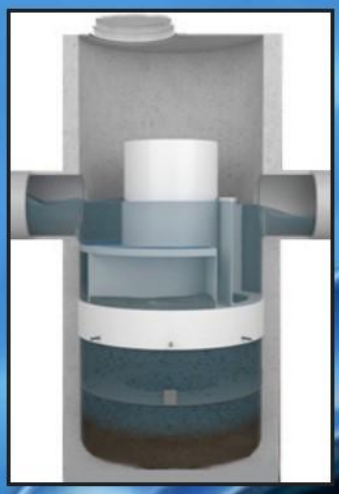
Triggers for Level 3 Inspection

The most likely triggers for Level 3 Inspection of BR practices are:

- Standing water caused by clogged or over compacted media
- Vegetation management needed
- Bioretention does not conform to original design plan in surface area or storage.
- Severe erosion especially when caused by subsurface defect
- Widespread significant and persistent sediment accumulation

HydroStorm

Hydrodynamic Separator



Product Info

HydroStorm efficiently removes oil, trash, and TSS (suspended solids and their associated metals, nutrients, bacteria), from stormwater runoff which is required in NDPES permits and the Clean Water Act.

Applications

HydroStorm is used as a standalone treatment solution for urban retrofit and redevelopment applications; as part of a treatment train for new developments; and as a pretreatment device for infiltration, underground storage, and bio-retention.

Features

- Internal high flow bypass prevents scour at high flows
- Designed to accommodate multiple inlet pipes
- Captures oil spills, TSS and trash
- Lower cost compared to other competitors
- Reduced sump depths to minimize excavation
- Small footprint to avoid conflicts with other services
- Engineered for traffic loading
- Can be used as a inlet, bend, or junction structure
- Sized based on independent TSS removal results
- Low Headloss (K= 1.04) to minimize impact to drainage system
- Minimum elevation drop from inlet to outlet

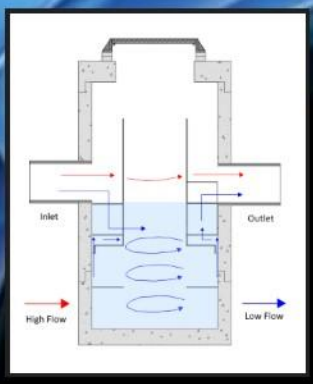
Sizing & Design

Sized based on independent laboratory testing results. Approved and/or certified by numerous agencies (NJDEP, 2018; NJCAT, 2018; ETV Canada, 2018)

Hydroworks LLC
888-290-7900
www.hydroworks.com
info@hydroworks.com

HydroStorm

Hydrodynamic Separator



HYDROSTORM WATER QUALITY FLOW RATES (cfs)					
Model	NJDEP* (67 um)	ConnDOT** (100 um)	NH*** (OK110)	150 um***	200 um***
HS 4/HS 4i	0.9	1.1	0.9	1.6	2.0
HS 5	1.4	2.0	1.5	2.5	3.2
HS 6	2.0	3.1	2.1	3.6	4.5
HS 7	2.7	4.5	2.9	4.9	6.2
HS 8	3.5	6.1	3.8	6.3	8.1
HS 10	5.5	11.3	5.9	9.9	12.6
HS 12	7.9	18.9	8.5	14.3	18.2

*50% Annual TSS Removal **60% Annual TSS Removal ***80% TSS Removal at WQF

Hydroworks will design a unit for you or you can download our free design software at www.hydroworks.com

Hydroworks LLC
888-290-7900
www.hydroworks.com
info@hydroworks.com

For more information, call your local Hydroworks representative:

Specifications

1. Must be independently tested to the 2013 NJDEP Laboratory Protocol and 2013 ETV Canada protocol (ISO 14024:2016). Separator must be sized based on this data.

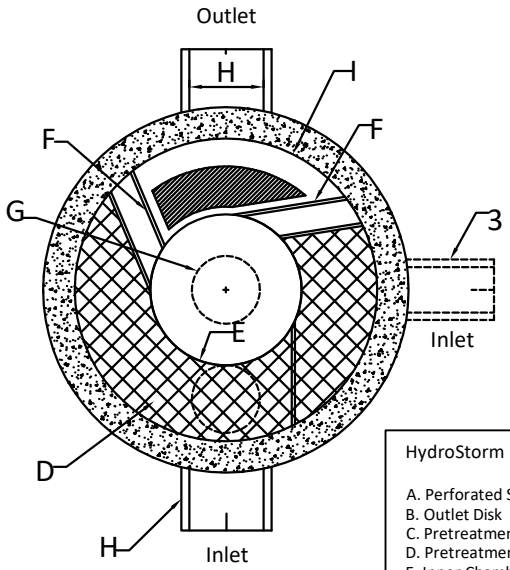
2. Any testing performed by the manufacturer is unacceptable to demonstrate an alternate equal.

3. Field Testing is unreliable, site and storm specific, and subject to compounding equipment and analytical errors and therefore is unacceptable as verification of an alternate equal. TARP verfication as per NJDEP is testing consistent with the 2013 NJDEP laboratory protocol.

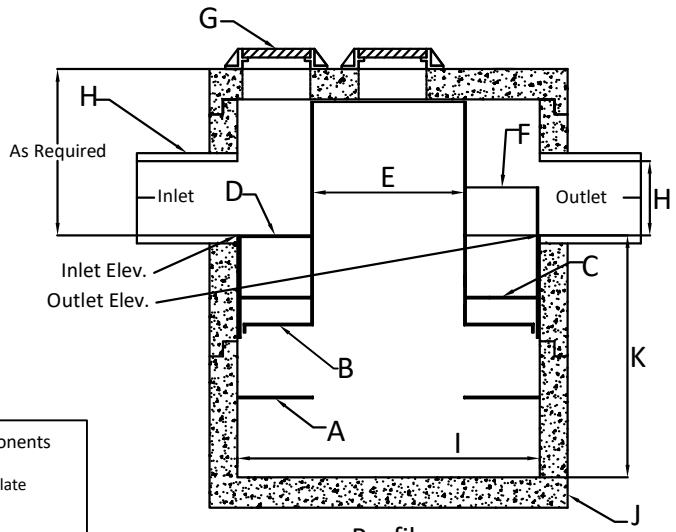
4. The separator must be designed based on the following criteria:

Flow Criteria	
Water Quality FLow Rate cfs (L/s)	
Peak Design Flow Rate cfs (L/s)	

TSS Removal Criteria	
Annual TSS Removal (%)	
NJDEP/ETV Canada TSS	
OK110 Sand	
City of Toronto	
Other	



Plan



Profile

HydroStorm Components

A. Perforated Scour Plate
B. Outlet Disk
C. Pretreatment Disk
D. Pretreatment Grate
E. Inner Chamber
F. By-Pass Weirs
G. Frame and Cover (1-2)
H. Inlet and Outlet Pipes
I. Structure Diameter
J. Base Extension (HS4 - HS6)
K. Sump Depth

HydroStorm by Hydroworks, LLC
US Patent No. 10,710,907
www.hydroworks.com
888-290-7900

HydroStorm Dimensions / Capacities

Model	Diameter ft (m) (9)	Sump Depth ft (m) (11)	Inner Chamber Diam. ft (m) (5)	Max. Pipe in (mm) (8)	Oil Spill Volume gal (L)	Sediment Volume ft3 (m3)	Total Volume gal (L)
HS 3	3 (0.9)	3 (0.9)	1.5 (0.45)	18 (450)	40 (155)	10 (0.35)	155 (600)
HS 4	4 (1.2)	4 (1.2)	2 (0.6)	24 (600)	95 (375)	30 (0.85)	375 (1420)
HS 5	5 (1.5)	5 (1.5)	2.5 (0.8)	30 (750)	165 (635)	60 (1.8)	730 (2780)
HS 6	6 (1.8)	6 (1.8)	3 (0.9)	36 (900)	270 (1030)	110 (3.2)	1265 (4800)
HS 7	7 (2.1)	6.5 (2.0)	3.5 (1.0)	42 (1050)	410 (1560)	160 (4.6)	1870 (7080)
HS 8	8 (2.4)	7 (2.1)	4 (1.2)	48 (1200)	615 (2330)	220 (6.2)	2630 (9960)
HS 10	10 (3.0)	9 (2.7)	5 (1.5)	60 (1500)	1130 (4285)	465 (13.1)	5285 (20015)
HS 12	12 (3.6)	11 (3.3)	6 (1.8)	72 (1800)	1875 (7100)	835 (23.7)	9305 (35225)

Notes:

1. Headloss K factor of 1.04 for hydraulic gradeline calculations

2. Sump depths shown are typical. Additional depth can be added as required

3. Multiple inlet pipes allowed

4. Drops allowed

5. Inlet invert elevations should be the same or higher than the outlet invert elevation. Inlet can be up to 12" (300 mm) lower than outlet if pretreatment area is omitted but 12" (300 mm) must be added to sump depth to maintain overall treatment volume.

6. Solid Cover shown. HydroStorm can be desiged with an inlet grate if required.

7. Oil capacities given are spill capacities.

8. Sediment depths are maximum holding capacities and not recommended capacities for regular maintenance.

9. Capacities are rounded down to nearest 5 gal or ft3 (1L or 0.1 m3 for metric units)

10. Base Extensions not provided on standard units larger than the HS 6. Extensions can be provided if required due to groundwater/buoyancy concerns at the request of the engineer of record.

11. HS4 to HS6 models require one frame and cover. HS7 to HS12 models require two covers

Hydroworks HydroStorm

PROJECT:

LOCATION:

REVISION DATE: 08/07/2020

Hydroworks

Hydroworks® HydroStorm

Operations & Maintenance Manual

Version 1.2

Please call Hydroworks at 888-290-7900 or email us at support@hydroworks.com if you have any questions regarding the Inspection Checklist. Please email a copy of the completed checklist to Hydroworks at for our records.

Introduction

The HydroStorm is a state-of-the-art hydrodynamic separator. Hydrodynamic separators remove solids, debris and lighter than water (oil, trash, floating debris) pollutants from stormwater. Hydrodynamic separators and other water quality measures are mandated by regulatory agencies (Town/City, State, Federal Government) to protect storm water quality from pollution generated by urban development (traffic, people) as part of new development permitting requirements.

As storm water treatment structures fill up with pollutants they become less and less effective in removing new pollution. Therefore, it is important that storm water treatment structures be maintained on a regular basis to ensure that they are operating at optimum performance. The HydroStorm is no different in this regard and this manual has been assembled to provide the owner/operator with the necessary information to inspect and coordinate maintenance of their HydroStorm.

Hydroworks® HydroStorm Operation

The Hydroworks HydroStorm (HS) separator is a unique hydrodynamic by-pass separator. It incorporates a protected submerged pretreatment zone to collect larger solids, a treatment tank to remove finer solids, and a dual set of weirs to create a high flow bypass. High flows are conveyed directly to the outlet and do not enter the treatment area, however, the submerged pretreatment area still allows removal of coarse solids during high flows.

Under normal or low flows, water enters an inlet area with a horizontal grate. The area underneath the grate is submerged with openings to the main treatment area of the separator. Coarse solids fall through the grate and are either trapped in the pretreatment area or conveyed into the main treatment area depending on the flow rate. Fines are transported into the main treatment area. Openings and weirs in the pretreatment area allow entry of water and solids into the main treatment area and cause water to rotate in the main treatment area creating a vortex motion. Water in the main treatment area is forced to rise along the walls of the separator to discharge from the treatment area to the downstream pipe.

The vortex motion forces solids and floatables to the middle of the inner chamber. Floatables are trapped since the inlet to the treatment area is submerged. The design maximizes the retention of settled solids since solids are forced to the center of the inner chamber by the vortex motion of water while water must flow up the walls of the separator to discharge into the downstream pipe.

A set of high flow weirs near the outlet pipe create a high flow bypass over both the pretreatment area and main treatment chamber. The rate of flow into the treatment area is regulated by the number and size of openings into the treatment chamber and the height of by-pass weirs. High flows flow over the weirs directly to the outlet pipe preventing the scour and resuspension of any fines collected in the treatment chamber.

A central access tube is located in the structure to provide access for cleaning. The arrangement of the inlet area and bypass weirs near the outlet pipe facilitate the use of multiple inlet pipes.

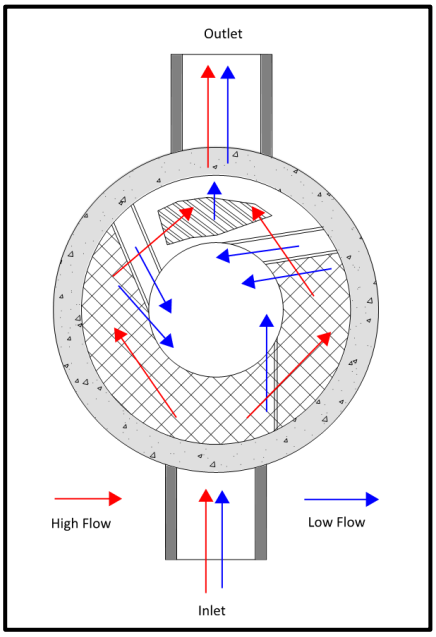


Figure 1. Hydroworks HydroStorm Operation – Plan View

Figure 2 is a profile view of the HydroStorm separator showing the flow patterns for low and high flows.

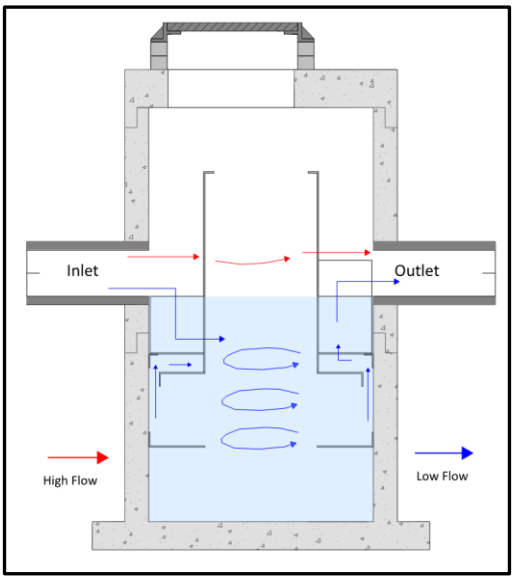


Figure 2. Hydroworks HydroStorm Operation – Profile View

Hydroworks

The HS 4i is an inlet version of the HS 4 separator. There is a catch-basin grate on top of the HS 4i. A funnel sits sits underneath the grate on the frame and directs the water to the inlet side of the separator to ensure all lows flows are properly treated. The whole funnel is removed for inspection and cleaning.

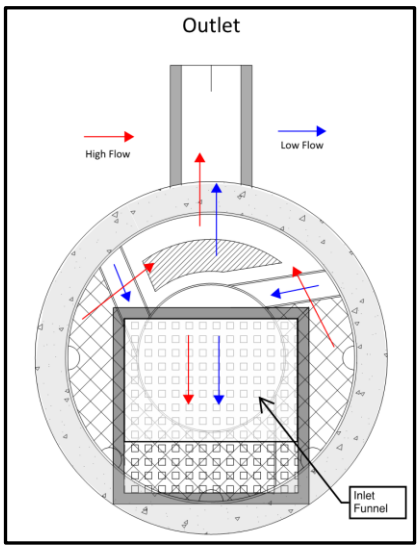


Figure 3. Hydroworks HS 4i Funnel

Construction Materials

The inner chamber and outlet baffle are made out of a copolymer plastic. The shell of the structure is pre-cast concrete. Pre-cast concrete is readily accepted by all municipalities since it has the following advantages:

- long service life
- ease of installation (less dependent on backfill (contractor proficiency) for structural integrity)
- concrete structures are designed for both anti-buoyancy and traffic loading without any field requirements (such as structural loading slabs in traffic areas and anti-buoyancy slabs to prevent groundwater uplift).
- low maintenance requirements

Hydroworks HS Separator Dimensions and Capacities

The HS separator is manufactured in a variety of sizes from 4 ft inside diameter to 12 ft inside diameter as shown in Table 1. Larger sizes may not be available in all areas. Please check with Hydroworks to ensure availability of the larger model sizes.

Table 1. Hydroworks HS Separator Dimensions*					
Model	Structure Inside Diam. (SID) (mm)	Structure Depth (mm)*	Sediment/ Sinking Trash Volume (L)	Oil/Floating Trash Volume (L)	Permanent Pool Wet Volume (L)
HS 3	900	1050	420	150	700
HS 4	1200	1200	845	355	1420
HS 5	1500	1500	1695	620	2775
HS 6	1800	1800	3110	1020	4800
HS 7	2100	1950	4530	1550	7080
HS 8	2400	2100	6225	2325	9960
HS 9	2700	2400	9200	3195	14410
HS 10	3000	2700	13025	4275	20015
HS 12	3600	3000	20525	7095	30535

*Dimensions vary with project requirements

The volumes provided in Table 1 for oil and sediment are to full capacity and not indicative of recommended depths/volumes for maintenance.

Headloss

Any water quality system implemented in a storm drain network will create headloss in the system. In general, depending on the configuration of the by-pass, systems designed to treat high flows or all of the flow will have a higher headloss impact on the storm drain network than systems that by-pass high flows.

The headloss created by the HS separator was measured in an independent laboratory (Alden Research Laboratory) for a full-scale HS 4. The K value ($h = K\ v^2/(2g)$) for headloss calculations was determined to be 1.04 as shown in Figure 3.

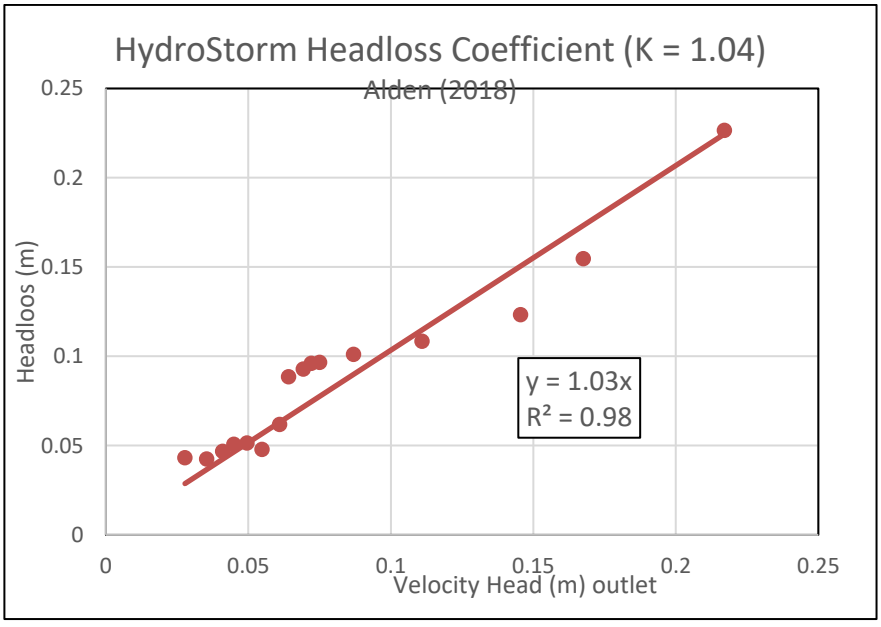


Figure 3. HydroStorm Headloss K Factor (1.04)

Hydroworks

Inspection

Procedure

Floatables

A visual inspection can be conducted for floatables by removing the covers and looking down into the center access tube of the separator. Separators with an inlet grate (HS 4i or custom separator) will have a plastic funnel located under the grate that must be removed from the frame prior to inspection or maintenance. If you are missing a funnel please contact Hydroworks at the numbers provided at the end of this document.

TSS/Sediment

Inspection for TSS build-up can be conducted using a Sludge Judge®, Core Pro®, AccuSludge® or equivalent sampling device that allows the measurement of the depth of TSS/sediment in the unit. These devices typically have a ball valve at the bottom of the tube that allows water and TSS to flow into the tube when lowering the tube into the unit. Once the unit touches the bottom of the device, it is quickly pulled upward such that the water and TSS in the tube forces the ball valve closed allowing the user to see a full core of water/TSS in the unit. The unit should be inspected for TSS through each of the access covers. Several readings (2 or 3) should be made at each access cover to ensure that an accurate TSS depth measurement is recorded.

Frequency

Construction Period

The HydroStorm separator should be inspected every four weeks and after every large storm (over 0.5” (12.5 mm) of rain) during the construction period.

Post-Construction Period

The Hydroworks HydroStorm separator should be inspected during the first year of operation for normal stabilized sites (grassed or paved areas). If the unit is subject to oil spills or runoff from unstabilized (storage piles, exposed soils) areas the HydroStorm separator should be inspected more frequently (4 times per year). The initial annual inspection will indicate the required future frequency of inspection and maintenance if the unit was maintained after the construction period.

Reporting

Reports should be prepared as part of each inspection and include the following information:

1. Date of inspection
2. GPS coordinates of Hydroworks unit
3. Time since last rainfall
4. Date of last inspection
5. Installation deficiencies (missing parts, incorrect installation of parts)
6. Structural deficiencies (concrete cracks, broken parts)
7. Operational deficiencies (leaks, blockages)
8. Presence of oil sheen or depth of oil layer
9. Estimate of depth/volume of floatables (trash, leaves) captured
10. Sediment depth measured
11. Recommendations for any repairs and/or maintenance for the unit
12. Estimation of time before maintenance is required if not required at time of inspection

A sample inspection checklist is provided at the end of this manual.

Maintenance

Procedure

The Hydroworks HydroStorm unit is typically maintained using a vacuum truck. There are numerous companies that can maintain the HydroStorm separator. Maintenance with a vacuum truck involves removing all of the water and sediment together. The water is then separated from the sediment on the truck or at the disposal facility.

A central access opening (24” (600 mm) or greater) is provided to the gain access to the lower treatment tank of the unit. This is the primary location to maintain by vacuum truck. The pretreatment area can also be vacuumed and/or flushed into the lower treatment tank of the separator for cleaning via the central access once the water level is lowered below the pretreatment floor.

In instances where a vacuum truck is not available other maintenance methods (i.e. clamshell bucket) can be used, but they will be less effective. If a clamshell bucket is used the water must be decanted prior to cleaning since the sediment is under water and typically fine in nature.

The local municipality should be consulted for the allowable disposal options for both water and sediments prior to any maintenance operation. Once the water is decanted the sediment can be removed with the clamshell bucket.

Disposal of the contents of the separator depend on local requirements. Maintenance of a Hydroworks HydroStorm unit will typically take 1 to 2 hours based on a vacuum truck and longer for other cleaning methods (i.e. clamshell bucket).

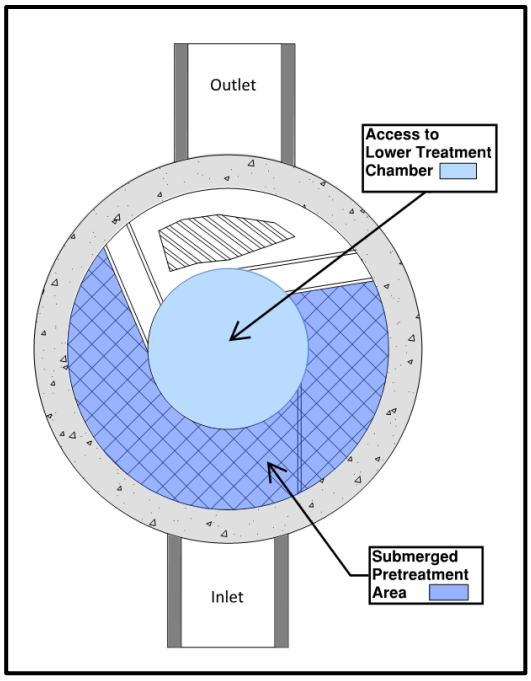


Figure 3. Maintenance Access

Frequency

Construction Period

A HydroStorm separator can fill with construction sediment quickly during the construction period. The HydroStorm must be maintained during the construction period when the depth of TSS/sediment reaches 24” (600 mm). It must also be maintained during the construction period if there is an appreciable depth of oil in the unit (more than a sheen) or if floatables other than oil cover over 50% of the area of the separator

The HydroStorm separator should be maintained at the end of the construction period, prior to operation for the post-construction period.

Post-Construction Period

The HydroStorm was independently tested by Alden Research Laboratory in 2017. A HydroStorm HS 4 was tested for scour with a 50% sediment depth of 0.5 ft.(150 mm). The sump depths given in Table 1 are scaled larger than required based on standard scaling requirements (NJDEP, ETV Canada). Accordingly maintenance depths for units larger than the HS 4 will be larger than 300 mm.

There will be designs with increased sediment storage based on specifications or site-specific criteria. A measurement of the total depth in the separator through the central access tube should be taken and compared to sump depth given in Table 1.

The standard sump depth from Table 1 should be subtracted from the measured depth and the resulting extra depth should be added to the values given in Table 2 to determine the site-specific sediment maintenance depth for that separator.

For example, if the measured sump depth in the HS-7 is 7.5 feet, then the sediment maintenance depth for that HS-7 is 2.25 ft (= 0.5 + 1.75) and the separator does not need to be cleaned for sediment accumulation until the measure sediment depth is 2.25 ft.

The HydroStorm separator must also be maintained if there is an appreciable depth of oil in the unit (more than a sheen) or if floatables other than oil cover over 50% of the water surface of the separator.

Table 2 Standard Maintenance Depths for HydroStorm Models

Model	Diameter ft (mm)	Sediment Maintenance Depth for Total Water Depth ft (mm)*
HS-3	3 (900)	1 (300)
HS-4	4 (1200)	1 (300)
HS-5	5 (1500)	1.75 (530)
HS-6	6 (1800)	2 (610)
HS-7	7 (2100)	1.75 (535)
HS-8	8 (2400)	1.5 (465)
HS-9	9 (2700)	1.75 (540)
HS-10	10 (3000)	2 (615)
HS-12	12 (3600)	1.5 (470)

*based on standard sump depths in Table 1

HYDROSTORM INSPECTION SHEET

Date _____
Date of Last Inspection _____

Site _____
City _____
State _____
Owner _____

GPS Coordinates _____

Date of last rainfall _____

Site Characteristics	**Yes**	**No**
Soil erosion evident	☐	☐
Exposed material storage on site	☐	☐
Large exposure to leaf litter (lots of trees)	☐	☐
High traffic (vehicle) area	☐	☐

HydroStorm	**Yes**	**No**
Obstructions in the inlet or outlet	☐ *	☐
Missing internal components	☐ **	☐
Improperly installed inlet or outlet pipes	☐ ***	☐
Internal component damage (cracked, broken, loose pieces)	☐ **	☐
Floating debris in the separator (oil, leaves, trash)	☐	☐
Large debris visible in the separator	☐ *	☐
Concrete cracks/deficiencies	☐ ***	☐
Exposed rebar	☐ **	☐
Water seepage (water level not at outlet pipe invert)	☐ ***	☐

Water level depth below outlet pipe invert _____“

Routine Measurements

Floating debris depth	**< 0.5” (13mm)**	☐	**>0.5” 13mm)**	☐ *
Floating debris coverage	**< 50% of surface area**	☐	**> 50% surface area**	☐ *
Sludge depth	**< 12” (300mm)**	☐	**> 12” (300mm)**	☐ *****

* Maintenance required
** Repairs required
*** Further investigation is required

Hydroworks

Other Comments:

Hydroworks

Hydroworks® HydroStorm

One Year Limited Warranty

Hydroworks, LLC warrants, to the purchaser and subsequent owner(s) during the warranty period subject to the terms and conditions hereof, the Hydroworks HydroStorm to be free from defects in material and workmanship under normal use and service, when properly installed, used, inspected and maintained in accordance with Hydroworks written instructions, for the period of the warranty. The standard warranty period is 1 year.

The warranty period begins once the separator has been manufactured and is available for delivery. Any components determined to be defective, either by failure or by inspection, in material and workmanship will be repaired, replaced or remanufactured at Hydroworks' option provided, however, that by doing so Hydroworks, LLC will not be obligated to replace an entire insert or concrete section, or the complete unit. This warranty does not cover shipping charges, damages, labor, any costs incurred to obtain access to the unit, any costs to repair/replace any surface treatment/cover after repair/replacement, or other charges that may occur due to product failure, repair or replacement.

This warranty does not apply to any material that has been disassembled or modified without prior approval of Hydroworks, LLC, that has been subjected to misuse, misapplication, neglect, alteration, accident or act of God, or that has not been installed, inspected, operated or maintained in accordance with Hydroworks, LLC instructions and is in lieu of all other warranties expressed or implied. Hydroworks, LLC does not authorize any representative or other person to expand or otherwise modify this limited warranty.

The owner shall provide Hydroworks, LLC with written notice of any alleged defect in material or workmanship including a detailed description of the alleged defect upon discovery of the defect. Hydroworks, LLC should be contacted at 136 Central Ave., Clark, NJ 07066 or any other address as supplied by Hydroworks, LLC. (888-290-7900).

This limited warranty is exclusive. There are no other warranties, express or implied, or merchantability or fitness for a particular purpose and none shall be created whether under the uniform commercial code, custom or usage in the industry or the course of dealings between the parties. Hydroworks, LLC will replace any goods that are defective under this warranty as the sole and exclusive remedy for breach of this warranty.

Subject to the foregoing, all conditions, warranties, terms, undertakings or liabilities (including liability as to negligence), expressed or implied, and howsoever arising, as to the condition, suitability, fitness, safety, or title to the Hydroworks HydroStorm are hereby negated and excluded and Hydroworks, LLC gives and makes no such representation, warranty or undertaking except as expressly set forth herein. Under no circumstances shall Hydroworks, LLC be liable to the Purchaser or to any third party for product liability claims; claims arising from the design, shipment, or installation of the HydroStorm, or the cost of other goods or services related to the purchase and installation of the HydroStorm. For this Limited Warranty to apply, the HydroStorm must be installed in accordance with all site conditions required by state and local codes; all other applicable laws; and Hydroworks' written installation instructions.

Hydroworks, LLC expressly disclaims liability for special, consequential or incidental damages (even if it has been advised of the possibility of the same) or breach of expressed or implied warranty. Hydroworks, LLC shall not be liable for penalties or liquidated damages, including loss of production and profits; labor and materials; overhead costs; or other loss or expense incurred by the purchaser or any third party. Specifically excluded from limited warranty coverage are damages to the HydroStorm arising from ordinary wear and tear; alteration, accident, misuse, abuse or neglect; improper maintenance, failure of the product due to improper installation of the concrete sections or improper sizing; or any other event not caused by Hydroworks, LLC. This limited warranty represents Hydroworks' sole liability to the purchaser for claims related to the HydroStorm, whether the claim is based upon contract, tort, or other legal basis.