Stormwater Pollution Control Plan

Waterford Solar

117 Oil Mill Road
Waterford, Connecticut

PREPARED FOR

Greenskies Clean Energy, LLC
111 W Jackson Boulevard
Suite 1901
Chicago, Illinois 60604

PREPARED BY

100 Great Meadow Road
Suite 200
Wethersfield, Connecticut 06109

March 12, 2020

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1

Introduction

As it is proposed to disturb approximately 75 acres and clear 75 acres of wooded areas, this Stormwater Pollution Control Plan (SWPCP) has been prepared in accordance with Section 22a-430b of the Connecticut General Statutes and the General Permit for Discharge of Stormwater and Dewatering Wastewaters from Construction Activities (the "General Permit"), effective date October 1, 2018. This SWPCP addresses pre- and post-construction issues associated with stormwater management during construction. All actions required by this plan shall be followed by the permittee per the conditions of the General Permit.

2

Project Summary

This Stormwater Pollution Control Plan (SWPCP) has been developed for the proposed construction of the proposed Waterford Solar project (Greenskies Clean Energy, L.L.C.), a ±16 MW-AC photovoltaic solar energy facility (the "Project" or "Facility"). The Project will consist of ground-based solar racks, panels, combiner boxes, power conditioning systems (i.e. inverters), and buried conduit. The Project will also have access roads, perimeter security fences, and paths around the perimeter. The Project will be sited on one (1) parcel of land in Waterford, Connecticut, with access provided from Oil Mill Road. The Site is generally bounded by forest with residential developments to the northwest on Oil Mill Road. Stony Brook flows approximately 700 feet from the east of the property line. Refer to Figure A for a map of the Site.

The Project development will be on approximately 75 acres of forest that has been cleared for timber harvest. There are wetlands associated with the Stony Brook, and other parts of the Site.

The project filed a motion to reopen Petition 1347 from the Connecticut Siting Council on January 23, 2020 as Petition 1347A. Representatives of the project team have conducted multiple meetings with Connecticut Department of Energy & Environmental Protection (CTDEEP) Stormwater staff. A site walk was also conducted with CTDEEP Stormwater staff on January 27, 2020, and written comments were received from CTDEEP Stormwater staff on February 26, 2020.

Existing Conditions

Most of the Project is situated in the watersheds of the Stony Brook and wetlands that are within or adjacent to the Site. Therefore, most of the stormwater runoff generated in the current forest flows overland towards wetlands systems. Refer to USGS Locus Map in Appendix A.

While most of the Site occupies a near level to gently sloping terrace position, there exists a steeply-faced rock slope along portions of the southern and eastern face of the Site. Most of the Site consists of forest that has been timber harvested with forest remaining around the site perimeters.

Proposed Conditions

Under proposed conditions, Site grading has been designed to maintain as much of the existing topography and drainage patterns as practicable to preserve the Site's

existing hydrologic characteristics. Stormwater best management practices (BMPs) will be implemented throughout the Site to utilize natural processes of infiltrating rainfall and filtering runoff as close to its source as possible. The plan also avoids impact to ecologically sensitive areas and preserves existing vegetation cover to the maximum extent practicable. The Project avoids the creation of any new significant effective impervious areas.

Under proposed conditions, most of the stormwater runoff generated within the Project will continue to flow overland off the Site. Multiple conservatives measures were taken into consideration in the redesign of the stormwater management system in terms of maintaining pre- and post- peak rates and water quality. A hydrologic soil map unit geotechnical survey was performed around the Site, a loss of Hydrologic Soil Group (HSG) was taken into consideration in the stormwater modelling, and a significant geotechnical investigation was undertaken within the locations of the proposed stormwater basins. In accordance with State regulations, the net result of the design is that the post-development peak flow rates will be mitigated to pre-development rates up and including the 100-year storm event, water quality will be treated, and channel protection of low-flow storms will be provided as well.

No work is proposed within an inland wetland or watercourse. Most work in the vicinity of wetlands will maintain a minimum 100 foot undisturbed buffer with the exception of the preexisting access road that runs through wetlands and next to a vernal pool.

Estimated Site Area and Total Area to be disturbed during Construction

The total anticipated site area to be disturbed during construction is approximately 75 acres. Therefore, the Project will require a General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities from the CTDEEP. It is proposed to clear approximately 75 acres of existing wooded areas. It is intended to perform tree clearing and site stabilization and then allow the site to vegetate across a growing season prior to construction of site improvements.

Estimated Runoff Coefficients

Although a timber harvest was performed over a majority of the Site, an existing cover type of “forest” has been considered in the hydrologic model, and “grass” is proposed under the solar panels. A loss of hydrologic soil group within the development area has been taken into consideration in the model as well. Accordingly, stormwater basins are proposed to manage long-term stormwater peak runoff.

Water Quality Treatment

The Project proposes not to grub removed trees outside the limits of the physical solar development and to maintain a meadow condition for this buffer between the improvements and the treeline, to the maximum extents practicable. The Project proposes to meet or exceed water quality goals of the State regulations by design of the stormwater basins and incorporation of the results of the geotechnical surveys.

Stream Channel Protection

Stream channel protection is provided at the discharge point of each permanent stormwater basin, in accordance with the guidance in 2004 CTDEEP Stormwater Quality Manual, and also by use of the Minnesota Drainage Manual Solar Panel Calculator. The 2-year, 24-hour pre-development peak flow for each watershed is mitigated to 50% of the 2-year, 24-hour pre-development peak flow for each watershed containing development. This will assist in protecting the base flow streambanks in Oil Mill Brook and Stony Brook.

NDDB Consultation

A Preliminary Assessment was received from CTDEEP Wildlife Division on July 5, 2019. Over the summer/fall of 2019, the species listed in this assessment were addressed by VHB environmental staff by field survey, conservation measures, or other. A comprehrensive wildlife survey addressing each of these species was prepared, dated October 2, 2019, and a Final Determination was received from CTDEEP Wildlife Division on February 28, 2020. The recommended eastern ribbonsnake conservation measures were incorporated into the site plans, and VHB is currently working with Wildlife Division to clear up the fact that the Virginia copperleaf species was written in error in the wildlife report. Documentation received from NDDB is enclosed herewith in Appendix C.

SHPO Consultation

A Phase 1A historic/archaeological study was performed by Heritage Consultants and provided to SHPO for their review and reference. A letter dated March 3, 2020 was provided to CT Siting Council from SHPO requesting a Phase 1B survey of the site. Heritage Consultants performed a Phase 1B survey and SHPO provided a letter dated April 7, 2020 noting that no further field investigations were warranted. Doccumentation received from NDDB is enclosed herewith in Appendix D.

3

Construction Sequencing

All construction activities are expected to begin in the summer/fall of 2020 and completed by the end of 2021. The general construction notes are as follows:

1. The site contractor shall be fully responsible to control construction such that sedimentation shall not affect roads/highways and their drainage system, neighboring properties, wetlands and regulatory protected areas, whether such sedimentation is caused by water, wind, or direct deposit. Designated access drives must be used to the maximum extents possible.
2. A qualified inspector shall be assigned to be responsible for performing inspections and preparing reports in accordance with Section 5(b)(4)(B) of the Construction General Permit. It is also anticipated that representatives from CTDEEP and/or the State Conservation District will perform periodic inspections.
3. Engineer of record shall perform three (3) monthly plan implementation inspections within the first 90 days of construction activity, as required by Connecticut Department of Energy & Environmental Protection.
4. Throughout the course of the construction project, additional sediment and erosion control measures may be warranted at the discretion of the qualified inspector and/or design engineer. These improvements must be implemented in a timely fashion in accordance with the requirements of the Construction General Permit. Additionally, areas of proposed compacted native soil roads shall be converted to stable gravel roads if/as determined by the qualified inspector or engineer of record.
5. Prior to construction, the applicant shall provide the Town of Waterford with the name of contact and 24-hour contact information.
6. Contractor shall adhere to 2002 Connecticut Guidelines for Erosion and Sediment Control, as amended.
7. The contractor shall flag the limits of clearing necessary to facilitate the pre-construction meeting.
8. The contractor shall hold pre-construction meeting(s). Attendees shall include, but not be limited to, representatives of the general contractor, site contractor, CTDEEP, Town of Waterford, engineer of record, and qualified SWPPP inspector.
9. The contractor shall contact Call-Before-You-Dig (1-800-922-4455) prior to engaging in any excavation activities at the Site.
10. The contractor shall notify the Town of Waterford agent, Zoning Enforcement Officer, and Engineering Department, 48 hours prior to commencement of any construction activity.
11. No construction of site improvements may begin until the proper erosion control measures serving the area to be disturbed are in place.
12. Anticipated work hours will be between 6:30 AM and 5:00 PM.

13. High flotation tire equipment shall be used to the maximum extents practicable in lieu of track construction equipment in an effort to avoid compaction of the native soils.

Pre-Construction Site Protection Sequence (2020)

1. Install stabilized vehicle construction exit at the existing road intersecting with Oil Mill Road.
2. Survey and mark all woodland clearing limits.
3. Mark trees to be felled within 10 feet of clearing limits and install tree protection for trees to be preserved within 10 feet of clearing limits.
4. Field survey and mark boundary between clearing limits and grubbing limits.
5. The use of a tub grinder is recommended for the mulching of felled trees.
6. As trees are cleared and grubbed, grind tops and root balls in tub grinder to create material for wood chip mulch berm. To the extents feasible, grubbing shall take place following the installation of the sediment basins.
7. Access roads shall be designated as early as feasible and used primarily for construction traffic.
8. As material is produced, install mulch berm at the limit of disturbance generally in areas of cleared forest. Mulch berm has nominal dimensions of 1.5 to 2 feet high by 4-foot wide.
9. Immediately inside the perimeter mulch berm, install entrenched silt fence following standards of the 2002 Connecticut Guidelines for Erosion and Sediment Control. Mulch berm and perimeter silt fence shall be maintained in perpetuity until completion of construction. No work shall be allowed outside of these limits.
10. Concurrent with Items 2 through 9 above, the contractor shall address ongoing erosion problems using temporary diversions and filling and grading gullies. Track gullies up and down slope and hydroseed with a thermally-treated wood bonded fiber matrix (BFM) mulch with tackifier. A stapled biodegradable erosion control blanket without monofilament mesh is an acceptable alternative for hydroseed and BFM.
11. Install temporary sediment traps in accordance with the approved site-specific SWPCP and CT Guidelines. The engineer of record shall inspect features to confirm required storage capacities are provided and that outlets and/or spillways are constructed correctly. Discharge areas below outfalls must be inspected to confirm flow will be over stable ground and sheet flow is encouraged. If disturbed soils are present, the engineer of record to provide correct measures to address condition.
12. Seed and protect disturbed soils around sediment traps and basins within 10 days of completion. Secure seed with a thermally-treated BFM applied following manufacturer's specifications for use at specified application rates. An anionic polyacrylamide product may be included with the tackifier to promote soil stability. All other amendments should be prescribed based on the result of soil tests.
13. Install other erosion and sediment controls following the CT Guidelines and manufacturer's directions. During construction, the contractor shall install measures as required by the engineer of record or qualified inspector, to prevent sediment-laden runoff from reaching wetlands or discharging offsite.
14. Establish designated vehicular traffic access roads (gravel, or compacted native soil, per plans) that shall be used as primary accesses. Efforts must be made to minimize vehicular trafficking across non-designated areas to the extents possible.
15. Spreaded mulch and felled branches from pre-existing timber harvest on site shall be cleaned and areas seeded. Material cleaned in this way may be repurposed for

the use of wood chip mulch berms along the site perimeter or removed from the site. The use of hydroseed combined with tackifier and polyacrylamide (PAM) is recommended for this reseeding. The cleanup areas shall be left undisturbed through a full growing season before initiation of the construction sequence can take place.

Construction Sequence (2021)

1. Perform mass earthwork on the site and install perimeter fence to serve as construction barrier. Topsoil shall be stripped and stockpiled from areas proposed for regrading.
2. Topsoil shall be replaced to 3" minimum depth over regraded areas upon completion of mass earthwork activities and areas which were disturbed by mass earthwork operations shall be reseeded within 10 days of completion.
3. Areas disturbed by mass earthwork shall be reseeded with hydroseed, combined with tackifier and pam.
4. Drive piles for solar panel racking.
5. The installation of racking shall follow the pile driving by roughly one week starting from the same point. It is anticipated that approximately 13 acres of piles will be in ahead of racking on average.
6. Reseed and regrade all areas disturbed by construction traffic within the arrays where racks are installed as early as possible. Ruts and rills shall be smoothed and graded as discovered.
7. Install solar panel modules in the racking. Much of this work is anticipated to be performed by hand and light construction equipment which will cause minimal disturbance compared to the use of heavy equipment. Designated access roads shall still be used to the maximum extents possible.
8. Upon completion of construction, re-seed all disturbed areas within 10 days and prevent vehicular trafficking over these areas. Install final landscaping.
9. The temporary sediment traps/basins and their associated diversion channels may be removed once all tributary areas upstream of them have been completed and stabilized with 80 percent vegetated cover, at the direction of the qualified inspector and/or design engineer.
10. After site is stabilized, and after inspection by design engineer, or other owner's representative, remove temporary erosion and sediment controls. Entire site shall be checked for and cleaned of sediment as needed.

4

Erosion and Sedimentation Control Measures

The following erosion and sedimentation controls are for use during the earthwork and construction phases of the Project. The following controls are provided as recommendations for the site contractor and do not constitute or replace the final Stormwater Pollution Control Plan that must be fully implemented by the Contractor in compliance with the DEEP General Permit for the discharge of stormwater and dewatering wastewater from construction activities, and 2002 Connecticut Guidelines for Erosion and Sediment Control as amended.

Silt Fencing

This semi-permeable barrier made of a synthetic porous fabric will provide additional protection. The silt fences will be repaired or replaced as determined by periodic field inspections.

Temporary/Permanent Sediment Trap/Basin

These stormwater settling basins will be installed at the locations shown on the E&S plans and will have the majority of runoff from the on-site construction area diverted to them. The temporary sediment basins must have a safe outlet for excess stormwater. Additional temporary sediment traps may need to be installed during construction depending upon final phasing of improvements.

Temporary/Permanent Diversions

These swales shall be constructed generally as depicted on the site plans and adjusted to work for field conditions. They shall be installed upon completion of the tributary sediment trap/basin and fitted with erosion control blankets and check dams in accordance with the details and standard practices.

Construction Entrance/Exit

Temporary crushed-stone construction entrances/exits will be installed at access points off of town roads.

Street Sweeping

Adjacent streets affected by sediment runoff from vehicle tires shall be swept at a minimum of bi-weekly intervals or on an as-needed basis as required by the qualified inspector.

Flocculent Logs

Flocculent logs shall be placed in the bottom of diversion swales to assist in reducing total suspended solids.

Straw Wattles

Straw wattles are compressed weed-free straw encased in jute, nylon, or other biodegradable materials. The intended location for these are along slopes and at the edges of travel ways to intercept runoff.

Stockpile Management

Active stockpiles shall be topped with hay at the end of each work day. Stockpiles intended to be left dormant for more than 14 days must be stabilized with erosion control blankets and/or hydroseed. Stockpiles shall be completely surrounded with silt fence.

Compost Filter Socks

These media-filled mesh socks shall be installed in the areas depicted on the site plans primarily to act as check dams and/or perimeter control depending upon the area. Care should be taken that these socks do not divert flow, but rather allow it time to settle without modifying intended drainage patterns.

Erosion Control Blankets

Straw fiber or jute netting roll blankets designed for use on moderate slope and channel applications. Material type shall be selected to ensure no danger to wildlife.

Hydroseeding

Disturbed areas shall be hydroseeded at the intervals outlined in the construction sequence. Hydroseed shall be combined with an application of polyacrylamide (PAM) to assist.

Stone Check Dams

Stone check dams shall be constructed to the dimensions as detailed on the site plans and are intended to be left in place permanently to act as velocity dissipators downstream of the stormwater basins. In areas where they are proposed outside the limits of work, the stone check dams shall be constructed by hand without the use of heavy construction machinery.

Keeping Disturbance to a Minimum

Construction traffic shall utilize the existing timber harvest paths around the site (or designated access routes once they are established) and avoid travel across undisturbed areas to minimize soil compaction. The contractor shall also strive to limit areas of exposed soil in each sub-watershed as much as feasible during construction. Areas that have been regraded to final grade shall be seeded within 10 days.

Maintenance

The contractor or subcontractor will be responsible for implementing, at minimum, each control shown on the Site Plan. Refer to the Site Plans in Appendix F.

The qualified inspector will inspect all sediment and erosion control structures periodically and after each rainfall event. Records of the inspections will be prepared and maintained on-site by the contractor.

- Silt shall be removed from behind barriers if greater than 6-inches deep or as needed.
- Damaged or deteriorated items will be repaired within 48 hours of identification, or sooner if a significant rainfall event is predicted.
- Sediment that is collected in sediment traps and basins shall be removed in accordance with the details.
- Erosion control structures shall remain in place until all disturbed earth has been securely stabilized. After removal of structures, disturbed areas shall be regraded and stabilized as necessary.

5

Water Quantity and Quality Controls Long Term Maintenance

The following maintenance program is proposed to ensure the continued effectiveness of the structural water quality controls previously described.

Low Water Crossings

- Soil stability of rip-rap road crossings shall be checked and repaired, as necessary, once annually or after damaging rainfall events

Infiltration/Detention Ponds

- Pond shall be checked for and cleaned of sediment once annually or after damaging rainfall events
- Sediment shall be cleaned from the pond any time it affects the overall performance and infiltration capabilities of the system
- Any structural damage or other indication of malfunction will be reported to the site manager and repaired as necessary

Diversion Swales

- Swales shall be checked for and cleaned of sediment once annually or after damaging rainfall events
- Sediment shall be cleaned from a swale any time it affects the overall performance of the system
- Any structural damage or other indication of malfunction will be reported to the site manager and repaired as necessary

Vegetated Perimeter Filter Areas

- Vegetated filter areas shall be checked for and cleaned of sediment once annually or after damaging rainfall events
- Sediment shall be cleaned from the filter areas any time it affects the overall performance and infiltration capabilities of the system

Stone Check Dams

- Stone check dams shall be checked for and cleaned of sediment once annually or after damaging rainfall events, and repaired as necessary
- Sediment shall be cleaned from the stone check dams any time it affects the overall performance and infiltration capabilities of the system

6

Site Inspections

Qualified personnel (provided by the permittee) shall inspect disturbed areas of the construction activity that have not been finally stabilized, erosion and sediment control measures, all structural controls, soil stockpile areas, washout areas and locations where vehicles enter or exit the site. These areas shall be inspected for evidence of, or the potential for, pollutants entering the drainage system and impacts to the receiving waters. Locations where vehicles enter or exit the site shall also be inspected for evidence of off-site sediment tracking.

The permittee shall maintain a rain gauge on-site to document rainfall amounts. For storms that end on a weekend, holiday, or other time after normal working hours, an inspection is required within 24 hours only for storms that equal or exceed 0.5 inches. For storms of less than 0.5 inches, an inspection shall occur immediately upon the start of the subsequent normal working hours. Where sites have been temporarily or finally stabilized, such inspection shall be conducted at least once every month for three months. The engineer of record shall perform three (3) monthly plan implementation inspections within the first 90 days of construction activity.

Any and all violations to the terms and conditions of the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Actitivities and/or the approved SWPCP, including, but not limited to sediment discharges and chemical spills, shall be reported to the Water Permitting and Enforcement Division of the Connecticut Department of Energy and Environmental Protection (attention: Neal Williams – neal.williams@ct.gov or 860-424-3356).

Reports

A report shall be prepared and retained as part of the Plan. This report shall summarize: the scope of the inspection; name(s) and qualifications of personnel making the inspection; the date(s) of the inspection; weather conditions including precipitation information; major observations relating to erosion and sediment controls and the implementation of the Plan; a description of the stormwater discharge(s) from the site; and any water quality monitoring performed during the inspection. The report shall be signed by the permittee or his/her authorized representative in accordance with the "Certification of Documents" section

(subsection 5(i)) of this general permit. Copies of the reports must be provided to the contractor, site owner, CTDEEP, and the design engineer.

The report shall include a statement that, in the judgment of the qualified inspector(s) conducting the site inspection, the site is either in compliance or out of compliance with the terms and conditions of the Plan and permit. If the site inspection indicates that the site is out of compliance, the inspection report shall include a summary of the remedial actions required to bring the site back into compliance. Non-engineered corrective actions (as identified in the Guidelines) shall be implemented on site within 24 hours and incorporated into a revised Plan within three (3) calendar days of the date of inspection unless another schedule is specified in the Guidelines. Engineered corrective actions (as identified in the Guidelines) shall be implemented on site within seven (7) days and incorporated into a revised Plan within ten (10) days of the date of inspection, unless another schedule is specified in the Guidelines or is approved by the commissioner. During the period in which any corrective actions are being developed and have not yet been fully implemented, interim measures shall be implemented to minimize the potential for the discharge of pollutants from the site.

7

Turbidity Monitoring

Monitoring Frequency

Sampling shall be conducted at least once every month, when there is a discharge of stormwater from the site while construction activity is ongoing, until final stabilization of the drainage area associated with each outfall is achieved.

Samples are only required to be taken during normal working hours. If sampling is discontinued due to the end of normal working hours, it shall be resumed the following morning or the morning of the next working day following a weekend or holiday, as long as the discharge continues.

Sampling may be temporarily suspended any time conditions exist that may reasonably pose a threat to the safety of the person taking the sample. Such conditions may include high winds, lightning, impinging wave or tidal activity, intense rainfall or other hazardous condition. Once the unsafe condition is no longer present, sampling shall resume.

If there is no stormwater discharge during a month, sampling is not required.

Sample Collection

All samples shall be collected from discharges resulting from a storm event that occurs at least 24 hours after any previous storm event generating a stormwater discharge. Any sample containing snow or ice melt must be identified on the Stormwater Monitoring Report form. Sampling of snow or ice melt in the absence of a storm event is not a valid sample.

Samples shall be grab samples taken at least three separate times during a storm event and shall be representative of the flow and characteristics of the discharge(s). Samples may be taken manually or by an in-situ turbidity probe or other automatic sampling device equipped to take individual turbidity readings (i.e. not composite). The first sample shall be taken within the first hour of stormwater discharge from the site. In cases where samples are collected manually and the discharge begins outside of normal working hours, the first sample shall be taken at the start of normal working hours.

Sample Locations

For this project, 15 discharge points are identified. The location of outfalls that are included in this project are proposed to be the outlets from the 15 sediment traps and basins.

All sampling point(s) shall be clearly marked in the field with a flag, stake, or other visible marker.

Turbidity Values

The stormwater discharge turbidity value for each sampling point shall be determined by taking the average of the turbidity values of all samples taken at that sampling point during a given storm.

Stormwater Monitoring Reports

Copies of the reports must be provided to the contractor, site owner, CTDEEP, and the design engineer.

Within thirty (30) days following the end of each month, permittees shall enter the stormwater sampling result(s) on the Stormwater Monitoring Report (SMR) form (available at www.ct.gov/deep/stormwater) and submit it in accordance with the Network Discharge Monitoring Report (NetDMR) outlined in the Permit or, if the permittee has opted out of NetDMR, to the following address:

Bureau of Materials Management and Compliance Assurance
Water Permitting and Enforcement Division (Attn: DMR Processing)
Connecticut Department of Energy and Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

If there was no discharge during any given monitoring period, the permittee shall submit the form as required with the words “no discharge” entered in place of the monitoring results.

If the permittee monitors any discharge more frequently than required by this general permit, the results of this monitoring shall be included in additional SMRs for the month in which the samples were collected.

If sampling protocols are modified due to the limitations of normal working hours or unsafe conditions, a description of and reason for the modifications shall be included with the SMR.

If the permittee samples a discharge that is representative of two or more substantially identical discharge points, the permittee shall include the names or locations of the other discharge points.

Submittal of NetDMR Opt-Out Requests

All opt-out requests and requests for the NetDMR subscriber form should be sent to the following address or by email at deep.netdmr@ct.gov:

Attn: NetDMR Coordinator
Connecticut Department of Energy and Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

8

Termination Requirements

Notice of Termination

At the completion of a construction project registered of this general permit, a Notice of Termination must be filed with the Commissioner. A project shall be considered complete after all post-construction measures are installed, cleaned and functioning and the site has been stabilized for at least three months following the cessation of construction activities. A site is considered stabilized when there is no active erosion or sedimentation present and no disturbed areas remain exposed for all phases.

9

Contractors

Each Contractor and Subcontractor who will perform actions on the site that may reasonably be expected to cause or have the potential to cause pollution of the waters of the State shall sign the certification statement below:

Certification Statement

"I certify under penalty of the law that I have read and understand the terms and conditions of the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities. I understand that, as a Contractor or Subcontractor at the site, I am authorized by this General Permit, and must comply with the terms and conditions of this General Permit, including, but not limited to, the requirements of the Stormwater Pollution Control Plan prepared for the site."

List of Project Contractors

1. Contractor Name:_____
   Address:_____
   Telephone Number:_____ Fax Number:_____
   Contractor Specialty to be used on this Project:_____
   Contractor's On-site Representative:_____

_____
Signature Date

2. Contractor Name:_____
   Address:_____
   Telephone Number:_____ Fax Number:_____
   Contractor Specialty to be used on this Project:_____
   Contractor's On-site Representative:_____

_____
Signature Date

3. Contractor Name:_____
   Address:_____
   Telephone Number:_____ Fax Number:_____
   Contractor Specialty to be used on this Project:_____
   Contractor's On-site Representative:_____

_____
Signature Date

4. Contractor Name:_____
   Address:_____
   Telephone Number:_____ Fax Number:_____
   Contractor Specialty to be used on this Project:_____
   Contractor's On-site Representative:_____

_____
Signature Date

5. Contractor Name:_____
   Address:_____
   Telephone Number:_____ Fax Number:_____
   Contractor Specialty to be used on this Project:_____
   Contractor's On-site Representative:_____

_____
Signature Date

6. Contractor Name:_____
   Address:_____
   Telephone Number:_____ Fax Number:_____
   Contractor Specialty to be used on this Project:_____
   Contractor's On-site Representative:_____

_____
Signature Date

10

Reporting and Record Keeping Requirements

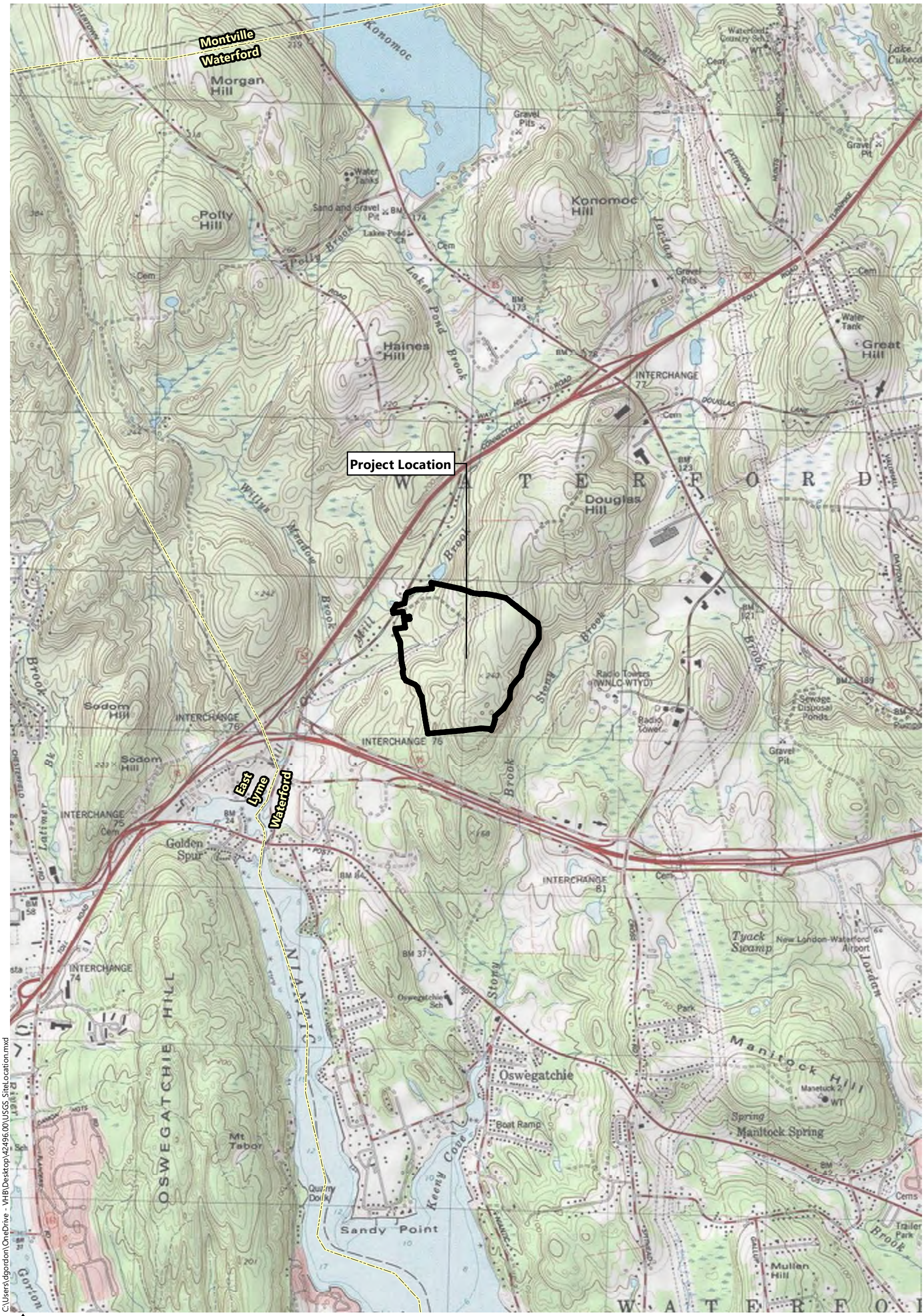
The permittee shall retain copies of the SWPCP and all reports required by this General Permit, and records of all data used to complete the registration to be authorized by this General Permit, for a period of at least five (5) years from the date that construction at the Site is completed, unless the Commissioner specifies another time period in writing.

The permittee shall retain an updated copy of the SWPCP required by this General Permit at the construction site from the date construction is initiated at the site until the date construction at the site is complete.

Stormwater Pollution Control Plan Permit Drawing

DRAWING TITLE	NO. OF SHEETS
Cover Sheet	1
Legend and General Notes	1
Key Plan	1
Layout and Materials Plan	13
Grading and Drainage Plan	13
Erosion and Sediment Control Plan	13
Site Details	2
Property Survey	2

Appendix A
USGS Quad Map & Project Layout Map



0 1000 2000 4000 Feet

Property Boundary

Town Boundary

42496.00 - Oil Mill Rd | Waterford, Connecticut

USGS Locus Map

Source: VHB, CTDEEP, ESRI

C:\Users\dgordon\OneDrive - VHB\Desktop\42496.00\USGS_SiteLocation.mxd

DWHUIRUG &RQVHUYDWLRQ DUHD

HVWDEOLVKHG &RQVHUYDWLRQ DUHD

)RUHVW &RQVHUYDWLRQ

&RQVHUYDWLRQ 3DVWXUH

&RQVHUYDWLRQ /LYHVWRFN

3UHPLHU &URS %RWWRP /DQG

3UHPLHU &URS &RQVHUYDWLRQ

3UHPLHU &URS 3DVWXUH

3UHPLHU &URS

Appendix B
Sample Inspection Forms

Waterford Solar – Waterford, CT – 117 Oil Mill Road

Best Management Practices – Maintenance/ Evaluation Checklist

Construction Practices

Best Management Practice	Inspection Frequency	Date Inspected	Inspector	Minimum Maintenance and Key Items to Check	Cleaning/Repair Needed ☐yes ☐no (List Items)	Date of Cleaning/Repair	Performed by
Silt Fencing	Once per week or after a 0.5″ or greater storm event						
Compost Filter Sock	Once per week or after a 0.5″ or greater storm event						
Straw Wattles	Once per week or after a 0.5″ or greater storm event						
Stabilized Construction Exit	Once per week or after a 0.5″ or greater storm event						
Temporary Sediment Trap/Basin & Diversion Swales	Once per week or after a 0.5″ or greater storm event						
Vegetated Slope Stabilization	Once per week or after a 0.5″ or greater storm event						
Energy Dissipators	Once per week or after a 0.5″ or greater storm event						

Stormwater Control Manager _____

Waterford Solar – Waterford, CT – 117 Oil Mill Road

Best Management Practices – Maintenance/ Evaluation Checklist

Long Term Practices

Best Management Practice	Inspection Frequency	Date Inspected	Inspector	Minimum Maintenance and Key Items to Check	Cleaning/Repair Needed ☐yes ☐no (List Items)	Date of Cleaning/Repair	Performed by
Trash/Litter	Routinely pick up and remove litter from entire property as required.						
Vegetated Areas	Inspect bi-annually. Replant bare areas upon identification.						
Energy Dissipators	Inspect monthly for the first 3 months and after any rain event exceeding 0.5″. Inspect 2x per year thereafter.						
Diversion Swales	Inspect monthly for the first 3 months and after any rain event exceeding 0.5″. Inspect 2x per year thereafter.						
Sand Filter	Inspect monthly for the first 3 months and after any rain event exceeding 0.5″. Inspect 2x per year thereafter.						
Wet Pond	Inspect monthly for the first 3 months and after any rain event exceeding 0.5″. Inspect 2x per year thereafter.						
Infiltration Basin	Inspect monthly for the first 3 months and after any rain event exceeding 0.5″. Inspect 2x per year thereafter.						

Stormwater Control Manager _____

Appendix C
Rare, Threatened, and Endangered Species

Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

July 5, 2019

Mr. Jeffery Shamas
VHB, Inc.
100 Great Meadows Road
Wethersfield, CT 06109
jshamas@vhb.com

Project: Preliminary Assessment for the Installation of Photovoltaic Electric Generating Facility for GRE Gacurux LLC, 117 Old Mill Road in Waterford, Connecticut
NDDB Preliminary Assessment No.: 201905764

Dear Jeffery Shamas,

I have reviewed Natural Diversity Data Base maps and files regarding the area delineated on the map provided for the Preliminary Assessment for the Installation of Photovoltaic Electric Generating Facility for GRE Gacurux LLC, 117 Old Mill Road in Waterford, Connecticut. According to our records there are known extant populations of State Listed Species known that occur within or close to the boundaries of this property. The species known from this area include:

Plants
Isotria medeoloides (Small whorled pogonia)
Status: Federal Threatened and State Endangered
Habitat: Mesic woods, often near vernal streams in dry mixed or deciduous woods, frequently under beech trees
Blooms: Mid-May through Mid-June

Aristida longespica var. geniculate (Neddlegrass)
Status: State Special Concern
Habitat: Dry or moist sandy and gravelly soils
Blooms: August through October

Polygala nuttallii (Nuttall's milkwort)
Status: State Threatened
Habitat: Dry, open sandy soils and rocky crevices
Blooms: July through September

Animals
Terrapene carolina carolina (Eastern box turtle)
Clemmys guttata (Spotted turtle)
Thamnophis sauritus (Eastern ribbon snake)
Opheodrys vernalis (smooth green snake)

Caprimulgus vociferus **(**Whip-poor-will**)**
Best times to survey for whip-poor-will are when moon is at least half illuminated and above the horizon, and not obscured by clouds. You will want minimal wind for your survey. In our experience, detection rates increase also after midnight, before sunrise. With a 6 minute survey point, that is 3 min of silent listening followed by callback, followed by 3 minutes of silent listening, you will have 60% probability of detecting the bird, given it is present, within 400m of your survey point. You will need to conduct multiple points in your project area on multiple nights to be sure that it is not there at all.

Please be advised that this is a preliminary review and not a final determination. A more detailed review will be necessary to move forward with any subsequent environmental permit applications submitted to DEEP for the

proposed project. This preliminary assessment letter cannot be used or submitted with your permit applications at DEEP. This letter is valid for one year.

To prevent impacts to State-listed species, field surveys of the site should be performed by a qualified biologist when these target species are identifiable. A report summarizing the results of such surveys should include:

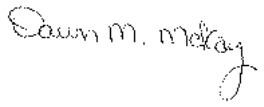
1. Survey date(s) and duration
2. Site descriptions and photographs
3. List of component vascular plant species and animal species within the survey area (including scientific binomials)
4. Data regarding population numbers and/or area occupied by State-listed species
5. Detailed maps of the area surveyed including the survey route and locations of State-listed species.
6. Statement/résumé indicating the biologist's qualifications to work with the taxon. A CT DEEP Scientific Collectors Permit may be required to survey for wildlife species and you should ask if your qualified biologist has one to work with taxon at this site.

The site surveys report should be sent to our CT DEEP-NDDB Program (deep.nddbrequest@ct.gov) for further review by our program biologists along with an updated request for another NDDB review. If you do not intend to do site surveys to determine the presence or absence of state-listed species, please let us know how you will protect the state-listed species from being impacted by this project with protection or conservation plans for the species.

Natural Diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. This information is a compilation of data collected over the years by the Department of Energy and Environmental Protection's Natural History Survey and cooperating units of DEEP, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the Data Base should not be substitutes for on-site surveys required for environmental assessments. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the Data Base as it becomes available. The result of this review does not preclude the possibility that listed species may be encountered on site and that additional action may be necessary to remain in compliance with certain state permits.

Please contact me if you have further questions at (860) 424-3592, or dawn.mckay@ct.gov . Thank you for consulting the Natural Diversity Data Base.

Sincerely,



Dawn M. McKay
Environmental Analyst 3

Connecticut Department of ENERGY & ENVIRONMENTAL PROTECTION

79 Elm Street • Hartford, CT 06106-5127 www.ct.gov/deep Affirmative Action/Equal Opportunity Employer

February 28, 2020

Jeffrey Shamas
Vanasse Hangen Brustlin, INC
100 Great Meadow Rd, Suite 200
Wethersfield, CTt 06109
JSHAMAS@VHB.COM

NDDB DETERMINATION NUMBER: 201914884

Project: Installation of Photovoltaic Electric Generating Facility GRE Gacrux, LLC Located at 117 Oil Mill Road in Waterford, CT

Expiration: February 28, 2022

I have reviewed Natural Diversity Data Base (NDDB) maps and files regarding this project. According to our records, the following State-listed species (RCSA Sec. 26-306) are in the area of or may be influenced by your project.

- **Eastern ribbonsnake (*Thamnophis sauritus*) State Special Concern**
- ***Acalypha virginica* (Virginia copperleaf) State Special Concern**

Eastern ribbonsnake (*Thamnophis sauritus*)
Eastern ribbon snakes inhabit areas with shallow water, grassy or shrubby areas bordering streams and wooded swamps. They also prefer sunny areas with low dense vegetation near shallow water areas. Their diet consists of insects, fish, frogs, salamanders and toads. They are dormant between Oct 15- March 31.

I concur with your recommendations to protect ribbonsnake with additional protection measures up to 300ft. Your protection measures include 100 ft, no disturbance buffers of wetlands, and no planned disturbance in the utility ROW. You include allowances for limited disturbance in the 100-200ft wetland buffer. Additionally, if work, traffic, or staging will occur within the 300ft wetland buffer of "wetland 1" during the snakes active season (between April 1- Oct 15), apply the following avoidance measures:

- A contractor awareness program will be developed and implemented to ensure that contractors working in the area have been instructed on the proper response in the event that an eastern ribbonsnake is observed in the work area.
- If any snakes are observed, construction personnel will safely relocate them to an area immediately outside of the work area.
- Any silt fence utilized will be removed after clearing is complete and soils are stabilized.
- Any confirmed eastern ribbon snake sightings will be reported to the NDDB.

***Acalypha virginica* (Virginia copperleaf)**
This plant is found in dry, open soils and bloom in August- September.
This plant was identified in your plant surveys and listed in Attachment 4, Observed Vascular Plant List. Delineate and avoid impacts to this plant from construction activities. Where possible, encourage habitat characteristics that will promote the plant onsite. Additionally, please forward the location information to our program for our records.

This is determination is valid for two years.

Natural Diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. This information is a compilation of data collected over the years by the Department of Energy and Environmental Protection's Bureau of Natural Resources and cooperating units of DEEP, independent conservation groups, and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the NDDB should not be substituted for on-site surveys required for environmental assessments. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated in the NDDB as it becomes available.

Please contact me if you have any questions (shannon.kearney@ct.gov). Thank you for consulting with the Natural Diversity Data Base and continuing to work with us to protect State-listed species.

Sincerely,

/s/ Shannon B. Kearney
Wildlife Biologist

Appendix D
Historic and/or Archaeological Resources

Connecticut

Department of Economic and Community Development

State Historic Preservation Office

March 3, 2020

Ms. Melanie Bachman
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

Subject: GRE GACRUX LLC Petition No. 1347A, Reopening
117 Oil Mill Road
Waterford, Connecticut.

Dear Ms. Bachman:

SHPO understands that the referenced petition will be reopened for a declaratory ruling by the Connecticut Siting Council (CSC). The proposed project plan consists of constructing, maintaining, and operating a 16.78 MW solar photovoltaic electric generating facility. The project parcel covers approximately 150 acres east of Oil Mill Road and north of Interstate 95. Because the proposed project will require approval by CSC, it is subject to review by this office pursuant to the Connecticut Environmental Policy Act (CEPA). However, no consultation has been initiated with SHPO regarding this project to date. The following comments are based on materials available on the CSC website for the petition.

Although no archaeological sites or properties listed on the National Register of Historic Places have been reported within the project parcel, a large number of previously recorded archeological sites have been reported in the general vicinity of the proposed project area. Based on the known historic resources in the vicinity and the environmental characteristics of the project site, SHPO concurs with the recommendations made by Heritage Consultants in the posted Phase IA Cultural Resources Assessment Survey that additional Phase IB archaeological investigations are warranted. This office recognizes that portions of the project area have been subjected to previous ground disturbing activities, and subsurface testing should evaluate all areas of anticipated ground disturbance, unless sufficient research or fieldwork documents that this level of effort is unwarranted. All work should be in compliance with our *Environmental Review Primer for Connecticut's Archaeological Resources* and no construction or other project-related ground disturbance should be initiated until SHPO has had an opportunity to review and comment upon the requested survey.

Connecticut
Department of Economic and Community Development
State Historic Preservation Office

This office appreciates your cooperation and we look forward to continuing consultation. For additional information, please contact Marena Wisniewski, Environmental Reviewer, at (860) 256-2754 or marena.wisniewski@ct.gov.

Sincerely,

Mary B. Dunne

Mary B. Dunne
State Historic Preservation Officer

Department of Economic and Community Development

State Historic Preservation Office

April 7, 2020

Mr. David R. George
Heritage Consultants
PO Box 310249
Newington, CT 06131

Subject: Phase IB Cultural Resource Reconnaissance Survey
Proposed Greenskies Solar Facility
Oil Mill Road
Waterford, Connecticut
ENV-20-0632

Dear Mr. George:

The State Historic Preservation Office (SHPO) has reviewed the cultural resource reconnaissance survey prepared by Heritage Consultants, LLC (Heritage), dated March 2020. The proposed activities are under the jurisdiction of the Connecticut Siting Council and are subject to review by this office pursuant to the Connecticut Environmental Policy Act (CEPA). The proposed facility includes the construction of a solar facility within an approximately 111.8 acre parcel. The parcel is bordered to the north and east by forested areas, to the south by Parkway North, a service road of Interstate 95, and to the West by residential parcels along Oil Mill Road. The submitted report is well-written, comprehensive, and meets the standards set forth in the *Environmental Review Primer for Connecticut's Archaeological Resources*.

Fourteen previously known archaeological sites are located within 1 mile of the project area; however, none will be impacted by the proposed undertaking. No properties listed or formally determined eligible for listing on the National Register of Historic Places, are located within 1 mile of the project area. Similarly, no properties listed or formally determined eligible for listing on the State Register of Historic Places, are located within one mile of the project area. It was also noted that tree clearing had recently taken place in the project area; however, as stumps were not removed, it is unlikely that any archaeological resources were significantly impacted.

The Phase IA assessment survey identified that out of the 111.8 acre study area, approximately 17.5 acres possessed a moderate to high degree to contain intact archaeological deposits, divided into three areas. Phase IB of the reconnaissance survey consisted of subsurface testing of these area. A total of 277 of 277 planned shovel tests were excavated successfully throughout the proposed work area. Survey Area 1, located in the northern section of the project area, did not

yield any cultural material or features. Survey Area 2, located in the northeast corner of the project area, contained a single, multicomponent locus (Locus 2-1), which contained a single quartz secondary thinning flake, and a blue handpainted pearlware sherd. No other cultural materials or features from either the historic or prehistoric periods were identified in Locus 2-1. Survey Area 3, located in the center of the project area, yielded a single historic period locus (Locus 3-1), which contained a plain English white salt-glazed stoneware sherd and a clear glazed redware sherd. No other cultural materials or features from either the historic or prehistoric periods were identified in Locus 3-1. None of the artifacts recovered were significant in number or possessed unique properties, and therefore do not possess the qualities of significance as defined by the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]).

Additionally, during the survey, 99 groupings of small- to medium-sized, rounded stones were observed within Survey Area 2. Some exhibited lichens, indicating their presence for a long period of time, while others did not. No artifacts were noted on top of or within the vicinity of any of the piles. Due to the lack of artifacts or any other temporally diagnostic attributes, the stone groupings could not be assigned to a specific date or function. Within Connecticut, there are recorded stone features that hold significance to several of the Native American tribes. This office lacks the expertise and knowledge to evaluate such features.

As a result of the information submitted, SHPO concurs with the findings of the report that additional archeological investigations of the project areas are not warranted. However, this office is unable to provide comment regarding the stone groupings, and suggests that the project sponsor contact subject matter experts in the respective tribes. SHPO is happy to provide contact information for such subject matter experts.

This office appreciates the opportunity to review and comment upon this project. For additional information, please contact Marena Wisniewski, Environmental Reviewer, at (860) 256-2754 or marena.wisniewski@ct.gov.

Sincerely,



Mary B. Dunne
State Historic Preservation Officer

Appendix E
Stormwater Report

STORMWATER REPORT

Waterford Solar

117 Oil Mill Road
Waterford, CT

PREPARED FOR

GRE Gacrux, LLC
10 Main Street, Suite E
Middletown, CT 06457

PREPARED BY

100 Great Meadow Road
Suite 200
Wethersfield, Connecticut
860.807.4300

December 2019
REVISED July 2020



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1

Project Summary

Project Description

The Petitioner, GRE Gacrux, LLC, is proposing to construct a 15.3 MW solar farm on undeveloped primarily wooded land along with all associated utilities, access paths, fencing, and landscaping to support this use (the Project). When the Project reaches the end of its life cycle, the improvements constructed as part of this petition will be removed and the land will be restored in accordance with the decommissioning plan.

Site Description

The ±152-acre Project Site (Site) is comprised of a single parcel at 117 Oil Mill Road (Map 80 / Lot 5497) in Waterford, Connecticut (see Figure 1). The parcel is generally bounded by undeveloped industrially-zoned properties to the south and east, and by single-family residential properties to the west and north. The parcel is zoned RU-120 (Rural Residential District).

Under existing conditions, the majority of the Project area is wooded. A timber harvest performed by the current land owner over the past couple years resulted in the cutting of approximately 45 acres of the Project's wooded area within the development limits, and a total of approximately 66 acres of the Site. There are on-site wetland systems in the eastern and western portions of the site. Under existing conditions, runoff from the Project area generally flows to the west to the on-site wetland system which appears to have become a tributary of Oil Mill Brook during construction of Route 95, or to the east down a steep embankment to Stony Brook which is approximately 600 feet away from the parcel. Both Oil Mill Brook and Stony Brook discharge to the Niantic River.

According to available soil mapping[1], a boring test pit investigation dated March 21, 2019, a hydrologic soil group confirmation study performed in September 2019, and a stormwater basin geotechnical investigation performed in September 2019, on-site soils range in depth to restrictive layers from ±2 feet to greater than 10 feet. The soil profiles examined in test

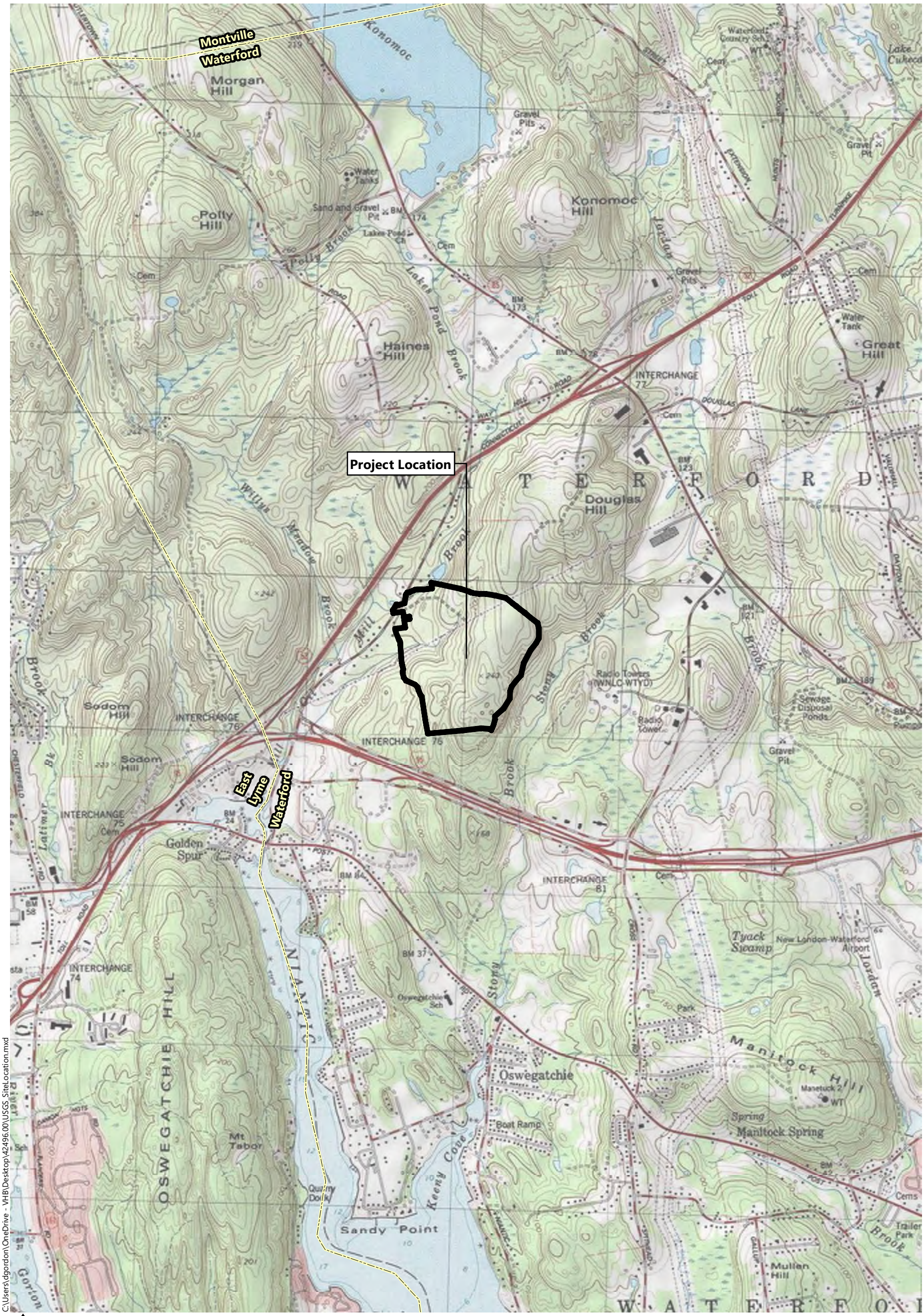
[1] https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx

pits were generally consistent or similar to the named series in the mapped units available on-line[1]. Based on this mapping, the majority of on-Site soils within the Project area belong to the Hydraulic Soil Group "B", indicating that the soils have a moderate infiltration rate when thoroughly wet. See Appendix A for NRCS Web Soil Survey output and field-performed test pit and infiltration data.

Methodology

The Project was designed to incorporate measures provided in the Connecticut Stormwater Quality Manual (CTDEP 2004). The conclusion of this analysis is that the proposed improvements will not increase the post-development peak runoff rates in comparison to existing pre-development rates at any of the critical design points analyzed and the quality of stormwater runoff leaving the Site will be improved compared to existing. It is also proposed to meet State channel protection requirements for frequent rainfall events.

Figure 1: Site Location Map



0 1000 2000 4000 Feet

Property Boundary

Town Boundary

42496.00 - Oil Mill Rd | Waterford, Connecticut

USGS Locus Map

Source: VHB, CTDEEP, ESRI

C:\Users\dgordon\OneDrive - VHB\Desktop\42496.00\USGS_SiteLocation.mxd

2

Existing Drainage Conditions

Summary

Under existing conditions, untreated stormwater runoff from the Project area generally flows to the west to the on-site wetland system which is a tributary of Oil Mill Brook, or to the east down a steep embankment to Stony Brook. The Site is generally at its highest elevation in the central portion of the Project and slopes down in all directions to the adjacent wetland systems and brooks. The majority of the Project area is wooded. A timber harvest performed by the current land owner over the past couple years resulted in the cutting of approximately 45 acres of the Project's wooded area within the limits of development, and a total of approximately 66 acres of the Site. Terrain slopes in the Project area range from 0% to approximately 20% with the majority of the Project area (roughly 95%) at less than 15% existing slope. Most of the Project Site perimeter is woodland.

Hydrologic Information

For the existing conditions hydrologic analysis, the Site is divided into 26 drainage areas, which have been identified as areas at the Project limits where flow begins to concentrate naturally. Table 1 provides a summary of the existing conditions hydrologic data. Figure 2 illustrates the existing drainage patterns on the Site. Only the areas of the Site that are proposed to be affected by construction have been included in this drainage analysis, while portions of the Site unaffected by construction have been excluded.

Drainage Area 1 - This ±3-acre area is the only development area to the north/west of the Eversource right-of-way which transects the Site. Stormwater in this area flows untreated generally to the southwest to the on-site wetlands tributary to Oil Mill Brook ultimately.

Drainage Area 2 - This ±3-acre area is located at the northeastern portion of the Site. Stormwater in this area flows untreated generally to the east to Stony Brook.

Drainage Area 2A - This ±1-acre area is located at the northeastern portion of the Site. Stormwater in this area flows untreated generally to the east to Stony Brook. No infrastructure is proposed in this watershed.

Drainage Area 3- This ±3-acre area is located at the northeastern portion of the Site. Stormwater in this area flows untreated generally to the east to Stony Brook.

Drainage Area 3A- This ±1-acre area is located at the northeastern portion of the Site. Stormwater in this area flows untreated generally to the east to Stony Brook. No infrastructure is proposed in this watershed.

Drainage Area 4- This ±6-acre area is located at the northeastern portion of the Site. Stormwater in this area flows untreated generally to the east to Stony Brook.

Drainage Area 5- This ±3-acre area is located in the eastern portion of the Site. Stormwater in this area flows untreated generally to the east to a small onsite rocky wetland which discharges to the east to Stony Brook.

Drainage Area 6- This ±3-acre area is located at the eastern portion of the Site. Stormwater in this area flows untreated generally to the east to Stony Brook.

Drainage Area 6A- This ±1-acre area is located at the southeastern portion of the Site. Stormwater in this area flows untreated generally to the east to Stony Brook. No infrastructure is proposed in this watershed.

Drainage Area 6B- This small area is located at the southeastern portion of the Site. Stormwater in this area flows untreated generally to the east to Stony Brook. No infrastructure is proposed in this watershed.

Drainage Area 6C- This ±1-acre area is located at the southeastern portion of the Site. Stormwater in this area flows untreated generally to the east to Stony Brook. No infrastructure is proposed in this watershed.

Drainage Area 7- This ±1-acre area is located at the southern portion of the Site. Stormwater in this area flows untreated generally to the south across the parcel line, and then to the east to Stony Brook.

Drainage Area 7A- This small area is located at the southern portion of the Site. Stormwater in this area flows untreated generally to the south across the parcel line, and then to the east to Stony Brook. No infrastructure is proposed in this watershed.

Drainage Area 8- This ±5-acre area is located at the southern portion of the Site. Stormwater in this area flows untreated generally to the south across the parcel line, and then to the east to Stony Brook.

Drainage Area 8A- This ±1-acre area is located at the southwestern portion of the Site. Stormwater in this area flows untreated generally to the west across the parcel line, and then to the south towards Route 95 and ultimately to Oil Mill Brook. No infrastructure is proposed in this watershed.

Drainage Area 9- This ±2-acre area is located at the southwestern portion of the Site. Stormwater in this area flows untreated generally to the west across the parcel line, and then to the south towards Route 95 and ultimately to Oil Mill Brook.

Drainage Area 9A- This small area is located at the southwestern portion of the Site. Stormwater in this area flows untreated generally to the west across the parcel line, and then to the south towards Route 95 and ultimately to Oil Mill Brook. No infrastructure is proposed in this watershed.

Drainage Area 10- This ±2-acre area is located at the southwestern portion of the Site. Stormwater in this area flows untreated generally to the west across the parcel line, and then to the south towards Route 95 and ultimately to Oil Mill Brook.

Drainage Area 10A- This small area is located at the southwestern portion of the Site. Stormwater in this area flows untreated generally to the west across the parcel line, and then to the south towards Route 95 and ultimately to Oil Mill Brook. No infrastructure is proposed in this watershed.

Drainage Area 11- This ±1-acre area is located at the western portion of the Site. Stormwater in this area flows untreated generally to the north to the on-site wetlands tributary to Oil Mill Brook ultimately.

Drainage Area 11A- This small area is located at the western portion of the Site. Stormwater in this area flows untreated generally to the north to the on-site wetlands tributary to Oil Mill Brook ultimately. No infrastructure is proposed in this watershed.

Drainage Area 12- This ±4-acre area is located at the western portion of the Site. Stormwater in this area flows untreated generally to the north to the on-site wetlands tributary to Oil Mill Brook ultimately.

Drainage Area 13- This ±12-acre area is located at the central portion of the Site. Stormwater in this area flows untreated generally to the north to the on-site wetlands tributary to Oil Mill Brook ultimately. Two onsite depressions which have the capacity to store some stormwater runoff exist in this watershed and have been delineated as Ponds 13.1 and 13.2.

Drainage Area 14- This ±4-acre area is located at the central portion of the Site. Stormwater in this area flows untreated generally to the west to the on-site wetlands tributary to Oil Mill Brook ultimately.

Drainage Area 16- This ±17-acre area is located at the northern portion of the Site. Stormwater in this area flows untreated generally to the west to the on-site wetlands tributary to Oil Mill Brook ultimately.

Drainage Area 16A- This ±1-acre area is located at the northern portion of the Site. Stormwater in this area flows untreated generally to the west to the on-site wetlands tributary to Oil Mill Brook ultimately. No infrastructure is proposed in this watershed.

Table 1 summarizes the key hydrologic parameters for each drainage area used in the existing conditions analysis.

Table 1 Existing Conditions Hydrologic Data

Drainage Area	*Discharge Location*	*Area (acres)*	*Curve Number*	*Time of Concentration (min)*
1	Onsite Wetlands (Oil Mill Brook)	3.0	60	13
2	Stony Brook	2.5	60	18
2A	Stony Brook	0.8	67	10
3	Stony Brook	2.6	60	19
3A	Stony Brook	0.3	78	10
4	Stony Brook	5.9	64	26
5	Stony Brook	2.6	60	15
6	Stony Brook	3.2	65	13
6A	Stony Brook	0.9	68	10
6B	Stony Brook	0.03	60	10
6C	Stony Brook	0.7	60	10
7	Stony Brook	1.2	60	11
7A	Stony Brook	0.2	60	10
8	Stony Brook	4.7	60	16
8A	Southwest	0.8	60	10
9	Southwest	1.5	60	11
9A	Southwest	0.3	60	10
10	Southwest	2.3	60	18
10A	Southwest	0.3	60	10
11	Onsite Wetlands (Oil Mill Brook)	1.1	60	8
11A	Onsite Wetlands (Oil Mill Brook)	0.4	60	10
12	Onsite Wetlands (Oil Mill Brook)	3.7	60	13
13.1	Onsite Wetlands (Oil Mill Brook)	3.1	60	10
13.2	Onsite Wetlands (Oil Mill Brook)	7.0	60	16
13.3	Onsite Wetlands (Oil Mill Brook)	2.3	60	14
14	Onsite Wetlands (Oil Mill Brook)	4.4	60	13
16	Onsite Wetlands (Oil Mill Brook)	16.9	60	39
16A	Onsite Wetlands (Oil Mill Brook)	0.6	60	10

Figure 2: Existing Drainage Areas



Legend

SYMBOLS

X — DRAINAGE AREA DESIGNATION

X — POND

LINETYPES

DRAINAGE AREA BOUNDARY

TIME OF CONCENTRATION FLOW LINE

0 250 500 Feet

Existing Drainage Areas

Figure 2

Waterford Solar
117 Oil Mill Road - Waterford, CT

11/19/2019

3

Proposed Drainage Conditions

Summary

The Site has been designed to mimic existing topography and drainage patterns to maintain the current hydrologic balance. In the majority of the on-Site areas, the Project proposes to install permanent turf-forming grasses to help stabilize the topsoil from erosion, sequester nutrients and pollutants, and lower runoff rates from the facility to the surrounding discharge points. Mature vegetation has been preserved to the maximum extents practicable. As a result, the proposed Project will have minimal impact to surrounding ecologically sensitive areas.

The only impervious surfaces that exist at the Site today are the existing access paths, and the only impervious surfaces proposed to be constructed are access roads and small concrete pads for utility equipment. No work will be performed within 100 feet of the on-Site wetlands. Once operational, vehicular access to the Project will be limited to infrequent maintenance visits. The vegetated buffers and proposed stormwater basins between the crushed stone access path and the wetland systems will provide water quality treatment in all portions of the Site.

Hydrologic Information

Natural drainage patterns will be maintained throughout the Site so that the proposed hydrologic conditions will closely match existing conditions. The proposed conditions analysis utilized the same 26 drainage areas from existing conditions as shown in the proposed conditions area map (see Figure 3).

Table 2 summarizes the key hydrologic parameters for each drainage area used in the proposed conditions analysis. Only the areas of the Site that are proposed to be disturbed by construction have been included in this drainage analysis, while portions of the Site unaffected by construction have been excluded.

Table 2 Proposed Conditions Hydrologic Data

Drainage Area	*Discharge Location*	*Area (acres)*	*Curve Number*	*Time of Concentration (min)*
1	Onsite Wetlands (Oil Mill Brook)	3.0	70	8
2	Stony Brook	2.5	72	12
2A	Stony Brook	0.8	65	10
3	Stony Brook	2.6	73	13
3A	Stony Brook	0.3	77	10
4	Stony Brook	5.9	73	16
5	Stony Brook	2.6	68	10
6	Stony Brook	3.2	73	8
6A	Stony Brook	0.9	67	10
6B	Stony Brook	0.03	58	10
6C	Stony Brook	0.7	58	10
7	Stony Brook	1.2	70	6
7A	Stony Brook	0.2	58	10
8	Stony Brook	4.7	72	10
8A	Southwest	0.8	58	10
9	Southwest	1.5	73	6
9A	Southwest	0.3	58	10
10	Southwest	2.3	72	11
10A	Southwest	0.3	58	10
11	Onsite Wetlands (Oil Mill Brook)	1.1	74	5
11A	Onsite Wetlands (Oil Mill Brook)	0.4	58	10
12	Onsite Wetlands (Oil Mill Brook)	3.7	71	8
13.1	Onsite Wetlands (Oil Mill Brook)	3.1	75	7
13.2	Onsite Wetlands (Oil Mill Brook)	9.3	73	12
14	Onsite Wetlands (Oil Mill Brook)	4.4	67	9
16	Onsite Wetlands (Oil Mill Brook)	16.9	74	31
16A	Onsite Wetlands (Oil Mill Brook)	0.6	58	10

Figure 3: Proposed Drainage Areas



Legend

SYMBOLS

X — DRAINAGE AREA DESIGNATION

X — POND

LINETYPES

DRAINAGE AREA BOUNDARY

TIME OF CONCENTRATION FLOW LINE

0 250 500 Feet

vhb

Proposed Drainage Areas

Figure 3

Waterford Solar
117 Oil Mill Road - Waterford, CT

11/19/2019

4

Hydrologic Analysis

Hydrologic Analysis

The rainfall-runoff was evaluated for the 2-, 10-, 25-, and 100-year storm recurrence. Rainfall volumes used for this analysis were based on the National Weather Service NOAA Hydrometeorological Design Studies Center, Type III, 24—hour storm event for the Site. Rainfall depths were 3.45, 6.19, 6.97, 7.81 inches respectively. Runoff coefficients for the pre- and post- development conditions provided in the tables below were determined using NRCS Technical Release 55 (TR-55) methodology as provided in the HydroCAD reports found in Appendix D.

In accordance with the guidance of CTDEEP Draft Solar Appendix I, the proposed conditions have been modelled with a loss of one class of Hydrologic Soil Group to conservatively estimate the effects of compaction during construction. The results of the pre- and post-development hydrologic models indicate that peak runoff rates from the Site will be reduced at all design points for all design storms with the implementation of the proposed permanent stormwater basins. The field soil test data was used in the design of the stormwater basins. One-half of the lowest field-tested infiltration rate for each infiltration basin has been assumed in the hydrologic model, to be conservative.

It is noted that no hydraulic analysis has been performed because no closed pipe systems are proposed or impacted by the proposed development.

Table 3 presents a summary of the existing and proposed conditions peak discharge rates where stormwater basins are proposed.

Table 3 Peak Discharge Rates (cfs*)

Watershed	2-year	25-year	50-year	100-year
Watershed 1				
Existing	0.94	5.45	7.01	8.79
Proposed	0.25	4.80	6.66	8.64
Watershed 2				
Existing	0.72	4.06	5.23	6.55
Proposed	0.00	2.38	4.30	6.50
Watershed 3				
Existing	0.71	3.95	5.08	6.37
Proposed	0.21	3.40	4.64	6.04
Watershed 4				
Existing	2.27	9.63	12.09	14.86
Proposed	0.00	5.72	9.81	14.21
Watershed 5				
Existing	0.79	4.49	5.79	7.26
Proposed	0.06	2.91	4.46	6.29
Watershed 6				
Existing	1.79	7.29	9.10	11.13
Proposed	0.19	5.36	7.84	10.50
Watershed 7				
Existing	0.39	2.27	2.92	3.66
Proposed	0.00	0.75	1.56	2.57
Watershed 8				
Existing	1.38	7.82	10.07	12.62
Proposed	0.45	6.77	9.19	11.88
Watershed 9				
Existing	0.51	2.95	3.80	4.76
Proposed	0.00	1.35	2.35	3.52
Watershed 10				
Existing	0.66	3.71	4.78	5.98
Proposed	0.00	2.24	3.61	5.19
Watershed 11				
Existing	0.41	2.31	2.98	3.77
Proposed	0.00	0.57	1.34	2.24
Watershed 12				
Existing	1.16	6.68	8.60	10.77
Proposed	0.27	5.33	7.50	9.87

Watershed 13				
Existing	0.70	13.20	19.91	27.53
Proposed	0.00	3.39	10.57	19.43
Watershed 14				
Existing	1.37	7.89	10.16	12.73
Proposed	0.00	4.99	7.64	10.82
Watershed 15				
Existing	0.74	4.34	5.58	6.99
Proposed	0.00	2.38	3.83	5.77
Watershed 16				
Existing	3.57	19.13	24.60	30.79
Proposed	0.00	8.28	16.80	27.30

* Expressed in cubic feet per second

Floodplain Information / Analysis

The Site is generally elevated above the surrounding network of brooks and rivers. No portions of the Site lie within the Federal Emergency Management Agency (FEMA) mapped 1% annual chance flood A/AE flood zones as shown on the FEMA Flood Insurance Rate Map No. 09011C0343G, dated July 18, 2011 (included in Appendix A).

Water Quality Volume

Water Quality Volume (WQV) is based upon the first inch of rainfall, or a 1-inch rainfall event, over the acreage of proposed impervious surfaces for the development. Neither the solar panels nor the concrete equipment pads will be subject to vehicular access nor will they produce any pollutants to stormwater runoff. The crushed stone access paths will be trafficked infrequently and the grassy meadows downstream of the paths will provide residence time of stormwater runoff to remove the small amount of sediment from runoff.

To be conservative, water quality computations have been performed using a combination of 2004 CTDEEP Stormwater Quality Manual for the access roads and Minnesota Drainage Manual for the solar panels to determine required water quality volumes. These water quality volumes are addressed in the design of the proposed permanent stormwater basins. Computations can be found in Appendix D. A pretreatment basin capable of storing a minimum of 25% of the Water Quality Volume for each basin is included.

Water Quality Flow

Water Quality Flow (WQF) is a rate of stormwater runoff based upon the first inch of rainfall, or a 1-inch rainfall event. This regulation is generally followed for "flow-through" treatment devices. As the proposed development does not incorporate any "flow-through" water quality treatment devices, WQF is not applicable to this project.

Stream Channel Protection

Stream channel protection is provided at the discharge point of each permanent stormwater basin, in accordance with the guidance in 2004 CTDEEP Stormwater Quality Manual. The 2-year, 24-hour post-development peak flow rate is mitigated to 50% of the 2-year, 24-hour pre-development peak flow for each watershed containing development. This will assist in protecting the base flow streambanks in Oil Mill Brook and Stony Brook.

Conveyance Protection

Stream channel protection is provided at the discharge point of each permanent stormwater basin, in accordance with the guidance in 2004 CTDEEP Stormwater Quality Manual. Energy dissipators are proposed at the exit of each basin spillway which will help to slow and spread the discharge of runoff from infrequent storm events.

Appendix A:

FEMA Flood Insurance Rate Map

NOAA Rainfall Depth Estimates

CTDEEP Groundwater Classification Map

FEMA Flood Insurance Rate Map

National Flood Hazard Layer FIRMette

FEMA

41°22'56.82"N

72°10'56.98"W



72°10'19.52"W

41°22'29.82"N

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

1:6,000

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 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- 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 12/2/2019 at 3:57:54 PM 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.

NOAA Rainfall Depth Estimates

NOAA Atlas 14, Volume 10, Version 3
Location name: Waterford, Connecticut, USA*
Latitude: 41.3796°, Longitude: -72.1773°
Elevation: 196.62 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.337** (0.263-0.420)	**0.403** (0.314-0.502)	**0.511** (0.397-0.638)	**0.601** (0.464-0.754)	**0.724** (0.542-0.944)	**0.816** (0.599-1.08)	**0.914** (0.652-1.25)	**1.03** (0.691-1.43)	**1.19** (0.771-1.71)	**1.33** (0.839-1.93)
10-min	**0.478** (0.373-0.595)	**0.571** (0.445-0.712)	**0.724** (0.562-0.905)	**0.851** (0.657-1.07)	**1.03** (0.767-1.34)	**1.16** (0.849-1.54)	**1.30** (0.923-1.78)	**1.45** (0.979-2.03)	**1.69** (1.09-2.42)	**1.88** (1.19-2.74)
15-min	**0.562** (0.439-0.699)	**0.672** (0.524-0.837)	**0.852** (0.662-1.06)	**1.00** (0.773-1.26)	**1.21** (0.903-1.57)	**1.36** (0.998-1.81)	**1.52** (1.09-2.09)	**1.71** (1.15-2.38)	**1.98** (1.29-2.84)	**2.21** (1.40-3.22)
30-min	**0.796** (0.621-0.990)	**0.951** (0.741-1.18)	**1.21** (0.936-1.51)	**1.42** (1.09-1.78)	**1.71** (1.28-2.22)	**1.92** (1.41-2.56)	**2.15** (1.54-2.96)	**2.42** (1.63-3.37)	**2.80** (1.81-4.01)	**3.11** (1.97-4.54)
60-min	**1.03** (0.803-1.28)	**1.23** (0.958-1.53)	**1.56** (1.21-1.95)	**1.83** (1.41-2.30)	**2.21** (1.65-2.88)	**2.49** (1.82-3.30)	**2.78** (1.98-3.82)	**3.12** (2.10-4.35)	**3.61** (2.34-5.18)	**4.02** (2.54-5.86)
2-hr	**1.35** (1.07-1.67)	**1.62** (1.27-2.00)	**2.05** (1.60-2.54)	**2.40** (1.87-3.00)	**2.90** (2.19-3.75)	**3.26** (2.41-4.31)	**3.66** (2.63-4.98)	**4.11** (2.78-5.67)	**4.78** (3.11-6.78)	**5.34** (3.39-7.71)
3-hr	**1.57** (1.24-1.94)	**1.88** (1.48-2.31)	**2.38** (1.87-2.93)	**2.79** (2.18-3.46)	**3.36** (2.54-4.32)	**3.78** (2.81-4.96)	**4.23** (3.05-5.74)	**4.76** (3.23-6.53)	**5.54** (3.62-7.82)	**6.20** (3.95-8.90)
6-hr	**2.00** (1.59-2.44)	**2.38** (1.90-2.91)	**3.00** (2.38-3.68)	**3.52** (2.78-4.33)	**4.23** (3.23-5.40)	**4.76** (3.56-6.19)	**5.32** (3.87-7.16)	**5.98** (4.09-8.13)	**6.96** (4.57-9.72)	**7.78** (4.98-11.0)
12-hr	**2.47** (1.99-3.00)	**2.93** (2.36-3.56)	**3.69** (2.96-4.50)	**4.33** (3.44-5.29)	**5.19** (3.99-6.58)	**5.84** (4.40-7.53)	**6.53** (4.77-8.69)	**7.33** (5.03-9.86)	**8.50** (5.60-11.7)	**9.48** (6.09-13.3)
24-hr	**2.89** (2.35-3.48)	**3.45** (2.80-4.16)	**4.37** (3.53-5.28)	**5.14** (4.12-6.23)	**6.19** (4.80-7.78)	**6.97** (5.29-8.92)	**7.81** (5.75-10.3)	**8.79** (6.07-11.7)	**10.2** (6.78-14.0)	**11.4** (7.39-15.9)
2-day	**3.23** (2.65-3.86)	**3.90** (3.19-4.67)	**5.00** (4.07-5.99)	**5.91** (4.78-7.11)	**7.16** (5.60-8.95)	**8.09** (6.19-10.3)	**9.09** (6.76-12.0)	**10.3** (7.15-13.6)	**12.1** (8.06-16.4)	**13.7** (8.86-18.8)
3-day	**3.50** (2.88-4.17)	**4.23** (3.48-5.04)	**5.41** (4.43-6.46)	**6.40** (5.20-7.67)	**7.75** (6.09-9.64)	**8.75** (6.73-11.1)	**9.83** (7.34-12.9)	**11.1** (7.76-14.6)	**13.1** (8.75-17.6)	**14.8** (9.63-20.2)
4-day	**3.76** (3.11-4.46)	**4.52** (3.73-5.37)	**5.76** (4.73-6.86)	**6.79** (5.54-8.11)	**8.21** (6.47-10.2)	**9.26** (7.14-11.7)	**10.4** (7.78-13.5)	**11.8** (8.21-15.3)	**13.8** (9.24-18.5)	**15.6** (10.1-21.2)
7-day	**4.48** (3.73-5.29)	**5.31** (4.41-6.26)	**6.66** (5.51-7.87)	**7.77** (6.39-9.23)	**9.31** (7.39-11.4)	**10.5** (8.10-13.1)	**11.7** (8.77-15.0)	**13.1** (9.21-17.0)	**15.3** (10.3-20.3)	**17.1** (11.2-23.0)
10-day	**5.20** (4.34-6.10)	**6.06** (5.06-7.12)	**7.46** (6.21-8.80)	**8.63** (7.13-10.2)	**10.2** (8.15-12.5)	**11.4** (8.89-14.2)	**12.7** (9.55-16.2)	**14.2** (9.99-18.3)	**16.3** (11.0-21.5)	**18.1** (11.9-24.2)
20-day	**7.38** (6.23-8.61)	**8.30** (6.99-9.69)	**9.80** (8.23-11.5)	**11.1** (9.21-13.0)	**12.8** (10.2-15.4)	**14.1** (11.0-17.2)	**15.4** (11.6-19.2)	**16.8** (11.9-21.4)	**18.8** (12.7-24.4)	**20.3** (13.3-26.8)
30-day	**9.20** (7.81-10.7)	**10.2** (8.61-11.8)	**11.7** (9.90-13.7)	**13.0** (10.9-15.2)	**14.8** (11.9-17.7)	**16.2** (12.7-19.6)	**17.6** (13.2-21.7)	**18.9** (13.5-23.9)	**20.7** (14.1-26.7)	**21.9** (14.5-28.8)
45-day	**11.5** (9.77-13.2)	**12.5** (10.6-14.4)	**14.1** (12.0-16.4)	**15.5** (13.1-18.0)	**17.4** (14.0-20.6)	**18.9** (14.8-22.6)	**20.3** (15.2-24.7)	**21.6** (15.5-27.1)	**23.2** (15.8-29.7)	**24.2** (16.0-31.6)
60-day	**13.3** (11.4-15.4)	**14.4** (12.3-16.6)	**16.1** (13.7-18.6)	**17.6** (14.9-20.4)	**19.6** (15.8-23.1)	**21.2** (16.6-25.2)	**22.6** (17.0-27.4)	**23.9** (17.2-29.8)	**25.4** (17.4-32.4)	**26.3** (17.5-34.1)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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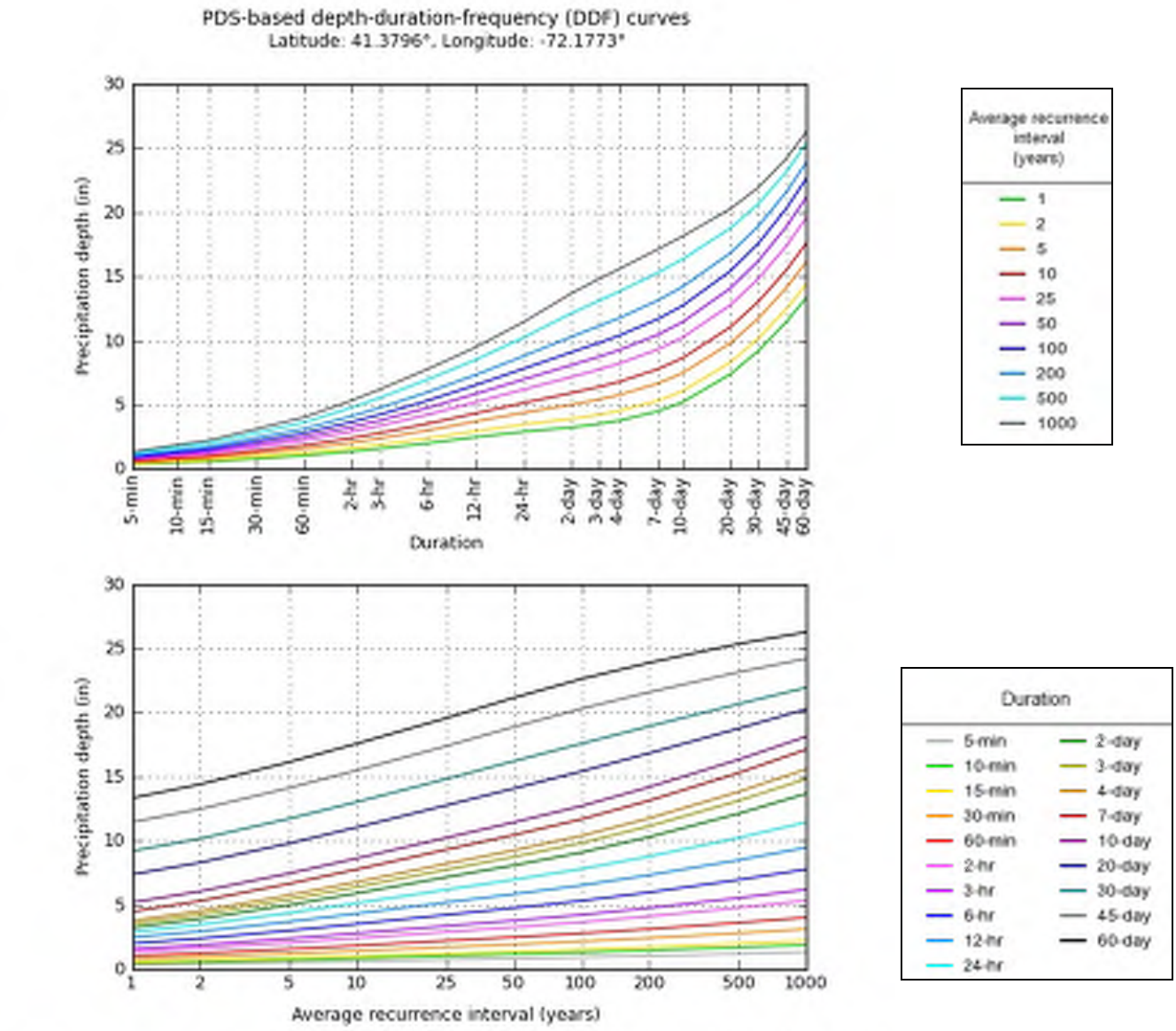
PF graphical



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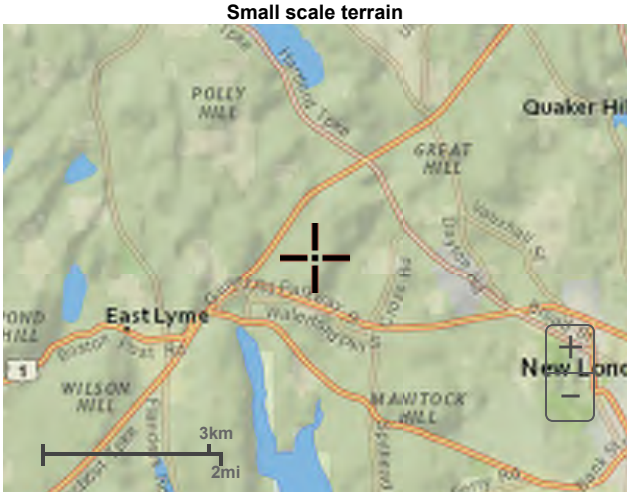
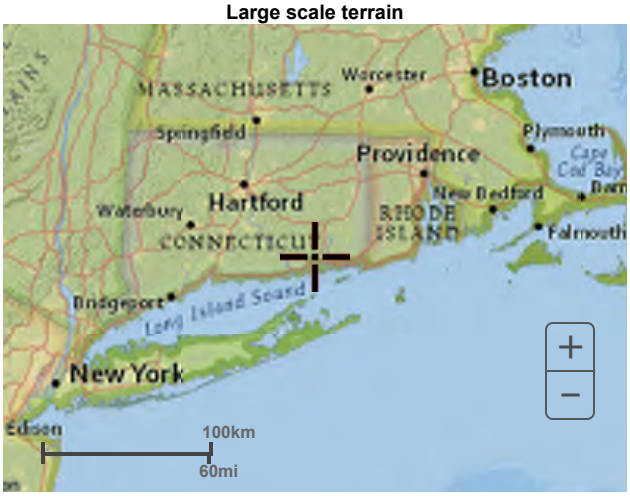
Maps & aerials

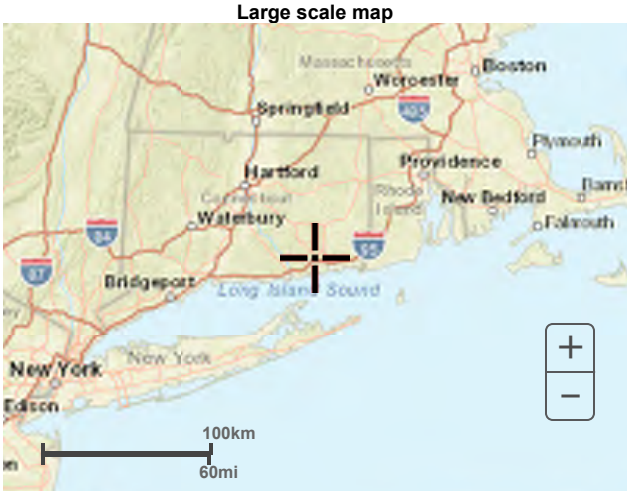
Small scale terrain



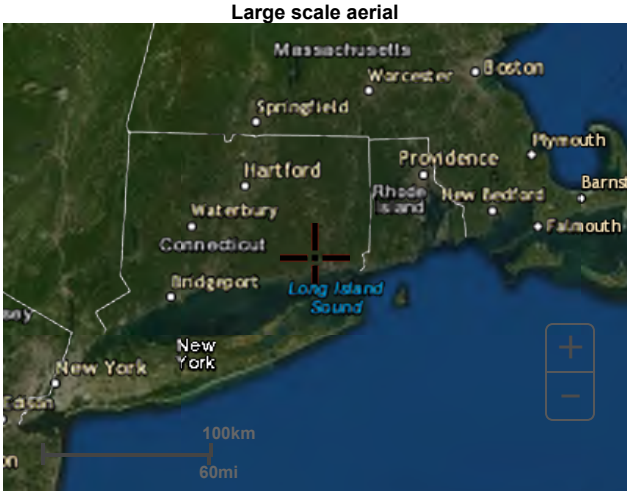
Large scale terrain



Large scale map



Large scale aerial



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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

CTDEEP Groundwater Classification Map

WATER QUALITY CLASSIFICATIONS
WATERFORD, CT

SURFACE WATER QUALITY CLASSES

A	A
AA	AA
B, B*	B, B*
SA	SA
SB	SB

NOTES:
Surface Water Classifications beginning with S refer to Coastal and Marine Surface Water.
B* is a subset of Class B where no direct wastewater discharges are allowed other than those consistent with Class AA, A and SA surface waters.

GROUND WATER QUALITY CLASSES

GA (white background)
GAA, GAAs
GA, GAA may not meet current standards
GB
GC

Area of Contribution to Public Supply Well

Final Aquifer Protection Area (Level A)
Major Basin Boundary

EXPLANATION

WATER QUALITY CLASSIFICATIONS (WQC) MAPS are one of the elements of the Water Quality Standards (WQS) for the State of Connecticut. The WQS are a part of Connecticut's clean water program and are essential for protecting and improving water quality. The WQS follow the principles of Connecticut's Clean Water Act which is in Chapter 446K of the Connecticut General Statutes. The WQS provide policy guidance in many areas, for example decisions on acceptable discharges to water resources, siting of landfills, remediation or prioritization of municipal sewerage system projects. The first two elements of the WQS are the Standards, which set an overall policy for management of water quality, and the Criteria, which are descriptive and numerical standards that describe the allowable parameters and goals for various water quality classifications. A discussion of these two elements is found in the Water Quality Standards document available on the CT DEEP website. The third element is the Classifications and the Water Quality Classification Maps which show the Classification assigned to each surface and groundwater resource throughout the State. The WQS are adopted using a public participation process. The WQC maps are also adopted using a public participation process but go through hearings separately from the Standards and Criteria hearings. Revision and adoption of the WQC data occurs in accordance with the public participation procedures contained in Section 22a-426 of the Connecticut General Statutes. Ground WQC is subject to Connecticut regulation and changes must be reviewed and adopted. All changes to the Surface WQC require an adoption process which is subject to federal review and approval in addition to CT regulation. The adoption dates for the WQC by major drainage basin are: Housatonic River, Hudson River and Southwest Coastal Basins - March 1999; Connecticut River and South Central Coastal Basins - February 1993; Thames River, Pawcatuck River and Southeast Coastal Basins - December 1986. Surface Water Classifications do not change after the adoption date until the next major revision. Ground Water Classifications may change after the adoption date under specific circumstances. The map may have more than one WQC adoption date because a town may be in more than one major drainage basin.

SURFACE WATERS in Connecticut are divided into freshwater classified as AA, A, B or B* and saline waters classified as SA or SB. Class AA designated uses are existing or proposed drinking water supplies; habitat for fish and other aquatic life and wildlife; recreation; and water supply for industry and agriculture. Class A designated uses are habitat for fish and other aquatic life and wildlife; potential drinking water supplies; recreation; navigation; and water supply for industry and agriculture. Class SA designated uses are habitat for marine fish, other aquatic life and wildlife; shellfish harvesting for direct human consumption; recreation; industrial water supply; and navigation. Class B designated uses are habitat for fish and aquatic life and wildlife; recreation; navigation; and industrial and agricultural water supply. Class B*, applicable to Candlewood Lake, is a subset of Class B and is identical in all ways to the designated uses, criteria and standards for Class B waters except for the restriction on direct discharges. Class SB designated uses are habitat for marine fish and aquatic life and wildlife; commercial shellfish harvesting; recreation; industrial water supply; and navigation.

Surface waters which are not specifically classified shall be considered as Class A or Class AA. Surface waters in GA ground water areas are assumed Class A or Class SA unless otherwise indicated. Surface waters in GAA ground water areas are assumed Class AA unless otherwise indicated.

On the WQC map a surface water quality goal of A is represented by blue colored water bodies. Surface water quality goal of AA is represented by purple colored water bodies. Surface water quality goal of B is represented by gold colored water bodies.

GROUND WATERS in Connecticut are classified as GAA, GA, GB and GC. Class GAA designated uses are existing or potential public supply of water suitable for drinking without treatment and baseflow for hydraulically-connected surface water bodies. The Class GAAs is a subclass of GAA for ground water that is tributary to a public water supply reservoir. The area of contribution to a public water supply well is represented by a 500-foot radius around the well and is assumed to be Class GAA unless otherwise classified. Class GA designated uses are existing private and potential public or private supplies of water suitable for drinking without treatment and baseflow for hydraulically-connected surface water bodies. All ground waters not specifically classified are considered as Class GA. Class GB designated uses are industrial process water and cooling waters and baseflow for hydraulically-connected water bodies and is presumed not suitable for human consumption without treatment. Class GC designated uses are assimilation of discharges authorized by the Commissioner pursuant to Section 22a-430 of the General Statutes.

On the WQC map GA is represented by white colored land areas. Class GAA and class GAAs are represented by blue colored land areas. The area of contribution to a public water supply well is shown by a blue cross-hatch overprint. A notation of GAA followed by a state abbreviation indicates a watershed that contributes to the public water supply for a state other than Connecticut. Class GA or Class GAA areas that currently may not be meeting the GA or GAA standards are represented on the WQC maps by tan colored land areas. Class GB is represented by green colored land areas. Class GC is represented by magenta colored land areas.

FINAL AQUIFER PROTECTION AREAS (Level A) are included on the WQC maps for informational purposes. These areas are anticipated to be reclassified GAA during the next major basin updates, subject to public participation. The Aquifer Protection Program helps protect Connecticut's public drinking water resources by delineating aquifer protection areas (also called wellhead protection areas) for public supply wells and establishing land use regulations within these areas. These areas represent the land area contributing ground water to active public water supply wells or well fields that serve more than 1000 people and are set in sand and gravel aquifers (stratified drift deposits).

DATA SOURCES

WATER QUALITY CLASSIFICATIONS DATA – Water quality classifications shown on this map are based on information from the following digital spatial datasets that are typically shown together – Ground Water Quality Classifications Poly, Surface Water Quality Classifications Line, and Surface Water Quality Classifications Poly. The map legend above reflects the content of these three data sources. These WQC data were initially compiled on 1:24,000-scale 7.5 minute USGS topographic quadrangle maps and later digitized at 1:24,000 scale. For example, the Surface Water Quality Classifications Line and Surface Water Quality Classifications Poly digital data assigns surface water quality classifications to water bodies such as rivers, streams, reservoirs, lakes, ponds and coves found in 1:24,000-scale hydrography data available from CT DEEP. The hydrography may not include all the waterbodies in Connecticut. The Ground Water Quality Classifications Poly data assigns ground water quality classifications, at 1:24,000 scale, to the remaining land areas in Connecticut.

AQUIFER PROTECTION AREA DATA – Aquifer Protection Areas shown on this map are from the Aquifer Protection Area digital dataset which contains polygon data intended to be used at 1:24,000 scale. The dataset contains regulated areas classified as Level A Aquifer Protection Area (Final) and Level B Aquifer Protection Area (Preliminary). The Level B areas are not shown on the WQC maps. The data was collected from 1991 to the present and is actively updated as Final area mapping replaces earlier Preliminary areas. The Aquifer Protection Areas are delineated by the individual water companies owning the well fields and submitted to the CT DEEP for approval. Preliminary mapping provides a general estimate of the area contributing ground water to the well field. Final mapping is based on extensive, site-specific, detailed modeling of the ground water flow system. CT DEEP may adjust Final area boundaries to be consistent with 1:24,000 scale topography and base map data where appropriate during the approval process.

MAJOR DRAINAGE BASIN DATA – Major drainage basins shown on this map are from Major Basin Line data developed by CT DEEP and intended to be used at 1:24,000 scale.

BASE MAP DATA - Based on data originally from 1:24,000-scale USGS 7.5 minute topographic quadrangle maps published between 1969 and 1992. It includes political boundaries, railroads, airports, hydrography, geographic names and geographic places. Streets and street names are from Tele Atlas® copyrighted data. Base map information is neither current nor complete.

RELATED INFORMATION
This map is intended to be printed at its original dimensions in order to maintain the 1:24,000 scale (1 inch = 2000 feet).
WATER QUALITY STANDARDS - Go to the CT DEEP website for a summary and the full text of the "Water Quality Standards" and for other information on water quality.
AQUIFER PROTECTION AREAS - Go to the CT DEEP website for more information.

ADOPTED DATES

Water Quality Standards
February 25, 2011

Thames River, Pawcatuck River and Southeast Coastal Basins: December 1986

Connecticut River and South Central Coastal Basins: February 1993

Housatonic River, Hudson River and Southwest Coastal Basins: March 1999

MAJOR BASINS

1 Pawcatuck
2 Southeast Coast
3 Thames
4 Connecticut
5 South Central Coast
6 Housatonic
7 Southwest Coast
8 Hudson

MAP LOCATION

State Plane Coordinate System of 1983. Zone 3526
Lambert Conformal Conic Projection
North American Datum of 1983

0.5 0 1 Miles
1000 0 1000 2000 3000 4000 5000 6000 7000 Feet
1 0.5 0 1 Kilometers

SCALE 1:24,000 (1 inch = 2000 feet) when map is printed at original size

STATE OF CONNECTICUT
DEPARTMENT OF
ENERGY & ENVIRONMENTAL PROTECTION
79 Elm Street
Hartford, CT 06106-5127

Map created by CT DEEP
October 2018

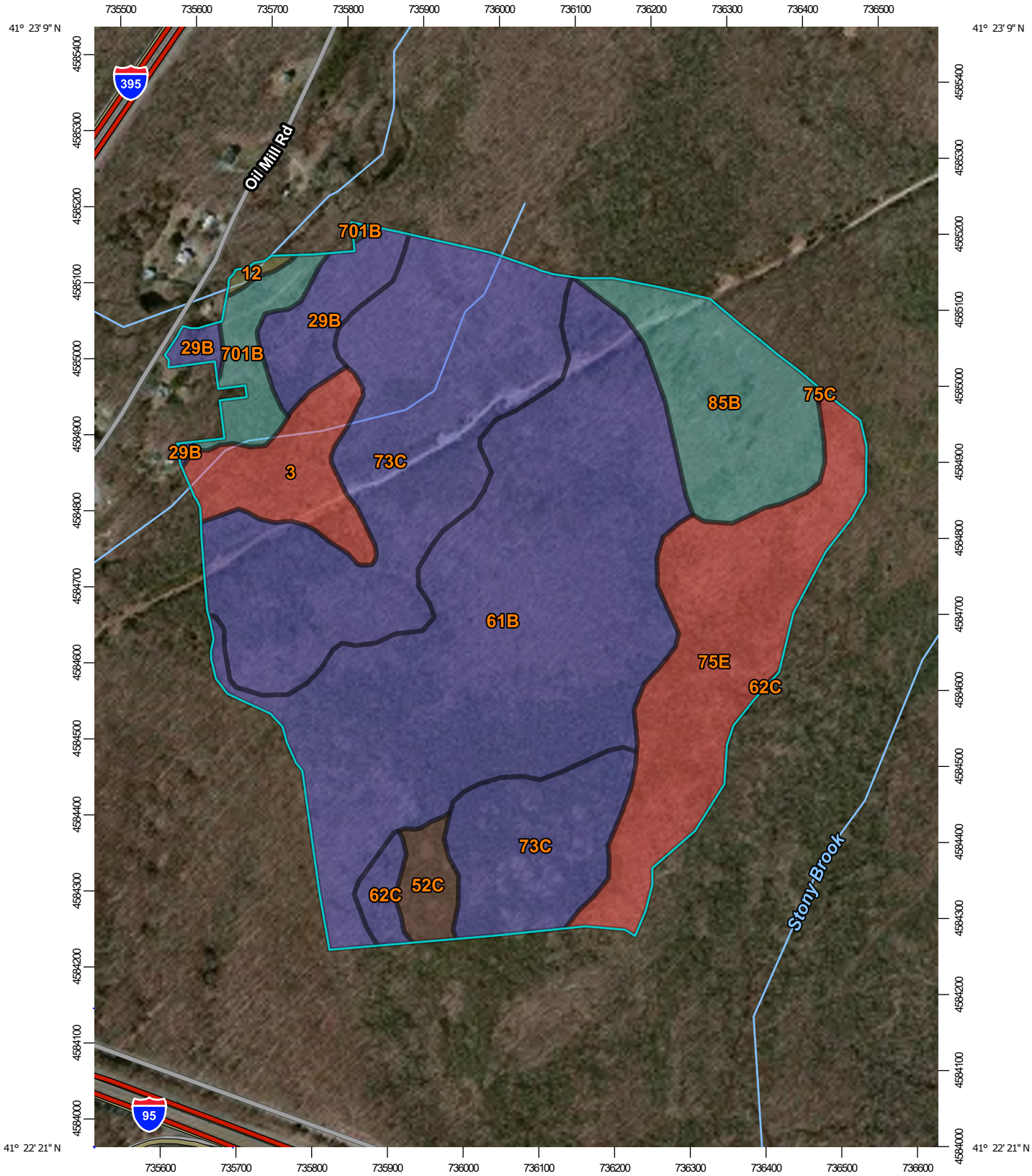
Map is not colorfast
Protect from light and moisture

Appendix B:

NRCS Soil Survey Information
Test Pit and Infiltration Testing Data

NRCS Soil Survey Information

Hydrologic Soil Group—State of Connecticut
(Waterford Property Line)



Map Scale: 1:7,180 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 100 200 400 600

Feet
0 300 600 1200 1800

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

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

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: State of Connecticut
Survey Area Data: Version 18, Dec 6, 2018

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

Date(s) aerial images were photographed: Mar 28, 2011—May 12, 2011

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
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony	D	7.3	4.8%
12	Raypol silt loam	C/D	0.4	0.3%
29B	Agawam fine sandy loam, 3 to 8 percent slopes	B	6.0	4.0%
52C	Sutton fine sandy loam, 2 to 15 percent slopes, extremely stony	B/D	2.6	1.7%
61B	Canton and Charlton fine sandy loams, 0 to 8 percent slopes, very stony	B	52.2	34.3%
62C	Canton and Charlton fine sandy loams, 3 to 15 percent slopes, extremely stony	B	1.6	1.1%
73C	Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky	B	43.6	28.7%
75C	Hollis-Chatfield-Rock outcrop complex, 3 to 15 percent slopes	D	0.0	0.0%
75E	Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes	D	21.1	13.8%
85B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes, very stony	C	13.1	8.6%
701B	Ninigret fine sandy loam, 3 to 8 percent slopes	C	4.3	2.8%
Totals for Area of Interest			**152.2**	**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

Test Pit and Infiltration Testing Data

March 21, 2019

BL Companies
355 Research Parkway
Meriden, CT 06450

Attn: Mr. Christopher Albino, P.E. – Senior Project Manager / Principal
P: (203) 608 2509
E: calbino@blcompanies.com

Re: Addendum to Geotechnical Engineering Report – *In-Situ* Permeability Testing
Photovoltaic Installation
117 Oil Mill Road
Waterford, Connecticut
Terracon Project No. J2185052

Dear Mr. Albino:

At your request, Terracon Consultants, Inc. (Terracon) has completed this addendum to our Geotechnical Engineering Report, dated May 22, 2018, for the above-referenced project. The additional services included performing *in-situ* permeability testing at 13 locations throughout the site. Our services were conducted in general accordance with our supplemental proposal dated January 23, 2019. The General Conditions in our report apply to the *in-situ* testing in this letter.

1.0 PROJECT INFORMATION

The project site is an approximately 140-acre parcel west of Oil Mill Road and north of Parkway North, in the town of Waterford, Connecticut. The site undulates between relative highs and lows, generally sloping downward to the west from approximately Elevations 240 to 100 feet. The majority of the site is heavily wooded. However, portions of the site have been cleared, presumably in anticipation of site development.

Our understanding of the project comes from our recent conversations and review of the site plan titled *"SWMB – Geotech Boring Locations"*, Project No. 17D3515, Sheet No. EXH-1, dated July 30, 2018, by BL Companies of Meriden, Connecticut. As such, we understand that the project will include the construction of 13 stormwater management basins within the solar power facility. Cuts and fills, up to about 10 feet, are anticipated for site and stormwater detention development.

2.0 FIELD EXPLORATION AND GEOLOGIC DESCRIPTION

Field Exploration Description

The approximate exploration and test locations, which are shown in Exhibit A-2, were obtained using a handheld GPS unit (estimated horizontal accuracy of about ±10 feet) and approximate elevations were obtained by interpolating from 7.5 minute topographic quadrangle maps, including Montville, Connecticut (1983) and Niantic, Connecticut (1983). Ground surface elevations rounded to the nearest foot are shown on the individual exploration logs. The locations of the explorations and tests as well as their elevations should be considered accurate only to the degree implied by the method used to define them.

Terracon advanced 13 test probes (INF-1 through INF-13) between February 22 and April 1, 2019 for the purpose of performing *in-situ* infiltration tests. With the exception of INF-6, INF-7, and INF-8, the probes were advanced using 3¼-inch inside diameter continuous flight hollow-stem augers or 4-inch diameter continuous flight solid stem augers powered by an all-terrain vehicle (ATV) mounted Diedrich D-50 rotary drill rig. INF-6, INF-7, and INF-8 were in an area that was inaccessible to our drill rig and therefore were advanced by hand using a 2-inch diameter auger.

Select soil samples were collected in the field and placed in labeled bags and glass jars and transported to our Rocky Hill (Hartford) laboratory for further review by a Terracon geotechnical engineer, laboratory testing, and classification. Information provided on the exploration logs attached to this report includes soil descriptions, exploration depths, and groundwater conditions. Field logs of the explorations were prepared by a Terracon field engineer. These logs included visual classifications of the materials encountered during drilling as well as interpretation by our field engineer of the subsurface conditions between samples. Final exploration logs included with this report represent further interpretation by the geotechnical engineer of the field logs and incorporate, where appropriate, modifications based on observations and laboratory classification of the samples.

Geotechnical Characterization

Based on our knowledge of the site, the subsurface conditions consist of forest mat underlain by glacial till over bedrock. The glacial till consists of brown, medium dense to very dense silty, silty sand (SM), with gravel, occasional to frequent cobbles and boulders. Bedrock, the upper several feet of which is weathered, consists of gray granitic gneiss.

INF-1 through INF-5, INF-9, INF-12, and INF-13 terminated without refusal in the glacial till at a depth of approximately 10 feet below existing grade. INF-6 terminated on a probable boulder in the glacial till at a depth of approximately 2 feet. INF-7, INF-8, INF-10, and INF-11 terminated on bedrock at depths ranging from approximately 2 to 4 feet.

Groundwater

With the exception of INF-1 and INF-2, groundwater was not encountered at the time of our explorations. Fluctuations in groundwater level may occur because of seasonal variations in the amount of rainfall, runoff, and other factors. Additionally, grade adjustments on and around the site, as well as surrounding drainage improvements, may affect the water table. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project. Groundwater levels are tabulated below:

Boring	Depth to Groundwater While Drilling (feet)
INF-1	0.5
INF-2	1.0

3.0 *IN-SITU* PERMEABILITY TESTING

Between February 22 and March 15, 2019, Terracon performed *in-situ* soil hydraulic conductivity testing at 13 locations (INF-1 through INF-13) using falling head infiltration testing. Testing was performed by installing 2-inch diameter PVC well pipe to the bottom of the test hole. Granular filter media (i.e. coarse sand) was placed at the bottom of the pipe to prevent scouring and silting. The pipes were then filled with water to the top of pipe and allowed to presoak. Following the presoaking period, infiltration testing was performed in general accordance with the *2004 Connecticut Stormwater Quality Manual* by the Connecticut Department of Environmental Protection. The results are tabulated below.

Soils at the appropriate test depths from each location were collected and classified using the USDA Textural Triangle. Classification was by visual/manual procedures. Results of the field permeability testing is summarized below:

Test No.	Approximate Depth (feet)	Material at Test Depth	Textural Class	Infiltration Rate, K, (inches/hour)
INF-1	10	Weathered Rock	Loamy Sand	<0.1
INF-2	10	Glacial Till	Loamy Sand	No Movement[1]
INF-3	10	Glacial Till	Loamy Sand	No Movement[1]
INF-4	10	Glacial Till	Loamy Sand	No Movement[1]
INF-5	10	Glacial Till	Loamy Sand	No Movement[1]

Test No.	Approximate Depth (feet)	Material at Test Depth	Textural Class	Infiltration Rate, K, (inches/hour)
INF-6	2	Glacial Till	Loamy Sand	2.8
INF-7	2	Bedrock	Not Applicable	No Movement[1]
INF-8	3.6	Bedrock	Not Applicable	No Movement[1]
INF-9	10	Glacial Till	Loamy Sand	3.0
INF-10	2.6	Weathered Rock	Loamy Sand	<0.1
INF-11	4	Bedrock	Not Applicable	0.1
INF-12	10	Glacial Till	Loamy Sand	2.3
INF-13	10	Glacial Till	Loamy Sand	2.3

1. No perceivable movement in water level after 60 minutes.

Individual permeability tests only measure the hydraulic conductivity in the immediate vicinity of the test, and may not be representative of the average hydraulic conductivity of the soil. Additionally, field hydraulic conductivity values are generally accurate to an order of magnitude.

Various factors may influence field infiltration testing results, including lack of soil saturation, a non-homogenous soil profile surrounding the test interval, the presence of bedrock, gravel, cobbles, boulders, or deleterious material, or variation in soil density. Field infiltration values should be evaluated based on the measured data in conjunction with published values for the material.

We trust that this report meets your current needs. We appreciate the opportunity to have been of service to you on this project. Should you require further information, please contact us.

Sincerely,
Terracon Consultants, Inc.

Brian D. Opp, P.E.
Senior Engineer

Stephen C. Lanne, P.E.
Geotechnical Department Manager

/bdo/J2185052

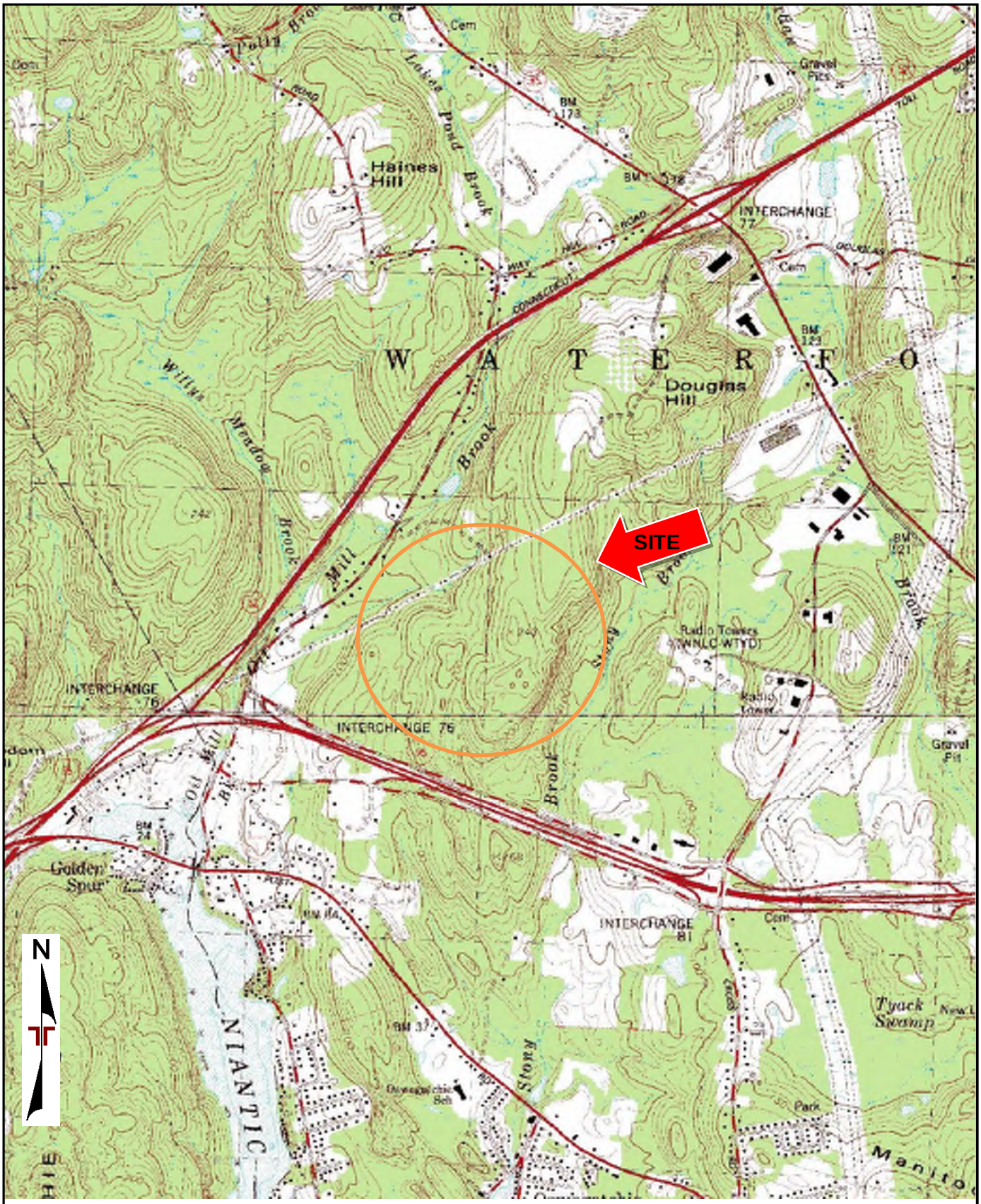
APPENDIX A – FIELD EXPLORATION

Exhibit A-1	Site Location Map
Exhibit A-2	Test Location Diagram
Exhibits A-3 to A-15	Test Probe Logs (INF-1 through INF-13)

APPENDIX B – SUPPORTING DOCUMENTS

Exhibit B-1	General Notes
Exhibit B-2	Unified Soil Classification System
Exhibit B-3	Description of Rock Properties

APPENDIX A
FIELD EXPLORATION



TOPOGRAPHIC MAP IMAGE COURTESY OF THE U.S. GEOLOGICAL SURVEY
QUADRANGLES INCLUDE: MONTVILLE, CT (1/1/1983) and NIANTIC, CT (1/1/1983).

Project Manager: BDO	Project No. J2185052	Terracon 201 Hammer Mill Rd Rocky Hill, CT 06067-3768	SITE LOCATION MAP	Exhibit
Drawn by: BDO	Scale: 1"=2,000'		Proposed Solar Power Facility, Waterford, CT 117 Oil Mill Road Waterford, CT	A-1
Checked by: SCL	File Name: J2185052			
Approved by: SCL	Date: MAR 2019			

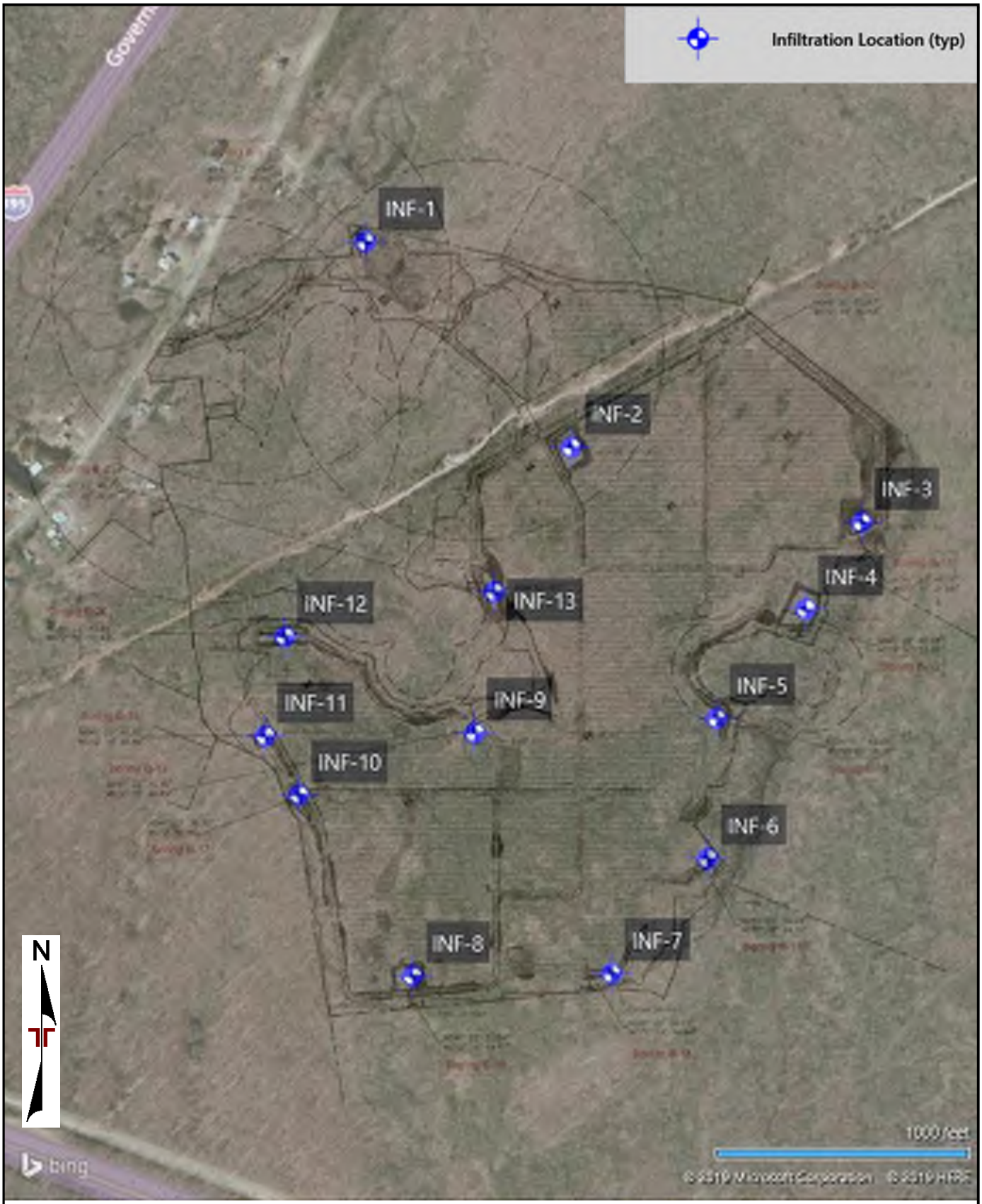


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

BASED ON THE SITE PLAN TITLED *'SWMB – GEOTECH BORING LOCATIONS'*, SHEET No. EXH-1, DATED JULY 30, 2018, BY BL COMPANIES AND AERIAL PHOTOGRAPHY PROVIDED BY MICROSOFT BING MAPS

Project Manager:	BDO
Drawn by:	BDO
Checked by:	SCL
Approved by:	SCL

Project No.	J218505
Scale:	AS SHOWN
File Name:	J2185052
Date:	MAR 2019

Terracon
201 Hammer Mill Rd
Rocky Hill, CT 06067-3768

TEST LOCATION PLAN

Proposed Solar Power Facility, Waterford, CT

117 Oil Mill Road
Waterford, CT

Exhibit

A-2

PROBE LOG NO. INF-1

PROJECT: Photovoltaic Installation

CLIENT: BL Companies
Meriden, Connecticut

SITE: 117 Oil Mill Road
Waterford, Connecticut

LOCATION See Exhibit A-2

Latitude: 41.3835° Longitude: -72.1796°

Approximate Surface Elev.: 130 (Ft.) +/-

GRAPHIC LOG	DEPTH		ELEVATION (Ft.)
	0.5	**FOREST MAT**	129.5+/-
	1.5	**SILTY SAND (SM)**, trace roots, brown, **(SUBSOIL)**	128.5+/-
	6.0	**SILTY SAND (SM)**, with gravel, gray	124+/-
	10.0	**COMPLETLEY WEATHERED GRANITIC GNEISS**, gray to black	120+/-
		Probe Terminated at 10 Feet	

INSTALLATION DETAILS: 2" PVC Installed for Infiltration test

DEPTH (Ft.): 5, 10

WATER LEVEL OBSERVATIONS

SAMPLE TYPE

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
3 1/4-inch I.D. continuous flight hollow stem augers.

Abandonment Method:

Notes:

See addendum report for description of field procedures.
See Appendix B for explanation of symbols and abbreviations.
Elevations were interpolated from topographic maps.

WATER LEVEL OBSERVATIONS

While drilling

Terracon

Probe Started: 02-22-2019	Probe Completed: 02-22-2019
Drill Rig: Diedrich D-50	Driller: C.Johnston
Project No.: J2185052	Exhibit: A-3

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL J2185052 INFILTRATION TESTING.GPJ TERRACON_DATATEMPLATE.GDT 3/21/19

PROBE LOG NO. INF-2

PROJECT: Photovoltaic Installation

CLIENT: BL Companies
Meriden, Connecticut

SITE: 117 Oil Mill Road
Waterford, Connecticut

LOCATION See Exhibit A-2

Latitude: 41.3813° Longitude: -72.1766°

Approximate Surface Elev.: 220 (Ft.) +/-

GRAPHIC LOG	DEPTH		ELEVATION (Ft.)	INSTALLATION DETAILS	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE
	0.5	**FOREST MAT**	219.5+/-				
		SILTY SAND (SM), trace roots, brown, **(SUBSOIL)**				▽	
	2.0		218+/-				
		SILTY SAND (SM), with gravel, gray		2" PVC Installed for Infiltration test	5		
	10.0		210+/-		10		
		Probe Terminated at 10 Feet					

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
4-inch diameter continuous flight solid stem augers.

Abandonment Method:

Notes:

See addendum report for description of field procedures.
See Appendix B for explanation of symbols and abbreviations.
Elevations were interpolated from topographic maps.

WATER LEVEL OBSERVATIONS

▽ *While drilling*

Terracon

Probe Started: 02-22-2019	Probe Completed: 02-22-2019
Drill Rig: Diedrich D-50	Driller: C.Johnston
Project No.: J2185052	Exhibit: A-4

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL J2185052 INFILTRATION TESTING.GPJ TERRACON_DATATEMPLATE.GDT 3/21/19

PROBE LOG NO. INF-3

PROJECT: Photovoltaic Installation

CLIENT: BL Companies
Meriden, Connecticut

SITE: 117 Oil Mill Road
Waterford, Connecticut

LOCATION See Exhibit A-2

Latitude: 41.3805° Longitude: -72.1724°

Approximate Surface Elev.: 230 (Ft.) +/-

GRAPHIC LOG	DEPTH		ELEVATION (Ft.)	INSTALLATION DETAILS	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE
	0.5	**FOREST MAT**	229.5+/-				
		SILTY SAND (SM), trace roots, brown, **(SUBSOIL)**					
	2.0		228+/-				
		SILTY SAND (SM), with gravel, gray		2" PVC Installed for Infiltration test	5		
	10.0		220+/-		10		
		Probe Terminated at 10 Feet					

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
4-inch diameter continuous flight solid stem augers.

Abandonment Method:

Notes:

See addendum report for description of field procedures.
See Appendix B for explanation of symbols and abbreviations.
Elevations were interpolated from topographic maps.

WATER LEVEL OBSERVATIONS

No free water observed

Terracon

Probe Started: 02-28-2019	Probe Completed: 02-28-2019
Drill Rig: Diedrich D-50	Driller: C.Johnston
Project No.: J2185052	Exhibit: A-5

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL J2185052 INFILTRATION TESTING.GPJ TERRACON_DATATEMPLATE.GDT 3/21/19

PROBE LOG NO. INF-4

PROJECT: Photovoltaic Installation

CLIENT: BL Companies
Meriden, Connecticut

SITE: 117 Oil Mill Road
Waterford, Connecticut

LOCATION See Exhibit A-2

Latitude: 41.3795° Longitude: -72.1732°

Approximate Surface Elev.: 200 (Ft.) +/-

GRAPHIC LOG	DEPTH		ELEVATION (Ft.)	INSTALLATION DETAILS	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE
	0.5	**FOREST MAT**	199.5+/-				
		SILTY SAND (SM), trace roots, brown, **(SUBSOIL)**					
	2.0		198+/-				
		SILTY SAND (SM), with gravel, gray		2" PVC Installed for Infiltration test	5		
	10.0		190+/-		10		
		Probe Terminated at 10 Feet					

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
4-inch diameter continuous flight solid stem augers.

Abandonment Method:

Notes:

See addendum report for description of field procedures.
See Appendix B for explanation of symbols and abbreviations.
Elevations were interpolated from topographic maps.

WATER LEVEL OBSERVATIONS

No free water observed

Terracon

Probe Started: 02-28-2019	Probe Completed: 02-28-2019
Drill Rig: Diedrich D-50	Driller: C.Johnston
Project No.: J2185052	Exhibit: A-6

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL J2185052 INFILTRATION TESTING.GPJ TERRACON_DATATEMPLATE.GDT 3/21/19

PROBE LOG NO. INF-5

PROJECT: Photovoltaic Installation

CLIENT: BL Companies
Meriden, Connecticut

SITE: 117 Oil Mill Road
Waterford, Connecticut

LOCATION See Exhibit A-2

Latitude: 41.3783° Longitude: -72.1745°

Approximate Surface Elev.: 220 (Ft.) +/-

GRAPHIC LOG	DEPTH		ELEVATION (Ft.)	INSTALLATION DETAILS	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE
	0.5	**FOREST MAT**	219.5+/-				
		SILTY SAND (SM), trace roots, brown, **(SUBSOIL)**					
	2.0		218+/-				
		SILTY SAND (SM), with gravel, gray		2" PVC Installed for Infiltration test	5		
	10.0		210+/-		10		
		Probe Terminated at 10 Feet					

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
4-inch diameter continuous flight solid stem augers.

Abandonment Method:

Notes:

See addendum report for description of field procedures.
See Appendix B for explanation of symbols and abbreviations.
Elevations were interpolated from topographic maps.

WATER LEVEL OBSERVATIONS

No free water observed

Terracon

Probe Started: 02-28-2019	Probe Completed: 02-28-2019
Drill Rig: Diedrich D-50	Driller: C.Johnston
Project No.: J2185052	Exhibit: A-7

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL J2185052 INFILTRATION TESTING.GPJ TERRACON_DATATEMPLATE.GDT 3/21/19

PROBE LOG NO. INF-6

PROJECT: Photovoltaic Installation

CLIENT: BL Companies
Meriden, Connecticut

SITE: 117 Oil Mill Road
Waterford, Connecticut

LOCATION See Exhibit A-2

Latitude: 41.3768° Longitude: -72.1747°

Approximate Surface Elev.: 235 (Ft.) +/-

GRAPHIC LOG	DEPTH		ELEVATION (Ft.)	INSTALLATION DETAILS	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE
	0.5	**FOREST MAT**	234.5+/-				
	1.5	**SILTY SAND (SM)**, trace roots, brown, **(SUBSOIL)**	233.5+/-	2" PVC Installed for Infiltration test			
	2.0	**SILTY SAND (SM)**, with gravel, gray	233+/-				
		Auger Refusal on Probable Boulder at 2 Feet					

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
2-inch diameter hand auger

Abandonment Method:

Notes:

See addendum report for description of field procedures.
See Appendix B for explanation of symbols and abbreviations.
Elevations were interpolated from topographic maps.

WATER LEVEL OBSERVATIONS

No free water observed

Terracon

Probe Started: 03-01-2019	Probe Completed: 03-01-2019
Drill Rig:	Driller: C.Johnston
Project No.: J2185052	Exhibit: A-8

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL J2185052 INFILTRATION TESTING.GPJ TERRACON_DATATEMPLATE.GDT 3/21/19

PROBE LOG NO. INF-7

PROJECT: Photovoltaic Installation

CLIENT: BL Companies
Meriden, Connecticut

SITE: 117 Oil Mill Road
Waterford, Connecticut

LOCATION See Exhibit A-2

Latitude: 41.3756° Longitude: -72.176°

Approximate Surface Elev.: 240 (Ft.) +/-

GRAPHIC LOG	DEPTH		ELEVATION (Ft.)	INSTALLATION DETAILS	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE
	0.5	**FOREST MAT**	239.5+/-				
	1.5	**SILTY SAND (SM)**, trace roots, brown, **(SUBSOIL)**	238.5+/-	2" PVC Installed for Infiltration test			
	2.0	**SILTY SAND (SM)**, with gravel, gray	238+/-				
		Auger Refusal on Probable Bedrock at 2 Feet					

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
2-inch diameter hand auger

Abandonment Method:

Notes:

See addendum report for description of field procedures.
See Appendix B for explanation of symbols and abbreviations.
Elevations were interpolated from topographic maps.

WATER LEVEL OBSERVATIONS

No free water observed

Terracon

Probe Started: 03-01-2019	Probe Completed: 03-01-2019
Drill Rig:	Driller: C.Johnston
Project No.: J2185052	Exhibit: A-9

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL J2185052 INFILTRATION TESTING.GPJ TERRACON_DATATEMPLATE.GDT 3/21/19

PROBE LOG NO. INF-8

PROJECT: Photovoltaic Installation

CLIENT: BL Companies
Meriden, Connecticut

SITE: 117 Oil Mill Road
Waterford, Connecticut

LOCATION See Exhibit A-2

Latitude: 41.3755° Longitude: -72.1789°

Approximate Surface Elev.: 190 (Ft.) +/-

DEPTH		ELEVATION (Ft.)
0.5	**FOREST MAT**	189.5+/-
	SILTY SAND (SM), trace roots, brown, **(SUBSOIL)**	
2.0		188+/-
	SILTY SAND (SM), with gravel, gray	
3.6		186.5+/-
	Auger Refusal on Probable Bedrock at 3.58 Feet	

INSTALLATION DETAILS: 2" PVC Installed for Infiltration test

GRAPHIC LOG | DEPTH (Ft.) | WATER LEVEL OBSERVATIONS | SAMPLE TYPE

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
2-inch diameter hand auger

Abandonment Method:

Notes:

See addendum report for description of field procedures.
See Appendix B for explanation of symbols and abbreviations.
Elevations were interpolated from topographic maps.

WATER LEVEL OBSERVATIONS

No free water observed

Terracon

Probe Started: 03-01-2019	Probe Completed: 03-01-2019
Drill Rig:	Driller: C.Johnston
Project No.: J2185052	Exhibit: A-10

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL J2185052 INFILTRATION TESTING.GPJ TERRACON_DATATEMPLATE.GDT 3/21/19

PROBE LOG NO. INF-9

PROJECT: Photovoltaic Installation

CLIENT: BL Companies
Meriden, Connecticut

SITE: 117 Oil Mill Road
Waterford, Connecticut

LOCATION See Exhibit A-2

Latitude: 41.3782° Longitude: -72.178°

Approximate Surface Elev.: 195 (Ft.) +/-

GRAPHIC LOG	DEPTH		ELEVATION (Ft.)	INSTALLATION DETAILS	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE
	0.5	**FOREST MAT**	194.5+/-				
		SILTY SAND (SM), trace roots, brown, **(SUBSOIL)**					
	2.5		192.5+/-				
		SILTY SAND (SM), with gravel, gray		2" PVC Installed for Infiltration test	5		
	10.0		185+/-		10		
		Probe Terminated at 10 Feet					

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
4-inch diameter continuous flight solid stem augers.

Abandonment Method:

Notes:

See addendum report for description of field procedures.
See Appendix B for explanation of symbols and abbreviations.
Elevations were interpolated from topographic maps.

WATER LEVEL OBSERVATIONS

No free water observed

Terracon

Probe Started: 02-22-2019	Probe Completed: 02-22-2019
Drill Rig: Diedrich D-50	Driller: C.Johnston
Project No.: J2185052	Exhibit: A-11

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL J2185052 INFILTRATION TESTING.GPJ TERRACON_DATATEMPLATE.GDT 3/21/19

PROBE LOG NO. INF-10

PROJECT: Photovoltaic Installation

CLIENT: BL Companies
Meriden, Connecticut

SITE: 117 Oil Mill Road
Waterford, Connecticut

LOCATION See Exhibit A-2

Latitude: 41.3775° Longitude: -72.1806°

Approximate Surface Elev.: 190 (Ft.) +/-

GRAPHIC LOG	DEPTH		ELEVATION (Ft.)	INSTALLATION DETAILS	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE
	0.5	**FOREST MAT**	189.5+/-				
		SILTY SAND (SM), trace roots, brown, **(SUBSOIL)**		2" PVC Installed for Infiltration test			
	2.0		188+/-				
	2.6	**COMPLETLEY WEATHERED GRANITIC GNEISS**, gray to black	187.5+/-				
		Auger Refusal on Competent Bedrock at 2.58 Feet					

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
4-inch diameter continuous flight solid stem augers.

Abandonment Method:

Notes:

See addendum report for description of field procedures.
See Appendix B for explanation of symbols and abbreviations.
Elevations were interpolated from topographic maps.

WATER LEVEL OBSERVATIONS

No free water observed

Terracon

Probe Started: 02-26-2019	Probe Completed: 02-26-2019
Drill Rig: Diedrich D-50	Driller: C.Johnston
Project No.: J2185052	Exhibit: A-12

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL J2185052 INFILTRATION TESTING.GPJ TERRACON_DATATEMPLATE.GDT 3/21/19

PROBE LOG NO. INF-11

PROJECT: Photovoltaic Installation

CLIENT: BL Companies
Meriden, Connecticut

SITE: 117 Oil Mill Road
Waterford, Connecticut

LOCATION See Exhibit A-2

Latitude: 41.3781° Longitude: -72.181°

Approximate Surface Elev.: 170 (Ft.) +/-

GRAPHIC LOG	DEPTH		ELEVATION (Ft.)	INSTALLATION DETAILS	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE
	0.5	**FOREST MAT**	169.5+/-				
	1.5	**SILTY SAND (SM)**, trace roots, brown, **(SUBSOIL)**	168.5+/-				
		COMPLETLEY WEATHERED GRANITIC GNEISS, gray to black		2" PVC Installed for Infiltration test			
	4.0		166+/-				
		Auger Refusal on Competent Bedrock at 4 Feet					

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
4-inch diameter continuous flight solid stem augers.

Abandonment Method:

Notes:

See addendum report for description of field procedures.
See Appendix B for explanation of symbols and abbreviations.
Elevations were interpolated from topographic maps.

WATER LEVEL OBSERVATIONS

No free water observed

Terracon

Probe Started: 02-27-2019	Probe Completed: 02-27-2019
Drill Rig: Diedrich D-50	Driller: C.Johnston
Project No.: J2185052	Exhibit: A-13

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL J2185052 INFILTRATION TESTING.GPJ TERRACON_DATATEMPLATE.GDT 3/21/19

PROBE LOG NO. INF-12

PROJECT: Photovoltaic Installation

CLIENT: BL Companies
Meriden, Connecticut

SITE: 117 Oil Mill Road
Waterford, Connecticut

LOCATION See Exhibit A-2

Latitude: 41.3792° Longitude: -72.1807°

Approximate Surface Elev.: 160 (Ft.) +/-

GRAPHIC LOG	DEPTH		ELEVATION (Ft.)	INSTALLATION DETAILS	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE
	0.5	**FOREST MAT**	159.5+/-				
	1.5	**SILTY SAND (SM)**, trace roots, brown, **(SUBSOIL)**	158.5+/-				
		SILTY SAND (SM), with gravel, gray		2" PVC Installed for Infiltration test	5		
	10.0		150+/-		10		
		Probe Terminated at 10 Feet					

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
4-inch diameter continuous flight solid stem augers.

Abandonment Method:

Notes:

See addendum report for description of field procedures.
See Appendix B for explanation of symbols and abbreviations.
Elevations were interpolated from topographic maps.

WATER LEVEL OBSERVATIONS

No free water observed

Terracon

Probe Started: 02-27-2019	Probe Completed: 02-27-2019
Drill Rig: Diedrich D-50	Driller: C.Johnston
Project No.: J2185052	Exhibit: A-14

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL J2185052 INFILTRATION TESTING.GPJ TERRACON_DATATEMPLATE.GDT 3/21/19

PROBE LOG NO. INF-13

PROJECT: Photovoltaic Installation

CLIENT: BL Companies
Meriden, Connecticut

SITE: 117 Oil Mill Road
Waterford, Connecticut

LOCATION See Exhibit A-2

Latitude: 41.3797° Longitude: -72.1777°

Approximate Surface Elev.: 190 (Ft.) +/-

GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	INSTALLATION DETAILS	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE
	0.8	189+/-				
FOREST MAT						
SILTY SAND (SM), trace roots, brown, **(SUBSOIL)**	4.0	186+/-				
SILTY SAND (SM), with gravel, gray			2" PVC Installed for Infiltration test	5		
	10.0	180+/-		10		
Probe Terminated at 10 Feet						

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
4-inch diameter continuous flight solid stem augers.

Abandonment Method:

Notes:

See addendum report for description of field procedures.
See Appendix B for explanation of symbols and abbreviations.
Elevations were interpolated from topographic maps.

WATER LEVEL OBSERVATIONS

No free water observed

Terracon

Probe Started: 02-22-2019	Probe Completed: 02-22-2019
Drill Rig: Diedrich D-50	Driller: C.Johnston
Project No.: J2185052	Exhibit: A-15

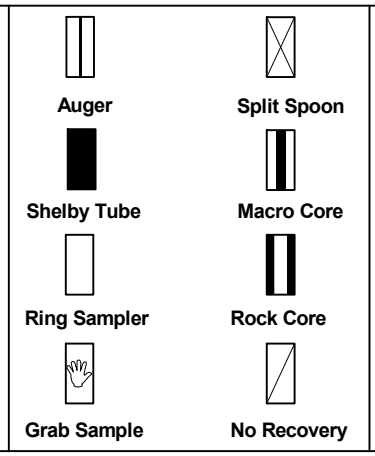
THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL J2185052 INFILTRATION TESTING.GPJ TERRACON_DATATEMPLATE.GDT 3/21/19

APPENDIX B
SUPPORTING DOCUMENTS

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

SAMPLING



WATER LEVEL



Water Initially Encountered

Water Level After a Specified Period of Time

Water Level After a Specified Period of Time

Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.

FIELD TESTS

(HP)	Hand Penetrometer
(T)	Torvane
(b/f)	Standard Penetration Test (blows per foot)
(PID)	Photo-Ionization Detector
(OVA)	Organic Vapor Analyzer

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

LOCATION AND ELEVATION NOTES

Unless otherwise noted, Latitude and Longitude are approximately determined using a hand-held GPS device. The accuracy of such devices is variable. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

STRENGTH TERMS

RELATIVE DENSITY OF COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance Includes gravels, sands and silts.			CONSISTENCY OF FINE-GRAINED SOILS (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance				BEDROCK		
Descriptive Term (Density)	**Standard Penetration or N-Value Blows/Ft.**	**Ring Sampler Blows/Ft.**	**Descriptive Term (Consistency)**	**Unconfined Compressive Strength, Qu, tsf**	**Standard Penetration or N-Value Blows/Ft.**	**Ring Sampler Blows/Ft.**	**Ring Sampler Blows/Ft.**	**Standard Penetration or N-Value Blows/Ft.**	**Descriptive Term (Consistency)**
Very Loose	0 - 3	0 - 6	Very Soft	less than 0.25	0 - 1	< 3	< 30	< 20	Weathered
Loose	4 - 9	7 - 18	Soft	0.25 to 0.50	2 - 4	3 - 4	30 - 49	20 - 29	Firm
Medium Dense	10 - 29	19 - 58	Medium-Stiff	0.50 to 1.00	4 - 8	5 - 9	50 - 89	30 - 49	Medium Hard
Dense	30 - 50	59 - 98	Stiff	1.00 to 2.00	8 - 15	10 - 18	90 - 119	50 - 79	Hard
Very Dense	> 50	≥ 99	Very Stiff	2.00 to 4.00	15 - 30	19 - 42	> 119	>79	Very Hard
			Hard	> 4.00	> 30	> 42			

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 15
With	15 - 29
Modifier	> 30

GRAIN SIZE TERMINOLOGY

Major Component of Sample	Particle Size
Boulders	Over 12 in. (300 mm)
Cobbles	12 in. to 3 in. (300mm to 75mm)
Gravel	3 in. to #4 sieve (75mm to 4.75 mm)
Sand	#4 to #200 sieve (4.75mm to 0.075mm
Silt or Clay	Passing #200 sieve (0.075mm)

RELATIVE PROPORTIONS OF FINES

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 5
With	5 - 12
Modifier	> 12

PLASTICITY DESCRIPTION

Term	Plasticity Index
Non-plastic	0
Low	1 - 10
Medium	11 - 30
High	> 30

UNIFIED SOIL CLASSIFICATION SYSTEM

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]					Soil Classification	
					Group Symbol	Group Name [B]
Coarse Grained Soils: More than 50% retained on No. 200 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	$Cu \geq 4$ and $1 \leq Cc \leq 3$ [E]		GW	Well-graded gravel [F]
			$Cu < 4$ and/or $1 > Cc > 3$ [E]		GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH		GM	Silty gravel [F,G,H]
			Fines classify as CL or CH		GC	Clayey gravel [F,G,H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	$Cu \geq 6$ and $1 \leq Cc \leq 3$ [E]		SW	Well-graded sand [I]
			$Cu < 6$ and/or $1 > Cc > 3$ [E]		SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH		SM	Silty sand [G,H,I]
			Fines classify as CL or CH		SC	Clayey sand [G,H,I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	PI > 7 and plots on or above "A" line [J]		CL	Lean clay [K,L,M]
			PI < 4 or plots below "A" line [J]		ML	Silt [K,L,M]
		Organic:	Liquid limit - oven dried	< 0.75	OL	Organic clay [K,L,M,N]
			Liquid limit - not dried			Organic silt [K,L,M,O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line		CH	Fat clay [K,L,M]
			PI plots below "A" line		MH	Elastic Silt [K,L,M]
		Organic:	Liquid limit - oven dried	< 0.75	OH	Organic clay [K,L,M,P]
			Liquid limit - not dried			Organic silt [K,L,M,Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor				PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.

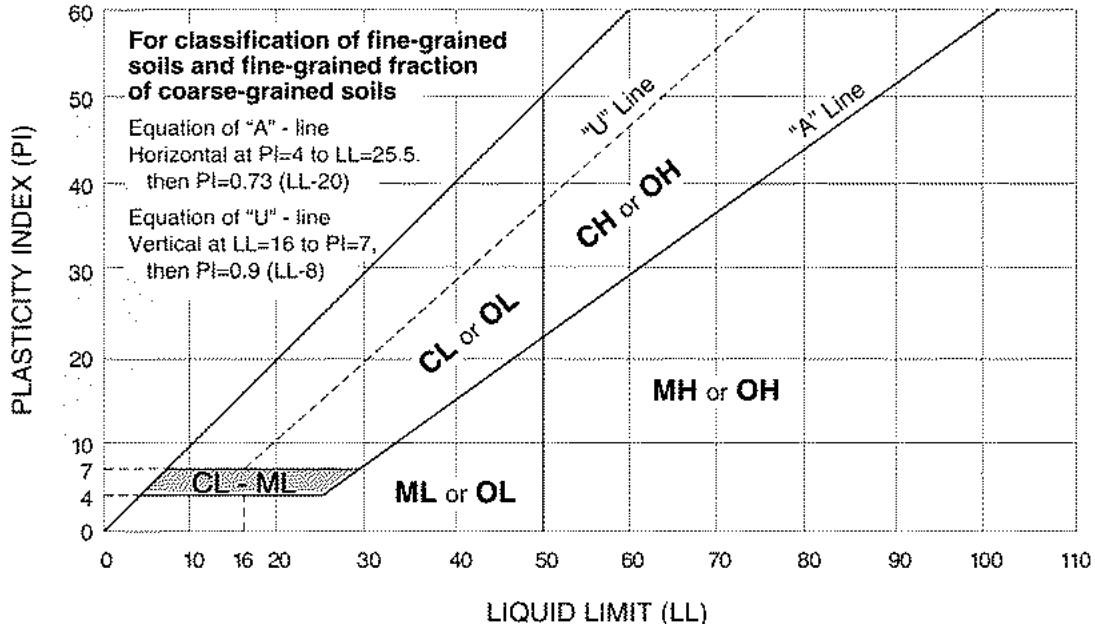
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI ≥ 4 and plots on or above "A" line.

[O] PI < 4 or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.



Terracon

Exhibit B-2

DESCRIPTION OF ROCK PROPERTIES

WEATHERING	
Term	**Description**
Unweathered	No visible sign of rock material weathering, perhaps slight discoloration on major discontinuity surfaces.
Slightly weathered	Discoloration indicates weathering of rock material and discontinuity surfaces. All the rock material may be discolored by weathering and may be somewhat weaker externally than in its fresh condition.
Moderately weathered	Less than half of the rock material is decomposed and/or disintegrated to a soil. Fresh or discolored rock is present either as a continuous framework or as corestones.
Highly weathered	More than half of the rock material is decomposed and/or disintegrated to a soil. Fresh or discolored rock is present either as a discontinuous framework or as corestones.
Completely weathered	All rock material is decomposed and/or disintegrated to soil. The original mass structure is still largely intact.
Residual soil	All rock material is converted to soil. The mass structure and material fabric are destroyed. There is a large change in volume, but the soil has not been significantly transported.

STRENGTH OR HARDNESS		
Description	**Field Identification**	**Uniaxial Compressive Strength, PSI (MPa)**
Extremely weak	Indented by thumbnail	40-150 (0.3-1)
Very weak	Crumbles under firm blows with point of geological hammer, can be peeled by a pocket knife	150-700 (1-5)
Weak rock	Can be peeled by a pocket knife with difficulty, shallow indentations made by firm blow with point of geological hammer	700-4,000 (5-30)
Medium strong	Cannot be scraped or peeled with a pocket knife, specimen can be fractured with single firm blow of geological hammer	4,000-7,000 (30-50)
Strong rock	Specimen requires more than one blow of geological hammer to fracture it	7,000-15,000 (50-100)
Very strong	Specimen requires many blows of geological hammer to fracture it	15,000-36,000 (100-250)
Extremely strong	Specimen can only be chipped with geological hammer	>36,000 (>250)

DISCONTINUITY DESCRIPTION			
Fracture Spacing (Joints, Faults, Other Fractures)		**Bedding Spacing (May Include Foliation or Banding)**	
Description	**Spacing**	**Description**	**Spacing**
Extremely close	< ¾ in (<19 mm)	**Laminated**	< ½ in (<12 mm)
Very close	¾ in – 2-1/2 in (19 - 60 mm)	**Very thin**	½ in – 2 in (12 – 50 mm)
Close	2-1/2 in – 8 in (60 – 200 mm)	**Thin**	2 in – 1 ft (50 – 300 mm)
Moderate	8 in – 2 ft (200 – 600 mm)	**Medium**	1 ft – 3 ft (300 – 900 mm)
Wide	2 ft – 6 ft (600 mm – 2.0 m)	**Thick**	3 ft – 10 ft (900 mm – 3 m)
Very Wide	6 ft – 20 ft (2.0 – 6 m)	**Massive**	> 10 ft (3 m)

Discontinuity Orientation (Angle): Measure the angle of discontinuity relative to a plane perpendicular to the longitudinal axis of the core. (For most cases, the core axis is vertical; therefore, the plane perpendicular to the core axis is horizontal.) For example, a horizontal bedding plane would have a 0 degree angle.

ROCK QUALITY DESIGNATION (RQD*)	
Description	**RQD Value (%)**
Very Poor	0 - 25
Poor	25 – 50
Fair	50 – 75
Good	75 – 90
Excellent	90 - 100

*The combined length of all sound and intact core segments equal to or greater than 4 inches in length, expressed as a percentage of the total core run length.

Reference: U.S. Department of Transportation, Federal Highway Administration, Publication No FHWA-NHI-10-034, December 2009 Technical Manual for Design and Construction of Road Tunnels – Civil Elements

DWHUIRUG &RQFHPLEOH[W

THW 3 W ARDOLRQ

)HW

- 3UHGLFWHG %RXQGDU\
- %RXQGDU\ 3URY 3UHGV
- /LEW RFUN
- &RQGXFWRU 3URYLGHU 3 WW
- &RQGXLW RQ &RQFUHWH
- DWUHDW YHU
- DWUHDW THW 3 W $UHD
- %RXQGDU\ %RXQGDU\
- DWUHDW THW 3 W $UHD
- DWUHDW YHU
- &RQGXLW RQ &RQFUHWH
- 3UHGLFWHG %RXQGDU\
- 3UHGLFWHG %RXQGDU\
- &RQGXFWRU 3URYLGHU 3 WW
- /LEW RFUN
- %RXQGDU\ %RXQGDU\
- 3UHGLFWHG %RXQGDU\

Hydrologic Soil Map Unit Test Pits
VHB
September 10-11, 2019

Test Pit **1**

A	0 to 5 inches	Dark brown (10YR 3/3) fine sandy loam, weak fine granular structure, friable, many roots, abrupt smooth boundary.
Bw1	5 to 12 inches	Dark yellowish brown (10YR 4/6) stony sandy loam, moderate medium subangular blocky structure, friable, few medium roots, clear smooth boundary.
Bw2	12 to 22 inches	Yellowish brown (10YR 5/6) stony sandy loam, common, fine, distinct 7.5YR 5/6 redox concentrations, moderate medium subangular blocky structure, friable, few fine roots, clear smooth boundary.
BC	22 to 29 inches	Light olive brown (2.5Y 5/3) stony gravelly loamy sand, massive, friable, few fine roots., abrupt, smooth boundary.
Cd	29 to 37 inches	Grayish brown (2.5Y 5/2) gravelly loamy sand, common, fine to medium, prominent 7.5YR (5/6) concentrations along ped faces weak medium platy structure, firm, no roots.
		Seasonal high water table estimated at 29 inches

Test Pit **2**

A	0 to 4 inches	Brown (10YR 4/3) fine sandy loam, weak medium granular structure, friable, many fine roots, abrupt smooth boundary.
Bw1	4 to 16 inches	Brown (7.5YR 4/4) stony sandy loam, moderate medium subangular blocky structure, friable, common medium/fine roots, clear smooth boundary.
Bw2	16 to 27 inches	Brown (7.5YR 5/4) stony sandy loam, weak fine to medium subangular blocky structure, friable, few roots, clear smooth boundary.
BC	27 to 48 inches	Yellowish brown (10YR 5/6) stony loamy sand, weak fine subangular blocky structure, few roots, clear smooth boundary.
C	48 to 52+ inches	Olive brown (2.5Y 4/4) fine sandy loam, structureless massive, friable, no roots.

Test Pit **4**

A	0 to 6 inches	Very dark grayish brown (10YR 3/2) fine sandy loam, weak fine granular structure, friable, many fine roots, abrupt smooth boundary.
Bw1	6 to 15 inches	Yellowish brown (10YR 5/6) sandy loam, weak medium subangular blocky structure, friable, common medium roots, clear smooth boundary.
Bw2	15 to 26 inches	Dark yellowish brown (10YR 4/6) sandy loam, weak medium subangular blocky structure, friable, common medium/fine roots, clear smooth boundary.

Bw3	26 to 36 inches	Light olive brown (2.5Y 5/4) sandy loam, common, fine to medium, prominent 7.5YR 5/6 redox concentrations, structureless massive, friable, few fine roots, abrupt smooth boundary.
Cd	36 to 43 inches	Light brownish gray (2.5Y 6/2) gravelly loamy sand, common, fine to medium, prominent 7.5YR 5/6 redox concentrations between geogenic structural units, weak medium platy structure, firm, no roots.
		Estimate seasonal high water at 26 inches

Test Pit **5**

Ap	0 to 7 inches	Dark brown (10YR 3/3) fine sandy loam, weak fine granular structure, friable, many roots.
Bw1	7 to 16 inches	Dark yellowish brown (10YR 4/4) sandy loam, weak fine to medium subangular blocky structure, friable, many roots.
Bw2	16 to 28 inches	Dark yellowish brown (10YR 4/6) gravelly sandy loam, moderate medium subangular blocky structure, friable, common roots.
BC	28 to 38 inches	Olive brown (2.5Y 4/4) gravelly sandy loam, structureless massive, friable, few roots. Common, medium to coarse, prominent 7.5YR 5/6 concentrations.
C	38 to 44 inches	Light gray (10YR 7/1) loamy sand, common, fine to medium, prominent 7.5YR 5/6 redox concentrations, structureless massive, friable, no roots.
		Estimate seasonal high water at 28 inches

Test Pit **6**

A	0 to 11 inches	Very dark grayish brown (10YR 3/2) sandy loam, weak fine granular structure, friable, many medium roots, clear smooth boundary.
Bw	10 to 22 inches	Dark yellowish brown (10YR 4/6) sandy loam, weak medium subangular blocky structure, friable, few medium roots, clear smooth boundary.
BC1	22 to 28 inches	Yellowish brown (10YR 5/4) fine sandy loam, weak medium subangular blocky structure, friable, few fine roots, clear smooth boundary.
2C1	28 to 43 inches	Dark yellowish Brown (10YR 4/4) sandy loam with silt and silt loam masses, grayish brown (10YR 5/2) redox depletions, massive, firm, common medium roots, abrupt, wavy boundary. (flow till?)
3C2	43 to 48 inches	Light olive brown (2.5Y 5/4) gravelly loamy sand, silt skins on some coarse fragments, single grain, loose.
		Estimate seasonal high water at 28 inches

Test Pit **7**

A	0 to 3 inches	Very dark grayish brown (10YR 3/2) silt loam, weak fine granular structure, friable, many fine roots, abrupt smooth boundary.

Ap	3 to 9 inches	Dark brown (10YR 3/3) stony fine sandy loam, moderate medium subangular blocky structure, friable, common fine/medium roots, abrupt smooth boundary.
Bw1	9 to 15 inches	Dark yellowish brown (10YR 4/6) stony loamy sand, weak medium subangular blocky structure, friable, few medium roots, clear smooth boundary.
Bw2	15 to 23 inches	Yellowish brown (10YR 5/4) stony loamy sand, weak fine subangular blocky structure, friable, few fine roots, clear smooth boundary.
BC	23 to 29 inches	Light olive brown (2.5Y 5/4) loamy sand, structureless massive, friable, few fine roots, clear wavy boundary.
C	29 to 48 inches	Olive brown (2.5Y 4/3) gravelly loamy sand, structureless massive, friable, no roots.

Test Pit **8**

A	0 to 3 inches	Dark yellowish brown (10YR 4/4) sandy loam, weak fine subangular blocky structure, friable, many fine roots, abrupt smooth boundary.
Bw1	3 to 9 inches	Brown (7.5YR 4/4) stony sandy loam, weak medium subangular blocky structure, friable, common fine and medium roots, abrupt smooth boundary.
Bw2	9 to 14 inches	Dark yellowish brown (10YR 4/6) stony loamy sand, weak medium subangular blocky structure, friable, common fine/medium roots, abrupt smooth boundary.
Bw3	14 to 20 inches	Yellowish brown (10YR 5/4) stony loamy sand, weak fine subangular blocky structure, friable, few medium roots clear smooth boundary.
C	20 to 45 inches	Light yellowish brown (2.5Y 6/3) loamy sand, common, coarse, prominent 7.5YR 5/6 redox concentrations, structureless massive, friable, no roots.
		Estimated seasonal high water table at 20 inches.

Test Pit **9**

A	0 to 2 inches	Very dark grayish brown (10YR 3/2) fine sandy loam, weak, moderate to fine granular structure, friable, many fine roots, clear smooth boundary.
Ap	2 to 8 inches	Dark yellowish brown (10YR 3/6) sandy loam, weak fine subangular blocky structure, friable, many fine roots, clear smooth boundary.
Bw	8 to 21 inches	Dark yellowish brown (10YR 4/6) sandy loam, weak medium subangular blocky structure, friable, common fine roots, clear wavy boundary.
2C	21 to 48 inches	Reddish brown (2.5Y 5/3) stony loamy sand, single grain, loose, few fine roots.

Test Pit **10**

Oe	0 to 2 inches	Partially decomposed deciduous leaf litter, many fine roots, abrupt smooth boundary
A	2 to 6 inches	Very dark grayish brown (10YR 3/2) silt loam, weak fine granular structure, friable, many fine roots, abrupt smooth boundary.
Bw1	6 to 10 inches	Brown (10YR 4/4) sandy loam, weak medium subangular blocky structure, friable, common fine and medium roots, abrupt smooth boundary.
Bw2	10 to 18 inches	Yellowish brown (10YR 5/4) sandy loam, weak fine subangular blocky structure, friable, few medium roots, clear smooth boundary.
BC	18 to 42 inches	Light olive brown (2.5Y 5/3) loamy sand, many, coarse, prominent 7.5YR 5/8 redox concentrations, structureless massive, friable, no roots. Estimated seasonal high groundwater at 18 inches, water seeping into bottom of test pit.

Test Pit **11**		
A	0 to 10 inches	Very dark grayish brown (10YR 3/2) stony sandy loam, weak fine granular structure, friable, common medium and fine roots abrupt smooth boundary.
B/A	10 to 13 inches	Dark yellowish brown (10YR 4/4) and very dark grayish brown (10YR 3/2) sandy loam, weak medium subangular blocky structure, friable, common medium roots, clear smooth boundary.
Bw	13 to 23 inches	Strong brown (7.5YR 4/6) coarse sandy loam, weak medium subangular blocky structure, friable, clear smooth boundary.
BC	23 to 32 inches	Yellowish brown (10YR 5/4) gravelly loamy sand, few fine roots, single grain, loose, abrupt smooth boundary.
C1	32 to 41 inches	Light olive brown (2.5Y 5/4) gravelly loamy sand, silt skins partially coat coarse fragments, massive, friable to firm, abrupt, smooth boundary.
C2	41 to 48 inches	Dark yellowish brown (10YR 4/4) gravelly coarse sand, single grain, loose.
Test Pit **12**		
A	0 to 6 inches	Brown (10YR 4/3) sandy loam, weak fine granular structure, friable, common fine roots, abrupt smooth boundary.
Bw1	6 to 12 inches	Brown (7.5YR 4/4) stony sandy loam, weak medium subangular blocky structure, friable, fine few roots, abrupt smooth boundary.
Bw2	12 to 27 inches	Yellowish brown (10YR 5/6) stony sandy loam, weak fine to medium subangular blocky structure, friable, few medium roots, abrupt smooth boundary.
2C1	27 to 36 inches	Light olive brown (2.5Y 5/3) stony gravelly loamy sand, common, fine, distinct 7.5YR 5/6 redox concentrations, structureless massive, friable, few roots, abrupt smooth boundary.

Cd	36 to 48 inches	Grayish brown (2.5Y 5/2) gravelly loamy sand, common, fine to medium, prominent 7.5YR 5/6 redox concentrations, weak fine to medium platy structure, firm, no roots. Estimated seasonal high water table at 27 inches

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Test Pit **13**

A	0 to 6 inches	Dark brown (10YR 3/3) sandy loam, weak fine to medium granular structure, friable, many fine roots, abrupt smooth boundary.
Bw1	6 to 13 inches	Dark yellowish brown (10YR 4/4) stony sandy loam, weak medium subangular blocky structure, friable, many fine/medium roots, clear smooth boundary.
Bw2	13 to 25 inches	Dark yellowish brown (10YR 4/6) stony loamy sand, weak fine to medium subangular blocky structure, friable, common medium roots, abrupt wavy boundary.
2C	25 to 48 inches	Yellowish brown (10YR 5/4) extremely cobbly, stony coarse sand, structureless single grain, loose, no roots.

Test Pit **13A**

A	0 to 6 inches	Very dark grayish brown (10YR 3/2) sandy loam, moderate medium subangular blocky structure, friable, many fine roots, abrupt smooth boundary.
Bw1	6 to 16 inches	Dark yellowish brown (10YR 4/6) stony loamy sand, weak medium subangular blocky structure, friable, common medium roots, clear smooth boundary.
Bw2	16 to 22 inches	Light olive brown (2.5Y 5/4) stony loamy sand, weak medium subangular blocky structure, friable, common medium and fine roots, clear smooth boundary.
BC	22 to 34 inches	Light olive brown (2.5Y 5/4) stony gravelly loamy sand, structureless single grain, loose, few fine roots, clear smooth boundary.
C	34 to 42 inches	Light yellowish brown (2.5Y 6/3) silt loam, common, coarse, prominent 7.5YR 5/8 redox concentrations, massive, friable, no roots. Estimated seasonal high water table at 34 inches.

Test Pit **14**

A	0 to 7 inches	Very dark grayish brown (10YR 3/2) fine sandy loam, moderate fine to medium granular structure, friable, many fine roots, abrupt smooth boundary.
Bw1	7 to 19 inches	Yellowish brown (10YR 5/4) gravelly loamy sand, common, fine, distinct 7.5YR 5/6 concentrations and common, fine, distinct 10YR 6/2 depletions, weak medium subangular blocky structure, friable, common medium roots clear smooth boundary.

Bw2	19 to 28 inches	Yellowish brown (10YR 5/4) gravelly loamy sand, many, medium, prominent 7.5YR 5/8 concentrations, structureless massive, friable, common fine roots.
BC	28 to 44 inches	Light yellowish brown (2.5Y 6/3) gravelly loamy sand, many, medium to coarse, prominent 7.5YR 5/8 redox concentrations and many, medium to coarse, distinct 2.5Y 6/1 redox depletions structureless, massive, friable, few roots.
		Estimated seasonal high water table at 7 inches

Test Pit **15**

A	0 to 6 inches	Dark brown (10YR 3/3) sandy loam, weak medium subangular blocky structure to weak medium granular structure, friable, many fine roots, clear smooth boundary
Bw1	6 to 17 inches	Brown (7.5YR 4/4) sandy loam, weak medium subangular blocky structure, common roots, friable, clear smooth boundary
Bw2	17 to 32 inches	Yellowish brown (10YR 5/4) sandy loam, weak medium subangular blocky structure, friable, no roots, clear smooth boundary
2C1	32 to 37 inches	Yellowish brown (10YR 5/4) gravelly sand, few fine and medium distinct strong brown (7.5Y 5/6) redox concentrations, single grain, loose, clear smooth boundary.
3C2	37 to 44 inches	Light yellowish brown (2.5Y 6/4) sand, single grain, loose.
		Estimated seasonal high water table at 32 inches

Test Pit **16**

A	0 to 2 inches	Very dark grayish brown (10YR 3/2) sandy loam, weak fine granular structure, friable, many fine roots, abrupt smooth boundary.
Ap	2 to 7 inches	Dark brown (10YR 3/3) sandy loam, weak fine granular structure, friable, many fine roots, abrupt smooth boundary.
Bw1	7 to 20 inches	Dark yellowish brown (10YR 4/4) loamy sand, weak medium subangular blocky structure, many medium roots, friable, clear smooth boundary.
Bw2	20 to 40 inches	Dark yellowish brown (10YR 4/6) gravelly loamy sand, weak medium subangular blocky structure, friable, common roots, clear smooth boundary.
C	40 to 44 inches+	Light yellowish brown (2.5Y 6/3) very gravelly coarse sand, single grain, loose.

Test Pit **17**

A	0 to 3 inches	Very dark brown (10YR 2/2) fine sandy loam, weak fine granular structure, friable, many fine and medium roots, abrupt smooth boundary.

Ap	3 to 10 inches	Dark brown (10YR 3/3) fine sandy loam, fine to medium subangular blocky structure, friable, many roots, abrupt smooth boundary.	
Bw1	10 to 20 inches	Dark yellowish brown (10YR 4/4) sandy loam, fine to medium subangular blocky structure, friable, common medium roots, clear smooth boundary.	
Bw2	20 to 32 inches	Dark yellowish brown (10YR 4/6) sandy loam, weak medium subangular blocky structure, friable, few roots, clear smooth boundary.	Test Pit **17A**
BC	32 to 42 inches	Light yellowish brown (10YR 5/4) sandy loam, massive, friable, few roots	
Oa	0 to 1 inch	Well decomposed deciduous leaf litter.	
A	1 to 3 inches	Very dark grayish brown (10YR 3/2) silt loam, fine granular structure, friable, many fine roots, abrupt smooth boundary	
Ap	3 to 16 inches	Brown (10YR 4/3) sandy loam, weak medium subangular blocky structure, friable, many roots, clear smooth boundary	
Bw	16 to 32 inches	Dark yellowish brown (10YR 4/6) sandy loam, weak medium subangular blocky structure, friable, many roots, abrupt smooth boundary.	
2C	32 to 48 inches	Light olive brown (2.5Y 5/4) stony coarse sand, single grain, loose.	

Test Pit **18**

Oa	0 to 1 inch	Well decomposed deciduous leaf litter.	
Ap	1 to 4 inches	Dark grayish brown (10YR 4/2) stony sandy loam, weak fine granular structure, friable, many fine roots, abrupt wavy boundary.	
A/B	4 to 7 inches	Brown (10YR 4/3) and yellowish brown (10YR 5/6) stony sandy loam, medium subangular blocky structure, friable, few roots, abrupt wavy boundary.	
Bw1	7 to 23 inches	Yellowish brown (10YR 5/6) stony sandy loam, weak fine to medium subangular blocky structure, friable, no roots, clear smooth boundary.	
Bw2	23 to 37 inches	Yellowish brown (10YR 5/4) sandy loam, weak medium subangular blocky structure, friable, clear smooth boundary.	
2C	37 to 47 inches	Light brownish gray (2.5Y 6/2) gravelly loamy sand, common (5 to15 percent) medium to coarse faint light yellowish brown (10YR 6/2) redox concentrations, massive, friable.	
		Estimate seasonal high water at 37 inches	

Test Pit **19**

A	0 to 3 inches	Very dark brown (10YR 2/2) silt loam, weak fine granular structure, friable, many fine roots, abrupt smooth boundary.

Bw1	3 to 7 inches	Yellowish brown (10YR 5/4) sandy loam, weak medium subangular blocky structure, friable, common medium and fine roots, clear smooth boundary.
Bw2	7 to 15 inches	Brownish yellow (10YR 6/6) sandy loam, weak medium subangular blocky structure, friable, few fine roots, clear smooth boundary.
Bw3	15 to 22 inches	Light yellowish brown (10YR 6/4) sandy loam, weak medium subangular blocky structure, friable, few fine roots, abrupt wavy boundary.
2C1	22 to 29 inches	Light yellowish brown (2.5Y 6/4) extremely cobbly coarse sand, single grain, loose, clear smooth boundary.
2C2	29 to 44 inches	Light yellowish brown (2.5Y 6/4) very cobbly coarse sand, single grain, loose

Test

Pit **20**

A	0 to 2 inches	Very dark brown (10YR 2/2) silt loam, weak fine granular structure, friable, many fine roots, abrupt smooth boundary.
Ap	2 to 6 inches	Dark brown (10YR 3/3) fine sandy loam, weak medium and fine subangular blocky structure, friable, few medium roots, abrupt smooth boundary.
Bw1	6 to 12 inches	Brown (7.5YR 4/4) sandy loam, weak fine to medium subangular blocky structure, friable, few roots, clear smooth boundary.
Bw2	12 to 19 inches	Brown (7.5YR 4/3) sandy loam, weak medium subangular blocky structure, friable, few fine roots, clear smooth boundary.
Bw3	19 to 28 inches	Yellowish brown (10YR 5/4) sandy loam, weak medium subangular blocky structure, friable, few fine roots,
BC	28 to 44 inches	Brown (10YR 5/3), fine sandy loam, massive, friable.

Test Pit **21**

A	0 to 2 inches	Very dark grayish brown (10YR 3/2) fine sandy loam, weak fine granular structure, friable, many fine roots, abrupt smooth boundary.
Bw1	2 to 8 inches	Dark yellowish brown (10YR 4/4) fine sandy loam, weak medium subangular blocky structure, friable, many fine/medium roots, clear smooth boundary.
Bw2	8 to 21 inches	Dark yellowish brown (10YR 4/6) fine sandy loam, weak medium subangular blocky structure, friable, common medium roots, clear smooth boundary.
Bw3	21 to 29 inches	Yellowish brown (10YR 5/6) fine sandy loam, weak medium subangular blocky structure, friable, few fine roots, clear smooth boundary.
BC	29 to 35 inches	Light yellowish brown (10YR 6/4) fine sandy loam, structureless massive, friable, few fine roots, abrupt wavy boundary.
Cg	35 to 49 inches	Light brownish gray (2.5Y 6/2) cobbly fine sandy loam, few, fine, prominent 10YR 6/6 redox concentrations, structureless massive, friable, no roots.

Estimated seasonal high water table at 35 inches.

Test Pit **22**

A	0 to 2 inches	Very dark grayish brown (10YR 3/2) sandy loam, weak fine granular structure, friable, many fine roots, abrupt smooth boundary.
Ap	2 to 9 inches	Dark yellowish brown (10YR 3/4) gravelly sandy loam, weak medium subangular blocky structure, friable, common medium and fine roots, abrupt smooth boundary.
Bw1	9 to 16 inches	Dark yellowish brown (10YR 4/4) very gravelly sandy loam, weak fine subangular blocky structure, friable, common medium roots, clear smooth boundary.
2C1	16 to 29 inches	Yellowish brown (10YR 4/6) very cobbly loamy coarse sand, massive, friable, few fine roots, clear smooth boundary.
3C2	29 to 37 inches	Yellowish brown (10YR 5/8) gravelly sand, structureless single grain, loose, few roots, clear smooth boundary.
4C3	37 to 45 inches	Light yellowish brown (10YR 6/4) sand, common, fine, faint 7.5YR 5/4 redox concentrations, structureless single grain, loose, no roots.

Estimated seasonal high water at 37 inches

Test Pit **23**

Oa	0 to 1 inch	Well decomposed deciduous leaf litter.
A	1 to 2 inches	Black (10YR 2/1) sandy loam, weak fine granular structure, friable many fine roots, abrupt smooth boundary.
Bw1	2 to 16 inches	Dark yellowish brown (10YR 4/6) sandy loam, weak medium subangular blocky structure, friable, few medium and fine roots, clear smooth boundary.
Bw2	16 to 27 inches	Yellowish brown (10YR 5/6) cobbly sandy loam, weak medium subangular blocky structure, friable, few fine roots, clear smooth boundary.
2C1	27 to 31 inches	Pale brown (10YR 6/3) cobbly sand, olive yellow (2.5Y 6/6) few medium faint redox, single grain loose, clear smooth boundary.
2C2	31 inches +	Very pale brown (10YR 7/3) very gravelly loamy sand, single grain loose

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Test Pit **24**

Oe	0 to 1 inch	Partially decomposed deciduous leaf litter, abrupt smooth boundary.

A	1 to 4 inches	Very dark brown (10YR 2/2) sandy loam, moderate fine subangular blocky structure, friable, few roots, abrupt smooth boundary.
Bw1	4 to 16 inches	Strong brown (7.5YR 5/6) stony loamy sand, weak medium subangular blocky structure, friable, few medium roots, clear smooth boundary.
Bw2	16 to 27 inches	Strong brown (7.5YR 5/8) stony loamy sand, weak medium subangular blocky structure, friable, few fine roots, clear smooth boundary.
C	27 to 40 inches	Light yellowish brown (10YR 6/4) loamy fine sand, structureless massive, friable, no roots. Common, coarse, prominent 5YR 4/6 redox concentrations with a sand texture and common, coarse, distinct 2.5Y 6/2 depletion masses. Estimated seasonal high water table at 27 inches.

Test Pit **26**

Oa	0 to 1 inch	Well decomposed deciduous leaf litter.
A	1 to 3 inches	Very dark brown (10YR 2/2) stony sandy loam, weak medium and fine granular structure, friable, many fine roots, abrupt smooth boundary.
Bw1	3 to 17 inches	Dark yellowish brown (10YR 4/6) cobbly loamy sand, weak medium subangular blocky structure, friable, few medium roots, clear smooth boundary.
Bw2	17 to 31 inches	Light olive brown (2.5Y 5/6) very cobbly loamy sand, massive, friable, few medium roots, clear smooth boundary.
C	31 to 44 inches	Light brownish gray (2.5YR 6/2) cobbly sand, single grain, loose

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Test Pit **27**

Oa	0 to 1 inch	Well decomposed deciduous leaf litter.
A	1 to 5 inches	Dark brown (10YR 3/3) stony sandy loam, weak medium subangular blocky structure, friable, many fine roots, abrupt smooth boundary
Bw1	5 to 16 inches	Dark yellowish brown (10YR 4/6) stony sandy loam, weak medium subangular blocky structure, friable, many medium roots, clear smooth boundary.
Bw2	16 to 22 inches	Yellowish brown (10YR 5/6) stony sandy loam, weak fine subangular blocky structure, friable, common medium roots, clear smooth boundary.
BC	22 to 28 inches	Light brownish yellow (2.5Y 6/4) very cobbly loamy sand, massive, friable, clear smooth boundary.
C	28 to 45 inches	Light brownish gray (2.5YR 6/2) cobbly sand, single grain, loose

Test Pit **28**

Oe	0 to 2 inches	Partially decomposed deciduous leaf litter, abrupt smooth boundary.
A	2 to 5 inches	Dark brown (10YR 3/3) sandy loam, moderate fine subangular blocky structure, friable, many fine roots abrupt smooth boundary.
Bw1	5 to 17 inches	Yellowish brown (10YR 4/6) stony gravelly loamy sand, weak fine to medium subangular blocky structure, friable, common medium roots, clear smooth boundary.
1C1	17 to 23 inches	Brownish yellow (10YR 6/6) stony very gravelly loamy coarse sand, structureless massive, friable, no roots, clear wavy boundary.
2C2	23 to 45 inches	Light yellowish brown (2.5Y 6/3) very cobbly coarse sand, structureless single grain, loose, no roots.

Test Pit **29**

Oe	0 to 3 inches	Partially decomposed deciduous leaf litter.
A	3 to 6 inches	Very dark grayish brown (10YR 3/2) sandy loam, weak medium subangular blocky breaking to medium granular structure, friable, many fine roots, abrupt smooth boundary.
Bw	6 to 13 inches	Dark yellowish brown (10YR 4/6) gravelly loamy sand, weak medium subangular blocky structure, friable, common medium roots, clear smooth boundary.
BC	13 to 20 inches	Yellowish brown (10YR 5/4) gravelly loamy sand, massive, friable, few fine roots, clear smooth boundary.
C	20 to 45 inches	Yellowish brown (10YR 6/3) gravelly sand, common medium faint olive yellow (2.5Y 5/6) redox concentrations, single grain, loose Estimated high seasonal water at 20 inches

Test Pit **30**

Oa	0 to 2 inches	
A	2 to 6 inches	Dark grayish brown (10YR 4/2) sandy loam, many fine roots, fine to medium granular structure, friable
Bw	6 to 17 inches	Yellowish brown (10YR 5/4) gravely loamy sand, common roots, weak to medium subangular blocky structure, friable
B/C	17 to 25 inches	Light olive brown (2.5Y 5/3) gravelly loamy sand, few roots, massive friable
C	25 to 45 inches	Gray (2.5YR 6/1) gravelly sand, single grain loose olive yellow (2.5Y 6/6) faint concentrations common, medium to coarse

*very stony profile

Test Pit **31**

A	0 to 3 inches	
Ap	3 to11 inches	Very dark brown (10YR 2/2) sandy loam, many fine roots, fine granular structure, friable
Bw1	11 to 18 inches	Dark brown (10YR 3/3) sandy loam, many roots, medium moderate granular structure, friable
Bw2	18 to 25 inches	Yellowish brown (10YR 5/6) loamy sand, common roots, weak medium subangular blocky structure, friable.
B/C	25 to 34 inches	Light olive brown (2.5YR 5/4) loamy sand, few roots, massive friable
C	34 inches +	Grayish brown (2.5YR 5/2) sand, prominent silt lenses throughout, single grain, loose

Test Pit **32**

A	0 to 4 inches	Dark brown (10YR 3/3) sandy loam, moderate fine subangular blocky structure, friable, many fine roots, abrupt smooth boundary.
Bw1	4 to 12 inches	Yellowish brown (10YR 4/6) stony sandy loam, weak fine to medium subangular blocky structure, friable, common medium roots, clear smooth boundary.
Bw2	12 to 23 inches	Yellowish brown (10YR 5/6) stony sandy loam, weak fine to medium subangular blocky structure, friable, common medium/fine roots, clear smooth boundary.
BC	23 to 36 inches	Brownish yellow (10YR 6/6) stony loamy sand, structureless massive, friable, few roots, clear smooth boundary.
C	36 to 48 inches	Light yellowish brown (10YR 6/4) coarse sandy loam, common, medium, distinct 7.5YR 5/6 and 10YR6/6 redox concentrations structureless massive, friable, few fine roots.
		Estimated seasonal high water table at 36 inches.

Test Pit **33**

A	0 to 4 inches	Brown (10YR 4/3) sandy loam, many roots, medium granular structure, friable
Bw1	4 to13 inches	Dark yellowish brown (10YR 3/4) silt loam, common roots, medium moderate subangular blocky structure, friable
Bw2	13 to 19 inches	Dark yellowish brown (10YR 4/6) silt loam, common roots, medium moderate subangular blocky structure, friable
Bw3	19 to 24 inches	Yellowish brown (10YR 5/4) l silt loam, common roots, medium moderate subangular blocky structure, friable

Bw4	24 to 45 inches	Light olive brown (2.5YR 5/4) silt loam, massive, friable Strong brown (7.5YR 5/6) prominent concentrations, coarse to very coarse Gray (2.5Y 6/1) depletions
Cd	45 to 48 inches	Grayish brown (2.5YR 5/2) loamy sand, firm, platy, medium sized, dense

Estimated seasonal high water at 24 inches

Test Pit **34**

A	0 to 3 inches	Very dark grayish brown (10YR 3/2) fine sandy loam, many roots, medium granular structure, friable
Bw1	3 to12 inches	Dark yellowish brown (10YR 4/4) fine sandy loam, common roots, medium subangular blocky structure, friable
Bw2	12 to 22 inches	Dark yellowish brown (10YR 4/6) fine sandy loam, medium subangular blocky structure, friable
Bw3	22 to 46 inches	Light olive brown (2.5YR 5/4) silt loam, massive, friable Grey (7.5YR 6/1) prominent concentrations, coarse to very coarse Gray (2.5Y 6/1) depletions
Cd	46 to 49 inches	Light olive brown (2.5YR 5/3) loamy sand, firm, platy, medium sized, dense

*****upper Cd has concentrations on the ped faces

Estimated seasonal high water at 22 inches

Test Pit **35**

A	0 to 4 inches	Very dark grayish brown (10YR 3/2) sandy loam, many roots, weak fine granular structure, friable
Bw1	4 to15 inches	Dark yellowish brown (10YR 4/6) sandy loam, common roots, medium subangular blocky structure, friable
Bw2	15 to 30 inches	Yellowish brown (10YR 5/4) sandy loam, moderate medium subangular blocky structure, friable
Cd	30 to 37 inches	Grayish brown (2.5Y 5/2) loamy sand, massive, dense Strong brown (7.5YR 5/8) prominent concentrations along the ped faces off the plates
	37 inches+	Ledge

Form #2 Technical Standards for Subsurface Sewage Disposal Systems

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #: _____

Property Owner_____Location 117 Oil Mill Road, Waterford, CT

DEEP TEST PIT DATA/SOIL DESCRIPTIONS

DATE: 9/26/19 (Record all Test Pits)

TEST PIT: 1A	TEST PIT: 1B	TEST PIT: 1C	TEST PIT:
0-1" organic 1-6" brown sandy loam 6-33" yellow-brown loamy sand 33-50" gray loamy sand	0-2" organic 2-9" brown sandy loam 9-15" yellow-brown loamy sand 15-59" gray loamy sand	0-1" organic 1-7" brown sandy loam 7-26" yellow-brown loamy sand 26-63" gray loamy sand	
Mottles: 33"	Mottles: 15"	Mottles: 26"	Mottles:
GW:	GW:	GW:	GW:
Ledge: 50"	Ledge: 59"	Ledge: 63"	Ledge:
Roots:	Roots:	Roots:	Roots:
Restrictive:	Restrictive:	Restrictive:	Restrictive:

COMMENTS: _____

_____

GROUNDWATER TABLE (Near max., below max., etc.)_____

SOIL MOISTURE (High, medium, low, etc): _____

PERCOLATION TEST DATA

DATE:_____ (Record all Perc Tests)

PERC:		PERC:		PERC:		PERC:	
DEPTH:		DEPTH:		DEPTH:		DEPTH:	
PRESOAK:		PRESOAK:		PRESOAK:		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
PERC RATE:		PERC RATE:		PERC RATE:		PERC RATE:	

COMMENTS: _____

_____

Form #2 Technical Standards for Subsurface Sewage Disposal Systems

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #: _____

Property Owner_____Location 117 Oil Mill Road, Waterford, CT

DEEP TEST PIT DATA/SOIL DESCRIPTIONS

DATE: 9/27/19 (Record all Test Pits)

TEST PIT: 2A	TEST PIT: 2B	TEST PIT: 2C	TEST PIT:
0-1" organic 1-12" brown cobbley sandy loam 12-35" yellow-brown sandy loam with cobbles 35-90" gray loamy sand with cobbles	0-1" organic 1-8" brown cobbley sandy loam 8-29" yellow-brown sandy loam 29-92" gray loamy sand with cobbles	0-1" organic 1-12" brown sandy loam 12-26" yellow-brown loamy sand 26-86" yellow-gray loamy sand with cobbles	
Mottles:	Mottles:	Mottles:	Mottles:
GW:	GW:	GW:	GW:
Ledge:	Ledge:	Ledge:	Ledge:
Roots:	Roots:	Roots:	Roots:
Restrictive:	Restrictive:	Restrictive:	Restrictive:

COMMENTS: _____

_____

GROUNDWATER TABLE (Near max., below max., etc.)_____

SOIL MOISTURE (High, medium, low, etc): _____

PERCOLATION TEST DATA

DATE: 9/27/19 (Record all Perc Tests)

PERC: 2A		PERC: 2B		PERC: 2C		PERC:	
DEPTH: 18" @ 36" bench		DEPTH: 19" @ 36" bench		DEPTH: 20" @ 36" bench		DEPTH:	
PRESOAK: 10:00 AM		PRESOAK: 10:00 AM		PRESOAK: 10:00 AM		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
12:08 12:18 12:28 12:38 12:48 12:58 1:08	2.4" 6.0" 8.3" 10.0" 11.1" 12.3" 13.3"	12:10 12:20 12:30 12:40 12:50 1:00 1:10	3.0" 7.7" 10.3" 12.1" 13.8" 15.0" 16.1"	12:12 12:22 12:32 12:42 12:52 1:02 1:12	1.9" 5.9" 8.4" 10.1" 11.4" 12.7" 13.8"		
PERC RATE: 6.0 in./hr		PERC RATE: 6.6 in./hr		PERC RATE: 6.6 in./hr		PERC RATE:	

COMMENTS: _____

_____

Form #2 Technical Standards for Subsurface Sewage Disposal Systems

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #: _____

Property Owner_____Location 117 Oil Mill Road, Waterford, CT

DEEP TEST PIT DATA/SOIL DESCRIPTIONS

DATE: 9/27/19 (Record all Test Pits)

TEST PIT: 3A	TEST PIT: 3B	TEST PIT: 3C	TEST PIT:
0-2" organic 2-6" brown sandy loam 6-22" yellow-brown sandy loam 22-78" gray loamy sand	0-1" organic 1-14" brown fine sandy loam 14-46" yellow-brown sandy loam 46-78" gray loamy sand with cobbles	0-1" organic 1-6" brown sandy loam 6-32" yellow-brown sandy loam 32-46" gray loamy sand with cobbles	
Mottles:	Mottles: 46"	Mottles:	Mottles:
GW:	GW:	GW:	GW:
Ledge:	Ledge:	Ledge: 46"	Ledge:
Roots:	Roots:	Roots:	Roots:
Restrictive:	Restrictive:	Restrictive:	Restrictive:

COMMENTS: _____

_____

GROUNDWATER TABLE (Near max., below max., etc.)_____

SOIL MOISTURE (High, medium, low, etc): _____

PERCOLATION TEST DATA

DATE:_____ (Record all Perc Tests)

PERC:		PERC:		PERC:		PERC:	
DEPTH:		DEPTH:		DEPTH:		DEPTH:	
PRESOAK:		PRESOAK:		PRESOAK:		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
PERC RATE:		PERC RATE:		PERC RATE:		PERC RATE:	

COMMENTS: _____

_____

Form #2 Technical Standards for Subsurface Sewage Disposal Systems

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #: _____

Property Owner_____Location 117 Oil Mill Road, Waterford, CT

DEEP TEST PIT DATA/SOIL DESCRIPTIONS

DATE: 9/27/19 (Record all Test Pits)

TEST PIT: 4A	TEST PIT: 4B	TEST PIT: 4C	TEST PIT:
0-3" organic 3-26" brown sandy loam 26-80" brown loamy sand with cobbles	0-6" organic 6-21" gray sandy loam with cobbles 21-42" brown sandy loam with cobbles 42-84" gray sandy loam	0-3" organic 3-21" gray sandy loam 21-76" brown loamy sand with cobbles	
Mottles: 26"	Mottles: 21"	Mottles: 21"	Mottles:
GW: seepage @ 53"	GW: seepage @ 42"	GW: seepage @ 48"	GW:
Ledge:	Ledge:	Ledge:	Ledge:
Roots:	Roots:	Roots:	Roots:
Restrictive:	Restrictive:	Restrictive:	Restrictive:

COMMENTS: _____

_____

GROUNDWATER TABLE (Near max., below max., etc.)_____

SOIL MOISTURE (High, medium, low, etc): _____

PERCOLATION TEST DATA

DATE:_____ (Record all Perc Tests)

PERC:		PERC:		PERC:		PERC:	
DEPTH:		DEPTH:		DEPTH:		DEPTH:	
PRESOAK:		PRESOAK:		PRESOAK:		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
PERC RATE:		PERC RATE:		PERC RATE:		PERC RATE:	

COMMENTS: _____

_____

Form #2 Technical Standards for Subsurface Sewage Disposal Systems

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #: _____

Property Owner_____Location 117 Oil Mill Road, Waterford, CT

DEEP TEST PIT DATA/SOIL DESCRIPTIONS

DATE: 9/26/19 (Record all Test Pits)

TEST PIT: 5A	TEST PIT: 5B	TEST PIT: 5C	TEST PIT:
0-2" organic 2-8" brown loamy sand 8-33" yellow-brown sandy loam 33-40" gray fine loamy sand 40-72" gray coarse sand with cobbles	0-2" organic 2-6" brown fine sandy loam 6-30" yellow-brown fine sandy loam 30-48" gray fine sandy loam	0-2" organic 2-6" brown sandy loam 6-24" yellow-brown sandy loam 24-39" gray sandy loam 39-62" gray sand	
Mottles: 26"	Mottles: 29"	Mottles: 23"	Mottles:
GW:	GW:	GW:	GW:
Ledge: 72"	Ledge: 48"	Ledge: 62"	Ledge:
Roots:	Roots:	Roots:	Roots:
Restrictive:	Restrictive:	Restrictive:	Restrictive:

COMMENTS: _____

_____

GROUNDWATER TABLE (Near max., below max., etc.)_____

SOIL MOISTURE (High, medium, low, etc): _____

PERCOLATION TEST DATA

DATE: 9/26/19 (Record all Perc Tests)

PERC: 5A		PERC:		PERC:		PERC:	
DEPTH: 20" @ 36" bench		DEPTH:		DEPTH:		DEPTH:	
PRESOAK: 10:30 AM		PRESOAK:		PRESOAK:		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
11:38 11:48 11:58 12:08 12:18 12:28 12:38	3.2" 7.0" 10.2" 12.7" 14.7" 18.0" 20.0"						
PERC RATE: 12.0 in./hr		PERC RATE:		PERC RATE:		PERC RATE:	

COMMENTS: _____

_____

Form #2 Technical Standards for Subsurface Sewage Disposal Systems

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #: _____

Property Owner_____Location 117 Oil Mill Road, Waterford, CT

DEEP TEST PIT DATA/SOIL DESCRIPTIONS

DATE: 9/26/19 (Record all Test Pits)

TEST PIT: 6A	TEST PIT: 6B	TEST PIT: 6C	TEST PIT:
0-2" organic 2-6" brown loamy sand 6-32" yellow-brown loamy sand 32-88" gray fine sandy loam	0-1" organic 1-8" brown sandy loam 8-22" yellow-brown loamy sand 22-89" gray fine sandy loam	0-1" organic 1-8" brown sandy loam 8-34" yellow-brown sandy loam 34-81" gray sandy loam	
Mottles: 23"	Mottles: 22"	Mottles: 24"	Mottles:
GW:	GW:	GW:	GW:
Ledge: 88"	Ledge: 89"	Ledge: 81"	Ledge:
Roots:	Roots:	Roots:	Roots:
Restrictive:	Restrictive:	Restrictive:	Restrictive:

COMMENTS: _____

_____

GROUNDWATER TABLE (Near max., below max., etc.)_____

SOIL MOISTURE (High, medium, low, etc): _____

PERCOLATION TEST DATA

DATE: 9/26/19 (Record all Perc Tests)

PERC: 6A		PERC: 6B		PERC: 6C		PERC:	
DEPTH: 21" @ 36" bench		DEPTH: 18" @ 36" bench		DEPTH: 20" @ 36" bench		DEPTH:	
PRESOAK: 10:00 AM		PRESOAK: 10:00 AM		PRESOAK: 10:00 AM		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
11:36 11:46 11:56 12:06 12:16 12:26 12:36	2.3" 6.3" 8.8" 11.3" 13.0" 14.9" 16.3"	11:35 11:45 11:55 12:05 12:15 12:25 12:35	3.1" 6.2" 8.2" 9.3" 11.0" 12.2" 13.0"	11:34 11:44 11:54 12:04 12:14	2.8" 10.6" 15.0" 17.4" 20.0"		
PERC RATE: 8.4 in./hr		PERC RATE: 4.8 in./hr		PERC RATE: 14.4 in./hr		PERC RATE:	

COMMENTS: _____

_____

Form #2 Technical Standards for Subsurface Sewage Disposal Systems

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #: _____

Property Owner_____Location 117 Oil Mill Road, Waterford, CT

DEEP TEST PIT DATA/SOIL DESCRIPTIONS

DATE: 9/23/19 (Record all Test Pits)

TEST PIT: 7A	TEST PIT: 7B	TEST PIT: 7C	TEST PIT:
0-4" organic 4-13" yellow-brown fine sandy loam 13-48" yellow-brown fine sandy loam 48-96" gray fine sand	0-13" brown fine sandy loam 13-22" light brown fine sandy loam 22-96" yellow-brown fine sand	0-27" brown fine sandy loam 27-48" light brown fine sandy loam 48-84" yellow-brown fine sand	
Mottles:	Mottles:	Mottles:	Mottles:
GW:	GW:	GW:	GW:
Ledge:	Ledge:	Ledge:	Ledge:
Roots:	Roots:	Roots:	Roots:
Restrictive:	Restrictive:	Restrictive:	Restrictive:

COMMENTS: _____

GROUNDWATER TABLE (Near max., below max., etc.)_____

SOIL MOISTURE (High, medium, low, etc): _____

PERCOLATION TEST DATA

DATE: 9/23/19 (Record all Perc Tests)

PERC: 7A		PERC: 7B		PERC: 7C		PERC:	
DEPTH: 18" @ 36" bench		DEPTH: 19" @ 36" bench		DEPTH: 18" @ 36" bench		DEPTH:	
PRESOAK: 3:00 PM		PRESOAK: 3:00 PM		PRESOAK: 3:00 PM		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
4:07 4:17 4:27 4:37 4:47 4:57	4.5" 8.3" 10.7" 13.0" 15.3" 18.0"	4:08 4:18 4:28 4:38	3.0" 10.0" 15.4" 19.0"	4:09 4:19 4:29 4:39 4:49 4:59 5:09	3.2" 7.6" 10.9" 13.3" 14.8" 16.7" 18.0"		
PERC RATE: 13.8 in./hr		PERC RATE: 21.6 in./hr		PERC RATE: 7.8 in./hr		PERC RATE:	

COMMENTS: _____

Form #2 Technical Standards for Subsurface Sewage Disposal Systems

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #: _____

Property Owner_____Location 117 Oil Mill Road, Waterford, CT

DEEP TEST PIT DATA/SOIL DESCRIPTIONS

DATE: 9/23/19 (Record all Test Pits)

TEST PIT: 8A	TEST PIT: 8B	TEST PIT: 8C	TEST PIT: 8D
0-30" brown sandy loam 30-43" brown fine sandy loam	0-24" brown sandy loam	0-21" brown sandy loam 21-35" yellow-brown sandy loam	0-30" brown sandy loam
Mottles:	Mottles:	Mottles:	Mottles:
GW:	GW:	GW:	GW:
Ledge: 43"	Ledge: 24"	Ledge: 35"	Ledge: 30"
Roots:	Roots:	Roots:	Roots:
Restrictive:	Restrictive:	Restrictive:	Restrictive:

COMMENTS: _____

_____

GROUNDWATER TABLE (Near max., below max., etc.)_____

SOIL MOISTURE (High, medium, low, etc): _____

PERCOLATION TEST DATA

DATE:_____ (Record all Perc Tests)

PERC:		PERC:		PERC:		PERC:	
DEPTH:		DEPTH:		DEPTH:		DEPTH:	
PRESOAK:		PRESOAK:		PRESOAK:		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
PERC RATE:		PERC RATE:		PERC RATE:		PERC RATE:	

COMMENTS: _____

_____

Form #2 Technical Standards for Subsurface Sewage Disposal Systems

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #: _____

Property Owner_____Location 117 Oil Mill Road, Waterford, CT

DEEP TEST PIT DATA/SOIL DESCRIPTIONS

DATE: 9/24/19 (Record all Test Pits)

TEST PIT: 9A	TEST PIT: 9B	TEST PIT: 9C	TEST PIT:
0-2" organic 2-17" brown sandy loam 17-34" light brown sandy loam 34-55" gray sandy loam 55-70" gray sand with cobbles	0-2" organic 2-15" brown sandy loam 15-25" light brown sandy loam 25-50" gray silty loam 50-72" gray sand with cobbles	0-2" organic 5-28" brown sandy loam 28-42" gray fine sandy loam 42-82" gray loamy sand with cobbles	
Mottles: 30-55"	Mottles: 25-50"	Mottles: 28"	Mottles:
GW:	GW:	GW:	GW:
Ledge: 70"	Ledge: 72"	Ledge:	Ledge:
Roots:	Roots:	Roots:	Roots:
Restrictive:	Restrictive:	Restrictive:	Restrictive:

COMMENTS: _____

_____

GROUNDWATER TABLE (Near max., below max., etc.)_____

SOIL MOISTURE (High, medium, low, etc): _____

PERCOLATION TEST DATA

DATE: 9/24/19 (Record all Perc Tests)

PERC: 9A		PERC: 9B		PERC: 9C		PERC:	
DEPTH: 18" @ 36" bench		DEPTH: 18" @ 36" bench		DEPTH: 18" @ 36" bench		DEPTH:	
PRESOAK: 11:30 AM		PRESOAK: 11:30 AM		PRESOAK: 11:30 AM		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
1:00 1:10 1:20 1:30 1:40 1:50 2:00	1.5" 3.5" 5.3" 6.8" 8.2" 9.7" 11.0"	1:01 1:11 1:21 1:31	4.0" 12.0" 15.8" 18.0"	1:02 1:12 1:22 1:32	3.8" 10.8" 14.5" 18.0"		
PERC RATE: 7.8 in./hr		PERC RATE: 13.2 in./hr		PERC RATE: 21.0 in./hr		PERC RATE:	

COMMENTS: _____

_____

Form #2 Technical Standards for Subsurface Sewage Disposal Systems

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #: _____

Property Owner_____Location 117 Oil Mill Road, Waterford, CT

DEEP TEST PIT DATA/SOIL DESCRIPTIONS

DATE: 9/24/19 (Record all Test Pits)

TEST PIT: 10A	TEST PIT: 10B	TEST PIT: 10C	TEST PIT: 10D
0-2" organic 2-20" brown loamy sand with cobbles 20-38" stony coarse sand	0-2" organic 2-16" brown sandy loam with cobbles 16-35" fine sandy loam with cobbles	0-2" organic 2-10" brown sandy loam 10-27" yellow-brown sandy loam 27-48" yellow-brown loamy sand with cobbles	0-1" organic 1-7" brown sandy loam 7-36" yellow-brown sandy loam 36-62" gray sand with cobbles
Mottles: 35"	Mottles:	Mottles:	Mottles: 37"
GW:	GW:	GW:	GW:
Ledge: 38"	Ledge: 35"	Ledge: 48"	Ledge: 62"
Roots:	Roots:	Roots:	Roots:
Restrictive:	Restrictive:	Restrictive:	Restrictive:

COMMENTS: _____

_____

GROUNDWATER TABLE (Near max., below max., etc.)_____

SOIL MOISTURE (High, medium, low, etc): _____

PERCOLATION TEST DATA

DATE:_____ (Record all Perc Tests)

PERC:		PERC:		PERC:		PERC:	
DEPTH:		DEPTH:		DEPTH:		DEPTH:	
PRESOAK:		PRESOAK:		PRESOAK:		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
PERC RATE:		PERC RATE:		PERC RATE:		PERC RATE:	

COMMENTS: _____

_____

Form #2 Technical Standards for Subsurface Sewage Disposal Systems

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #: _____

Property Owner_____Location 117 Oil Mill Road, Waterford, CT

DEEP TEST PIT DATA/SOIL DESCRIPTIONS

DATE: 9/24/19 (Record all Test Pits)

TEST PIT: 11A	TEST PIT: 11B	TEST PIT: 11C	TEST PIT: 11D
0-3" organic 3-7" brown sandy loam 7-32" yellow brown sandy loam 32-48" gray fine sandy loam	0-2" organic 2-6" brown sandy loam 6-18" yellow-brown sandy loam 18-25" gray fine sandy loam 25-51" dark gray coarse sand with cobbles	0-2" organic 2-8" brown sandy loam 8-23" yellow-brown sandy loam 23-37" gray fine sandy loam 37-64" dark gray coarse sand	0-2" organic 2-15" brown sandy loam 15-33" yellow-brown fine sandy loam 33-58" gray coarse sand wtih cobbles
Mottles: 32"	Mottles: 18"	Mottles: 23"	Mottles:
GW:	GW:	GW:	GW:
Ledge: 48"	Ledge: 51"	Ledge: 64"	Ledge: 58"
Roots:	Roots:	Roots:	Roots:
Restrictive:	Restrictive:	Restrictive:	Restrictive:

COMMENTS: _____

_____

GROUNDWATER TABLE (Near max., below max., etc.)_____

SOIL MOISTURE (High, medium, low, etc): _____

PERCOLATION TEST DATA

DATE:_____ (Record all Perc Tests)

PERC:		PERC:		PERC:		PERC:	
DEPTH:		DEPTH:		DEPTH:		DEPTH:	
PRESOAK:		PRESOAK:		PRESOAK:		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
PERC RATE:		PERC RATE:		PERC RATE:		PERC RATE:	

COMMENTS: _____

_____

Form #2 Technical Standards for Subsurface Sewage Disposal Systems

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #: _____

Property Owner_____Location 117 Oil Mill Road, Waterford, CT

DEEP TEST PIT DATA/SOIL DESCRIPTIONS

DATE: 9/24/19 (Record all Test Pits)

TEST PIT: 12A	TEST PIT: 12B	TEST PIT: 12C	TEST PIT:
0-2" organic 2-12" brown sandy loam with cobbles 12-44" yellow-brown sand with cobbles 44-56" gray sand 56-72" gray fine sand	0-8" brown sandy loam with cobbles 8-25" yellow-brown sandy loam 25-46" gray fine sandy loam 46-58" gray fine sand 58-84" gray sand	0-2" organic 2-15" brown sandy loam 15-28" yellow-brown sandy loam 28-44" gray fine sandy loam 44-59" brown sand 59-72" gray sand	
Mottles: 44"	Mottles: 25"	Mottles: 33"	Mottles:
GW:	GW:	GW:	GW:
Ledge: 72"	Ledge: 84"	Ledge: 72"	Ledge:
Roots:	Roots:	Roots:	Roots:
Restrictive:	Restrictive:	Restrictive:	Restrictive:

COMMENTS: _____

_____

GROUNDWATER TABLE (Near max., below max., etc.)_____

SOIL MOISTURE (High, medium, low, etc): _____

PERCOLATION TEST DATA

DATE: 9/24/19 (Record all Perc Tests)

PERC: 12A		PERC: 12B		PERC: 12C		PERC:	
DEPTH: 18" @ 36" bench		DEPTH: 19" @ 36" bench		DEPTH: 19" @ 36" bench		DEPTH:	
PRESOAK: 2:30 PM		PRESOAK: 2:30 PM		PRESOAK: 2:30 PM		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
3:44 3:54 4:04	4.0" 13.5" 18.0"	3:42 3:52 4:02	3.0" 12.0" 19.0"	3:40 3:50 4:00	3.8" 13.2" 19.0"		
PERC RATE: 27.0 in./hr		PERC RATE: 42.0 in./hr		PERC RATE: 34.8 in./hr		PERC RATE:	

COMMENTS: _____

_____

Form #2 Technical Standards for Subsurface Sewage Disposal Systems

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #: _____

Property Owner_____Location 117 Oil Mill Road, Waterford, CT

DEEP TEST PIT DATA/SOIL DESCRIPTIONS

DATE: 9/25/19 (Record all Test Pits)

TEST PIT: 13A	TEST PIT: 13B	TEST PIT: 13C	TEST PIT:
0-2" organic 2-10" brown sandy loam 10-33" yellow-brown sandy loam 33-86" gray sand with cobbles	0-3" organic 3-11" brown loamy sand 11-46" yellow-brown sand 46-96" brown coarse sand	0-2" organic 2-10" brown fine sandy loam 10-28" yellow-brown fine sandy loam 28-49" gray fine sandy loam 49-70" gray coarse sand 70-96" gray coarse sand	
Mottles:	Mottles:	Mottles:	Mottles:
GW:	GW:	GW:	GW:
Ledge:	Ledge:	Ledge:	Ledge:
Roots:	Roots:	Roots:	Roots:
Restrictive:	Restrictive:	Restrictive:	Restrictive:

COMMENTS: _____

_____

GROUNDWATER TABLE (Near max., below max., etc.)_____

SOIL MOISTURE (High, medium, low, etc): _____

PERCOLATION TEST DATA

DATE: 9/25/19 (Record all Perc Tests)

PERC: 13A		PERC: 13B		PERC: 13C		PERC:	
DEPTH: 20" @ 36" bench		DEPTH: 19" @ 36" bench		DEPTH: 18" @ 36" bench		DEPTH:	
PRESOAK: 11:00 AM		PRESOAK: 11:00 AM		PRESOAK: 11:00 AM		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
12:55 1:05 1:15 1:25 1:35 1:45	4.2" 11.2" 15.1" 17.5" 19.1" 20.0"	12:57 1:07 1:17	5.5" 14.3" 19.0"	1:00 1:10 1:20 1:30	3.7" 13.1" 16.5" 18.0"		
PERC RATE: 5.4 in./hr		PERC RATE: 28.2 in./hr		PERC RATE: 9.0 in./hr		PERC RATE:	

COMMENTS: _____

_____

Form #2 Technical Standards for Subsurface Sewage Disposal Systems

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #: _____

Property Owner_____Location 117 Oil Mill Road, Waterford, CT

DEEP TEST PIT DATA/SOIL DESCRIPTIONS

DATE: 9/26/19 (Record all Test Pits)

TEST PIT: 14A	TEST PIT: 14B	TEST PIT: 14C	TEST PIT:
0-1" organic 1-10" brown sandy loam 10-40" yellow-brown fine sandy loam 40-86" coarse sand with cobbles	0-1" organic 1-8" brown sandy loam 8-36" yellow-brown loamy sand 36-45" yellow-brown fine sandy loam 45-72" coarse sand	0-2" organic 2-16" brown loamy sand 16-37" yellow-brown loamy sand 37-52" yellow-brown sandy loam 52-80" gray coarse sand	
Mottles:	Mottles:	Mottles:	Mottles:
GW:	GW:	GW:	GW:
Ledge:	Ledge:	Ledge:	Ledge:
Roots:	Roots:	Roots:	Roots:
Restrictive:	Restrictive:	Restrictive:	Restrictive:

COMMENTS: _____

_____

GROUNDWATER TABLE (Near max., below max., etc.)_____

SOIL MOISTURE (High, medium, low, etc): _____

PERCOLATION TEST DATA

DATE: 9/26/19 (Record all Perc Tests)

PERC: 14A		PERC: 14B		PERC: 14C		PERC:	
DEPTH: 18" @ 36" bench		DEPTH: 19" @ 36" bench		DEPTH: 18" @ 36" bench		DEPTH:	
PRESOAK: 1:00 PM		PRESOAK: 1:00 PM		PRESOAK: 1:00 PM		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
2:58 3:08 3:18 3:28	3.7" 13.2" 15.3" 18.0"	2:56 3:06 3:16 3:26 3:36	6.5" 14.0" 15.5" 16.8" 19.0"	2:54 3:04 3:14	5.4" 11.8" 18.0"		
PERC RATE: 12.6 in./hr		PERC RATE: 7.8 in./hr		PERC RATE: 37.2 in./hr		PERC RATE:	

COMMENTS: _____

_____

Form #2 Technical Standards for Subsurface Sewage Disposal Systems

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #: _____

Property Owner_____Location 117 Oil Mill Road, Waterford, CT

DEEP TEST PIT DATA/SOIL DESCRIPTIONS

DATE: 9/25/19 (Record all Test Pits)

TEST PIT: 15A	TEST PIT: 15B	TEST PIT: 15C	TEST PIT:
0-1" organic 1-10" brown loamy sand 10-26" yellow-brown loamy sand 26-81" sand with cobbles	0-1" organic 1-17" brown loamy sand 17-41" yellow-brown loamy sand 41-60" gray fine sandy loam 60-87" gray sand	0-14" brown loamy sand 14-27" yellow-brown loamy sand 27-33" gray loamy sand 33-88" gray sand with cobbles	
Mottles: 37"	Mottles: 41"	Mottles:	Mottles:
GW:	GW:	GW:	GW:
Ledge:	Ledge:	Ledge:	Ledge:
Roots:	Roots:	Roots:	Roots:
Restrictive:	Restrictive:	Restrictive:	Restrictive:

COMMENTS: _____

_____

GROUNDWATER TABLE (Near max., below max., etc.)_____

SOIL MOISTURE (High, medium, low, etc): _____

PERCOLATION TEST DATA

DATE:_____ (Record all Perc Tests)

PERC:		PERC:		PERC:		PERC:	
DEPTH:		DEPTH:		DEPTH:		DEPTH:	
PRESOAK:		PRESOAK:		PRESOAK:		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
PERC RATE:		PERC RATE:		PERC RATE:		PERC RATE:	

COMMENTS: _____

_____

Form #2 Technical Standards for Subsurface Sewage Disposal Systems

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #: _____

Property Owner_____Location 117 Oil Mill Road, Waterford, CT

DEEP TEST PIT DATA/SOIL DESCRIPTIONS

DATE: 9/27/19 (Record all Test Pits)

TEST PIT: 16A	TEST PIT: 16B	TEST PIT: 16C	TEST PIT:
0-1" organic 1-8" brown sandy loam 8-25" yellow-brown sandy loam 25-36" yellow-brown sandy loam with cobbles 36-61" gray loamy sand 61-85" loamy sand with cobbles	0-2" organic 2-26" brown sandy loam with cobbles 26-61" yellow-brown loamy sand with cobbles 61-70" yellow-brown coarse sand	0-3" organic 2-11" brown sandy loam 11-29" yellow-brown loamy sand with cobbles 29-78" gray loamy sand with cobbles	
Mottles: 25"	Mottles: 26"	Mottles: 29"	Mottles:
GW:	GW: seepage @ 50"	GW:	GW:
Ledge:	Ledge:	Ledge:	Ledge:
Roots:	Roots:	Roots:	Roots:
Restrictive:	Restrictive:	Restrictive:	Restrictive:

COMMENTS: _____

_____

GROUNDWATER TABLE (Near max., below max., etc.)_____

SOIL MOISTURE (High, medium, low, etc): _____

PERCOLATION TEST DATA

DATE:_____ (Record all Perc Tests)

PERC:		PERC:		PERC:		PERC:	
DEPTH:		DEPTH:		DEPTH:		DEPTH:	
PRESOAK:		PRESOAK:		PRESOAK:		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
PERC RATE:		PERC RATE:		PERC RATE:		PERC RATE:	

COMMENTS: _____

_____

Appendix C:

Erosion and Sedimentation Control Checklist
Long Term Stormwater Operation and Maintenance Measures

Erosion and Sedimentation Control Checklist

Waterford Solar – Waterford, CT – 117 Oil Mill Road

Best Management Practices – Maintenance/ Evaluation Checklist

Construction Practices

Best Management Practice	Inspection Frequency	Date Inspected	Inspector	Minimum Maintenance and Key Items to Check	Cleaning/Repair Needed ☐yes ☐no (List Items)	Date of Cleaning/Repair	Performed by
Silt Fencing	Once per week or after a 0.5" or greater storm event			Check for coverage on site, inspect for tears, ensure proper burial depths, and inspect for sediment collection			
Compost Filter Sock	Once per week or after a 0.5" or greater storm event			Check for damage, inspect for sediment collection			
Straw Wattles	Once per week or after a 0.5" or greater storm event			Check for damage, inspect for sediment collection			
Stabilized Construction Exit	Once per week or after a 0.5" or greater storm event			Check for coverage, inspect for sediment collection			
Temporary Sediment Trap/Basin & Diversion Swales	Once per week or after a 0.5" or greater storm event			Check spillway, side slope stability, vegetative growth, sediment collection			
Vegetated Slope Stabilization	Once per week or after a 0.5" or greater storm event						
Energy Dissipators	Once per week or after a 0.5" or greater storm event			Check slope stability, vegetative growth, sediment collection, ensure that spreader lip remains level or must be repaired			
E-Fence	Once per week or after a 0.5" or greater storm event			Check for coverage on site, inspect for tears, ensure proper burial depths, and inspect for sediment collection			
Wood Chip Mulch Berm	Once per week or after a 0.5" or greater storm event			Inspect for sediment collection			

Stormwater Control Manager _____

Long Term Stormwater Operation and Maintenance Measures

Waterford Solar – Waterford, CT – 117 Oil Mill Road

Best Management Practices – Maintenance/ Evaluation Checklist

Long Term Practices

Best Management Practice	Inspection Frequency	Date Inspected	Inspector	Minimum Maintenance and Key Items to Check	Cleaning/Repair Needed ☐yes ☐no (List Items)	Date of Cleaning/Repair	Performed by
Trash/Litter	Routinely pick up and remove litter from entire property as required.						
Vegetated Areas	Inspect bi-annually. Replant bare areas upon identification.						
Energy Dissipators	Inspect monthly for the first 3 months and after any rain event exceeding 0.5″. Inspect 2x per year thereafter.			Check slope stability, vegetative growth, sediment collection, ensure that spreader lip remains level or must be repaired			
Diversion Swales	Inspect monthly for the first 3 months and after any rain event exceeding 0.5″. Inspect 2x per year thereafter.			Check slope stability, vegetative growth, sediment collection			
Sand Filter	Inspect monthly for the first 3 months and after any rain event exceeding 0.5″. Inspect 2x per year thereafter.			Check spillway, side slope stability, vegetative growth, sediment collection			
Wet Pond	Inspect monthly for the first 3 months and after any rain event exceeding 0.5″. Inspect 2x per year thereafter.			Check spillway, side slope stability, vegetative growth, sediment collection			
Infiltration Basin	Inspect monthly for the first 3 months and after any rain event exceeding 0.5″. Inspect 2x per year thereafter.			Check spillway, side slope stability, vegetative growth, sediment collection			

Stormwater Control Manager _____

Project Information

Site

Project Name:	Waterford Solar
Address or Locus:	117 Oil Mill Road
City, State & Zip:	Waterford, CT 06385

Developer

Client Name:	GRE Gacrux, LLC
Client Address:	10 Main Street, Suite E
Client City, State & Zip:	Middletown, CT 06457
Client Telephone No.:	
Client Cell Phone:	
Client E-Mail:	

Site Supervisor

Site Manager Name:	To be determined
Site Manager Address:	
Site Manager City, State & Zip:	
Site Manager Telephone No.:	
Site Manager Cell Phone:	
Site Manager E-Mail:	

Appendix D:

Diversion Swale & Sediment Trap/Basin Sizing
Water Quality Computations
HydroCAD: Existing Conditions
HydroCAD: Proposed Conditions

Diversion Swale & Sediment Trap/Basin Sizing

Temporary Diversion Sizing

TD	1-1
95,000	sf
2.18	ac

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.010	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (disturbed soil) =	10.73	cfs	
Bottom width, w =	1	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	1	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**2.68**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	4.00	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	7.32	ft	
R = A / P =	0.55	ft	
A * R^(2/3) =	**2.67**	(must be close to target)	
y =	62.4	pcf	
ŧd = y * d * S =	**0.62**	psf	< 1.45 psf for ECB - OK
Velocity, V = Q / A =	**2.68**	fps	< 5.00 fps for ECB - OK

Temporary Diversion Sizing

TD	2-1
20,000	sf
0.46	ac

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.040	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (disturbed soil) =	2.26	cfs	
Bottom width, w =	1	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.36	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.28**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	0.75	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	3.28	ft	
R = A / P =	0.23	ft	
A * R^(2/3) =	**0.28**	(must be close to target)	
y =	62.4	pcf	
ŧd = y * d * S =	**0.90**	psf	< 1.45 psf for ECB - OK
Velocity, V = Q / A =	**3.02**	fps	< 5.00 fps for ECB - OK

Temporary Diversion Sizing

TD	4-1
10,000	sf
0.23	ac

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.100	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (disturbed soil) =	1.13	cfs	
Bottom width, w =	1	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.2	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.09**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	0.32	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	2.26	ft	
R = A / P =	0.14	ft	
A * R^(2/3) =	**0.09**	(must be close to target)	
y =	62.4	pcf	
ŧd = y * d * S =	**1.25**	psf	< 1.45 psf for ECB - OK
Velocity, V = Q / A =	**3.53**	fps	< 5.00 fps for ECB - OK

Temporary Diversion Sizing

TD	5-1
40,000	sf
0.92	ac

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.015	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (disturbed soil) =	4.52	cfs	
Bottom width, w =	1	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.63	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.92**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	1.82	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	4.98	ft	
R = A / P =	0.37	ft	
A * R^(2/3) =	**0.93**	(must be close to target)	
y =	62.4	pcf	
ŧd = y * d * S =	**0.59**	psf	< 1.45 psf for ECB - OK
Velocity, V = Q / A =	**2.48**	fps	< 5.00 fps for ECB - OK

Temporary Diversion Sizing

TD	6-1
3,000	sf
0.07	ac

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.030	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (disturbed soil) =	0.34	cfs	
Bottom width, w =	1	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.15	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.05**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	0.22	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	1.95	ft	
R = A / P =	0.11	ft	
A * R^(2/3) =	**0.05**	(must be close to target)	
y =	62.4	pcf	
ŧd = y * d * S =	**0.28**	psf	< 1.45 psf for ECB - OK
Velocity, V = Q / A =	**1.56**	fps	< 5.00 fps for ECB - OK

Temporary Diversion Sizing

TD	7-1
1,000	sf
0.02	ac

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.030	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (disturbed soil) =	0.11	cfs	
Bottom width, w =	1	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.1	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.02**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	0.13	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	1.63	ft	
R = A / P =	0.08	ft	
A * R^(2/3) =	**0.02**	(must be close to target)	
y =	62.4	pcf	
ŧd = y * d * S =	**0.19**	psf	< 1.45 psf for ECB - OK
Velocity, V = Q / A =	**0.87**	fps	< 5.00 fps for ECB - OK

Temporary Diversion Sizing

TD	8-1
18,000	sf
0.41	ac

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.100	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (disturbed soil) =	2.03	cfs	
Bottom width, w =	2	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.2	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.16**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	0.52	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	3.26	ft	
R = A / P =	0.16	ft	
A * R^(2/3) =	**0.15**	(must be close to target)	
y =	62.4	pcf	
ŧd = y * d * S =	**1.25**	psf	< 1.45 psf for ECB - OK
Velocity, V = Q / A =	**3.91**	fps	< 5.00 fps for ECB - OK

Temporary Diversion Sizing

TD	8-2
5,000	sf
0.11	ac

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.040	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (disturbed soil) =	0.56	cfs	
Bottom width, w =	1	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.18	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.07**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	0.28	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	2.14	ft	
R = A / P =	0.13	ft	
A * R^(2/3) =	**0.07**	(must be close to target)	
y =	62.4	pcf	
ŧd = y * d * S =	**0.45**	psf	< 1.45 psf for ECB - OK
Velocity, V = Q / A =	**2.04**	fps	< 5.00 fps for ECB - OK

Temporary Diversion Sizing

TD	9-1
26,000	sf
0.60	ac

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.060	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (disturbed soil) =	2.94	cfs	
Bottom width, w =	1	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.37	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.30**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	0.78	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	3.34	ft	
R = A / P =	0.23	ft	
A * R^(2/3) =	**0.30**	(must be close to target)	
y =	62.4	pcf	
ŧd = y * d * S =	**1.39**	psf	< 1.45 psf for ECB - OK
Velocity, V = Q / A =	**3.76**	fps	< 5.00 fps for ECB - OK

Temporary Diversion Sizing

TD	10-1
23,000	sf
0.53	ac

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.090	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (disturbed soil) =	2.60	cfs	
Bottom width, w =	2	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.25	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.22**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	0.69	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	3.58	ft	
R = A / P =	0.19	ft	
A * R^(2/3) =	**0.23**	(must be close to target)	
y =	62.4	pcf	
ŧd = y * d * S =	**1.40**	psf	< 1.45 psf for ECB - OK
Velocity, V = Q / A =	**3.78**	fps	< 5.00 fps for ECB - OK

Temporary Diversion Sizing

TD	11-1
9,000	sf
0.21	ac

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.030	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (disturbed soil) =	1.02	cfs	
Bottom width, w =	1	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.27	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.15**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	0.49	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	2.71	ft	
R = A / P =	0.18	ft	
A * R^(2/3) =	**0.16**	(must be close to target)	
y =	62.4	pcf	
ŧd = y * d * S =	**0.51**	psf	< 1.45 psf for ECB - OK
Velocity, V = Q / A =	**2.08**	fps	< 5.00 fps for ECB - OK

Temporary Diversion Sizing

TD	11-2
10,000	sf
0.23	ac

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.100	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (disturbed soil) =	1.13	cfs	
Bottom width, w =	1	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.2	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.09**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	0.32	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	2.26	ft	
R = A / P =	0.14	ft	
A * R^(2/3) =	**0.09**	(must be close to target)	
y =	62.4	pcf	
ŧd = y * d * S =	**1.25**	psf	< 1.45 psf for ECB - OK
Velocity, V = Q / A =	**3.53**	fps	< 5.00 fps for ECB - OK

Temporary Diversion Sizing

TD	12-1
5,000	sf
0.11	ac

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.030	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (disturbed soil) =	0.56	cfs	
Bottom width, w =	1	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.2	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.08**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	0.32	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	2.26	ft	
R = A / P =	0.14	ft	
A * R^(2/3) =	**0.09**	(must be close to target)	
y =	62.4	pcf	
ŧd = y * d * S =	**0.37**	psf	< 1.45 psf for ECB - OK
Velocity, V = Q / A =	**1.76**	fps	< 5.00 fps for ECB - OK

Temporary Diversion Sizing

TD	12-2
64,000	sf
1.47	ac

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.020	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (disturbed soil) =	7.23	cfs	
Bottom width, w =	1	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.73	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**1.28**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	2.33	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	5.62	ft	
R = A / P =	0.41	ft	
A * R^(2/3) =	**1.29**	(must be close to target)	
y =	62.4	pcf	
ŧd = y * d * S =	**0.91**	psf	< 1.45 psf for ECB - OK
Velocity, V = Q / A =	**3.10**	fps	< 5.00 fps for ECB - OK

Temporary Diversion Sizing

TD	13-1
18,000	sf
0.41	ac

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.010	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (disturbed soil) =	2.03	cfs	
Bottom width, w =	1	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.48	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.51**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	1.17	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	4.04	ft	
R = A / P =	0.29	ft	
A * R^(2/3) =	**0.51**	(must be close to target)	
y =	62.4	pcf	
ŧd = y * d * S =	**0.30**	psf	< 1.45 psf for ECB - OK
Velocity, V = Q / A =	**1.74**	fps	< 5.00 fps for ECB - OK

Temporary Diversion Sizing

TD	14-1
11,000	sf
0.25	ac

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.030	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (disturbed soil) =	1.24	cfs	
Bottom width, w =	1	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.3	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.18**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	0.57	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	2.90	ft	
R = A / P =	0.20	ft	
A * R^(2/3) =	**0.19**	(must be close to target)	
y =	62.4	pcf	
ŧd = y * d * S =	**0.56**	psf	< 1.45 psf for ECB - OK
Velocity, V = Q / A =	**2.18**	fps	< 5.00 fps for ECB - OK

Temporary Diversion Sizing

TD	14-2		
11,000	sf		
0.25	ac		

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.140	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (disturbed soil) =	1.24	cfs	
Bottom width, w =	2	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.15	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.08**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	0.37	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	2.95	ft	
R = A / P =	0.12	ft	
A * R^(2/3) =	**0.09**	(must be close to target)	
y =	62.4	pcf	
ŧd = y * d * S =	**1.31**	psf	< 1.45 psf for ECB - OK
Velocity, V = Q / A =	**3.38**	fps	< 5.00 fps for ECB - OK

Temporary Diversion Sizing

TD	14-4
63,000	sf
1.45	ac

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.200	ft / ft	
Manning's n for riprap, n =	0.075		
Q25 (disturbed soil) =	7.12	cfs	
Bottom width, w =	5	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.4	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**1.19**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	2.48	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	7.53	ft	
R = A / P =	0.33	ft	
A * R^(2/3) =	**1.18**	(must be close to target)	
y =	62.4	pcf	
ŧd = y * d * S =	**4.99**	psf	< 5.00 psf for 15 in. riprap - OK
Velocity, V = Q / A =	**2.87**	fps	< 14.00 fps for riprap - OK

Temporary Diversion Sizing

TD	16-1		
600,000	sf		
13.77	ac		

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.010	ft / ft	
Manning's n for riprap, n =	0.075		
Q25 (disturbed soil) =	67.77	cfs	
Bottom width, w =	12	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	2.1	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**50.83**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	38.43	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	25.28	ft	
R = A / P =	1.52	ft	
A * R^(2/3) =	**50.81**	(must be close to target)	
y =	62.4	pcf	
ŧd = y * d * S =	**1.31**	psf	< 5.00 psf for 15 in. riprap - OK
Velocity, V = Q / A =	**1.76**	fps	< 14.00 fps for riprap - OK

Temporary Diversion Sizing

TD	16-2
180,000	sf
4.13	ac

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.060	ft / ft	
Manning's n for riprap, n =	0.075		
Q25 (disturbed soil) =	20.33	cfs	
Bottom width, w =	6	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.92	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**6.22**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	8.06	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	11.82	ft	
R = A / P =	0.68	ft	
A * R^(2/3) =	**6.24**	(must be close to target)	
y =	62.4	pcf	
ŧd = y * d * S =	**3.44**	psf	< 5.00 psf for 15 in. riprap - OK
Velocity, V = Q / A =	**2.52**	fps	< 14.00 fps for riprap - OK

Temporary Diversion Sizing

TD	16-3
57,000	sf
1.31	ac

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.070	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (disturbed soil) =	6.44	cfs	
Bottom width, w =	6	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.25	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.61**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	1.69	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	7.58	ft	
R = A / P =	0.22	ft	
A * R^(2/3) =	**0.62**	(must be close to target)	
y =	62.4	pcf	
ŧd = y * d * S =	**1.09**	psf	< 1.45 psf for ECB - OK
Velocity, V = Q / A =	**3.82**	fps	< 5.00 fps for ECB - OK

Temporary Sediment Trap Sizing
Waterford Solar
November 2019 (REVISED July 28, 2020)

TST #	Tributary Acreage, ac	*(134 cy / acre)** Volume Required Below Top of Spillway, cf	Volume Provided in Permanent Basin Below Top of Spillway, cf
1	3.0	10,854	19,071
2A	1.5	5,427	> 5,427
3	2.6	9,407	13,164
4	5.9	21,346	69,193
5A	1.0	3,618	> 3,618
6	3.2	11,578	24,822
7A	0.5	1,809	> 1,809
8	4.7	17,005	19,374
9	1.5	5,427	17,960
10	2.3	8,321	17,175
11	1.1	3,980	14,619
12	3.7	13,387	24,875
13A	2.5	9,045	> 9,045
13B	1.9	6,874	> 6,874
13C	4.9	17,728	> 17,728
14A	1.7	6,151	> 6,151

* Per 2002 Connecticut Guidelines for Soil Erosion and Sediment Control

SEDIMENT BASIN SIZING

SB 4

DA, drainage area =	255,700	sf
	5.87	ac
	0.009	sq mi.
Construction Duration:	8	months
(DA) (A) = 5.87 ac * 50 tons =	294	tons / year
	196	tons for life of basin
Delivery Ratio DR (from Figure SB-12) for sandy loam =	60%	
Density of sediment (from Figure SB-2) for sandy loam =	85	pcf
Trap Efficiency TE =	80%	
V sediment storage = (DA)(A)(DR)(TE)(2,000) / Density =	**2,214**	**cf**
10-year, 24-hour rainfall, P =	5.14	in.
Vr (from Hydrographs) =	3.38	watershed inches
Q10 = Qi (from Hydrographs) =	21.07	cfs
Qi / DA =	3.59	
Qo / Qi (from Figure SB-13) =	0.06	
Qo =	1.26	cfs
Release rate = Qo * 640 / DA =	137.8	csm
Vs (from Figure DB-6) =	1.8	watershed inches
Vs = Vs * DA / 12 * 43,560 =	**38,355**	**cf**
Minimum volume required below crest of emergency spillway =	**40,569**	**cf**
Minimum volume provided below crest of emergency spillway =	***46,128***	***cf***

SEDIMENT BASIN SIZING

SB 16

DA, drainage area =	736,000	sf
	16.90	ac
	0.026	sq mi.
Construction Duration:	8	months
(DA) (A) = 16.9 ac * 50 tons =	845	tons / year
	564	tons for life of basin
Delivery Ratio DR (from Figure SB-12) for sandy loam =	55%	
Density of sediment (from Figure SB-2) for sandy loam =	85	pcf
Trap Efficiency TE =	80%	
V sediment storage = (DA)(A)(DR)(TE)(2,000) / Density =	**5,839**	**cf**
10-year, 24-hour rainfall, P =	5.14	in.
Vr (from Hydrographs) =	3.38	watershed inches
Q10 = Qi (from Hydrographs) =	60.66	cfs
Qi / DA =	3.59	
Qo / Qi (from Figure SB-13) =	0.06	
Qo =	3.64	cfs
Release rate = Qo * 640 / DA =	137.8	csm
Vs (from Figure DB-6) =	1.8	watershed inches
Vs = Vs * DA / 12 * 43,560 =	**110,425**	**cf**
Minimum volume required below crest of emergency spillway =	**116,264**	**cf**
Minimum volume provided below crest of emergency spillway =	***131,329***	***cf***

Water Quality Computations

Water Quality Volume Calculations

Project: **CF/GRE Waterford Solar** By: JDW Date:
Location: 117 Oil Mill Road, Waterford, CT Checked: SJK Date:

Basin Name	1	2	3	4	
Rainfall, P	1.0 in.	1.0 in.	1.0 in.	1.0 in.	a
Area, A	1.25 ac	0.81 ac	0.41 ac	2.41 ac	b
Access Road & Equipment Pad Area	0.22 ac	0.24 ac	0.11 ac	0.30 ac	c
% Impervious, I	18 %	30 %	27 %	12 %	
Volumetric Runoff Coeff., R	0.208	0.317	0.291	0.162	d
Water Quality Volume for impervious areas, WQV	**0.022** ac-ft	**0.021** ac-ft	**0.010** ac-ft	**0.033** ac-ft	e
	946 cf	**931** cf	**434** cf	**1,418** cf	
HSG 'B' Pervious Area Unit	85.77 sf	85.77 sf	85.77 sf	85.77 sf	f
WQV per Unit	1.00 cf	1.00 cf	1.00 cf	1.00 cf	g
HSG 'B' Panel Area in Watershed	ac	ac	ac	ac	
Water Quality Volume for panelized areas, WQV	**0.000** ac-ft	**0.000** ac-ft	**0.000** ac-ft	**0.000** ac-ft	h
	0 cf	**0** cf	**0** cf	**0** cf	
HSG 'C' Pervious Area Unit	85.77 sf	85.77 sf	85.77 sf	85.77 sf	f
WQV per Unit	1.21 cf	1.21 cf	1.21 cf	1.21 cf	g
HSG 'C' Panel Area in Watershed	1.76 ac	1.75 ac	2.14 ac	3.28 ac	
Water Quality Volume for panelized areas, WQV	**0.025** ac-ft	**0.025** ac-ft	**0.030** ac-ft	**0.046** ac-ft	h
	1,082 cf	**1,075** cf	**1,315** cf	**2,016** cf	
HSG 'D' Pervious Area Unit	85.77 sf	85.77 sf	85.77 sf	85.77 sf	f
WQV per Unit	1.53 cf	1.53 cf	1.53 cf	1.53 cf	g
HSG 'D' Panel Area in Watershed	ac	ac	ac	0.19 ac	
Water Quality Volume for panelized areas, WQV	**0.000** ac-ft	**0.000** ac-ft	**0.000** ac-ft	**0.003** ac-ft	h
	0 cf	**0** cf	**0** cf	**148** cf	
Total WQV required	**0.047** ac-ft	**0.046** ac-ft	**0.040** ac-ft	**0.082** ac-ft	
	2,027 cf	**2,007** cf	**1,749** cf	**3,581** cf	
Total WQV Provided in Basin	***10,689 cf***	***9,991 cf***	***5,651 cf***	***46,128 cf***	i

[a] First one inch of rainfall; 2004 Connecticut Stormwater Quality Manual

[b] Area tributary to the stormwater management basin

[c] Impervious cover area tributary to the stormwater management basin

[d] R=0.05+0.009*I; Section 7.4.1 from 2004 Connecticut Stormwater Quality Manual

[e] WQV=P*R*A/12; Section 7.4.1 from 2004 Connecticut Stormwater Quality Manual

[f] Width of solar panel multiplied by length of 2 panels in portrait and pervious clear area; Solar Panel Calculator from Minnesota Public Drainage Manual

[g] Water quality volume to be treated per unit of 2-panels in portrait; Solar Panel Calculator from Minnesota Public Drainage Manual

[h] Computed by Solar Panel Calculator from Minnesota Public Drainage Manual

[i] Volume below crest of spillway from proposed stormwater basin

Water Quality Volume Calculations

Project: **CF/GRE Waterford Solar** By: JDW Date:
Location: 117 Oil Mill Road, Waterford, CT Checked: SJK Date:

Basin Name	**5**	**6**	**7**	**8**	
Rainfall, P	1.0 in.	1.0 in.	1.0 in.	1.0 in.	a
Area, A	1.02 ac	1.69 ac	0.54 ac	1.40 ac	b
Access Road & Equipment Pad Area	0.00 ac	0.21 ac	0.12 ac	0.29 ac	c
% Impervious, I	0 %	13 %	22 %	21 %	
Volumetric Runoff Coeff., R	0.050	0.163	0.250	0.236	d
Water Quality Volume for impervious areas, WQV	**0.004** ac-ft	**0.023** ac-ft	**0.011** ac-ft	**0.028** ac-ft	e
	185 cf	**1,003** cf	**490** cf	**1,202** cf	
HSG 'B' Pervious Area Unit	85.77 sf	85.77 sf	85.77 sf	85.77 sf	f
WQV per Unit	1.00 cf	1.00 cf	1.00 cf	1.00 cf	g
HSG 'B' Panel Area in Watershed	ac	ac	ac	ac	
Water Quality Volume for panelized areas, WQV	**0.000** ac-ft	**0.000** ac-ft	**0.000** ac-ft	**0.000** ac-ft	h
	0 cf	**0** cf	**0** cf	**0** cf	
HSG 'C' Pervious Area Unit	85.77 sf	85.77 sf	85.77 sf	85.77 sf	f
WQV per Unit	1.21 cf	1.21 cf	1.21 cf	1.21 cf	g
HSG 'C' Panel Area in Watershed	1.62 ac	1.40 ac	0.63 ac	3.28 ac	
Water Quality Volume for panelized areas, WQV	**0.023** ac-ft	**0.020** ac-ft	**0.009** ac-ft	**0.046** ac-ft	h
	996 cf	**860** cf	**384** cf	**2,016** cf	
HSG 'D' Pervious Area Unit	85.77 sf	85.77 sf	85.77 sf	85.77 sf	f
WQV per Unit	1.53 cf	1.53 cf	1.53 cf	1.53 cf	g
HSG 'D' Panel Area in Watershed	ac	0.11 ac	ac	ac	
Water Quality Volume for panelized areas, WQV	**0.000** ac-ft	**0.002** ac-ft	**0.000** ac-ft	**0.000** ac-ft	h
	0 cf	**85** cf	**0** cf	**0** cf	
Total WQV required	**0.027** ac-ft	**0.045** ac-ft	**0.020** ac-ft	**0.074** ac-ft	
	1,181 cf	**1,948** cf	**874** cf	**3,217** cf	
Total WQV Provided in Basin	***7,416** cf*	***15,568** cf*	***4,344** cf*	***8,553** cf*	i

[a] First one inch of rainfall; 2004 Connecticut Stormwater Quality Manual

[b] Area tributary to the stormwater management basin

[c] Impervious cover area tributary to the stormwater management basin

[d] R=0.05+0.009*I; Section 7.4.1 from 2004 Connecticut Stormwater Quality Manual

[e] WQV=P*R*A/12; Section 7.4.1 from 2004 Connecticut Stormwater Quality Manual

[f] Width of solar panel multiplied by length of 2 panels in portrait and pervious clear area; Solar Panel Calculator from Minnesota Public Drainage Manual

[g] Water quality volume to be treated per unit of 2-panels in portrait; Solar Panel Calculator from Minnesota Public Drainage Manual

[h] Computed by Solar Panel Calculator from Minnesota Public Drainage Manual

[i] Volume below crest of spillway from proposed stormwater basin

Water Quality Volume Calculations

Project: **CF/GRE Waterford Solar** By: JDW Date:
Location: 117 Oil Mill Road, Waterford, CT Checked: SJK Date:

Basin Name	9	10	11	12	
Rainfall, P	1.0 in.	1.0 in.	1.0 in.	1.0 in.	a
Area, A	0.60 ac	0.67 ac	0.31 ac	0.94 ac	b
Access Road & Equipment Pad Area	0.20 ac	0.16 ac	0.14 ac	0.10 ac	c
% Impervious, I	33 %	24 %	45 %	11 %	
Volumetric Runoff Coeff., R	0.350	0.265	0.456	0.146	d
Water Quality Volume for impervious areas, WQV	**0.018** ac-ft	**0.015** ac-ft	**0.012** ac-ft	**0.011** ac-ft	e
	762 cf	**644** cf	**514** cf	**497** cf	
HSG 'B' Pervious Area Unit	85.77 sf	85.77 sf	85.77 sf	85.77 sf	f
WQV per Unit	1.00 cf	1.00 cf	1.00 cf	1.00 cf	g
HSG 'B' Panel Area in Watershed	ac	ac	ac	ac	
Water Quality Volume for panelized areas, WQV	**0.000** ac-ft	**0.000** ac-ft	**0.000** ac-ft	**0.000** ac-ft	h
	0 cf	**0** cf	**0** cf	**0** cf	
HSG 'C' Pervious Area Unit	85.77 sf	85.77 sf	85.77 sf	85.77 sf	f
WQV per Unit	1.21 cf	1.21 cf	1.21 cf	1.21 cf	g
HSG 'C' Panel Area in Watershed	0.92 ac	1.64 ac	0.81 ac	2.74 ac	
Water Quality Volume for panelized areas, WQV	**0.013** ac-ft	**0.023** ac-ft	**0.011** ac-ft	**0.039** ac-ft	h
	565 cf	**1,008** cf	**498** cf	**1,684** cf	
HSG 'D' Pervious Area Unit	85.77 sf	85.77 sf	85.77 sf	85.77 sf	f
WQV per Unit	1.53 cf	1.53 cf	1.53 cf	1.53 cf	g
HSG 'D' Panel Area in Watershed	ac	ac	ac	ac	
Water Quality Volume for panelized areas, WQV	**0.000** ac-ft	**0.000** ac-ft	**0.000** ac-ft	**0.000** ac-ft	h
	0 cf	**0** cf	**0** cf	**0** cf	
Total WQV required	**0.030** ac-ft	**0.038** ac-ft	**0.023** ac-ft	**0.050** ac-ft	
	1,328 cf	**1,652** cf	**1,011** cf	**2,181** cf	
Total WQV Provided in Basin	***10,848 cf***	***4,316 cf***	***8,508 cf***	***14,600 cf***	i

[a] First one inch of rainfall; 2004 Connecticut Stormwater Quality Manual

[b] Area tributary to the stormwater management basin

[c] Impervious cover area tributary to the stormwater management basin

[d] R=0.05+0.009*I; Section 7.4.1 from 2004 Connecticut Stormwater Quality Manual

[e] WQV=P*R*A/12; Section 7.4.1 from 2004 Connecticut Stormwater Quality Manual

[f] Width of solar panel multiplied by length of 2 panels in portrait and pervious clear area; Solar Panel Calculator from Minnesota Public Drainage Manual

[g] Water quality volume to be treated per unit of 2-panels in portrait; Solar Panel Calculator from Minnesota Public Drainage Manual

[h] Computed by Solar Panel Calculator from Minnesota Public Drainage Manual

[i] Volume below crest of spillway from proposed stormwater basin

Water Quality Volume Calculations

Project: **CF/GRE Waterford Solar** By: JDW Date:
Location: 117 Oil Mill Road, Waterford, CT Checked: SJK Date:

Basin Name	**13**	**14**		**16**	
Rainfall, P	1.0 in.	1.0 in.		1.0 in.	a
Area, A	2.45 ac	2.48 ac		2.37 ac	b
Access Road & Equipment Pad Area	0.88 ac	0.19 ac		1.07 ac	c
% Impervious, I	36 %	8 %		45 %	
Volumetric Runoff Coeff., R	0.373	0.119		0.456	d
Water Quality Volume for impervious areas, WQV	**0.076** ac-ft	**0.025** ac-ft		**0.090** ac-ft	e
	3,320 cf	**1,071** cf		**3,926** cf	
HSG 'B' Pervious Area Unit	85.77 sf	85.77 sf		85.77 sf	f
WQV per Unit	1.00 cf	1.00 cf		1.00 cf	g
HSG 'B' Panel Area in Watershed	ac	ac		ac	
Water Quality Volume for panelized areas, WQV	**0.000** ac-ft	**0.000** ac-ft		**0.000** ac-ft	h
	0 cf	**0** cf		**0** cf	
HSG 'C' Pervious Area Unit	85.77 sf	85.77 sf		85.77 sf	f
WQV per Unit	1.21 cf	1.21 cf		1.21 cf	g
HSG 'C' Panel Area in Watershed	9.97 ac	1.96 ac		14.55 ac	
Water Quality Volume for panelized areas, WQV	**0.141** ac-ft	**0.028** ac-ft		**0.205** ac-ft	h
	6,127 cf	**1,204** cf		**8,941** cf	
HSG 'D' Pervious Area Unit	85.77 sf	85.77 sf		85.77 sf	f
WQV per Unit	1.53 cf	1.53 cf		1.53 cf	g
HSG 'D' Panel Area in Watershed	0.01 ac	ac		ac	
Water Quality Volume for panelized areas, WQV	**0.000** ac-ft	**0.000** ac-ft		**0.000** ac-ft	h
	8 cf	**0** cf		**0** cf	
Total WQV required	**0.217** ac-ft	**0.052** ac-ft		**0.295** ac-ft	
	9,454 cf	**2,275** cf		**12,867** cf	
Total WQV Provided in Basin	***67,168 cf***	***9,510 cf***		***131,329 cf***	i

[a] First one inch of rainfall; 2004 Connecticut Stormwater Quality Manual

[b] Area tributary to the stormwater management basin

[c] Impervious cover area tributary to the stormwater management basin

[d] R=0.05+0.009*I; Section 7.4.1 from 2004 Connecticut Stormwater Quality Manual

[e] WQV=P*R*A/12; Section 7.4.1 from 2004 Connecticut Stormwater Quality Manual

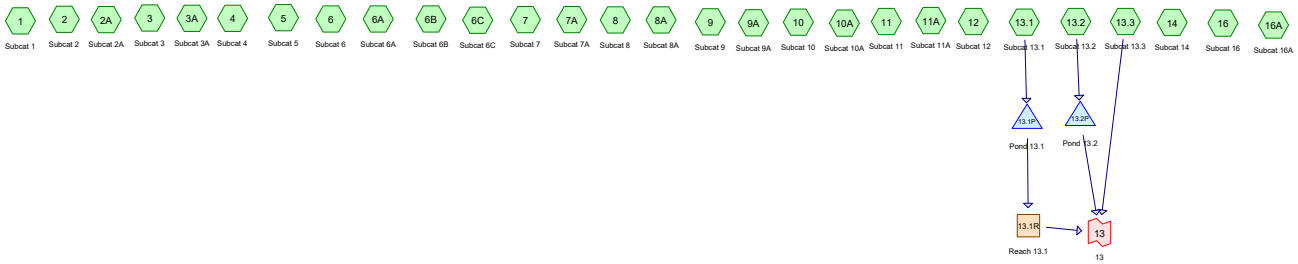
[f] Width of solar panel multiplied by length of 2 panels in portrait and pervious clear area; Solar Panel Calculator from Minnesota Public Drainage Manual

[g] Water quality volume to be treated per unit of 2-panels in portrait; Solar Panel Calculator from Minnesota Public Drainage Manual

[h] Computed by Solar Panel Calculator from Minnesota Public Drainage Manual

[i] Volume below crest of spillway from proposed stormwater basin

HydroCAD Analysis: Existing Conditions



Subcat Reach Pond Link

Routing Diagram for 42496.00 HydroCAD Existing
Prepared by VHB, Printed 12/2/2019
HydroCAD® 10.00-22 s/n 01038 © 2018 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
70.153	60	Woods, Fair, HSG B (1, 2, 2A, 3, 3A, 4, 5, 6, 6A, 6B, 6C, 7, 7A, 8, 8A, 9, 9A, 10, 10A, 11, 11A, 12, 13.1, 13.2, 13.3, 14, 16, 16A)
3.273	79	Woods, Fair, HSG D (2A, 3, 3A, 4, 6, 6A, 13.1)
73.426	**61**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
70.153	HSG B	1, 2, 2A, 3, 3A, 4, 5, 6, 6A, 6B, 6C, 7, 7A, 8, 8A, 9, 9A, 10, 10A, 11, 11A, 12, 13.1, 13.2, 13.3, 14, 16, 16A
0.000	HSG C	
3.273	HSG D	2A, 3, 3A, 4, 6, 6A, 13.1
0.000	Other	
73.426		**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	70.153	0.000	3.273	0.000	73.426	Woods, Fair	1, 2, 2A, 3, 3A, 4, 5, 6, 6A, 6B, 6C, 7, 7A, 8, 8A, 9, 9A, 10, 10A, 11, 11A, 12, 13.1, 13.2, 13.3, 14, 16, 16A
0.000	**70.153**	**0.000**	**3.273**	**0.000**	**73.426**	**TOTAL AREA**	

2-Year Storm Event – Existing

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=3.006 ac 0.00% Impervious Runoff Depth>0.45"
Flow Length=540' Slope=0.0800 '/' Tc=12.6 min CN=60 Runoff=0.94 cfs 0.112 af

Subcatchment2: Subcat 2 Runoff Area=2.551 ac 0.00% Impervious Runoff Depth>0.44"
Flow Length=440' Tc=18.0 min CN=60 Runoff=0.72 cfs 0.094 af

Subcatchment2A: Subcat 2A Runoff Area=0.775 ac 0.00% Impervious Runoff Depth>0.74"
Tc=10.0 min CN=67 Runoff=0.56 cfs 0.048 af

Subcatchment3: Subcat 3 Runoff Area=2.550 ac 0.00% Impervious Runoff Depth>0.44"
Flow Length=700' Tc=19.2 min CN=60 Runoff=0.71 cfs 0.094 af

Subcatchment3A: Subcat 3A Runoff Area=0.324 ac 0.00% Impervious Runoff Depth>1.34"
Tc=10.0 min CN=78 Runoff=0.47 cfs 0.036 af

Subcatchment4: Subcat 4 Runoff Area=5.870 ac 0.00% Impervious Runoff Depth>0.60"
Flow Length=950' Tc=26.2 min CN=64 Runoff=2.27 cfs 0.293 af

Subcatchment5: Subcat 5 Runoff Area=2.637 ac 0.00% Impervious Runoff Depth>0.44"
Flow Length=510' Slope=0.0500 '/' Tc=15.1 min CN=60 Runoff=0.79 cfs 0.098 af

Subcatchment6: Subcat 6 Runoff Area=3.200 ac 0.00% Impervious Runoff Depth>0.65"
Flow Length=480' Slope=0.0700 '/' Tc=12.6 min CN=65 Runoff=1.79 cfs 0.172 af

Subcatchment6A: Subcat 6A Runoff Area=0.919 ac 0.00% Impervious Runoff Depth>0.79"
Tc=10.0 min CN=68 Runoff=0.72 cfs 0.060 af

Subcatchment6B: Subcat 6B Runoff Area=0.030 ac 0.00% Impervious Runoff Depth>0.45"
Tc=10.0 min CN=60 Runoff=0.01 cfs 0.001 af

Subcatchment6C: Subcat 6C Runoff Area=0.694 ac 0.00% Impervious Runoff Depth>0.45"
Tc=10.0 min CN=60 Runoff=0.23 cfs 0.026 af

Subcatchment7: Subcat 7 Runoff Area=1.170 ac 0.00% Impervious Runoff Depth>0.45"
Flow Length=300' Tc=10.5 min CN=60 Runoff=0.39 cfs 0.043 af

Subcatchment7A: Subcat 7A Runoff Area=0.202 ac 0.00% Impervious Runoff Depth>0.45"
Tc=10.0 min CN=60 Runoff=0.07 cfs 0.008 af

Subcatchment8: Subcat 8 Runoff Area=4.689 ac 0.00% Impervious Runoff Depth>0.44"
Flow Length=720' Tc=15.8 min CN=60 Runoff=1.38 cfs 0.174 af

Subcatchment8A: Subcat 8A Runoff Area=0.770 ac 0.00% Impervious Runoff Depth>0.45"
Tc=10.0 min CN=60 Runoff=0.26 cfs 0.029 af

Subcatchment9: Subcat 9 Runoff Area=1.520 ac 0.00% Impervious Runoff Depth>0.45"
Flow Length=310' Slope=0.0700 '/' Tc=10.5 min CN=60 Runoff=0.51 cfs 0.057 af

Subcatchment9A: Subcat 9A Runoff Area=0.285 ac 0.00% Impervious Runoff Depth>0.45"
Tc=10.0 min CN=60 Runoff=0.10 cfs 0.011 af

Subcatchment10: Subcat 10 Runoff Area=2.304 ac 0.00% Impervious Runoff Depth>0.44"
Flow Length=490' Tc=17.5 min CN=60 Runoff=0.66 cfs 0.085 af

Subcatchment10A: Subcat 10A Runoff Area=0.287 ac 0.00% Impervious Runoff Depth>0.45"
Tc=10.0 min CN=60 Runoff=0.10 cfs 0.011 af

Subcatchment11: Subcat 11 Runoff Area=1.127 ac 0.00% Impervious Runoff Depth>0.45"
Flow Length=250' Slope=0.1000 '/' Tc=8.3 min CN=60 Runoff=0.41 cfs 0.042 af

Subcatchment11A: Subcat 11A Runoff Area=0.428 ac 0.00% Impervious Runoff Depth>0.45"
Tc=10.0 min CN=60 Runoff=0.14 cfs 0.016 af

Subcatchment12: Subcat 12 Runoff Area=3.677 ac 0.00% Impervious Runoff Depth>0.45"
Flow Length=590' Slope=0.0900 '/' Tc=12.5 min CN=60 Runoff=1.16 cfs 0.137 af

Subcatchment13.1: Subcat 13.1 Runoff Area=3.118 ac 0.00% Impervious Runoff Depth>0.45"
Flow Length=320' Slope=0.0800 '/' Tc=10.0 min CN=60 Runoff=1.05 cfs 0.116 af

Subcatchment13.2: Subcat 13.2 Runoff Area=7.029 ac 0.00% Impervious Runoff Depth>0.44"
Flow Length=800' Tc=16.0 min CN=60 Runoff=2.06 cfs 0.260 af

Subcatchment13.3: Subcat 13.3 Runoff Area=2.278 ac 0.00% Impervious Runoff Depth>0.45"
Flow Length=510' Slope=0.0600 '/' Tc=14.0 min CN=60 Runoff=0.70 cfs 0.085 af

Subcatchment14: Subcat 14 Runoff Area=4.438 ac 0.00% Impervious Runoff Depth>0.45"
Flow Length=500' Tc=13.4 min CN=60 Runoff=1.37 cfs 0.165 af

Subcatchment16: Subcat 16 Runoff Area=16.918 ac 0.00% Impervious Runoff Depth>0.44"
Flow Length=1,050' Tc=39.2 min CN=60 Runoff=3.57 cfs 0.617 af

Subcatchment16A: Subcat 16A Runoff Area=0.630 ac 0.00% Impervious Runoff Depth>0.45"
Tc=10.0 min CN=60 Runoff=0.21 cfs 0.023 af

Reach 13.1R: Reach 13.1 Avg. Flow Depth=0.03' Max Vel=0.92 fps Inflow=0.09 cfs 0.026 af
n=0.035 L=500.0' S=0.0684 '/' Capacity=0.96 cfs Outflow=0.09 cfs 0.024 af

Pond 13.1P: Pond 13.1 Peak Elev=224.21' Storage=3,971 cf Inflow=1.05 cfs 0.116 af
Outflow=0.09 cfs 0.026 af

Pond 13.2P: Pond 13.2 Peak Elev=189.40' Storage=4,210 cf Inflow=2.06 cfs 0.260 af
Discarded=0.39 cfs 0.214 af Primary=0.00 cfs 0.000 af Outflow=0.39 cfs 0.214 af

Link 13: 13 Inflow=0.70 cfs 0.109 af
Primary=0.70 cfs 0.109 af

Total Runoff Area = 73.426 ac Runoff Volume = 2.912 af Average Runoff Depth = 0.48"
100.00% Pervious = 73.426 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1: Subcat 1

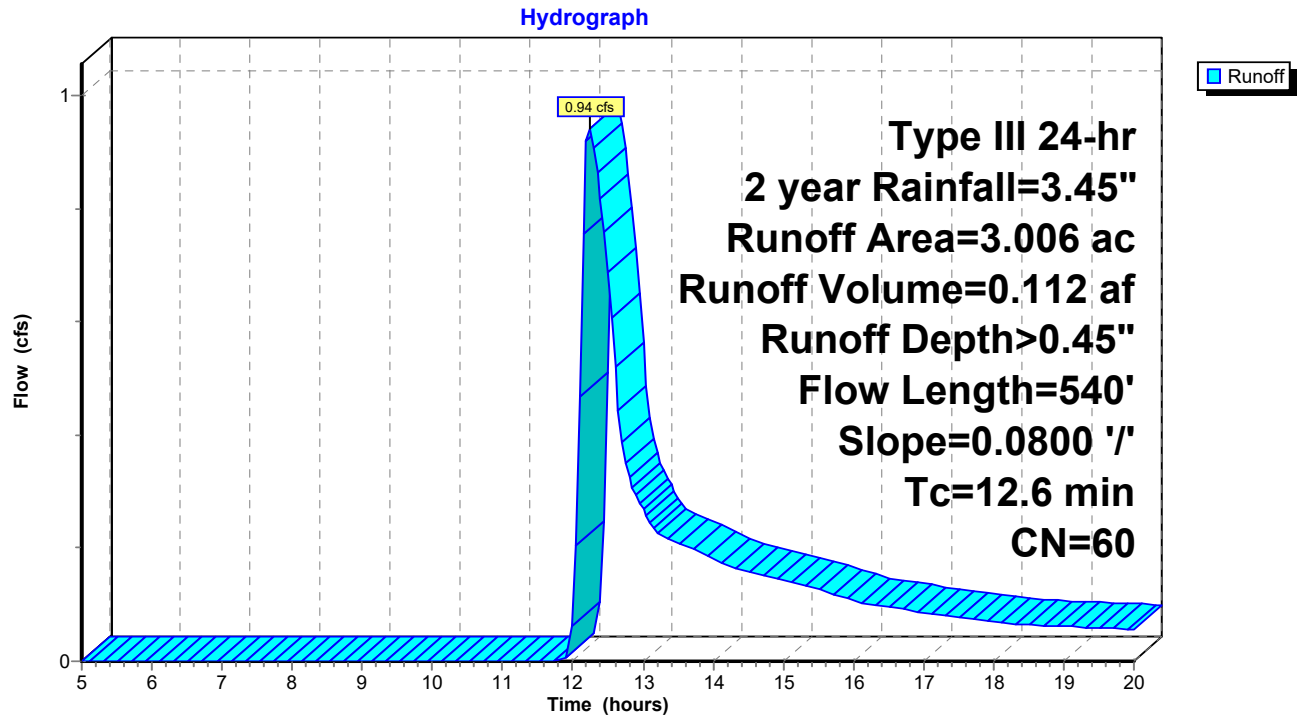
Runoff = 0.94 cfs @ 12.24 hrs, Volume= 0.112 af, Depth> 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
3.005	60	Woods, Fair, HSG B
3.006	60	Weighted Average
3.006		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
5.8	490	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.6	540	Total			

Subcatchment 1: Subcat 1



Summary for Subcatchment 2: Subcat 2

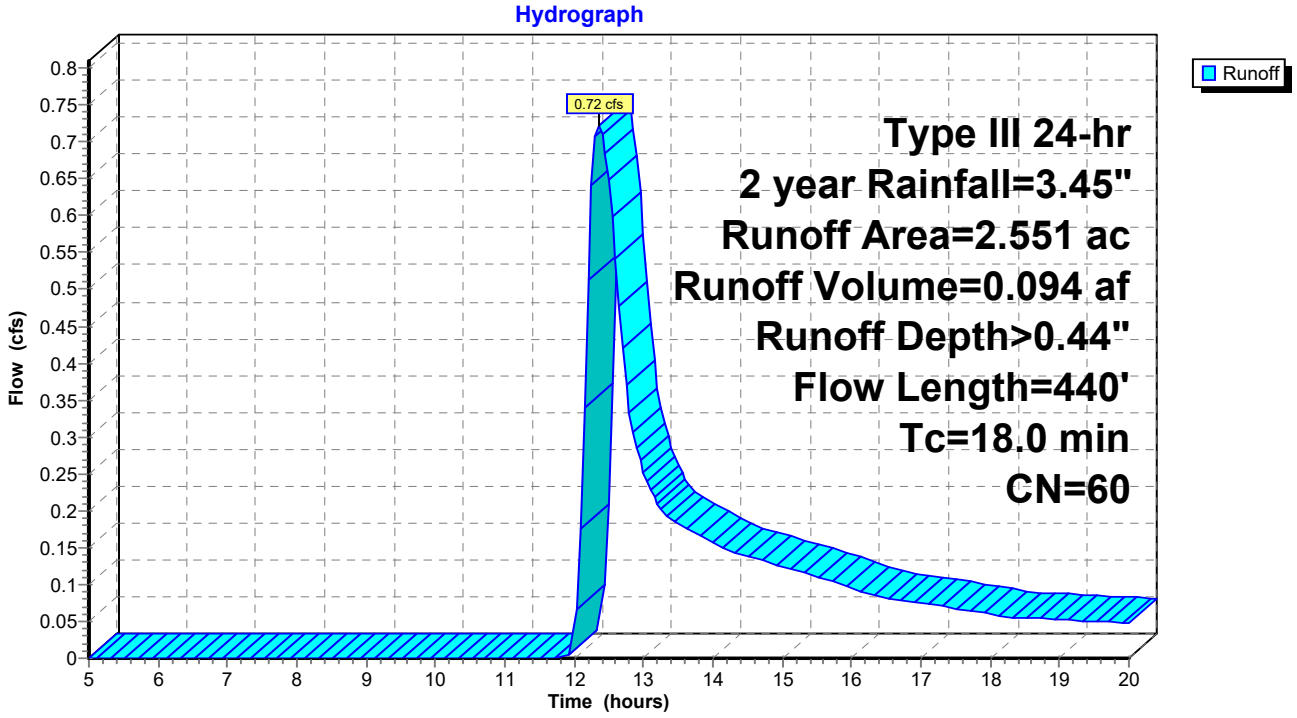
Runoff = 0.72 cfs @ 12.35 hrs, Volume= 0.094 af, Depth> 0.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
2.551	60	Woods, Fair, HSG B
2.551		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
5.7	340	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.4	50	0.2000	2.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
18.0	440	Total			

Subcatchment 2: Subcat 2



Summary for Subcatchment 2A: Subcat 2A

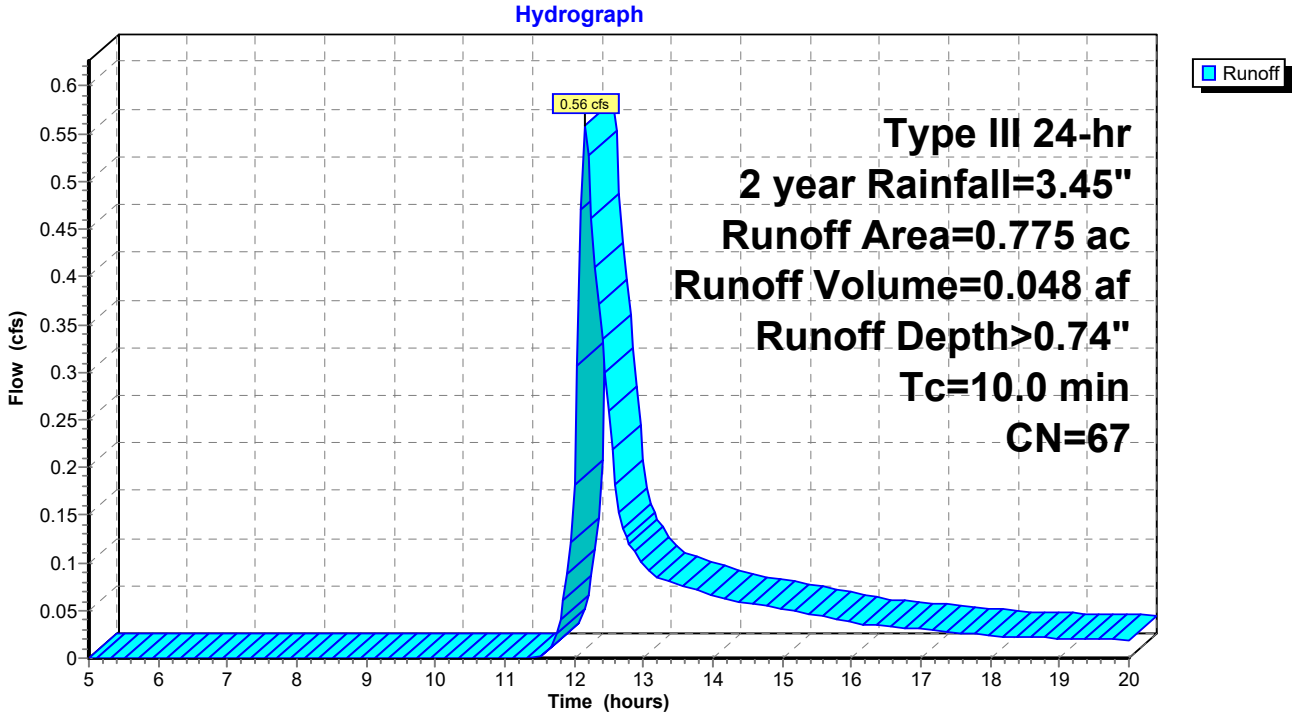
Runoff = 0.56 cfs @ 12.16 hrs, Volume= 0.048 af, Depth> 0.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.488	60	Woods, Fair, HSG B
0.287	79	Woods, Fair, HSG D
0.775	67	Weighted Average
0.775		100.00% Pervious Area

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

Subcatchment 2A: Subcat 2A



Summary for Subcatchment 3: Subcat 3

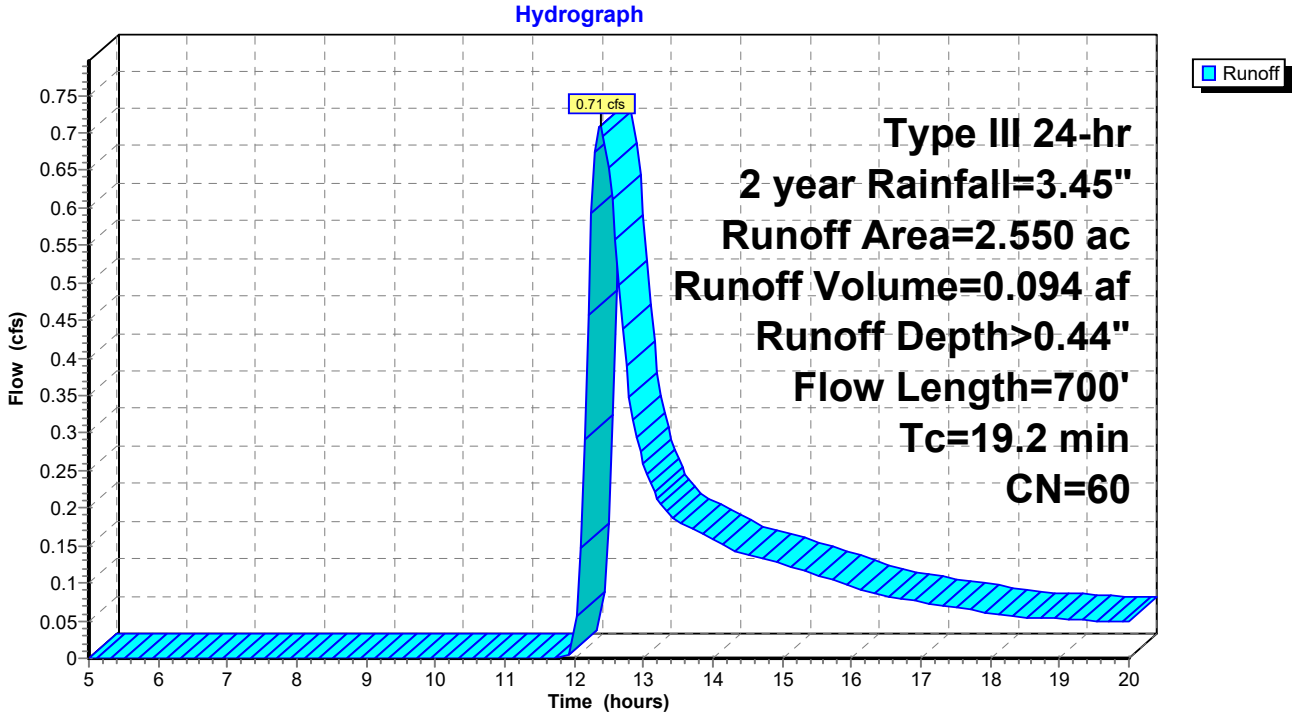
Runoff = 0.71 cfs @ 12.37 hrs, Volume= 0.094 af, Depth> 0.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
2.515	60	Woods, Fair, HSG B
0.034	79	Woods, Fair, HSG D
2.550	60	Weighted Average
2.550		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	50	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
8.3	500	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.9	150	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
19.2	700	Total			

Subcatchment 3: Subcat 3



Summary for Subcatchment 3A: Subcat 3A

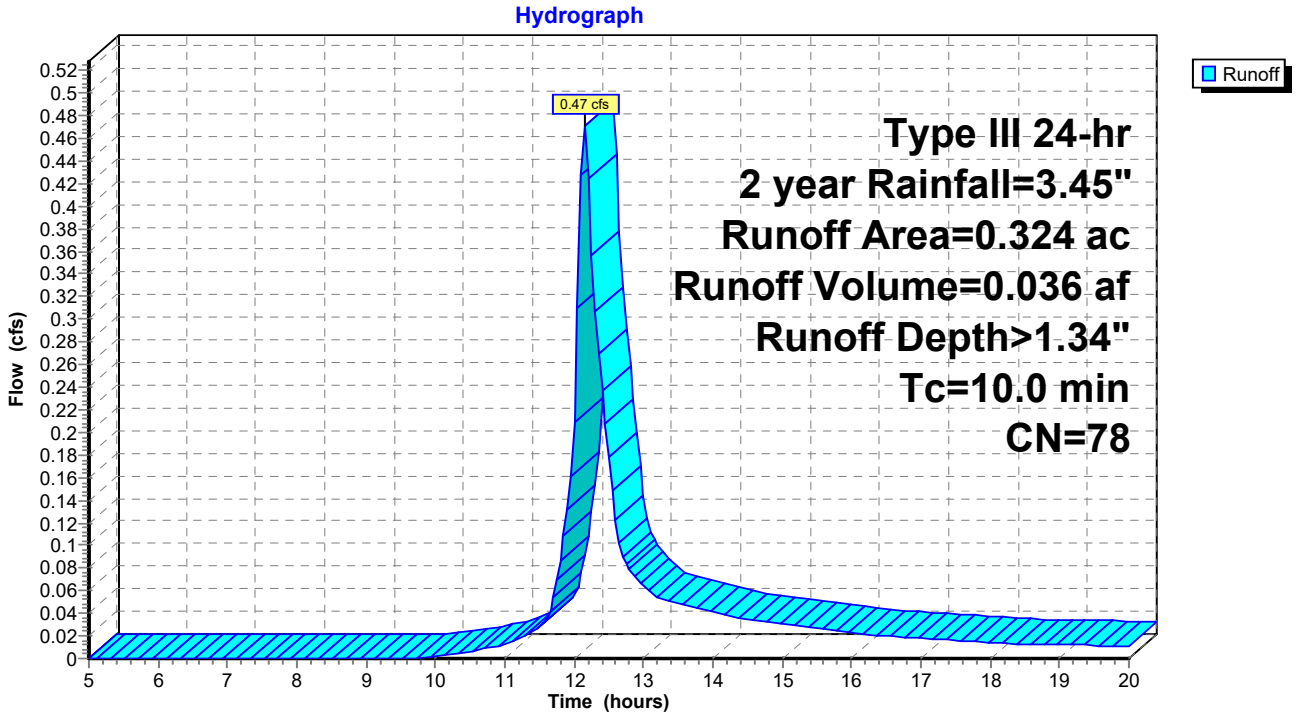
Runoff = 0.47 cfs @ 12.15 hrs, Volume= 0.036 af, Depth> 1.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.008	60	Woods, Fair, HSG B
0.002	60	Woods, Fair, HSG B
0.315	79	Woods, Fair, HSG D
0.324	78	Weighted Average
0.324		100.00% Pervious Area

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

Subcatchment 3A: Subcat 3A



Summary for Subcatchment 4: Subcat 4

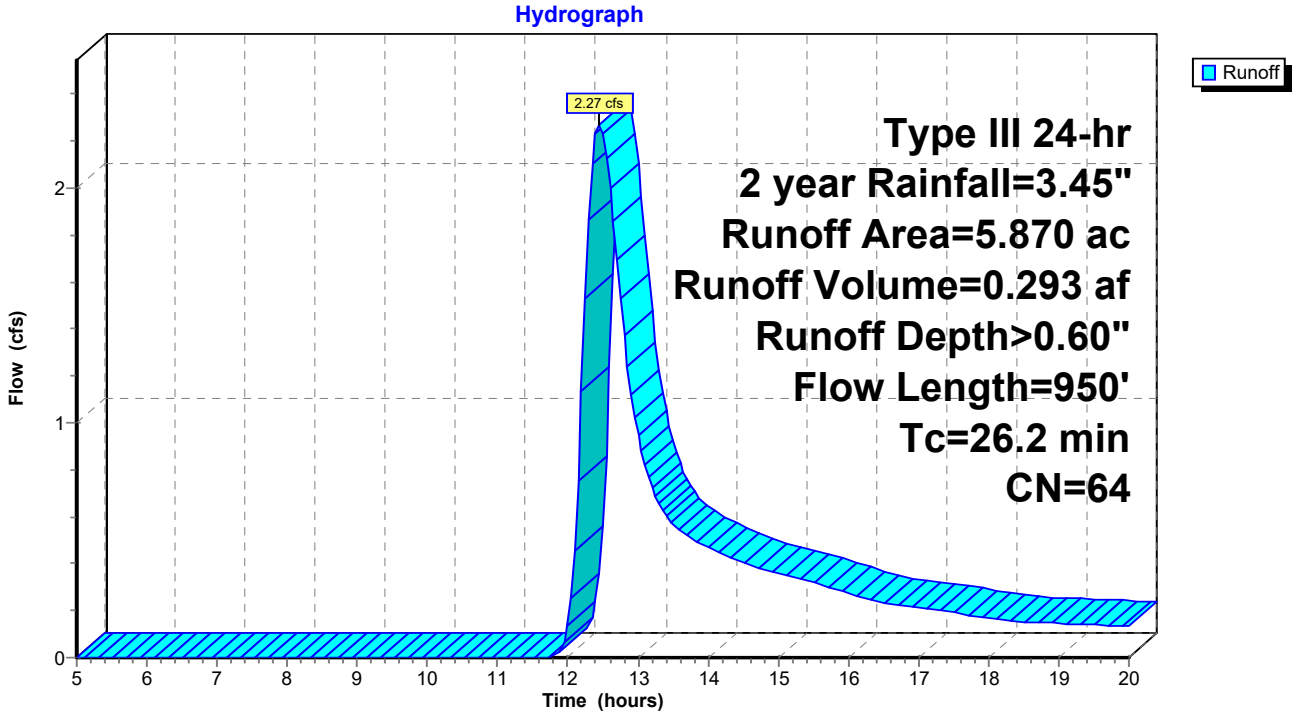
Runoff = 2.27 cfs @ 12.45 hrs, Volume= 0.293 af, Depth> 0.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
4.578	60	Woods, Fair, HSG B
1.292	79	Woods, Fair, HSG D
5.870	64	Weighted Average
5.870		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	50	0.0150	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
6.0	360	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.2	400	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.7	140	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
26.2	950	Total			

Subcatchment 4: Subcat 4



Summary for Subcatchment 5: Subcat 5

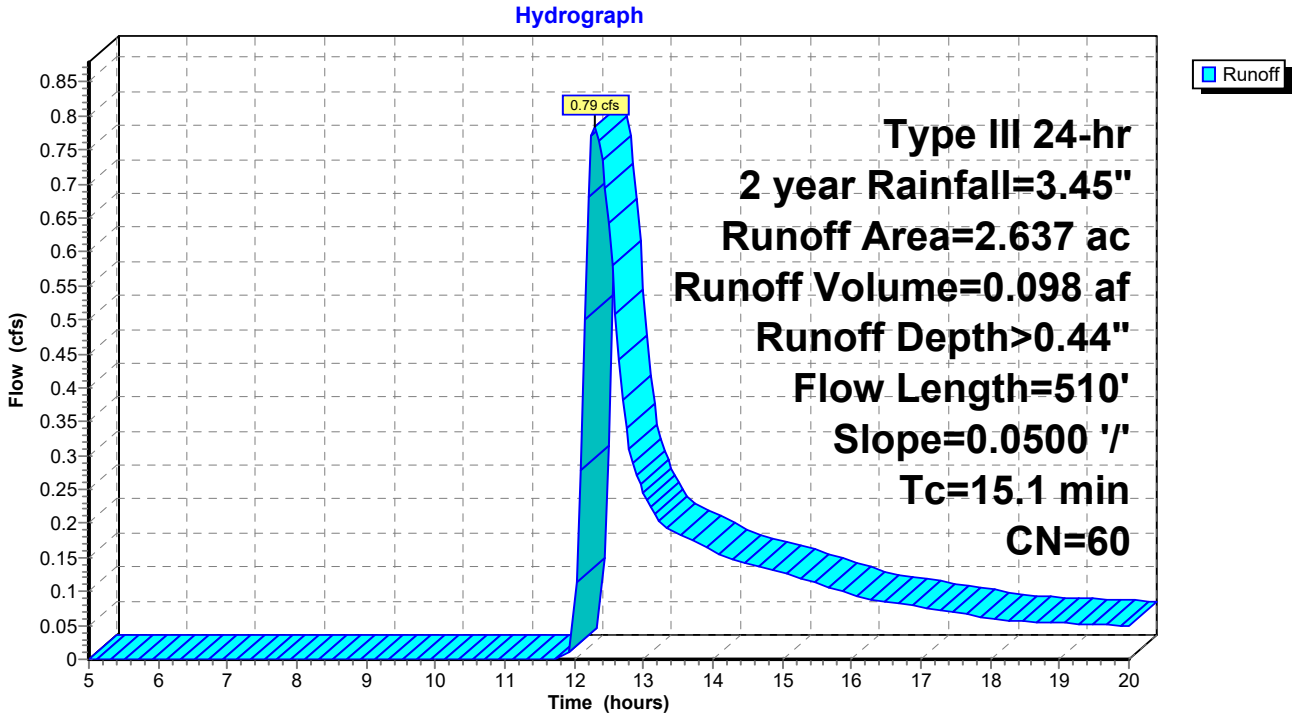
Runoff = 0.79 cfs @ 12.29 hrs, Volume= 0.098 af, Depth> 0.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
2.637	60	Woods, Fair, HSG B
2.637		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
6.9	460	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
15.1	510	Total			

Subcatchment 5: Subcat 5



Summary for Subcatchment 6: Subcat 6

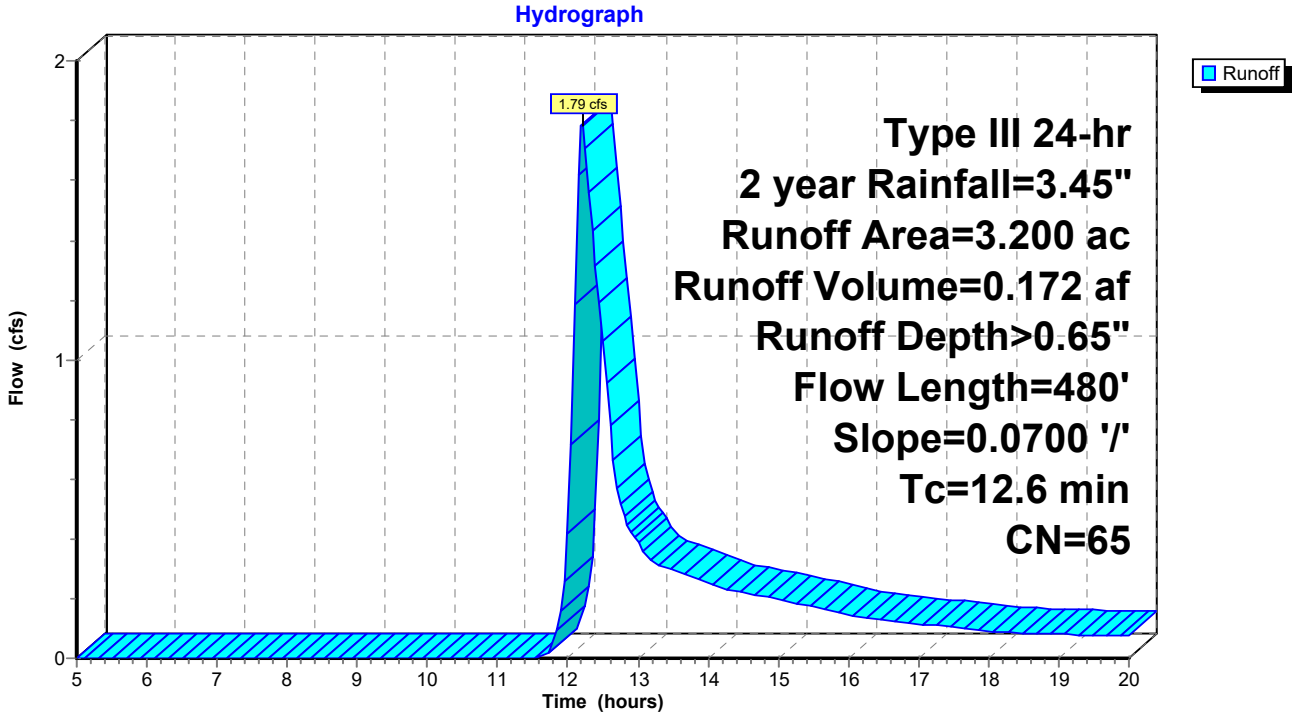
Runoff = 1.79 cfs @ 12.21 hrs, Volume= 0.172 af, Depth> 0.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
2.281	60	Woods, Fair, HSG B
0.919	79	Woods, Fair, HSG D
3.200	65	Weighted Average
3.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0700	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
5.4	430	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.6	480	Total			

Subcatchment 6: Subcat 6



Summary for Subcatchment 6A: Subcat 6A

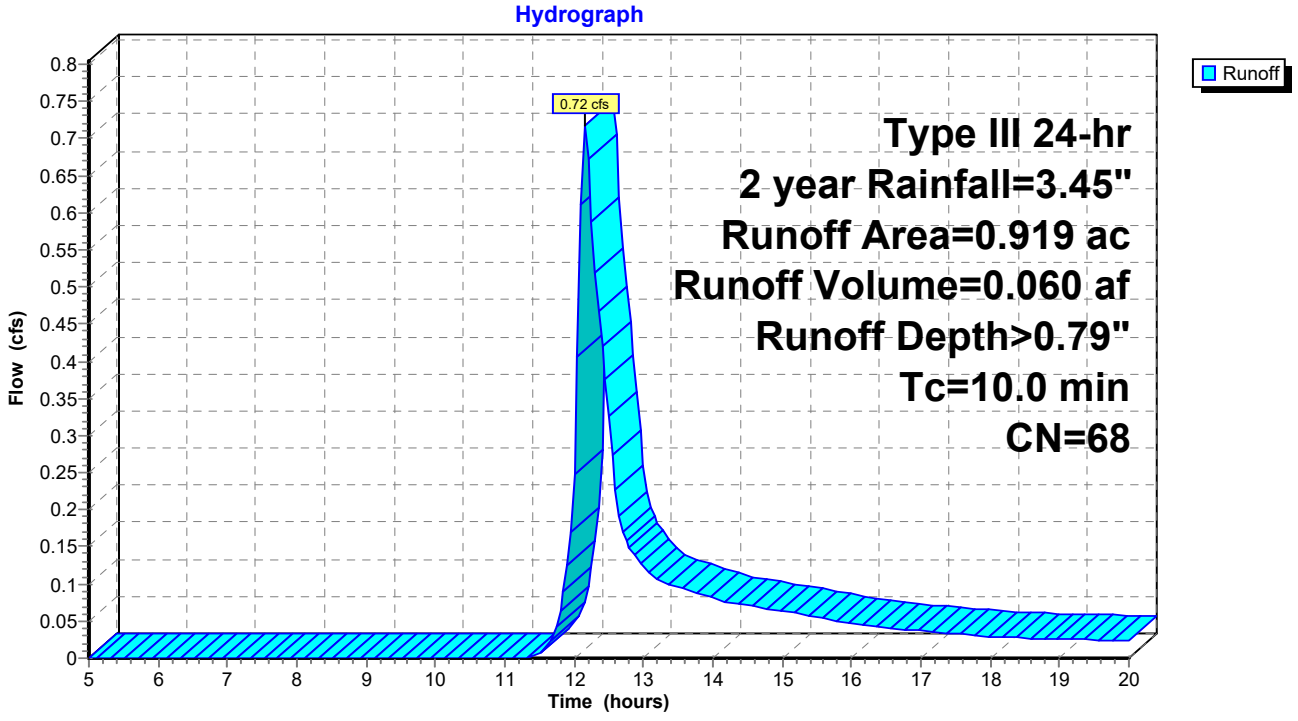
Runoff = 0.72 cfs @ 12.16 hrs, Volume= 0.060 af, Depth> 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.003	60	Woods, Fair, HSG B
0.517	60	Woods, Fair, HSG B
0.000	79	Woods, Fair, HSG D
0.400	79	Woods, Fair, HSG D
0.919	68	Weighted Average
0.919		100.00% Pervious Area

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

Subcatchment 6A: Subcat 6A



Summary for Subcatchment 6B: Subcat 6B

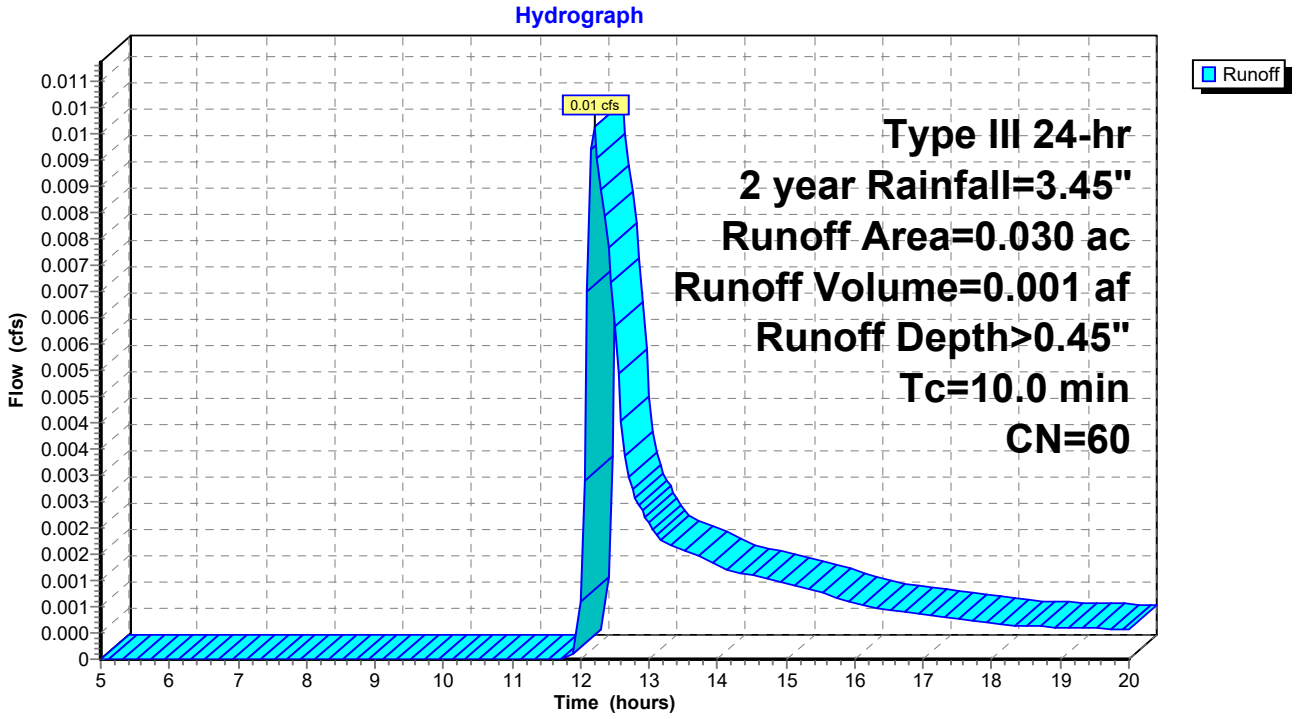
Runoff = 0.01 cfs @ 12.20 hrs, Volume= 0.001 af, Depth> 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.030	60	Woods, Fair, HSG B
0.030		100.00% Pervious Area

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

Subcatchment 6B: Subcat 6B



Summary for Subcatchment 6C: Subcat 6C

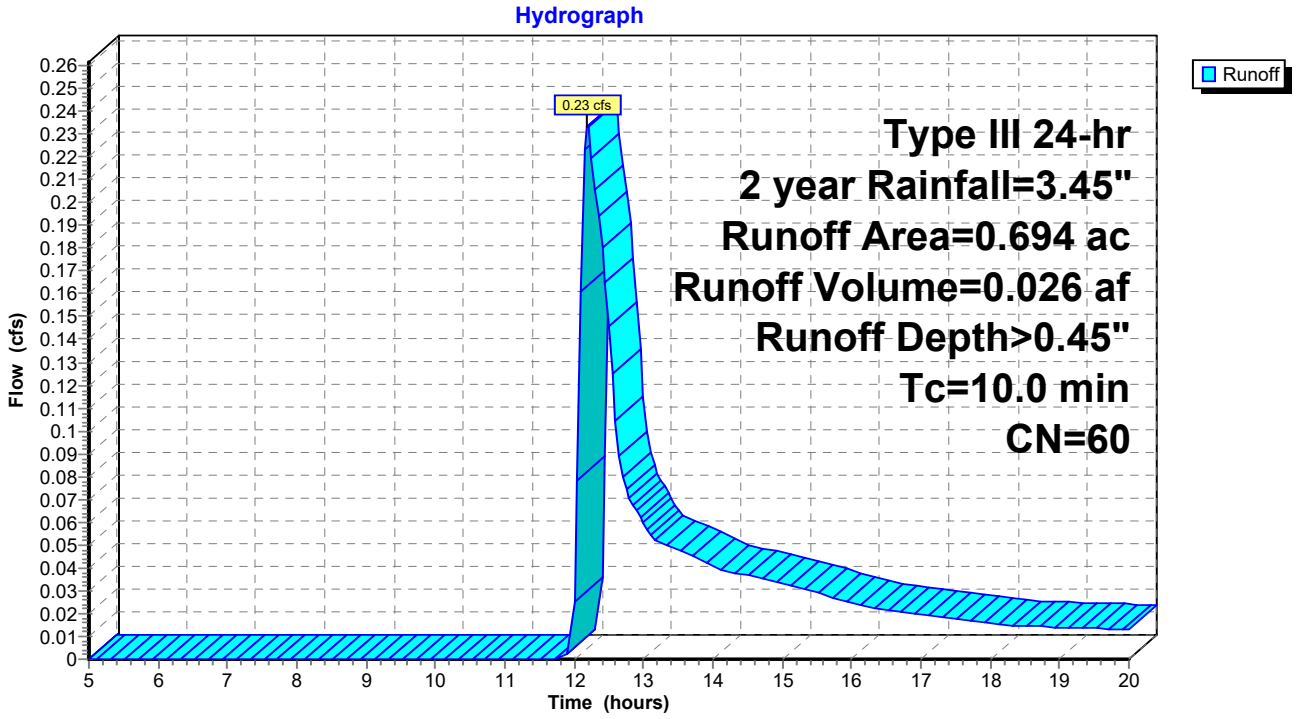
Runoff = 0.23 cfs @ 12.20 hrs, Volume= 0.026 af, Depth> 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.694	60	Woods, Fair, HSG B
0.694		100.00% Pervious Area

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

Subcatchment 6C: Subcat 6C



Summary for Subcatchment 7: Subcat 7

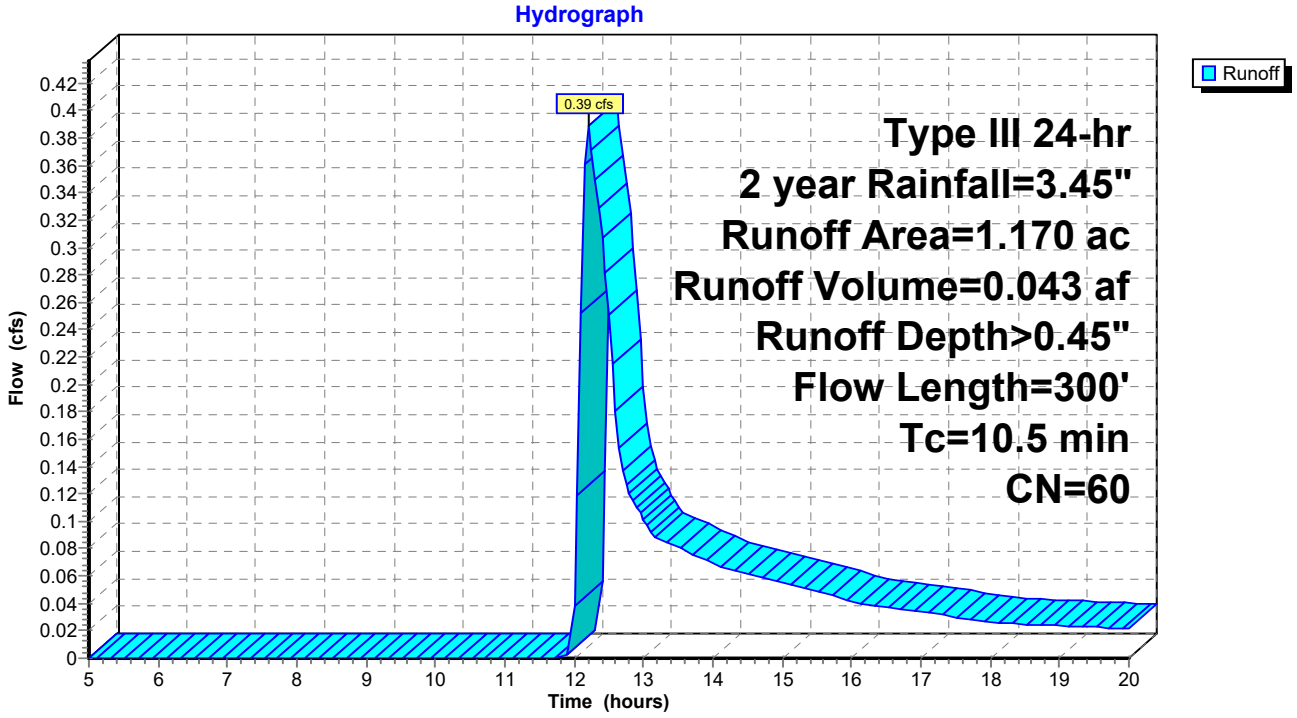
Runoff = 0.39 cfs @ 12.21 hrs, Volume= 0.043 af, Depth> 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
1.170	60	Woods, Fair, HSG B
1.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
1.8	150	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.9	100	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.5	300	Total			

Subcatchment 7: Subcat 7



Summary for Subcatchment 7A: Subcat 7A

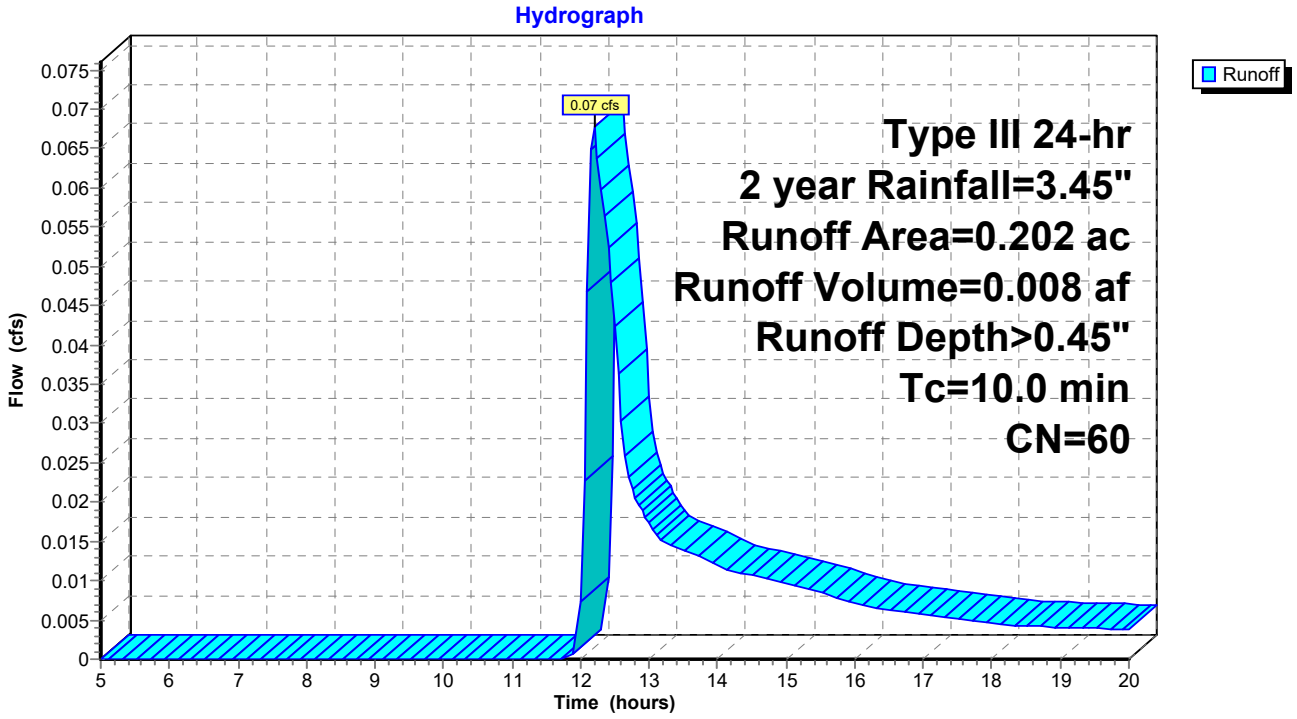
Runoff = 0.07 cfs @ 12.20 hrs, Volume= 0.008 af, Depth> 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.202	60	Woods, Fair, HSG B
0.202		100.00% Pervious Area

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

Subcatchment 7A: Subcat 7A



Summary for Subcatchment 8: Subcat 8

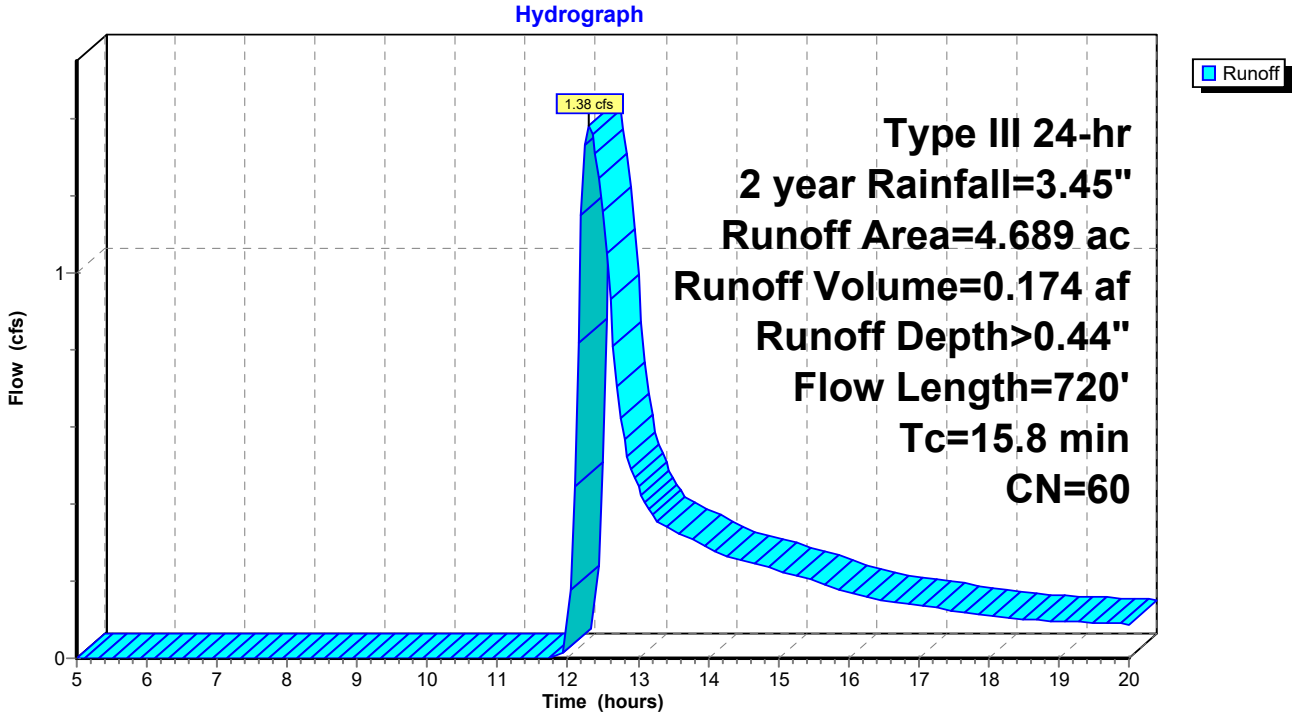
Runoff = 1.38 cfs @ 12.31 hrs, Volume= 0.174 af, Depth> 0.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
4.689	60	Woods, Fair, HSG B
4.689		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.1100	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
2.7	270	0.1100	1.66		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.1	400	0.0350	0.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
15.8	720	Total			

Subcatchment 8: Subcat 8



Summary for Subcatchment 8A: Subcat 8A

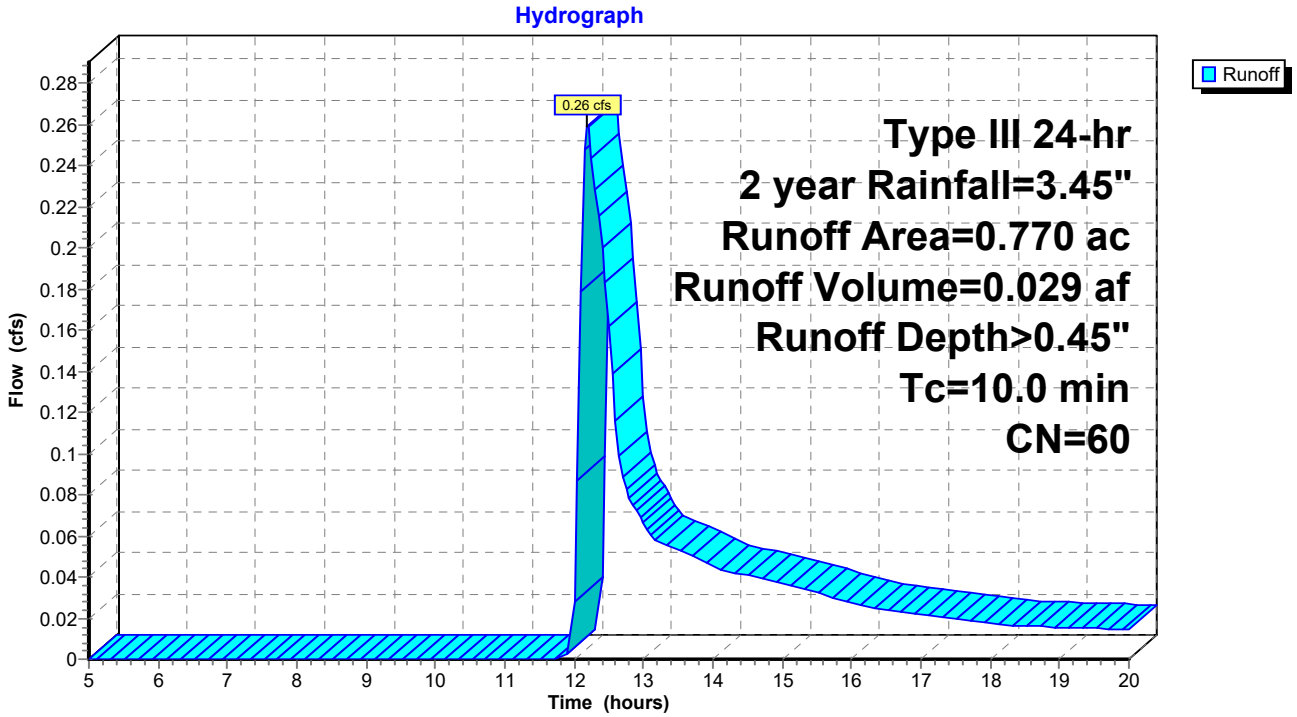
Runoff = 0.26 cfs @ 12.20 hrs, Volume= 0.029 af, Depth> 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.770	60	Woods, Fair, HSG B
0.770		100.00% Pervious Area

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

Subcatchment 8A: Subcat 8A



Summary for Subcatchment 9: Subcat 9

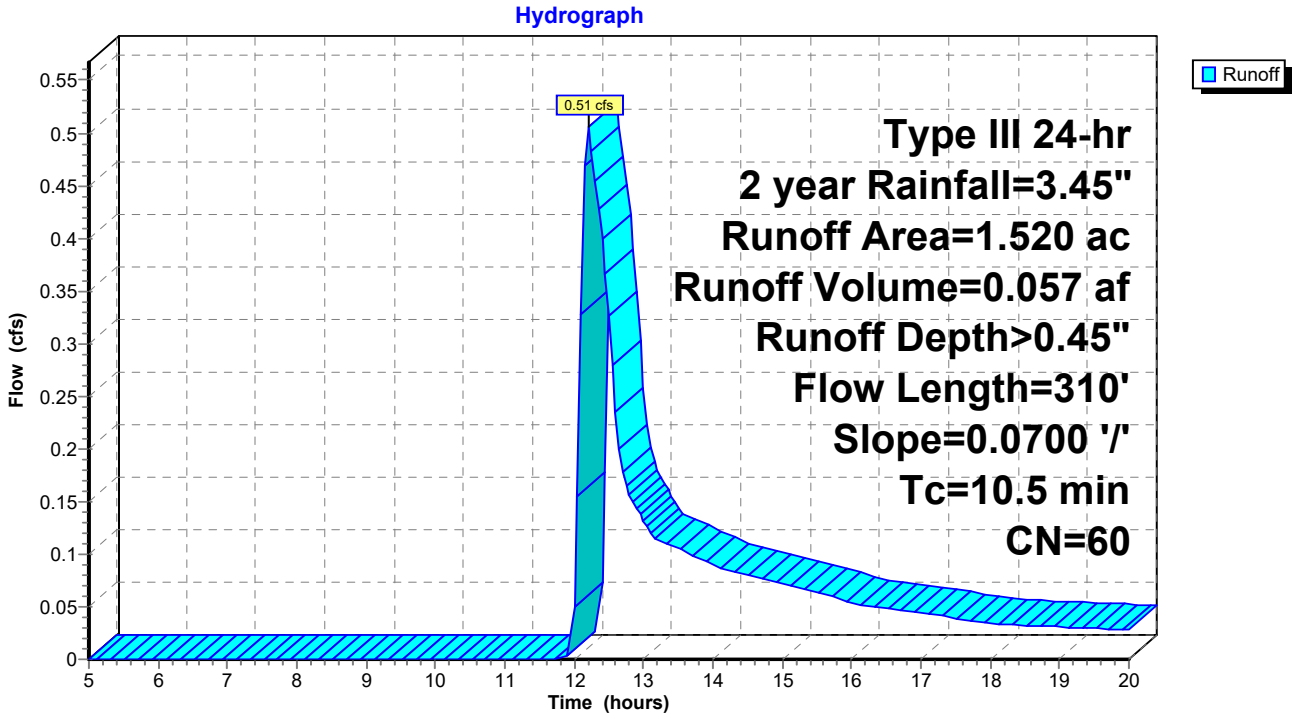
Runoff = 0.51 cfs @ 12.21 hrs, Volume= 0.057 af, Depth> 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
1.520	60	Woods, Fair, HSG B
1.520		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0700	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
3.3	260	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.5	310	Total			

Subcatchment 9: Subcat 9



Summary for Subcatchment 9A: Subcat 9A

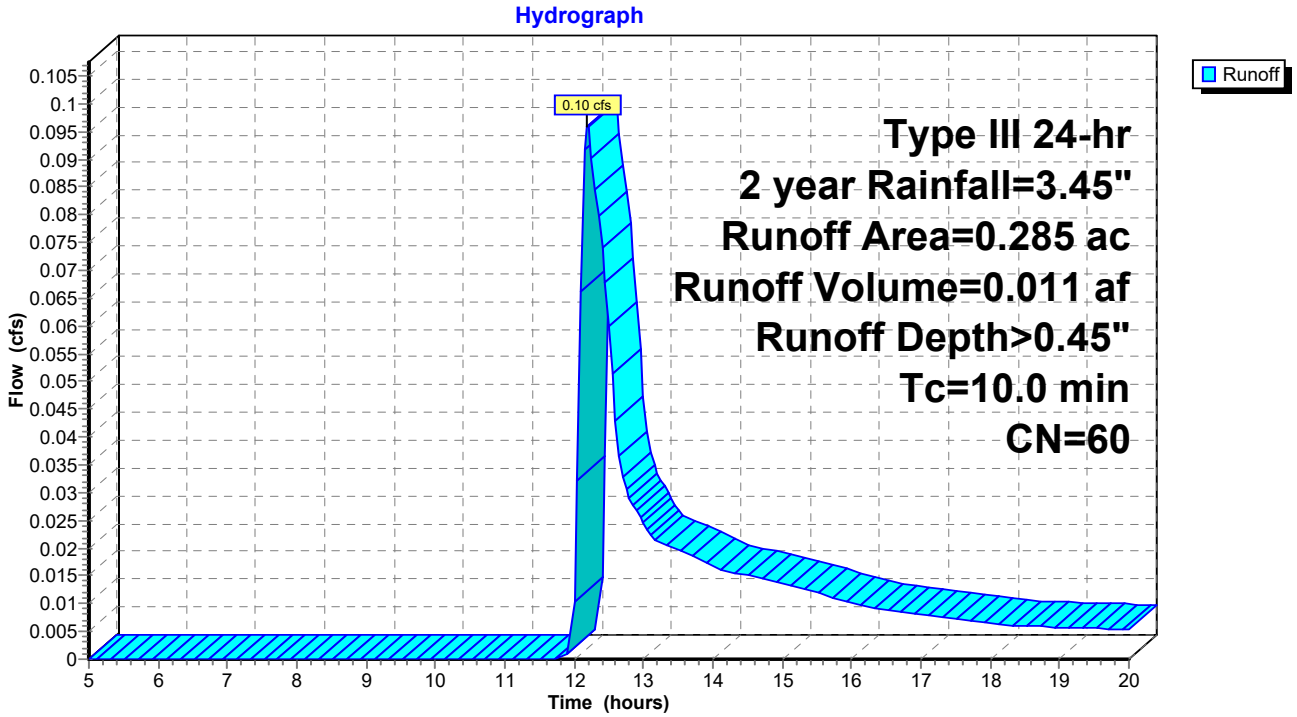
Runoff = 0.10 cfs @ 12.20 hrs, Volume= 0.011 af, Depth> 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.285	60	Woods, Fair, HSG B
0.285		100.00% Pervious Area

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

Subcatchment 9A: Subcat 9A



Summary for Subcatchment 10: Subcat 10

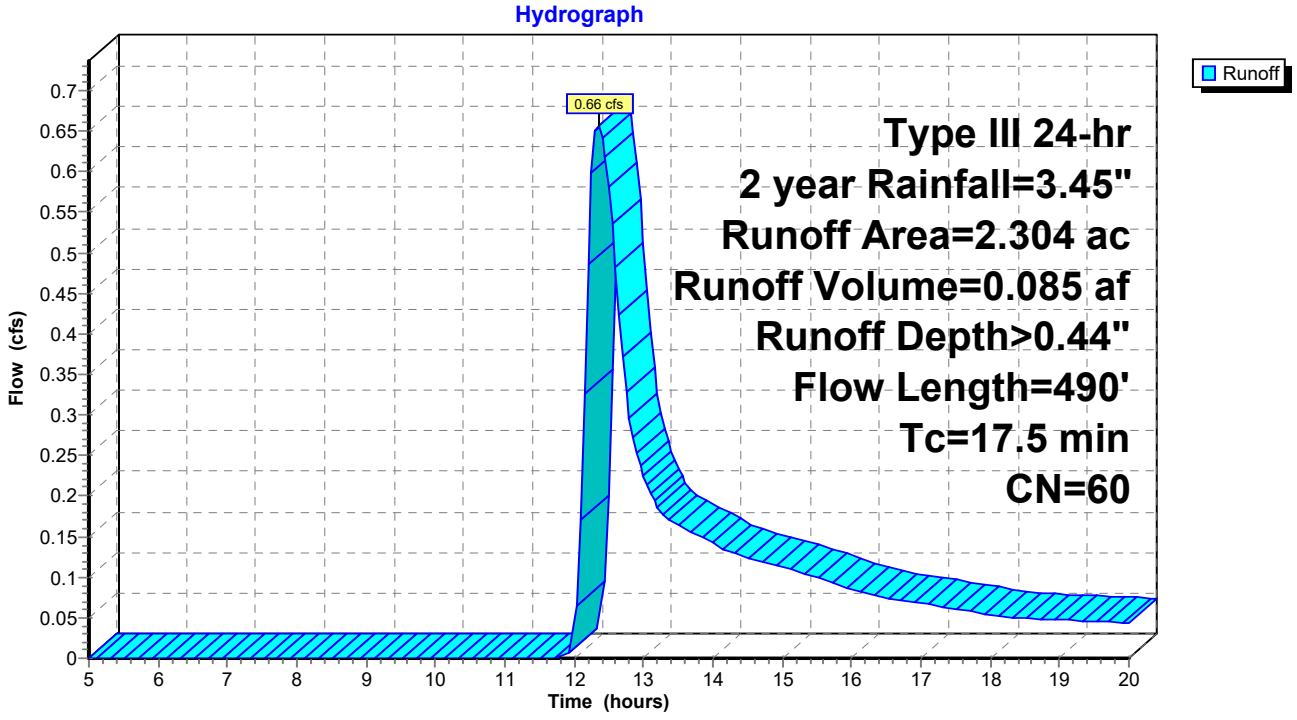
Runoff = 0.66 cfs @ 12.34 hrs, Volume= 0.085 af, Depth> 0.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
2.304	60	Woods, Fair, HSG B
2.304		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
2.8	270	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.8	170	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.5	490	Total			

Subcatchment 10: Subcat 10



Summary for Subcatchment 10A: Subcat 10A

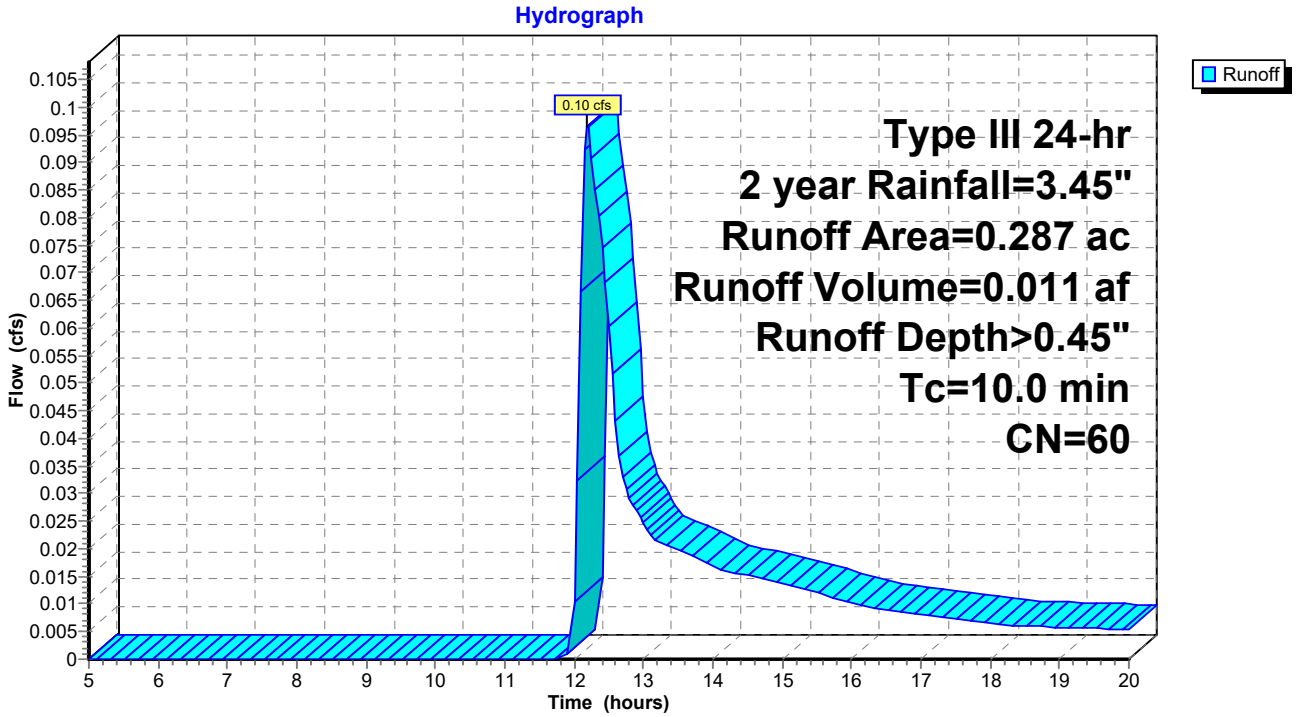
Runoff = 0.10 cfs @ 12.20 hrs, Volume= 0.011 af, Depth> 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.287	60	Woods, Fair, HSG B
0.287		100.00% Pervious Area

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

Subcatchment 10A: Subcat 10A



Summary for Subcatchment 11: Subcat 11

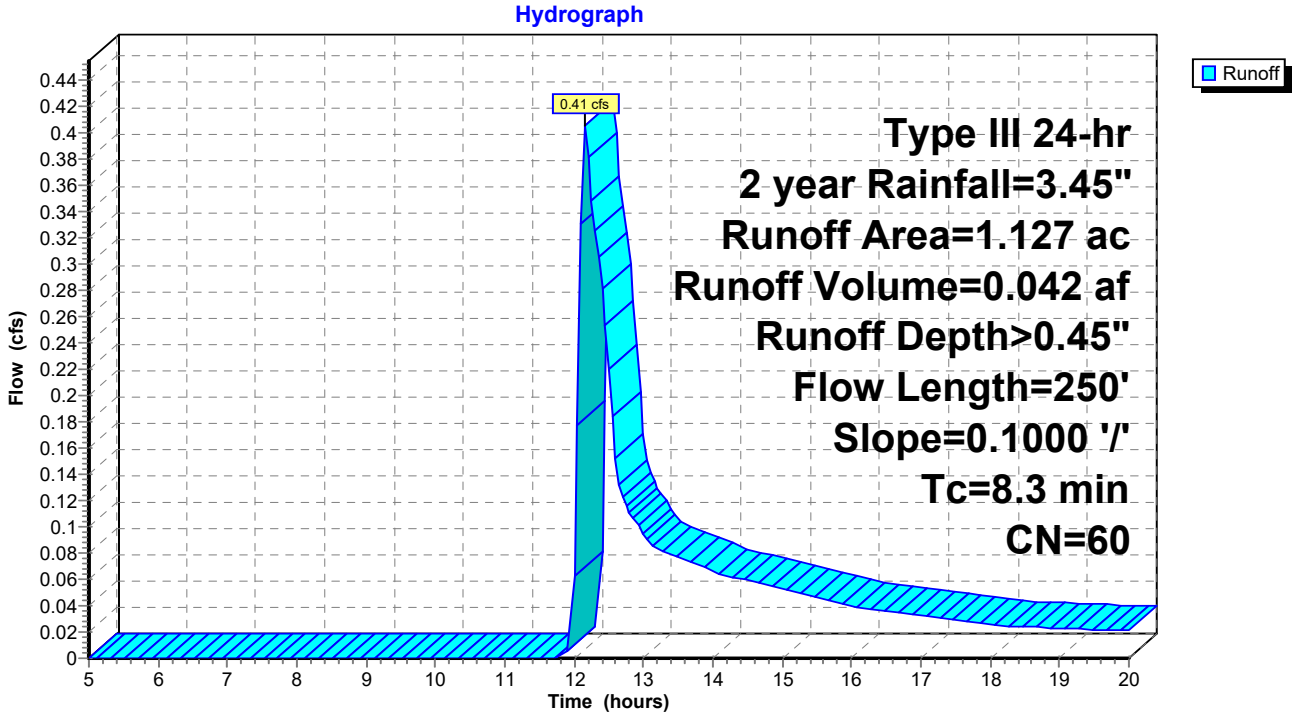
Runoff = 0.41 cfs @ 12.16 hrs, Volume= 0.042 af, Depth> 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
1.127	60	Woods, Fair, HSG B
1.127	60	Weighted Average
1.127		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.1000	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
2.1	200	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.3	250	Total			

Subcatchment 11: Subcat 11



Summary for Subcatchment 11A: Subcat 11A

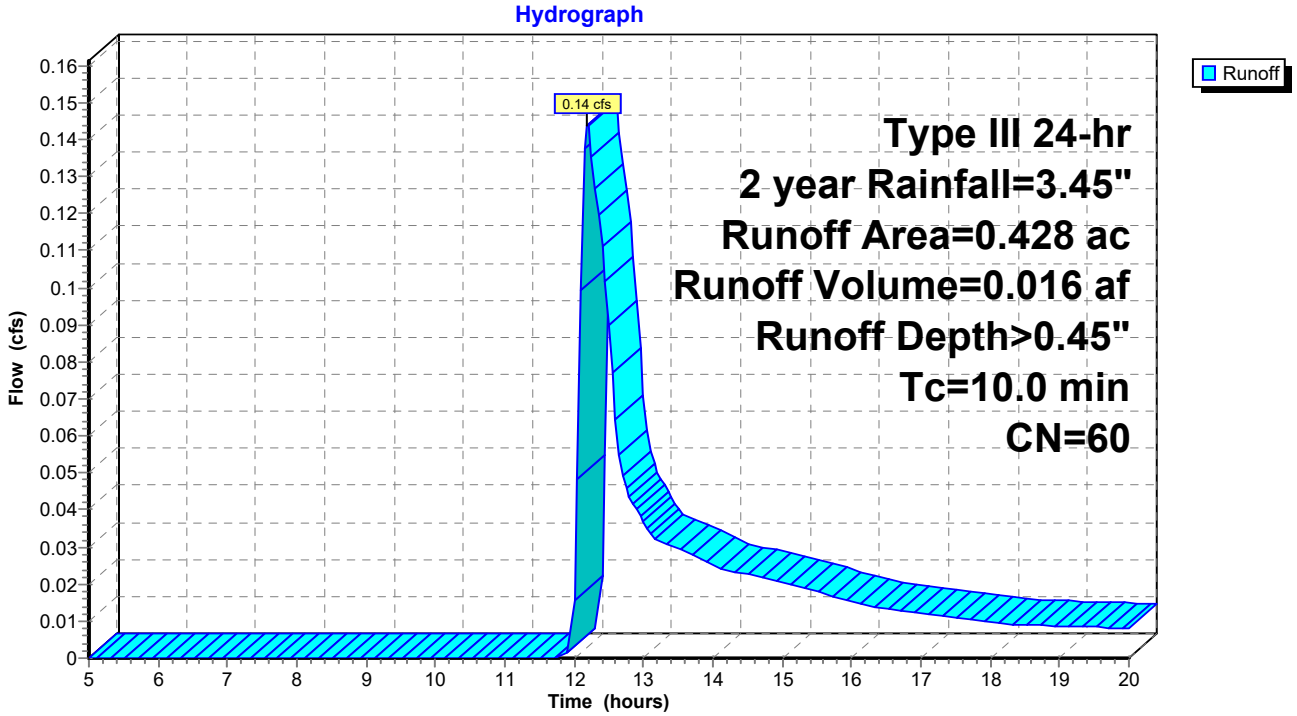
Runoff = 0.14 cfs @ 12.20 hrs, Volume= 0.016 af, Depth> 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
0.428	60	Woods, Fair, HSG B
0.428	60	Weighted Average
0.428		100.00% Pervious Area

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

Subcatchment 11A: Subcat 11A



Summary for Subcatchment 12: Subcat 12

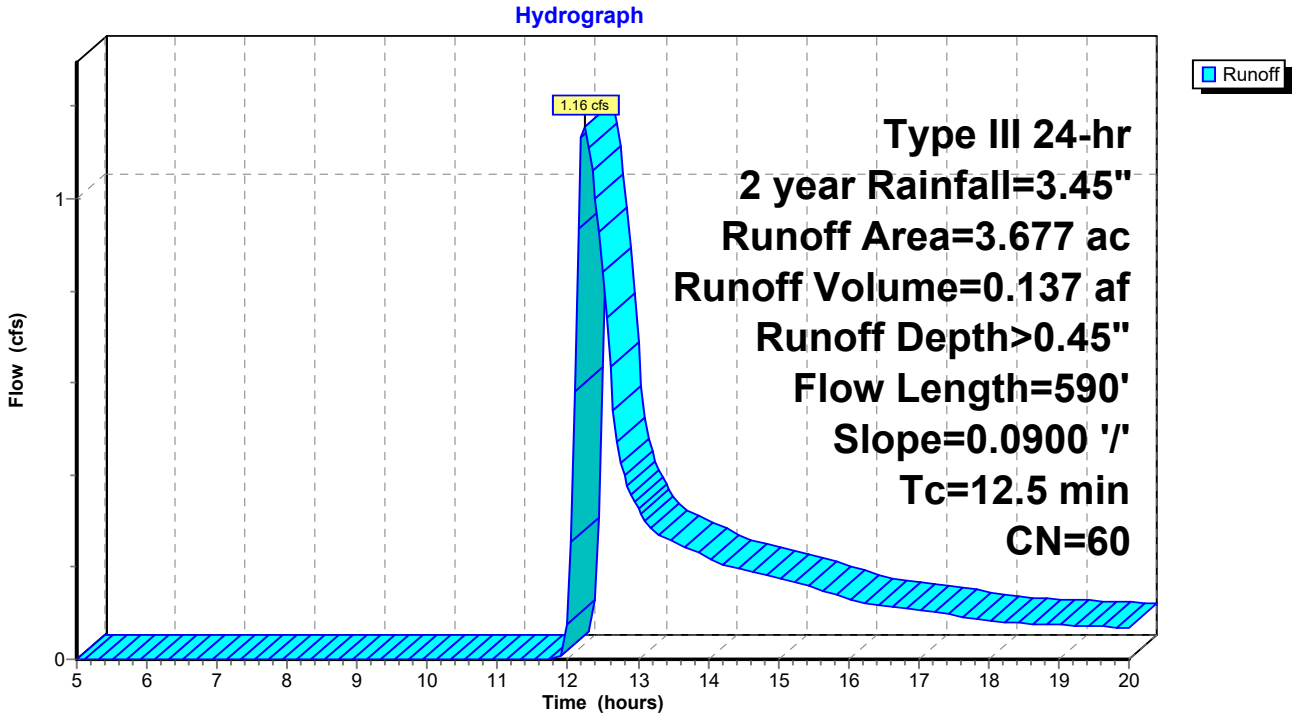
Runoff = 1.16 cfs @ 12.24 hrs, Volume= 0.137 af, Depth> 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
3.677	60	Woods, Fair, HSG B
3.677		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	50	0.0900	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
6.0	540	0.0900	1.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.5	590	Total			

Subcatchment 12: Subcat 12



Summary for Subcatchment 13.1: Subcat 13.1

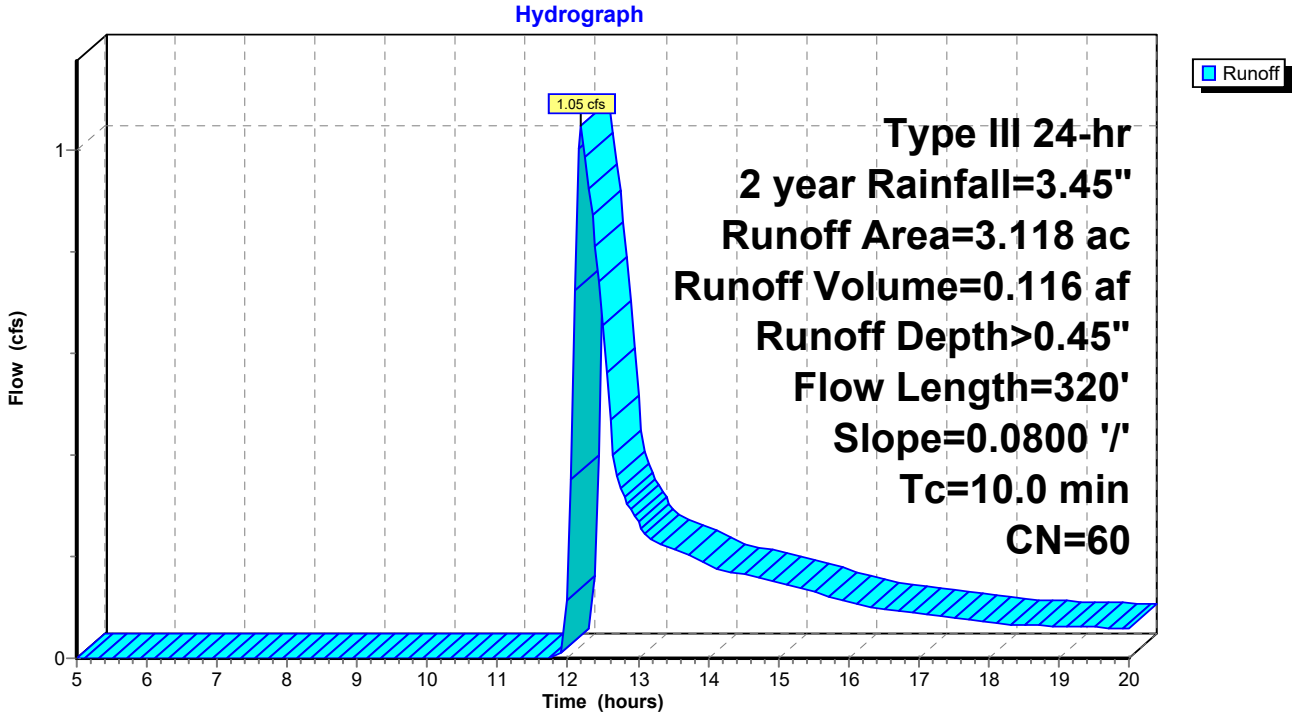
Runoff = 1.05 cfs @ 12.20 hrs, Volume= 0.116 af, Depth> 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
3.092	60	Woods, Fair, HSG B
0.026	79	Woods, Fair, HSG D
3.118	60	Weighted Average
3.118		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
3.2	270	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.0	320	Total			

Subcatchment 13.1: Subcat 13.1



Summary for Subcatchment 13.2: Subcat 13.2

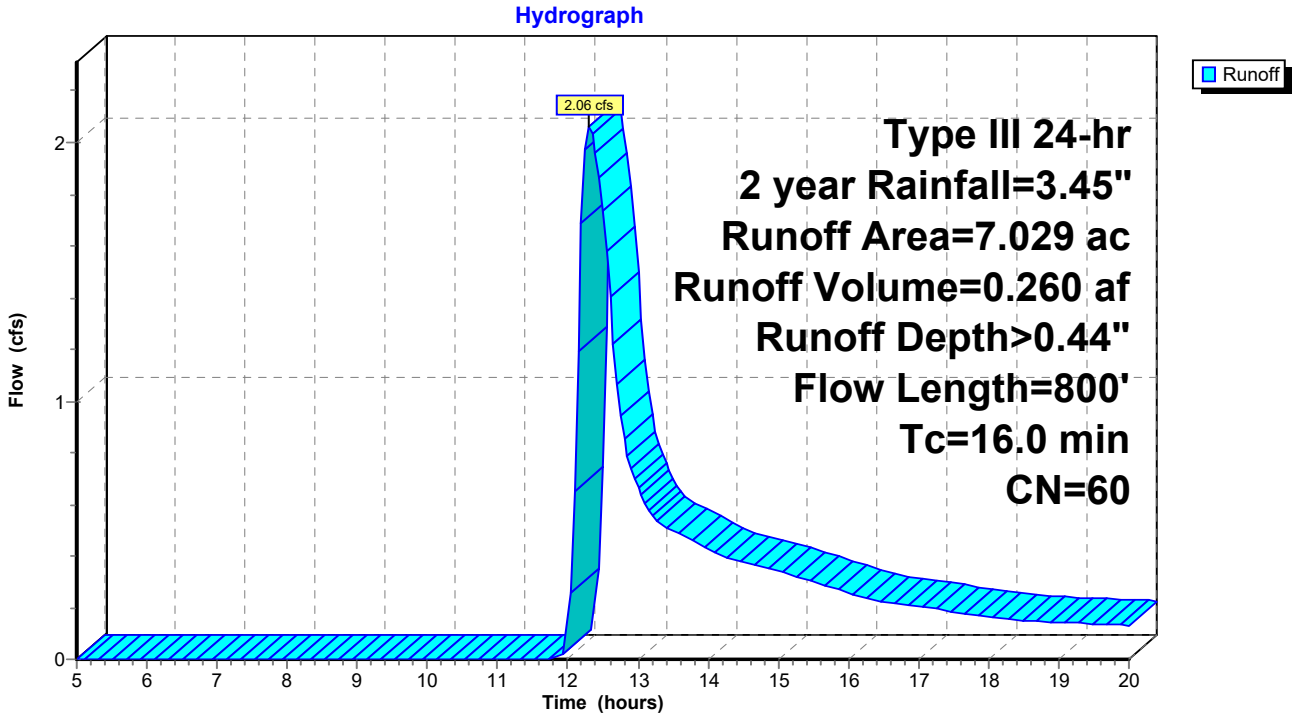
Runoff = 2.06 cfs @ 12.31 hrs, Volume= 0.260 af, Depth> 0.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
7.029	60	Woods, Fair, HSG B
7.029		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0700	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
8.8	750	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.0	800	Total			

Subcatchment 13.2: Subcat 13.2



Summary for Subcatchment 13.3: Subcat 13.3

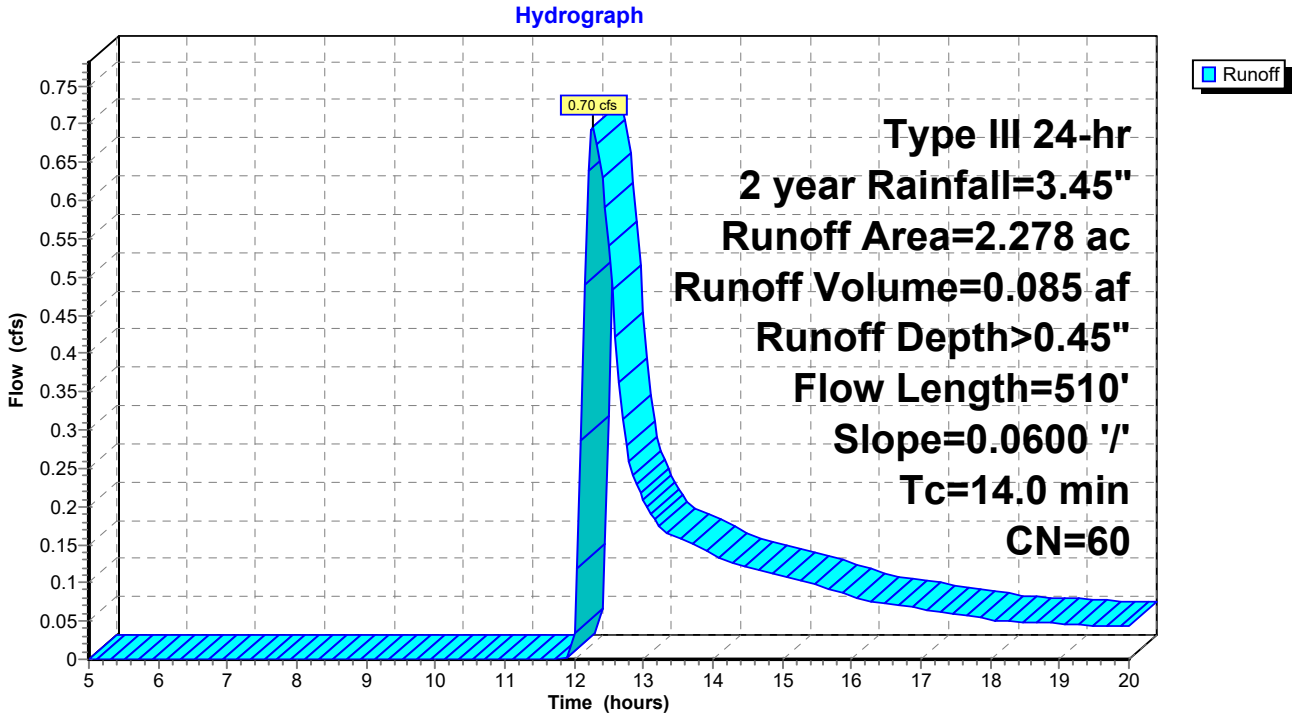
Runoff = 0.70 cfs @ 12.27 hrs, Volume= 0.085 af, Depth> 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
2.278	60	Woods, Fair, HSG B
2.278		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	50	0.0600	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
6.3	460	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
14.0	510	Total			

Subcatchment 13.3: Subcat 13.3



Summary for Subcatchment 14: Subcat 14

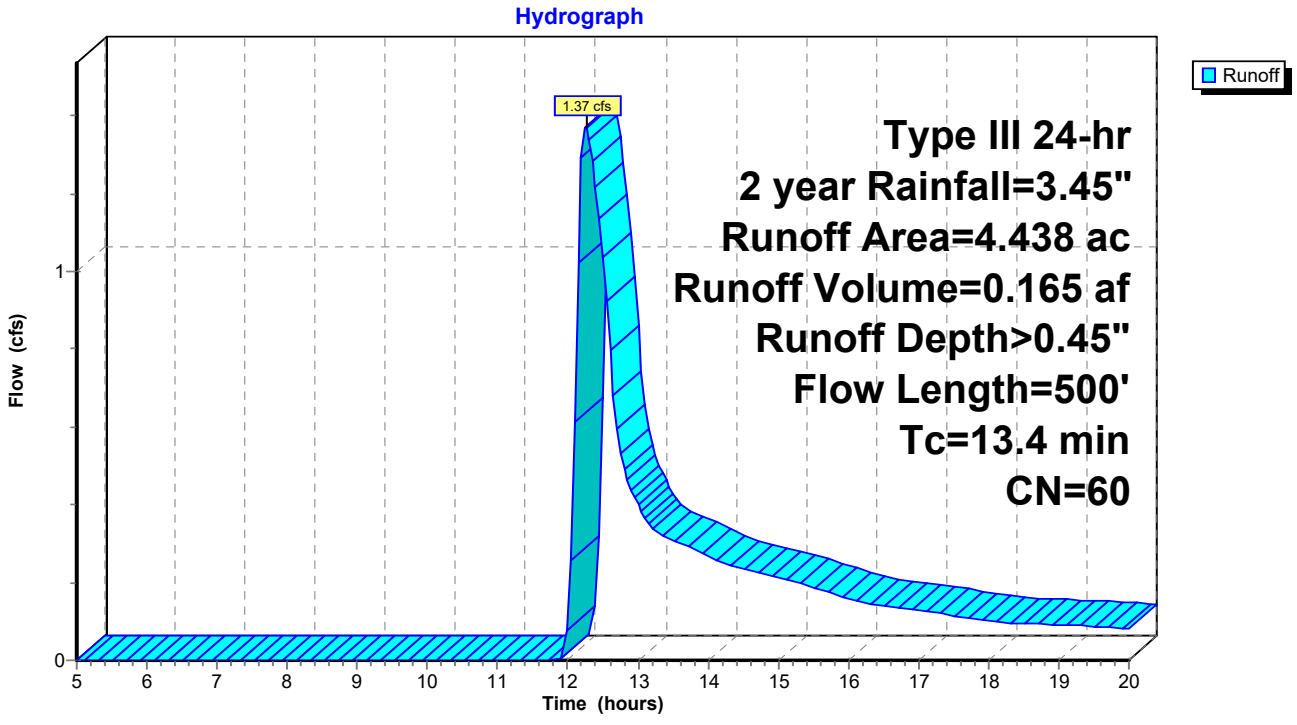
Runoff = 1.37 cfs @ 12.26 hrs, Volume= 0.165 af, Depth> 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
4.438	60	Woods, Fair, HSG B
4.438		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	50	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
1.9	160	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.7	180	0.1300	1.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.8	110	0.2000	2.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.4	500	Total			

Subcatchment 14: Subcat 14



Summary for Subcatchment 16: Subcat 16

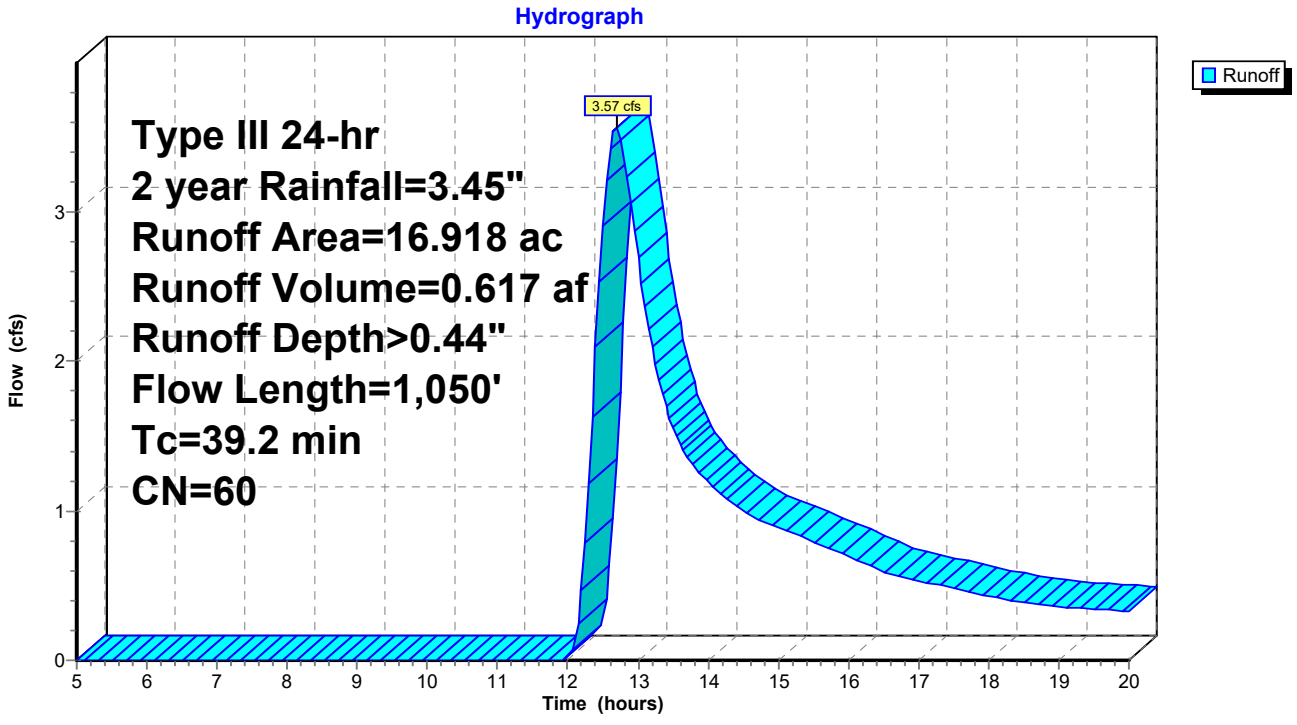
Runoff = 3.57 cfs @ 12.69 hrs, Volume= 0.617 af, Depth> 0.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
16.918	60	Woods, Fair, HSG B
16.918	60	Weighted Average
16.918		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	50	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
16.7	500	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.8	500	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
39.2	1,050	Total			

Subcatchment 16: Subcat 16



Summary for Subcatchment 16A: Subcat 16A

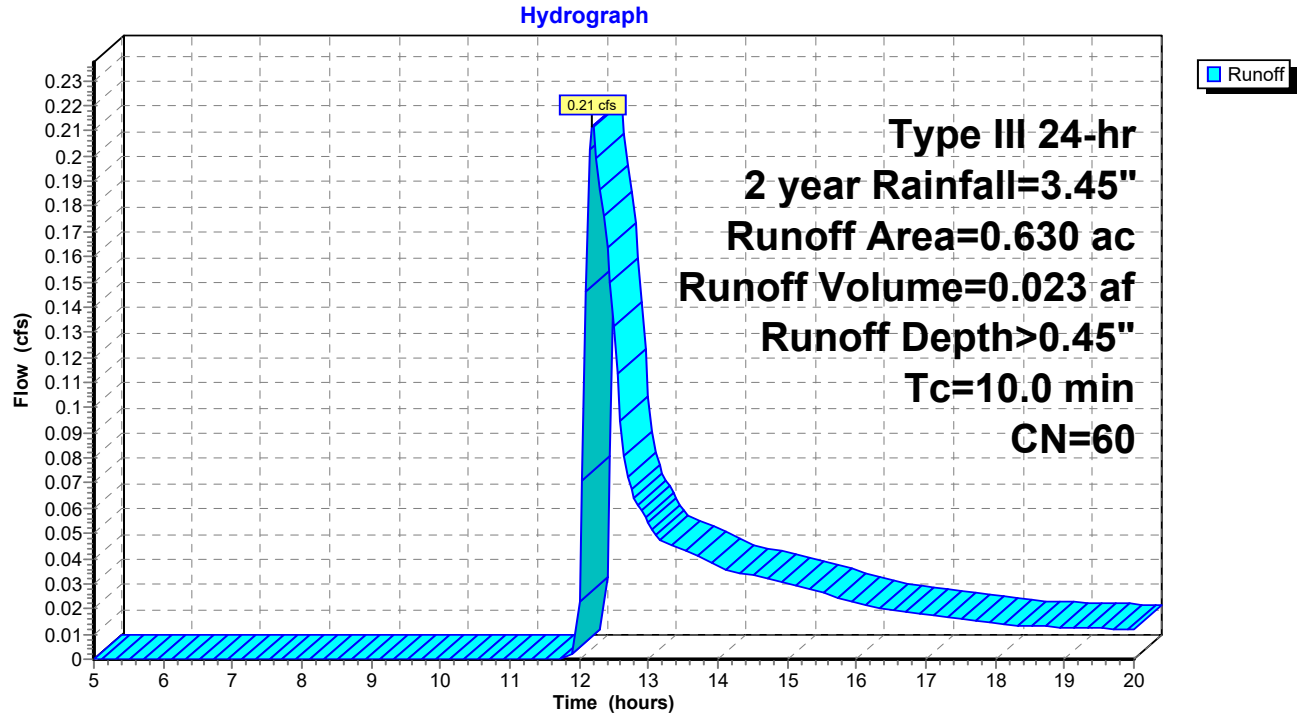
Runoff = 0.21 cfs @ 12.20 hrs, Volume= 0.023 af, Depth> 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.630	60	Woods, Fair, HSG B
0.630		100.00% Pervious Area

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

Subcatchment 16A: Subcat 16A



Summary for Reach 13.1R: Reach 13.1

[81] Warning: Exceeded Pond 13.1P by 0.01' @ 17.20 hrs

Inflow Area = 3.118 ac, 0.00% Impervious, Inflow Depth > 0.10" for 2 year event
Inflow = 0.09 cfs @ 16.96 hrs, Volume= 0.026 af
Outflow = 0.09 cfs @ 17.23 hrs, Volume= 0.024 af, Atten= 0%, Lag= 15.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.92 fps, Min. Travel Time= 9.1 min
Avg. Velocity = 0.80 fps, Avg. Travel Time= 10.4 min

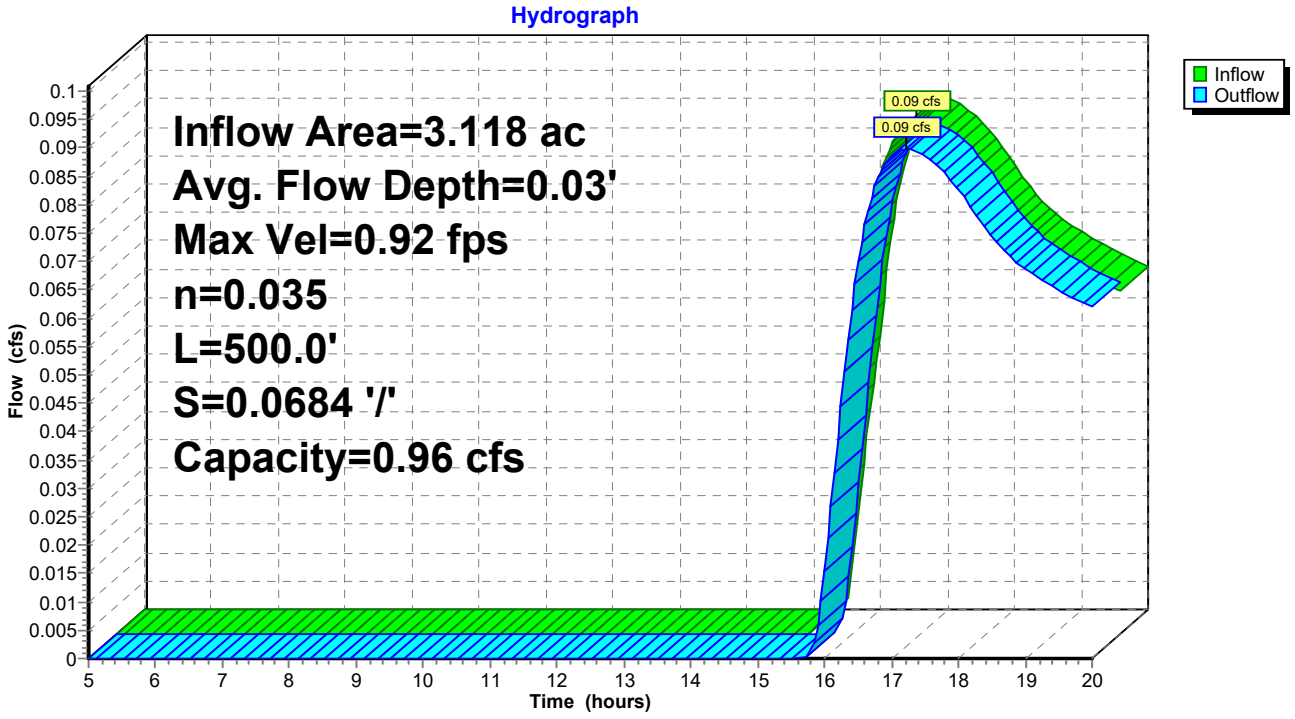
Peak Storage= 49 cf @ 17.08 hrs
Average Depth at Peak Storage= 0.03'
Bank-Full Depth= 0.10' Flow Area= 0.5 sf, Capacity= 0.96 cfs

3.00' x 0.10' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 20.0 '/' Top Width= 7.00'
Length= 500.0' Slope= 0.0684 '/'
Inlet Invert= 224.20', Outlet Invert= 190.00'



‡

Reach 13.1R: Reach 13.1



Summary for Pond 13.1P: Pond 13.1

Inflow Area = 3.118 ac, 0.00% Impervious, Inflow Depth > 0.45" for 2 year event
Inflow = 1.05 cfs @ 12.20 hrs, Volume= 0.116 af
Outflow = 0.09 cfs @ 16.96 hrs, Volume= 0.026 af, Atten= 91%, Lag= 286.1 min
Primary = 0.09 cfs @ 16.96 hrs, Volume= 0.026 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 224.21' @ 16.96 hrs Surf.Area= 15,088 sf Storage= 3,971 cf

Plug-Flow detention time= 336.4 min calculated for 0.026 af (22% of inflow)
Center-of-Mass det. time= 213.1 min (1,069.8 - 856.6)

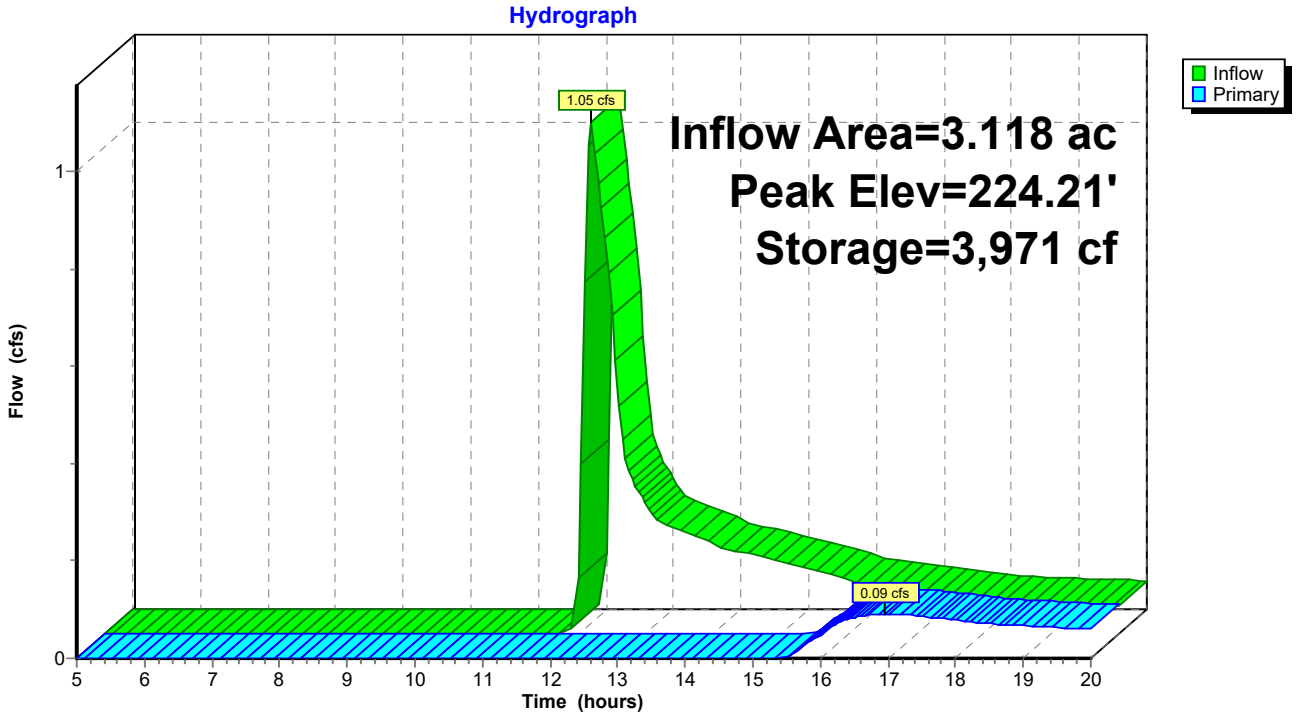
Volume	Invert	Avail.Storage	Storage Description
#1	223.70'	21,750 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
223.70	0	0	0
224.20	15,000	3,750	3,750
225.20	21,000	18,000	21,750

Device	Routing	Invert	Outlet Devices
#1	Primary	224.20'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.08 cfs @ 16.96 hrs HW=224.21' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 0.08 cfs @ 0.28 fps)

Pond 13.1P: Pond 13.1



Summary for Pond 13.2P: Pond 13.2

Inflow Area = 7.029 ac, 0.00% Impervious, Inflow Depth > 0.44" for 2 year event
Inflow = 2.06 cfs @ 12.31 hrs, Volume= 0.260 af
Outflow = 0.39 cfs @ 14.38 hrs, Volume= 0.214 af, Atten= 81%, Lag= 123.9 min
Discarded = 0.39 cfs @ 14.38 hrs, Volume= 0.214 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 189.40' @ 14.38 hrs Surf.Area= 5,678 sf Storage= 4,210 cf

Plug-Flow detention time= 144.2 min calculated for 0.214 af (82% of inflow)
Center-of-Mass det. time= 94.7 min (955.6 - 860.9)

Volume	Invert	Avail.Storage	Storage Description
#1	187.70'	34,621 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

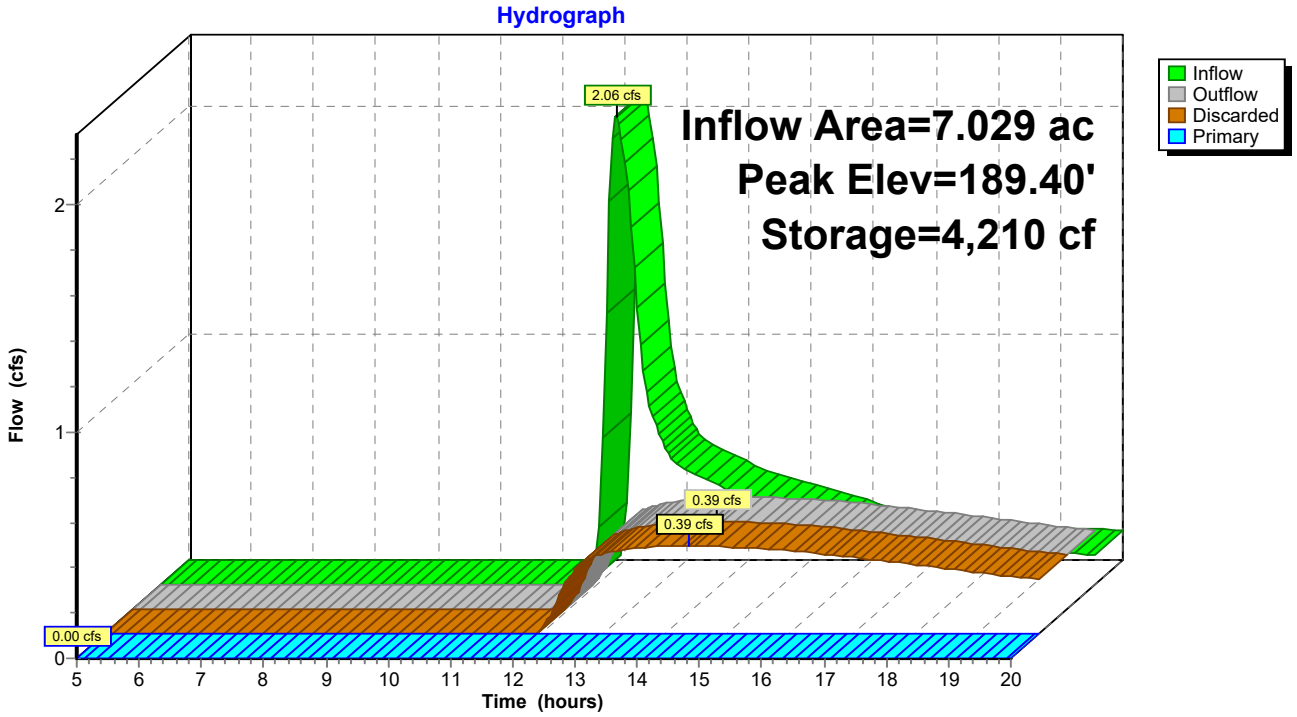
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
187.70	0	0	0	0
188.00	900	90	90	900
190.00	9,000	8,497	8,587	9,012
192.00	17,500	26,033	34,621	17,550

Device	Routing	Invert	Outlet Devices
#1	Primary	190.00'	**15.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Discarded	187.70'	**2.700 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 180.00'

Discarded OutFlow Max=0.39 cfs @ 14.38 hrs HW=189.40' (Free Discharge)
↑**2=Exfiltration** (Controls 0.39 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=187.70' (Free Discharge)
↑**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 13.2P: Pond 13.2

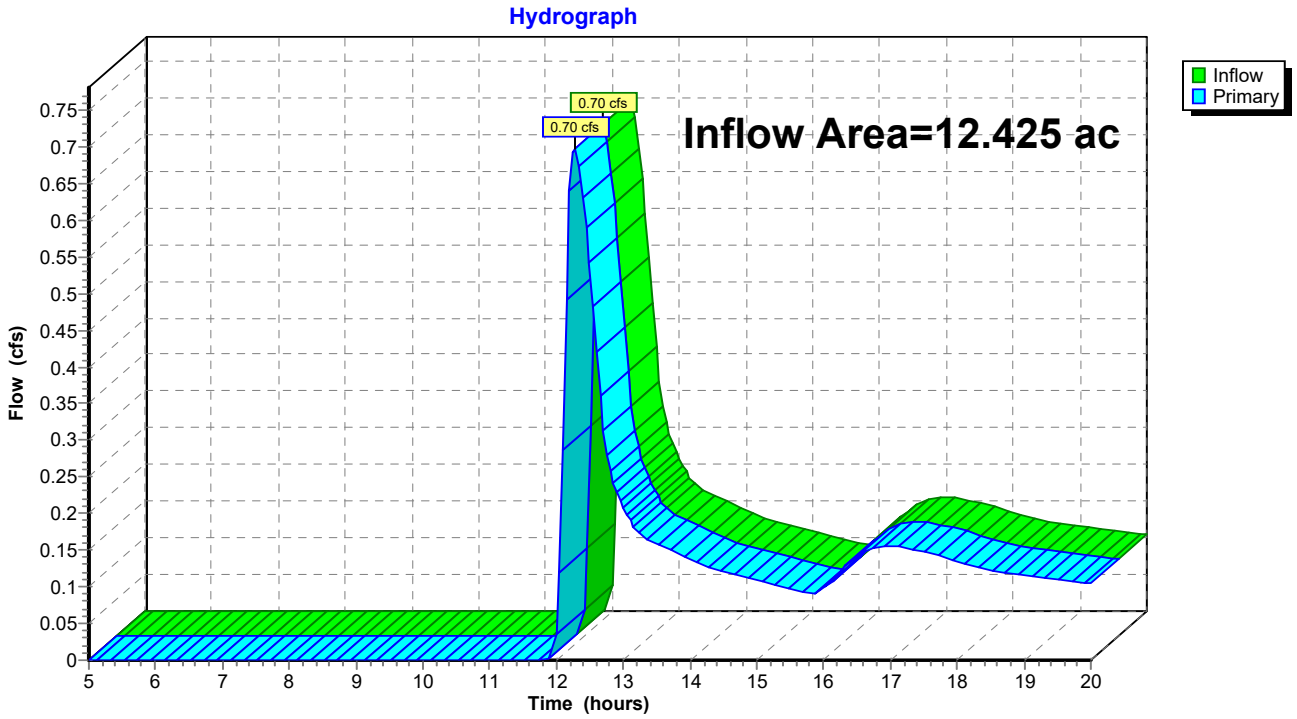


Summary for Link 13: 13

Inflow Area = 12.425 ac, 0.00% Impervious, Inflow Depth > 0.11" for 2 year event
Inflow = 0.70 cfs @ 12.27 hrs, Volume= 0.109 af
Primary = 0.70 cfs @ 12.27 hrs, Volume= 0.109 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 13: 13



25-Year Storm Event – Existing

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=3.006 ac 0.00% Impervious Runoff Depth>1.86"
Flow Length=540' Slope=0.0800 '/' Tc=12.6 min CN=60 Runoff=5.45 cfs 0.467 af

Subcatchment2: Subcat 2 Runoff Area=2.551 ac 0.00% Impervious Runoff Depth>1.86"
Flow Length=440' Tc=18.0 min CN=60 Runoff=4.06 cfs 0.395 af

Subcatchment2A: Subcat 2A Runoff Area=0.775 ac 0.00% Impervious Runoff Depth>2.46"
Tc=10.0 min CN=67 Runoff=2.07 cfs 0.159 af

Subcatchment3: Subcat 3 Runoff Area=2.550 ac 0.00% Impervious Runoff Depth>1.86"
Flow Length=700' Tc=19.2 min CN=60 Runoff=3.95 cfs 0.395 af

Subcatchment3A: Subcat 3A Runoff Area=0.324 ac 0.00% Impervious Runoff Depth>3.50"
Tc=10.0 min CN=78 Runoff=1.23 cfs 0.095 af

Subcatchment4: Subcat 4 Runoff Area=5.870 ac 0.00% Impervious Runoff Depth>2.19"
Flow Length=950' Tc=26.2 min CN=64 Runoff=9.63 cfs 1.070 af

Subcatchment5: Subcat 5 Runoff Area=2.637 ac 0.00% Impervious Runoff Depth>1.86"
Flow Length=510' Slope=0.0500 '/' Tc=15.1 min CN=60 Runoff=4.49 cfs 0.409 af

Subcatchment6: Subcat 6 Runoff Area=3.200 ac 0.00% Impervious Runoff Depth>2.29"
Flow Length=480' Slope=0.0700 '/' Tc=12.6 min CN=65 Runoff=7.29 cfs 0.610 af

Subcatchment6A: Subcat 6A Runoff Area=0.919 ac 0.00% Impervious Runoff Depth>2.55"
Tc=10.0 min CN=68 Runoff=2.55 cfs 0.196 af

Subcatchment6B: Subcat 6B Runoff Area=0.030 ac 0.00% Impervious Runoff Depth>1.87"
Tc=10.0 min CN=60 Runoff=0.06 cfs 0.005 af

Subcatchment6C: Subcat 6C Runoff Area=0.694 ac 0.00% Impervious Runoff Depth>1.87"
Tc=10.0 min CN=60 Runoff=1.37 cfs 0.108 af

Subcatchment7: Subcat 7 Runoff Area=1.170 ac 0.00% Impervious Runoff Depth>1.86"
Flow Length=300' Tc=10.5 min CN=60 Runoff=2.27 cfs 0.182 af

Subcatchment7A: Subcat 7A Runoff Area=0.202 ac 0.00% Impervious Runoff Depth>1.87"
Tc=10.0 min CN=60 Runoff=0.40 cfs 0.031 af

Subcatchment8: Subcat 8 Runoff Area=4.689 ac 0.00% Impervious Runoff Depth>1.86"
Flow Length=720' Tc=15.8 min CN=60 Runoff=7.82 cfs 0.727 af

Subcatchment8A: Subcat 8A Runoff Area=0.770 ac 0.00% Impervious Runoff Depth>1.87"
Tc=10.0 min CN=60 Runoff=1.52 cfs 0.120 af

Subcatchment9: Subcat 9 Runoff Area=1.520 ac 0.00% Impervious Runoff Depth>1.86"
Flow Length=310' Slope=0.0700 '/' Tc=10.5 min CN=60 Runoff=2.95 cfs 0.236 af

Subcatchment9A: Subcat 9A Runoff Area=0.285 ac 0.00% Impervious Runoff Depth>1.87"
Tc=10.0 min CN=60 Runoff=0.56 cfs 0.044 af

Subcatchment10: Subcat 10 Runoff Area=2.304 ac 0.00% Impervious Runoff Depth>1.86"
Flow Length=490' Tc=17.5 min CN=60 Runoff=3.71 cfs 0.357 af

Subcatchment10A: Subcat 10A Runoff Area=0.287 ac 0.00% Impervious Runoff Depth>1.87"
Tc=10.0 min CN=60 Runoff=0.56 cfs 0.045 af

Subcatchment11: Subcat 11 Runoff Area=1.127 ac 0.00% Impervious Runoff Depth>1.87"
Flow Length=250' Slope=0.1000 '/' Tc=8.3 min CN=60 Runoff=2.31 cfs 0.175 af

Subcatchment11A: Subcat 11A Runoff Area=0.428 ac 0.00% Impervious Runoff Depth>1.87"
Tc=10.0 min CN=60 Runoff=0.84 cfs 0.066 af

Subcatchment12: Subcat 12 Runoff Area=3.677 ac 0.00% Impervious Runoff Depth>1.86"
Flow Length=590' Slope=0.0900 '/' Tc=12.5 min CN=60 Runoff=6.68 cfs 0.571 af

Subcatchment13.1: Subcat 13.1 Runoff Area=3.118 ac 0.00% Impervious Runoff Depth>1.87"
Flow Length=320' Slope=0.0800 '/' Tc=10.0 min CN=60 Runoff=6.13 cfs 0.485 af

Subcatchment13.2: Subcat 13.2 Runoff Area=7.029 ac 0.00% Impervious Runoff Depth>1.86"
Flow Length=800' Tc=16.0 min CN=60 Runoff=11.67 cfs 1.090 af

Subcatchment13.3: Subcat 13.3 Runoff Area=2.278 ac 0.00% Impervious Runoff Depth>1.86"
Flow Length=510' Slope=0.0600 '/' Tc=14.0 min CN=60 Runoff=3.99 cfs 0.353 af

Subcatchment14: Subcat 14 Runoff Area=4.438 ac 0.00% Impervious Runoff Depth>1.86"
Flow Length=500' Tc=13.4 min CN=60 Runoff=7.89 cfs 0.689 af

Subcatchment16: Subcat 16 Runoff Area=16.918 ac 0.00% Impervious Runoff Depth>1.84"
Flow Length=1,050' Tc=39.2 min CN=60 Runoff=19.13 cfs 2.595 af

Subcatchment16A: Subcat 16A Runoff Area=0.630 ac 0.00% Impervious Runoff Depth>1.87"
Tc=10.0 min CN=60 Runoff=1.24 cfs 0.098 af

Reach 13.1R: Reach 13.1 Avg. Flow Depth=0.22' Max Vel=2.38 fps Inflow=3.24 cfs 0.390 af
n=0.035 L=500.0' S=0.0684 '/' Capacity=0.96 cfs Outflow=3.15 cfs 0.388 af

Pond 13.1P: Pond 13.1 Peak Elev=224.37' Storage=6,365 cf Inflow=6.13 cfs 0.485 af
Outflow=3.24 cfs 0.390 af

Pond 13.2P: Pond 13.2 Peak Elev=190.35' Storage=11,993 cf Inflow=11.67 cfs 1.090 af
Discarded=0.73 cfs 0.423 af Primary=7.77 cfs 0.502 af Outflow=8.50 cfs 0.925 af

Link 13: 13 Inflow=13.20 cfs 1.243 af
Primary=13.20 cfs 1.243 af

Total Runoff Area = 73.426 ac Runoff Volume = 11.770 af Average Runoff Depth = 1.92"
100.00% Pervious = 73.426 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1: Subcat 1

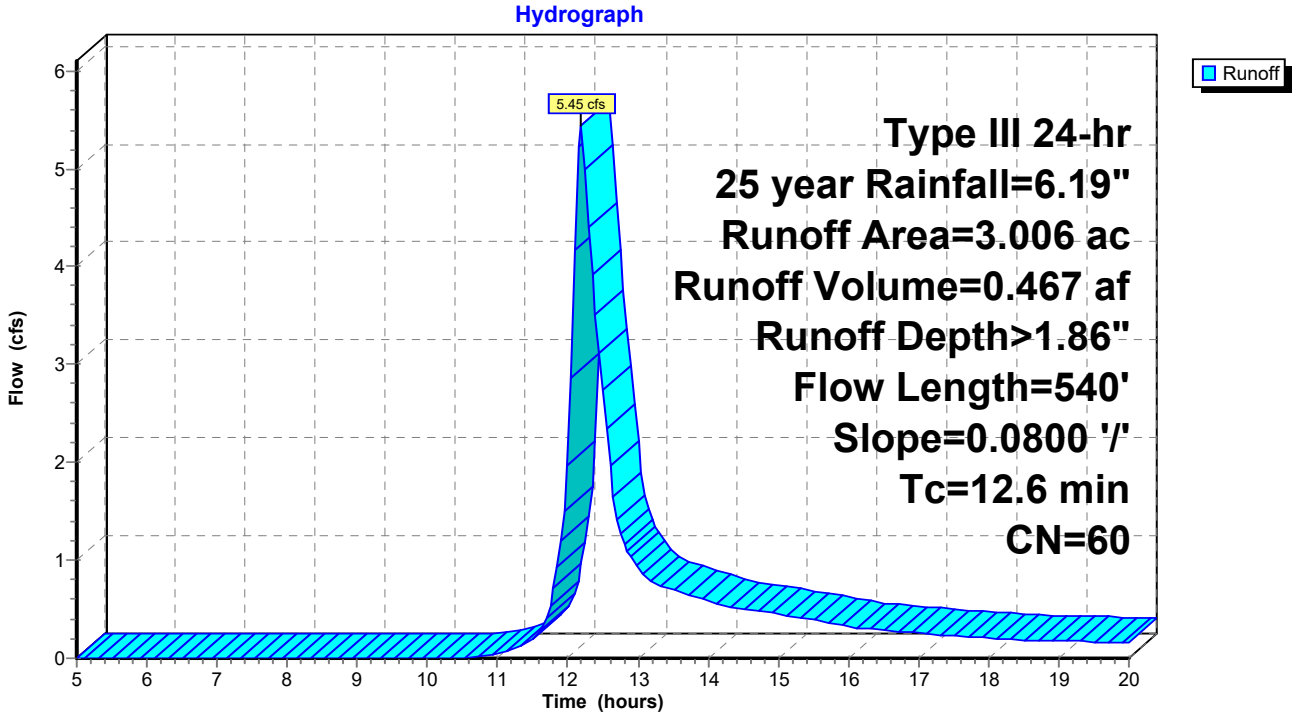
Runoff = 5.45 cfs @ 12.19 hrs, Volume= 0.467 af, Depth> 1.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
3.005	60	Woods, Fair, HSG B
3.006	60	Weighted Average
3.006		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
5.8	490	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.6	540	Total			

Subcatchment 1: Subcat 1



Summary for Subcatchment 2: Subcat 2

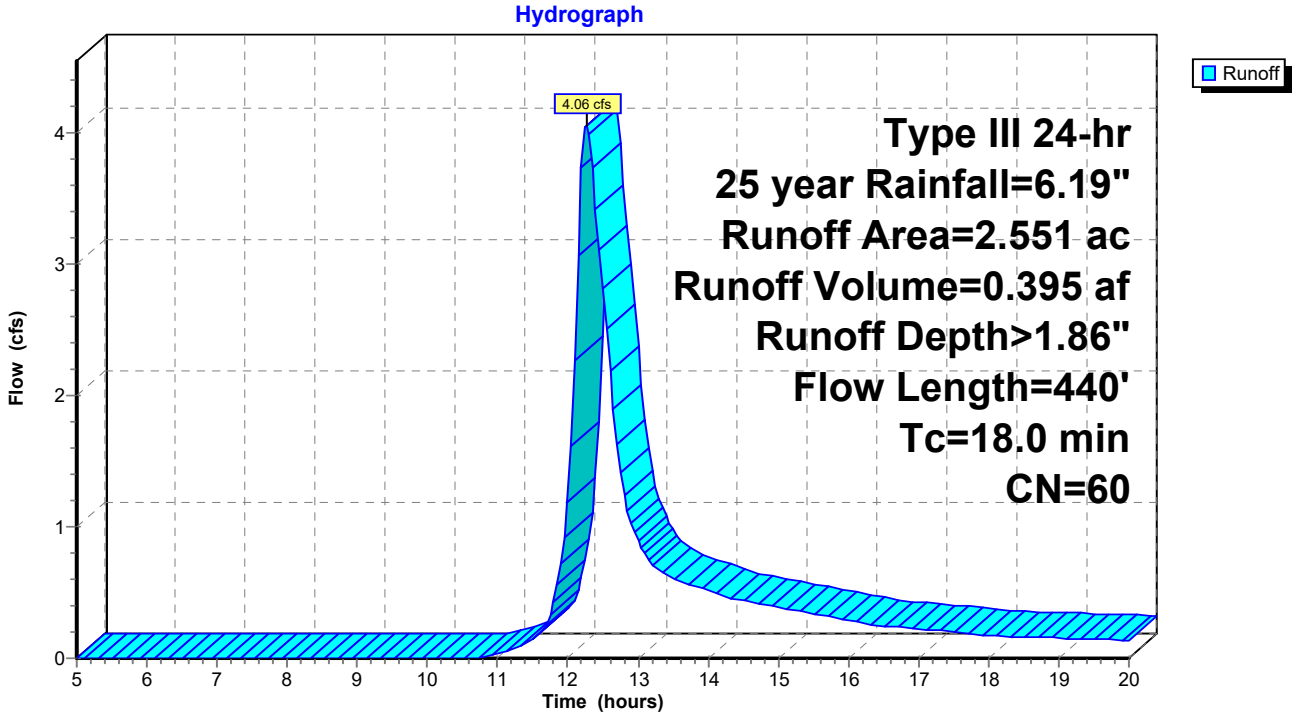
Runoff = 4.06 cfs @ 12.27 hrs, Volume= 0.395 af, Depth> 1.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
2.551	60	Woods, Fair, HSG B
2.551		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
5.7	340	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.4	50	0.2000	2.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
18.0	440	Total			

Subcatchment 2: Subcat 2



Summary for Subcatchment 2A: Subcat 2A

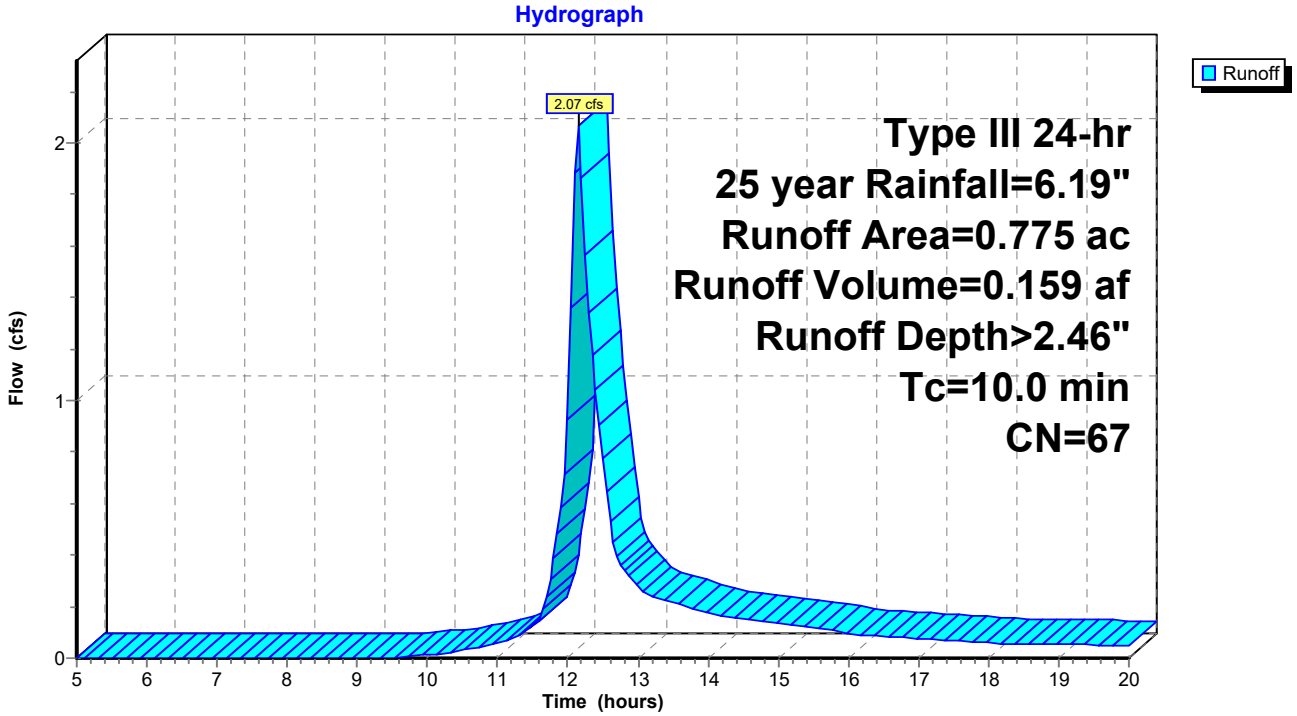
Runoff = 2.07 cfs @ 12.15 hrs, Volume= 0.159 af, Depth> 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.488	60	Woods, Fair, HSG B
0.287	79	Woods, Fair, HSG D
0.775	67	Weighted Average
0.775		100.00% Pervious Area

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

Subcatchment 2A: Subcat 2A



Summary for Subcatchment 3: Subcat 3

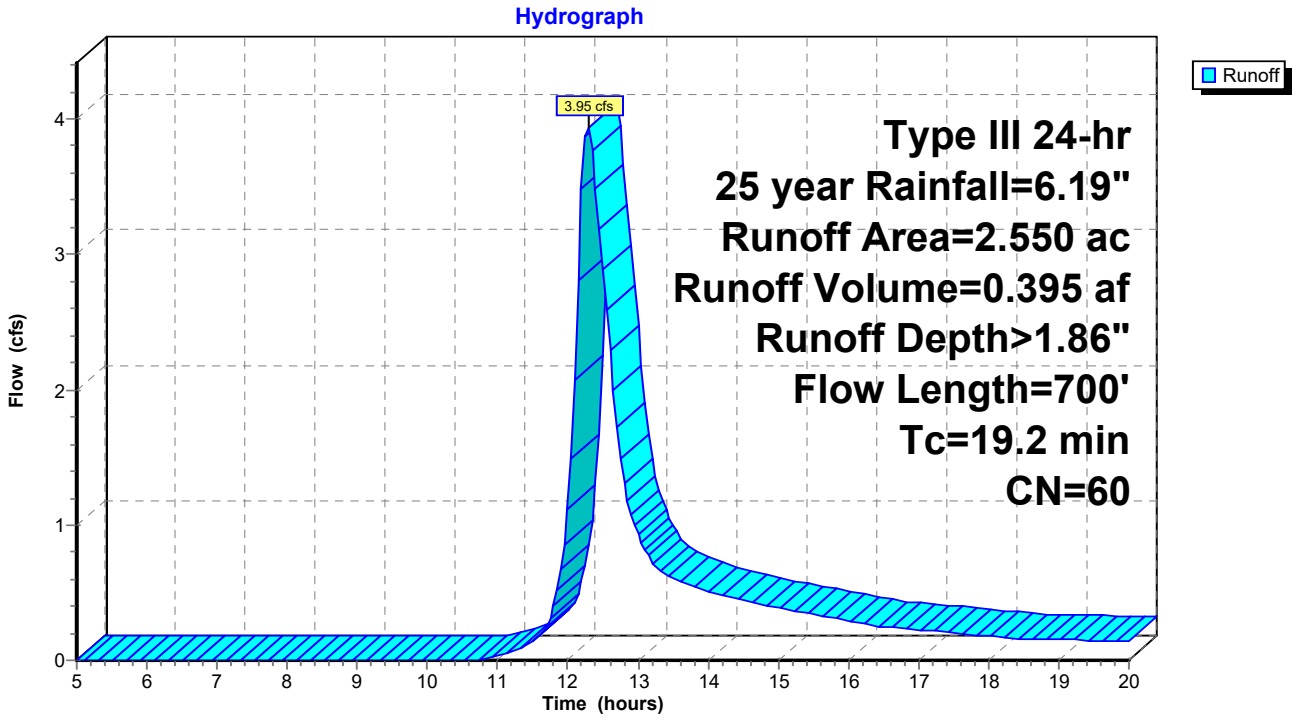
Runoff = 3.95 cfs @ 12.29 hrs, Volume= 0.395 af, Depth> 1.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
2.515	60	Woods, Fair, HSG B
0.034	79	Woods, Fair, HSG D
2.550	60	Weighted Average
2.550		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	50	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
8.3	500	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.9	150	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
19.2	700	Total			

Subcatchment 3: Subcat 3



Summary for Subcatchment 3A: Subcat 3A

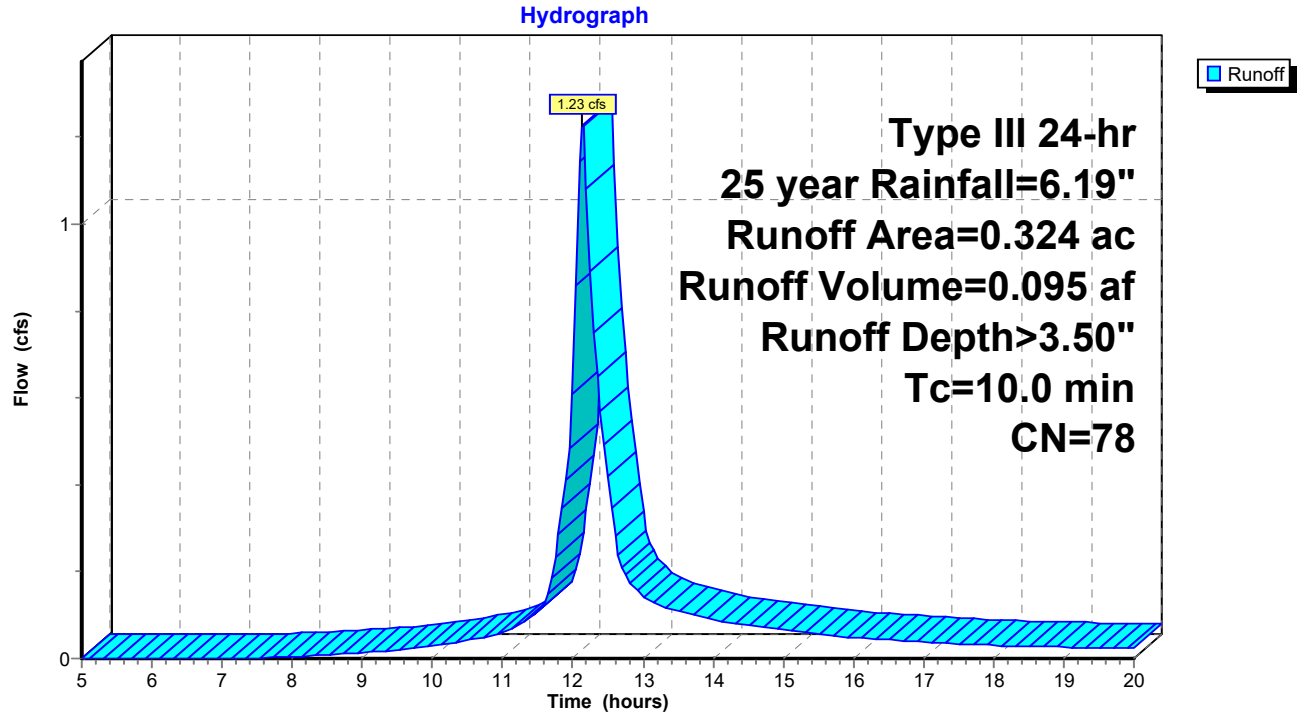
Runoff = 1.23 cfs @ 12.14 hrs, Volume= 0.095 af, Depth> 3.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.008	60	Woods, Fair, HSG B
0.002	60	Woods, Fair, HSG B
0.315	79	Woods, Fair, HSG D
0.324	78	Weighted Average
0.324		100.00% Pervious Area

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

Subcatchment 3A: Subcat 3A



Summary for Subcatchment 4: Subcat 4

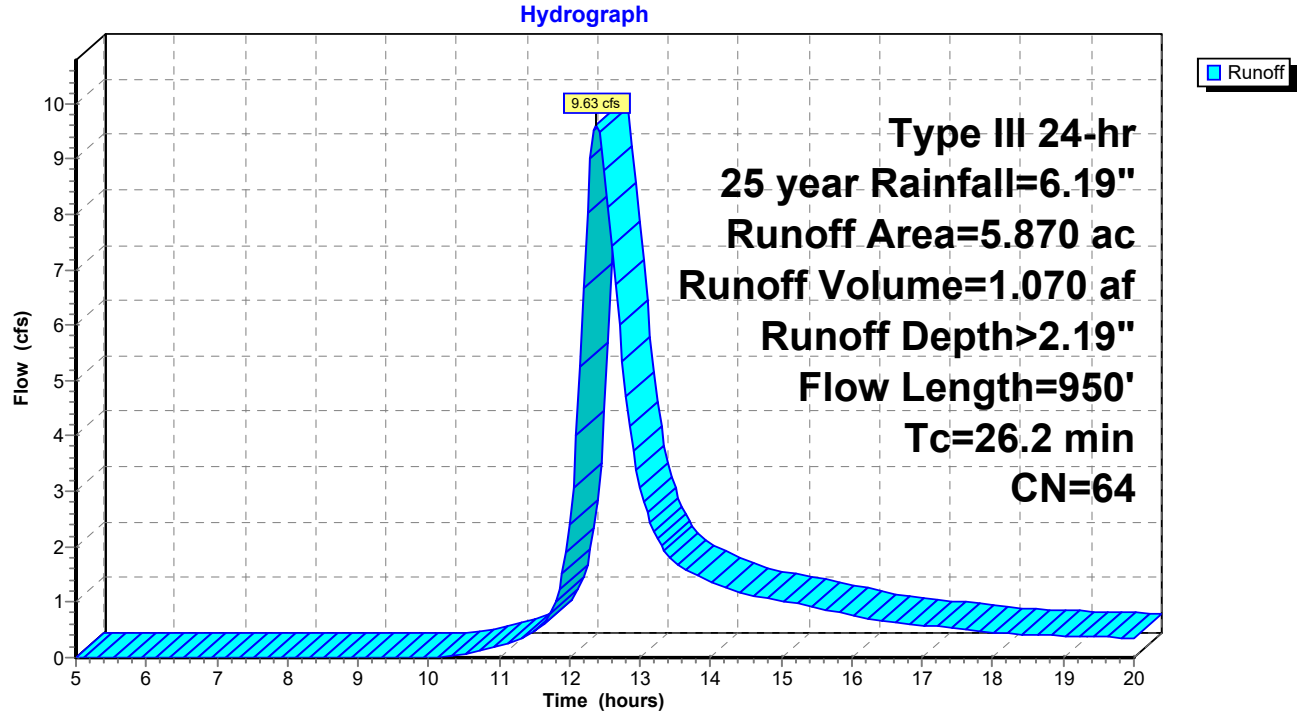
Runoff = 9.63 cfs @ 12.39 hrs, Volume= 1.070 af, Depth> 2.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
4.578	60	Woods, Fair, HSG B
1.292	79	Woods, Fair, HSG D
5.870	64	Weighted Average
5.870		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	50	0.0150	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
6.0	360	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.2	400	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.7	140	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
26.2	950	Total			

Subcatchment 4: Subcat 4



Summary for Subcatchment 5: Subcat 5

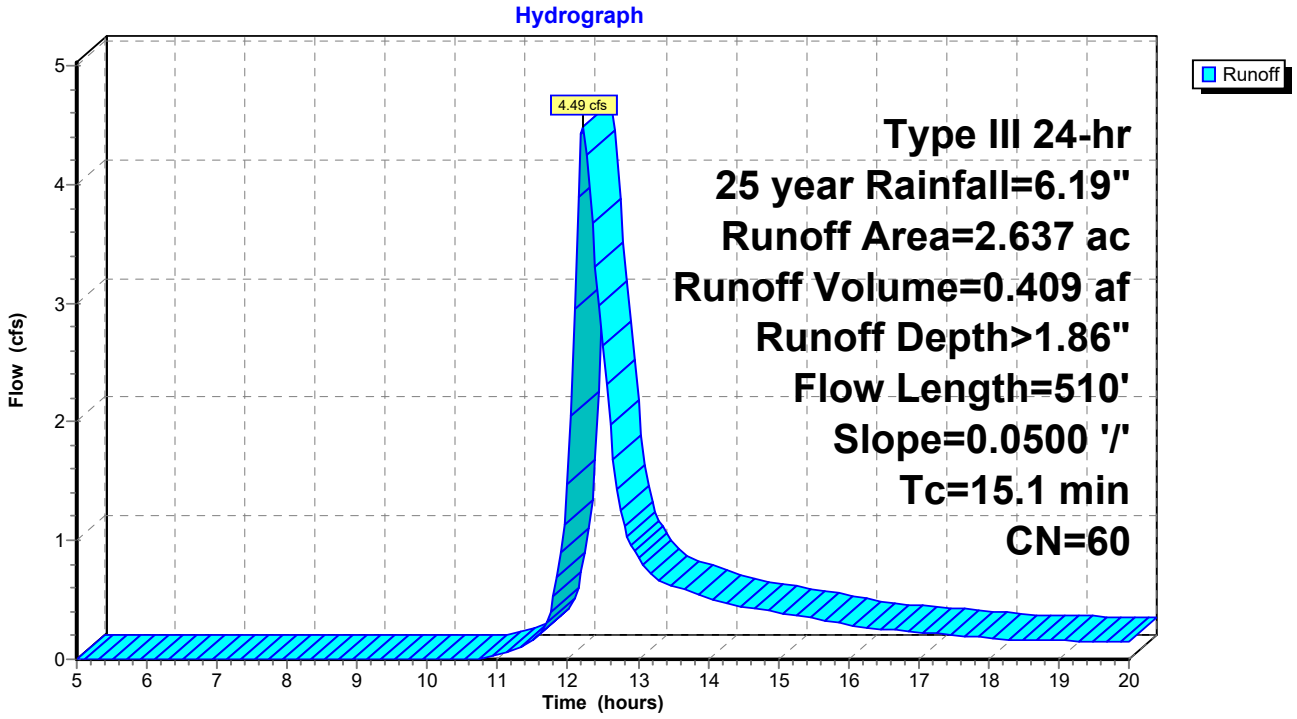
Runoff = 4.49 cfs @ 12.22 hrs, Volume= 0.409 af, Depth> 1.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
2.637	60	Woods, Fair, HSG B
2.637		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
6.9	460	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
15.1	510	Total			

Subcatchment 5: Subcat 5



Summary for Subcatchment 6: Subcat 6

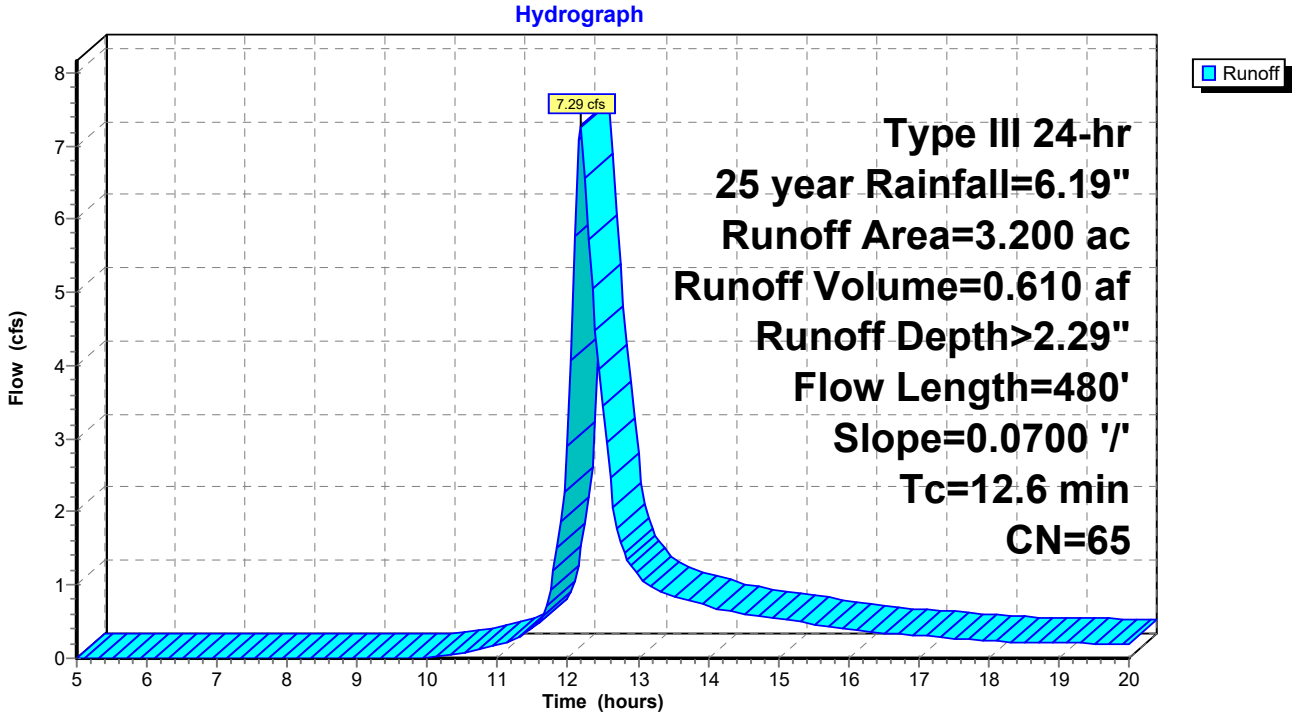
Runoff = 7.29 cfs @ 12.18 hrs, Volume= 0.610 af, Depth> 2.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
2.281	60	Woods, Fair, HSG B
0.919	79	Woods, Fair, HSG D
3.200	65	Weighted Average
3.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0700	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
5.4	430	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.6	480	Total			

Subcatchment 6: Subcat 6



Summary for Subcatchment 6A: Subcat 6A

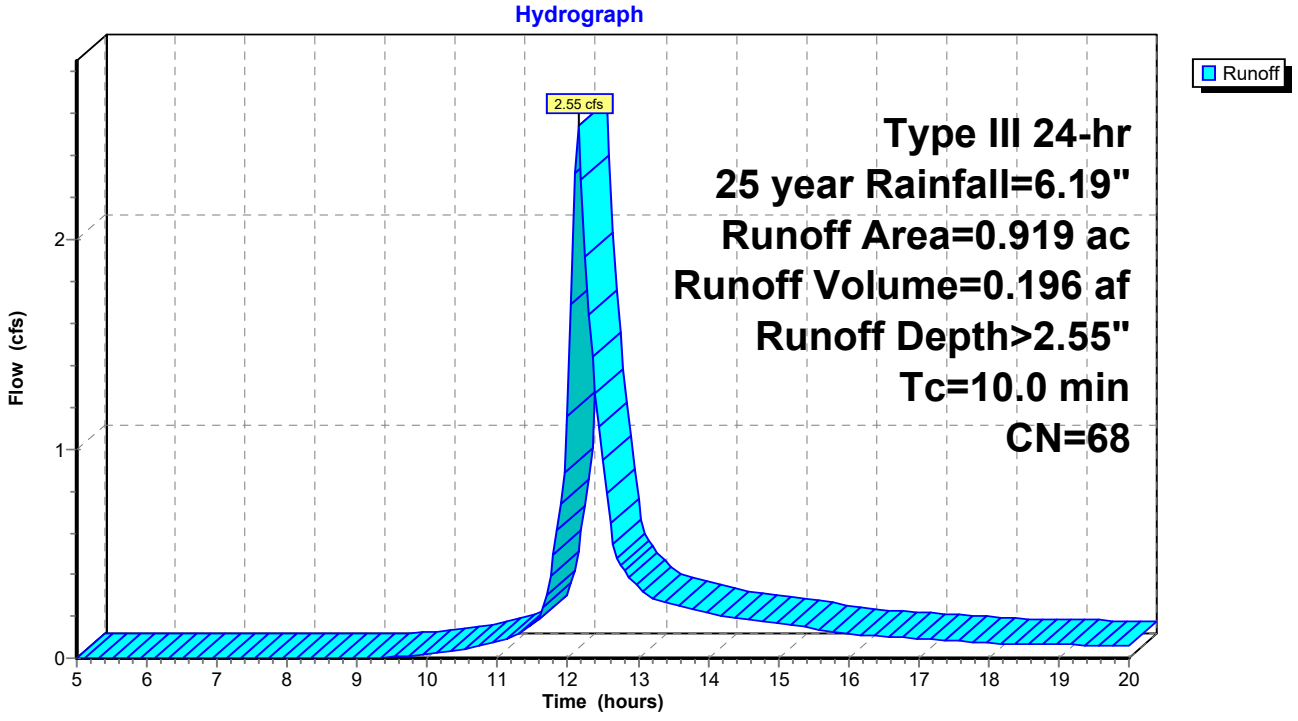
Runoff = 2.55 cfs @ 12.15 hrs, Volume= 0.196 af, Depth> 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.003	60	Woods, Fair, HSG B
0.517	60	Woods, Fair, HSG B
0.000	79	Woods, Fair, HSG D
0.400	79	Woods, Fair, HSG D
0.919	68	Weighted Average
0.919		100.00% Pervious Area

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

Subcatchment 6A: Subcat 6A



Summary for Subcatchment 6B: Subcat 6B

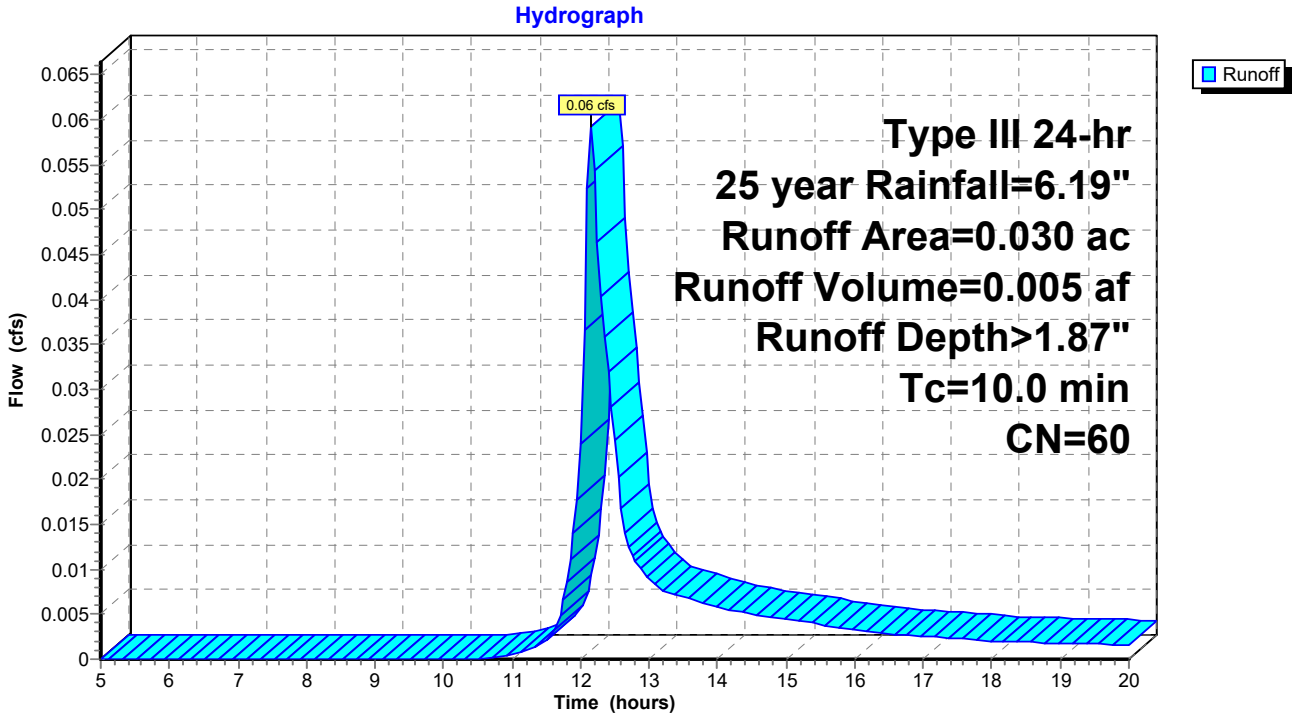
Runoff = 0.06 cfs @ 12.15 hrs, Volume= 0.005 af, Depth> 1.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.030	60	Woods, Fair, HSG B
0.030		100.00% Pervious Area

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

Subcatchment 6B: Subcat 6B



Summary for Subcatchment 6C: Subcat 6C

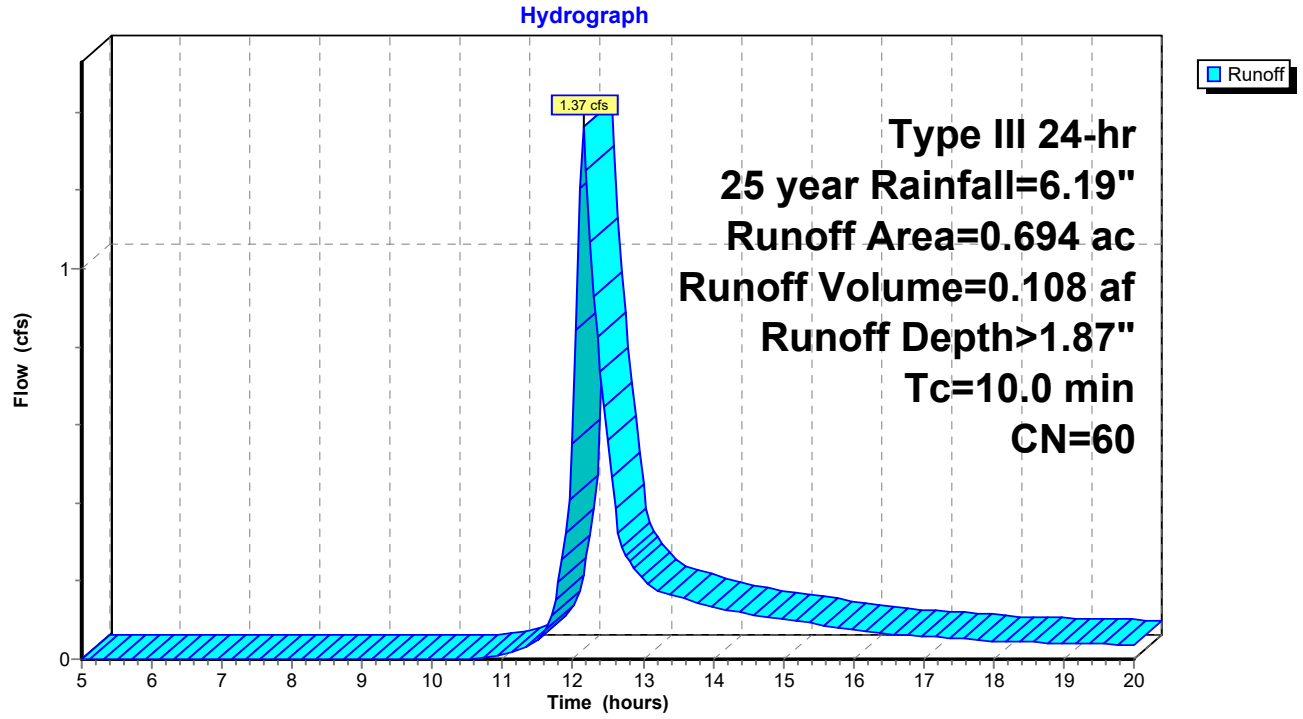
Runoff = 1.37 cfs @ 12.15 hrs, Volume= 0.108 af, Depth> 1.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.694	60	Woods, Fair, HSG B
0.694		100.00% Pervious Area

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

Subcatchment 6C: Subcat 6C



Summary for Subcatchment 7: Subcat 7

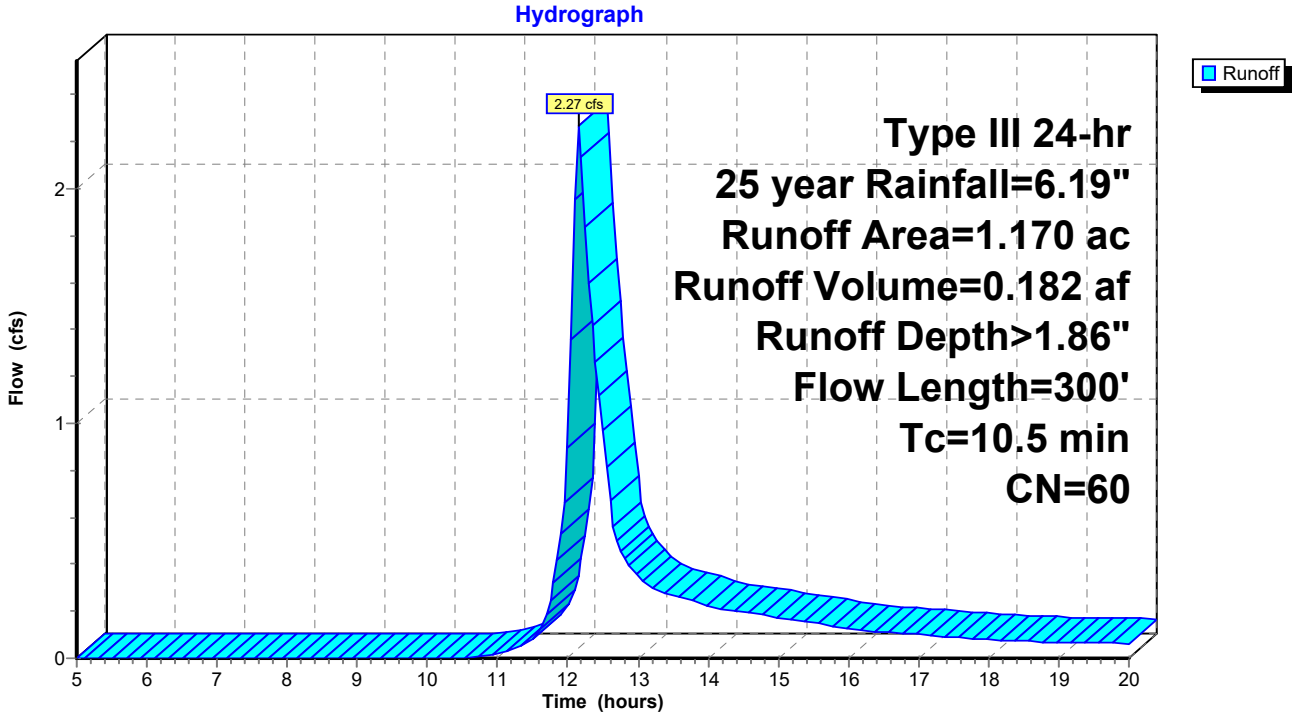
Runoff = 2.27 cfs @ 12.16 hrs, Volume= 0.182 af, Depth> 1.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
1.170	60	Woods, Fair, HSG B
1.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
1.8	150	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.9	100	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.5	300	Total			

Subcatchment 7: Subcat 7



Summary for Subcatchment 7A: Subcat 7A

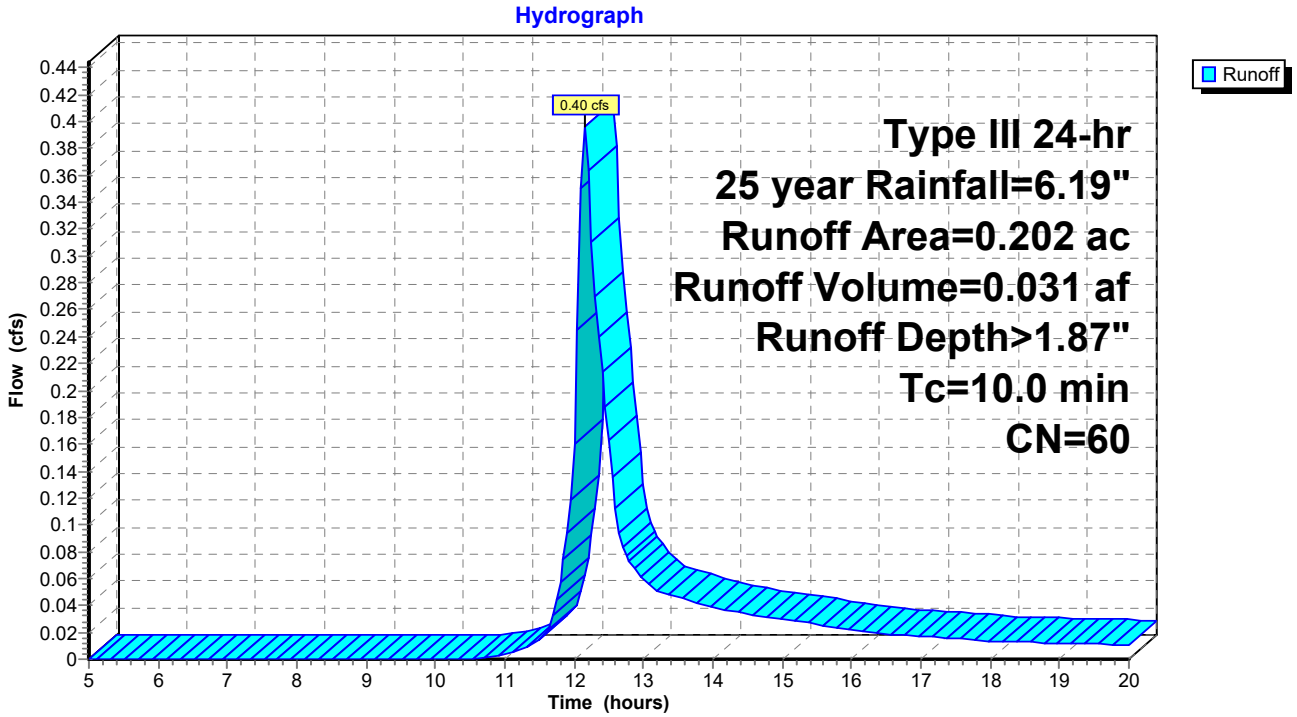
Runoff = 0.40 cfs @ 12.15 hrs, Volume= 0.031 af, Depth> 1.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.202	60	Woods, Fair, HSG B
0.202		100.00% Pervious Area

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

Subcatchment 7A: Subcat 7A



Summary for Subcatchment 8: Subcat 8

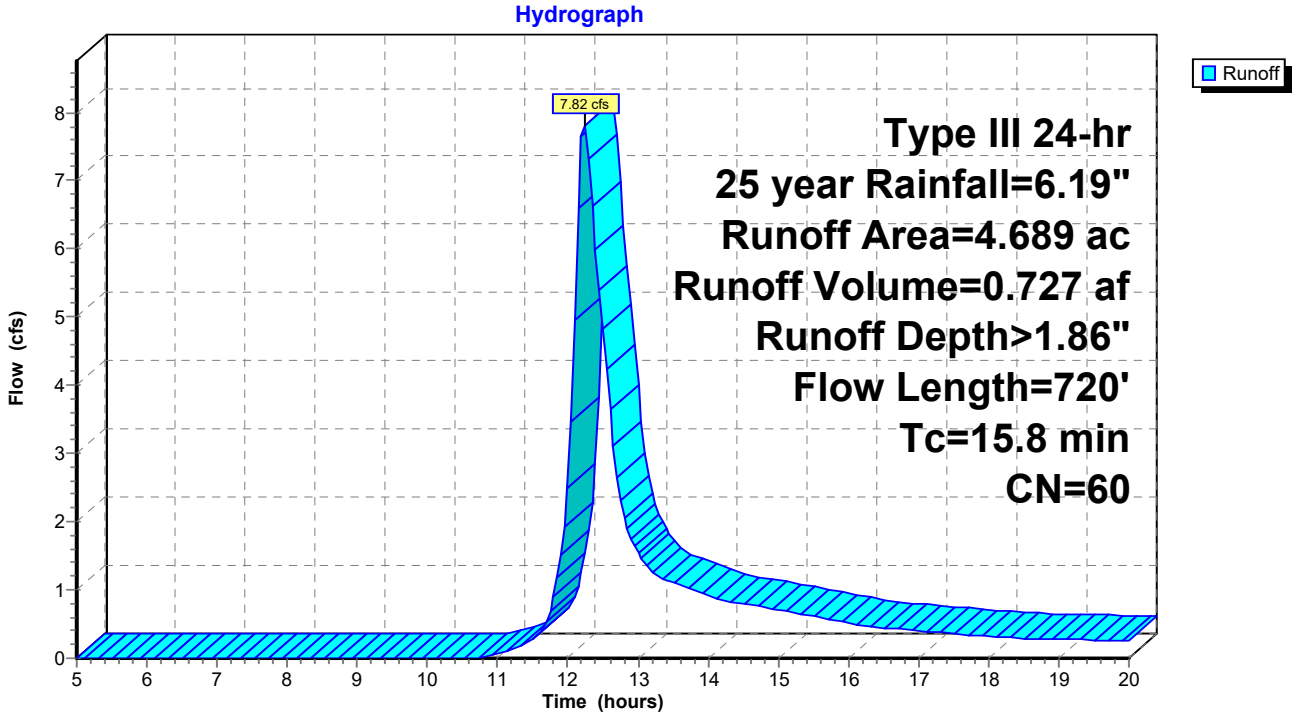
Runoff = 7.82 cfs @ 12.24 hrs, Volume= 0.727 af, Depth> 1.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
4.689	60	Woods, Fair, HSG B
4.689		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.1100	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
2.7	270	0.1100	1.66		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.1	400	0.0350	0.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
15.8	720	Total			

Subcatchment 8: Subcat 8



Summary for Subcatchment 8A: Subcat 8A

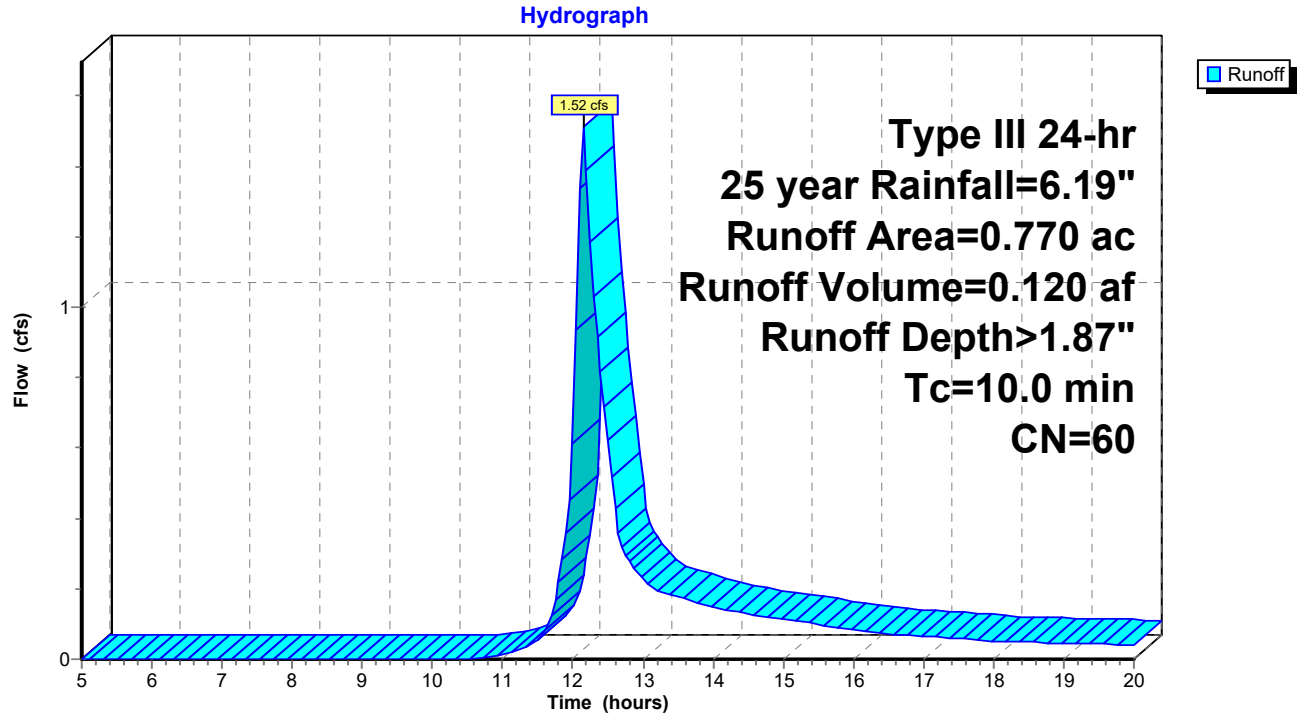
Runoff = 1.52 cfs @ 12.15 hrs, Volume= 0.120 af, Depth> 1.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.770	60	Woods, Fair, HSG B
0.770		100.00% Pervious Area

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

Subcatchment 8A: Subcat 8A



Summary for Subcatchment 9: Subcat 9

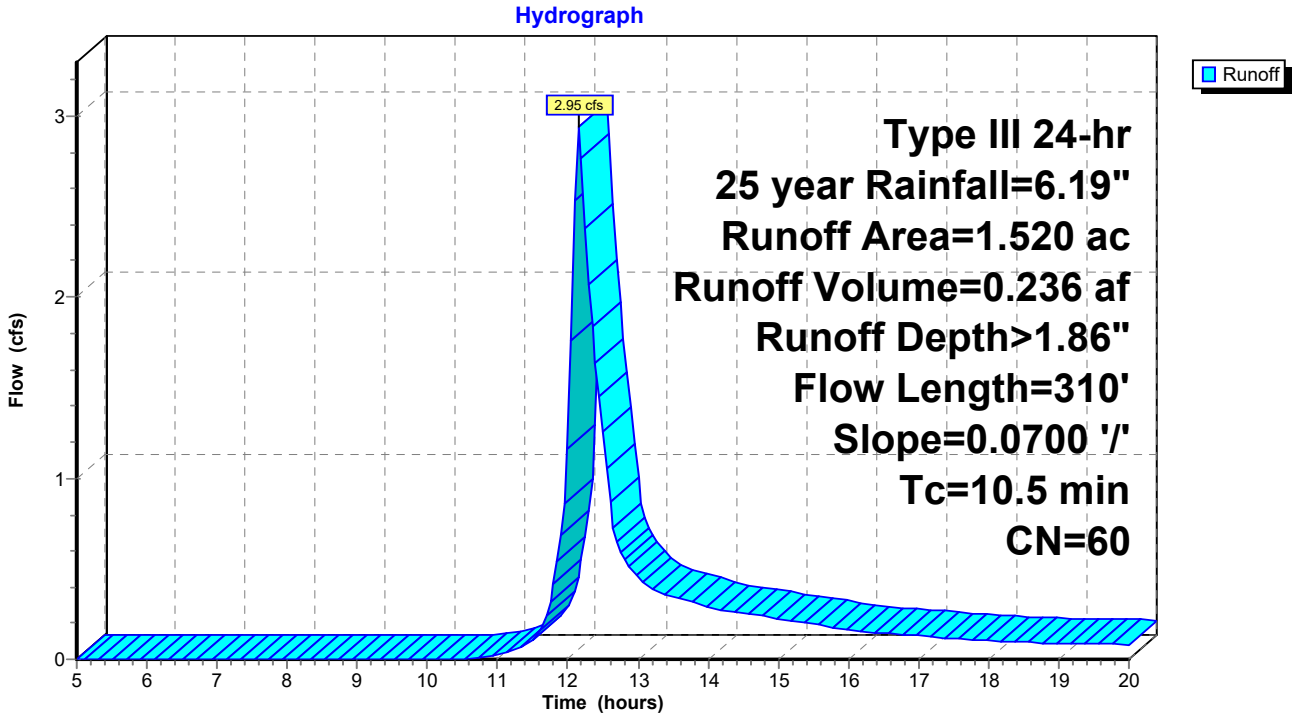
Runoff = 2.95 cfs @ 12.16 hrs, Volume= 0.236 af, Depth> 1.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
1.520	60	Woods, Fair, HSG B
1.520		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0700	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
3.3	260	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.5	310	Total			

Subcatchment 9: Subcat 9



Summary for Subcatchment 9A: Subcat 9A

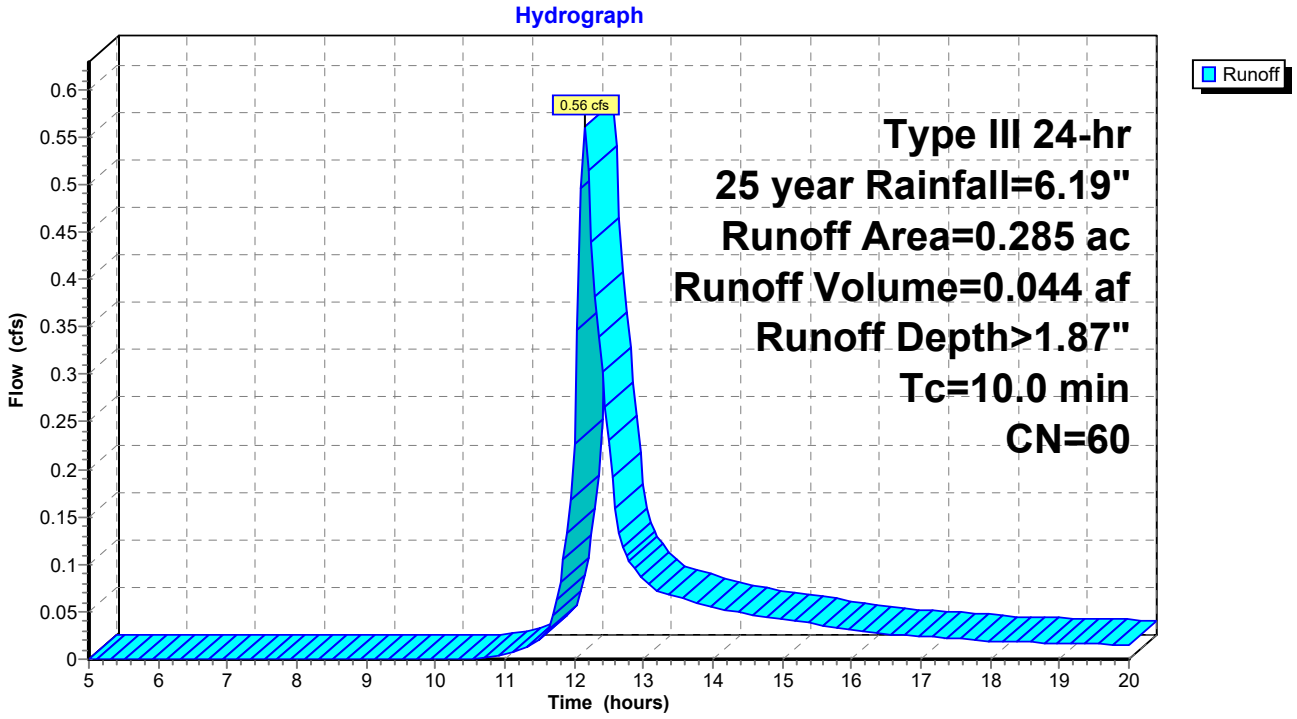
Runoff = 0.56 cfs @ 12.15 hrs, Volume= 0.044 af, Depth> 1.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.285	60	Woods, Fair, HSG B
0.285		100.00% Pervious Area

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

Subcatchment 9A: Subcat 9A



Summary for Subcatchment 10: Subcat 10

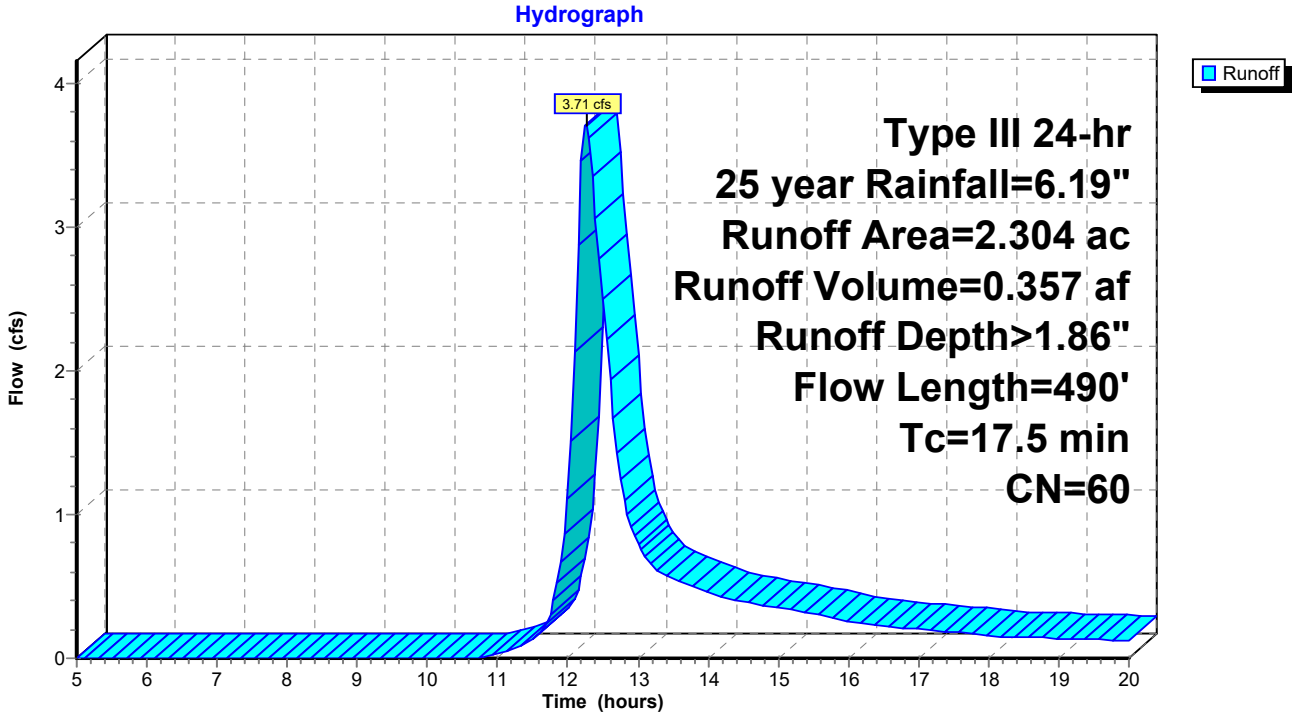
Runoff = 3.71 cfs @ 12.26 hrs, Volume= 0.357 af, Depth> 1.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
2.304	60	Woods, Fair, HSG B
2.304		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
2.8	270	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.8	170	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.5	490	Total			

Subcatchment 10: Subcat 10



Summary for Subcatchment 10A: Subcat 10A

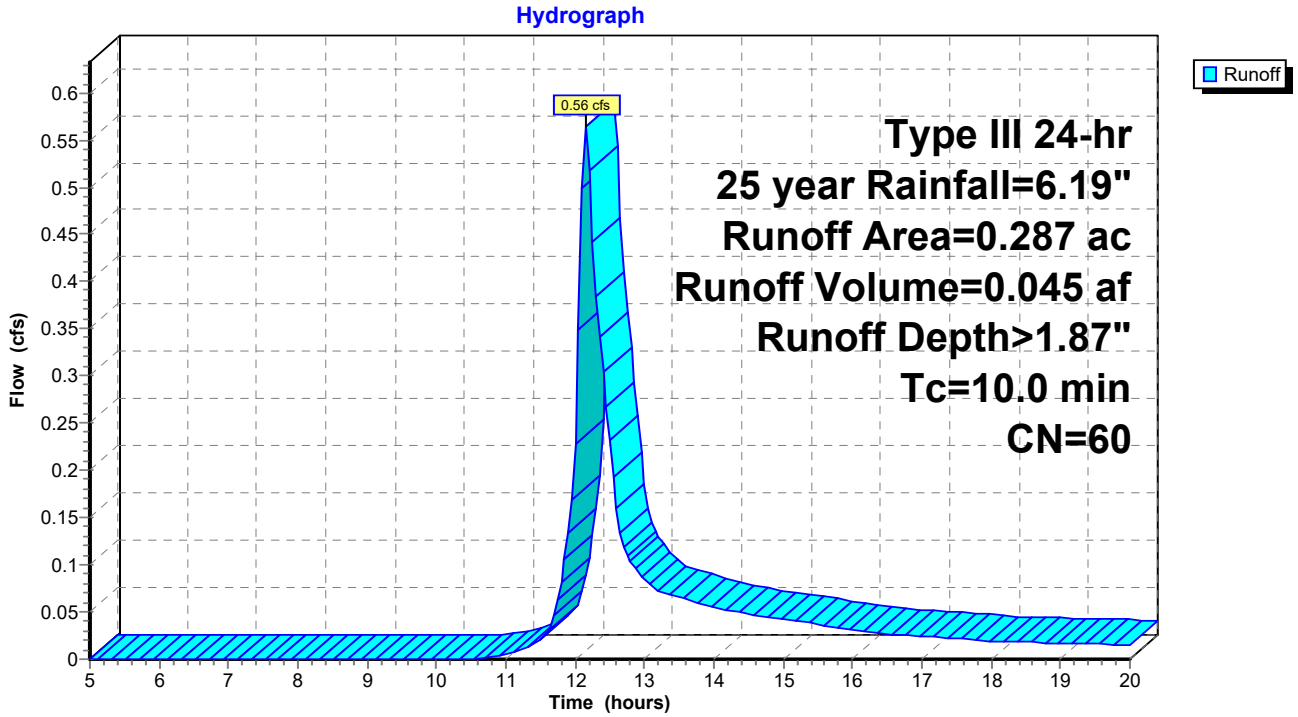
Runoff = 0.56 cfs @ 12.15 hrs, Volume= 0.045 af, Depth> 1.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.287	60	Woods, Fair, HSG B
0.287		100.00% Pervious Area

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

Subcatchment 10A: Subcat 10A



Summary for Subcatchment 11: Subcat 11

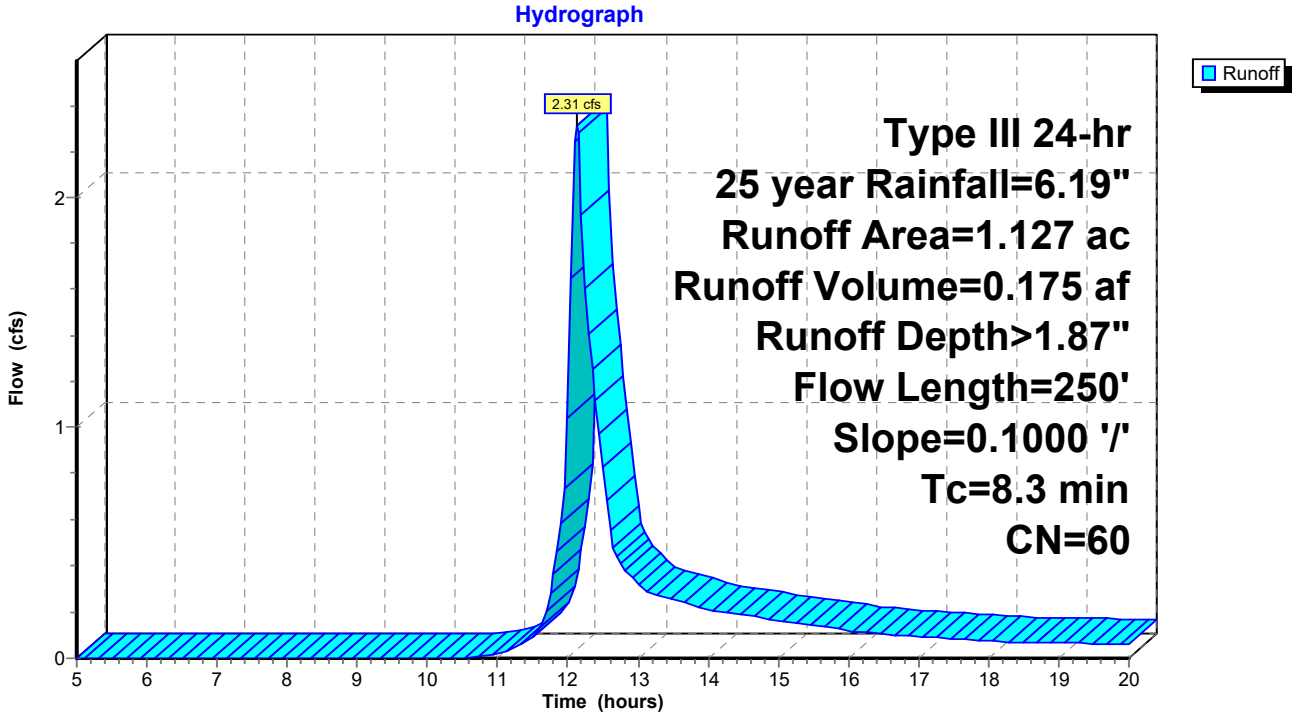
Runoff = 2.31 cfs @ 12.13 hrs, Volume= 0.175 af, Depth> 1.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
1.127	60	Woods, Fair, HSG B
1.127	60	Weighted Average
1.127		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.1000	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
2.1	200	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.3	250	Total			

Subcatchment 11: Subcat 11



Summary for Subcatchment 11A: Subcat 11A

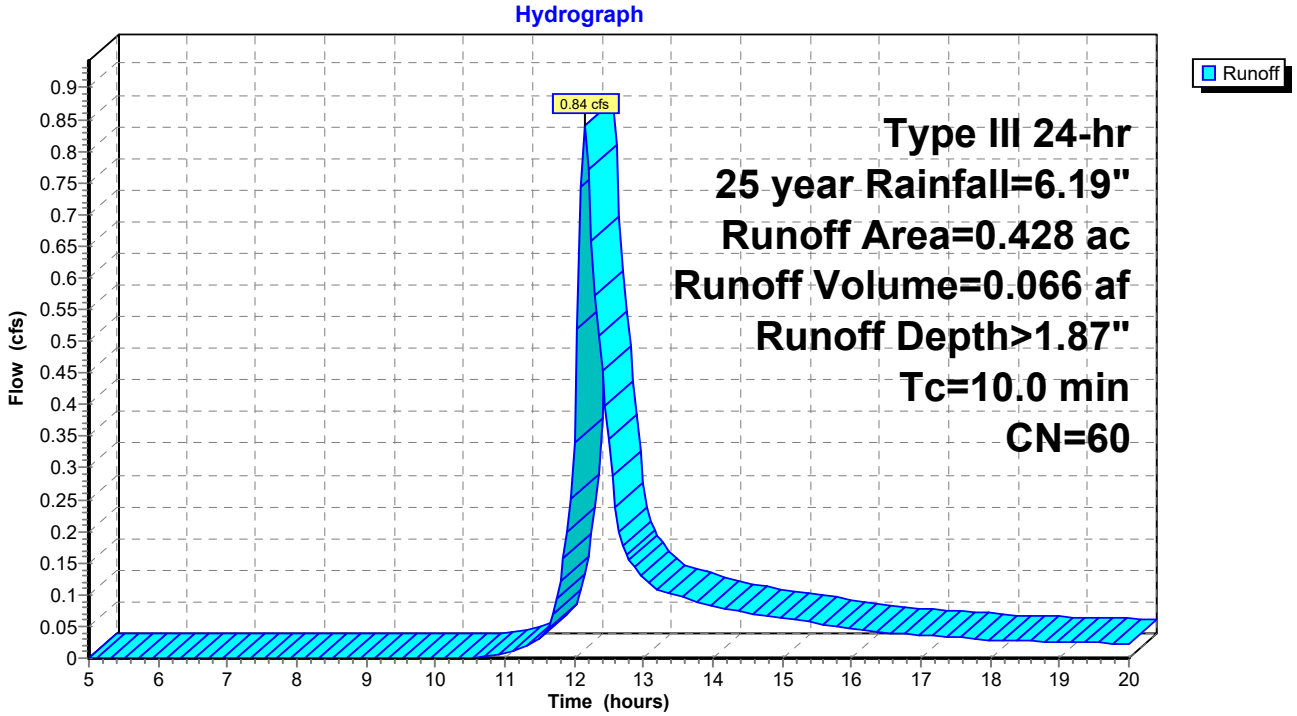
Runoff = 0.84 cfs @ 12.15 hrs, Volume= 0.066 af, Depth> 1.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
0.428	60	Woods, Fair, HSG B
0.428	60	Weighted Average
0.428		100.00% Pervious Area

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

Subcatchment 11A: Subcat 11A



Summary for Subcatchment 12: Subcat 12

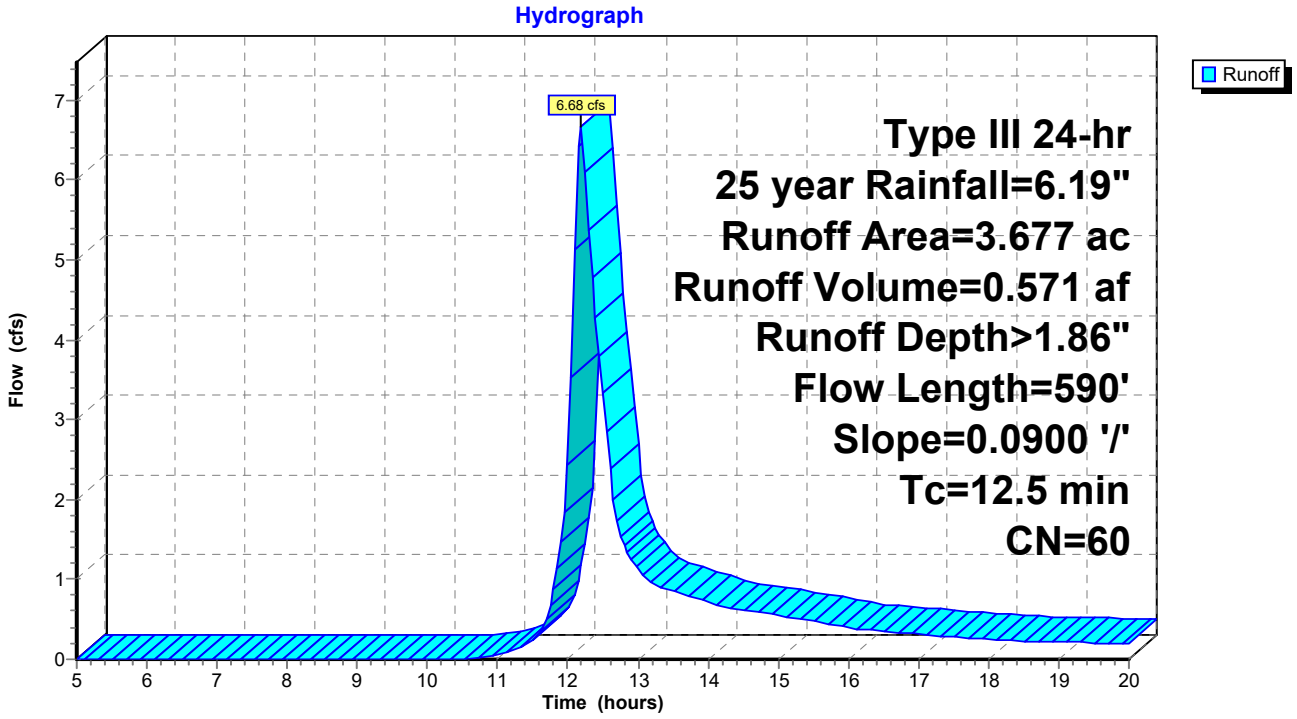
Runoff = 6.68 cfs @ 12.19 hrs, Volume= 0.571 af, Depth> 1.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
3.677	60	Woods, Fair, HSG B
3.677		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	50	0.0900	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
6.0	540	0.0900	1.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.5	590	Total			

Subcatchment 12: Subcat 12



Summary for Subcatchment 13.1: Subcat 13.1

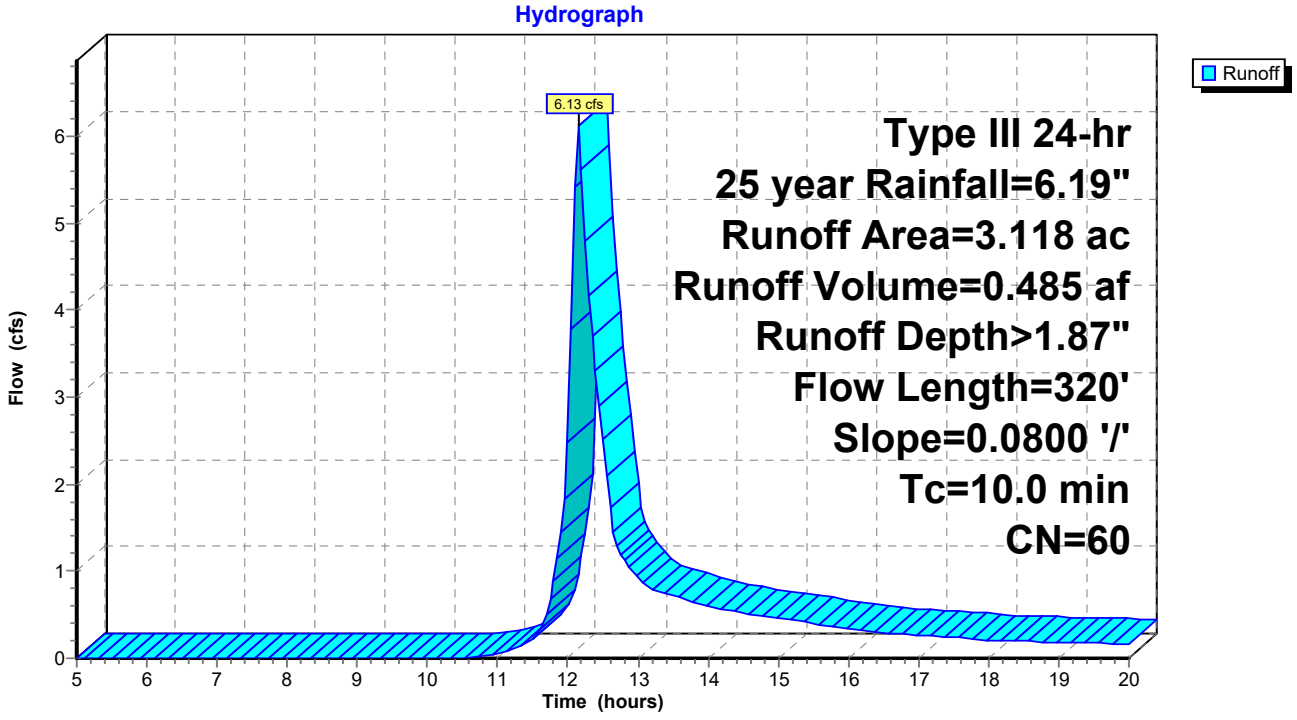
Runoff = 6.13 cfs @ 12.15 hrs, Volume= 0.485 af, Depth> 1.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
3.092	60	Woods, Fair, HSG B
0.026	79	Woods, Fair, HSG D
3.118	60	Weighted Average
3.118		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
3.2	270	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.0	320	Total			

Subcatchment 13.1: Subcat 13.1



Summary for Subcatchment 13.2: Subcat 13.2

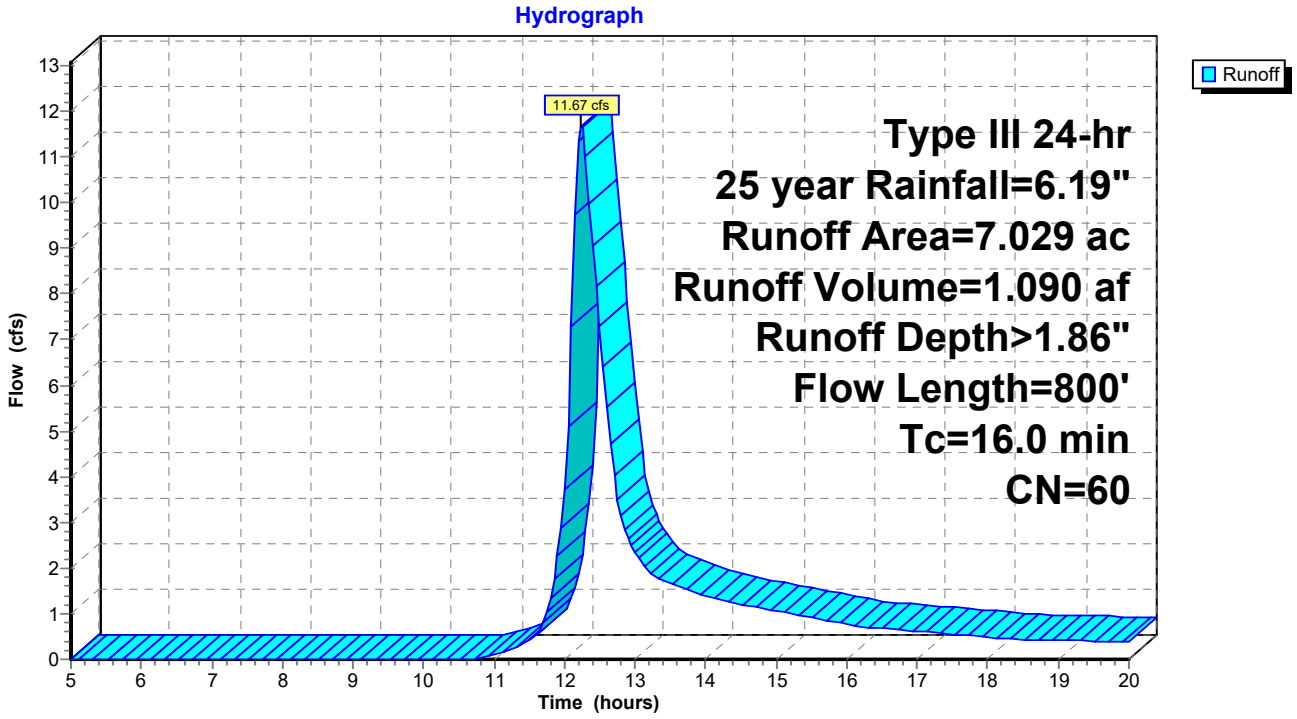
Runoff = 11.67 cfs @ 12.24 hrs, Volume= 1.090 af, Depth> 1.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
7.029	60	Woods, Fair, HSG B
7.029		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0700	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
8.8	750	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.0	800	Total			

Subcatchment 13.2: Subcat 13.2



Summary for Subcatchment 13.3: Subcat 13.3

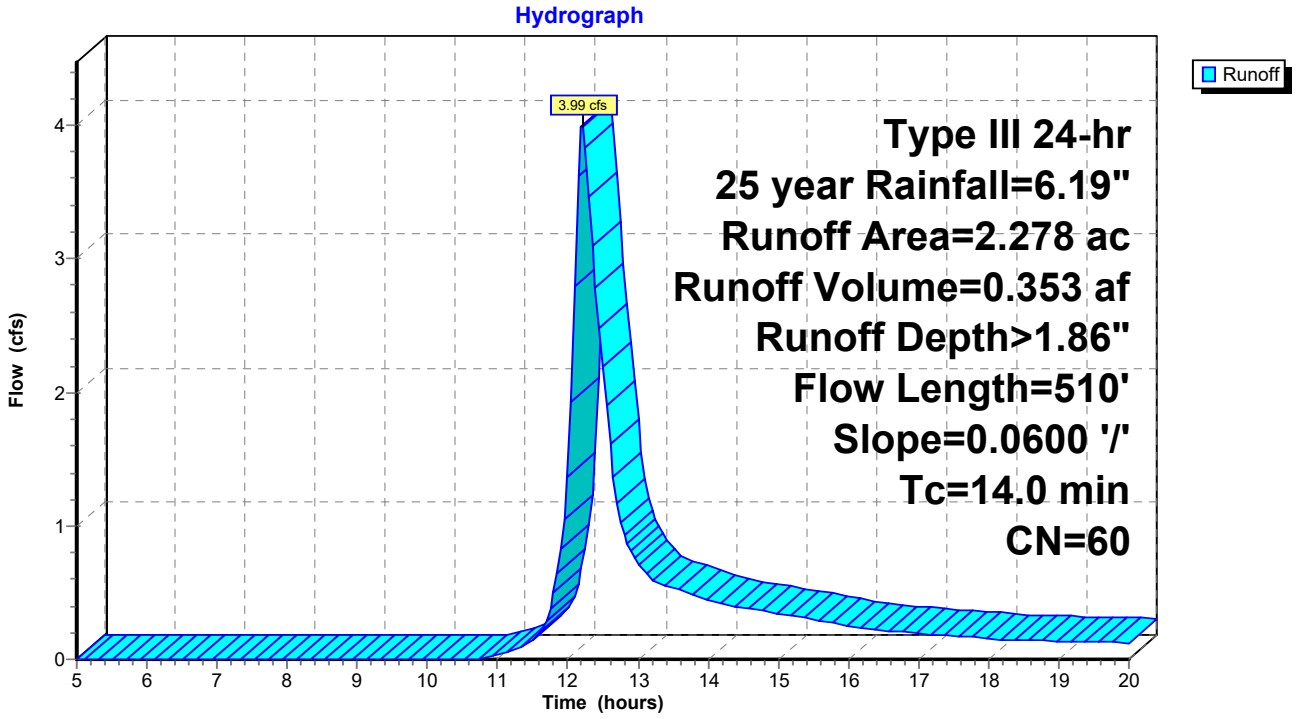
Runoff = 3.99 cfs @ 12.21 hrs, Volume= 0.353 af, Depth> 1.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
2.278	60	Woods, Fair, HSG B
2.278		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	50	0.0600	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
6.3	460	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
14.0	510	Total			

Subcatchment 13.3: Subcat 13.3



Summary for Subcatchment 14: Subcat 14

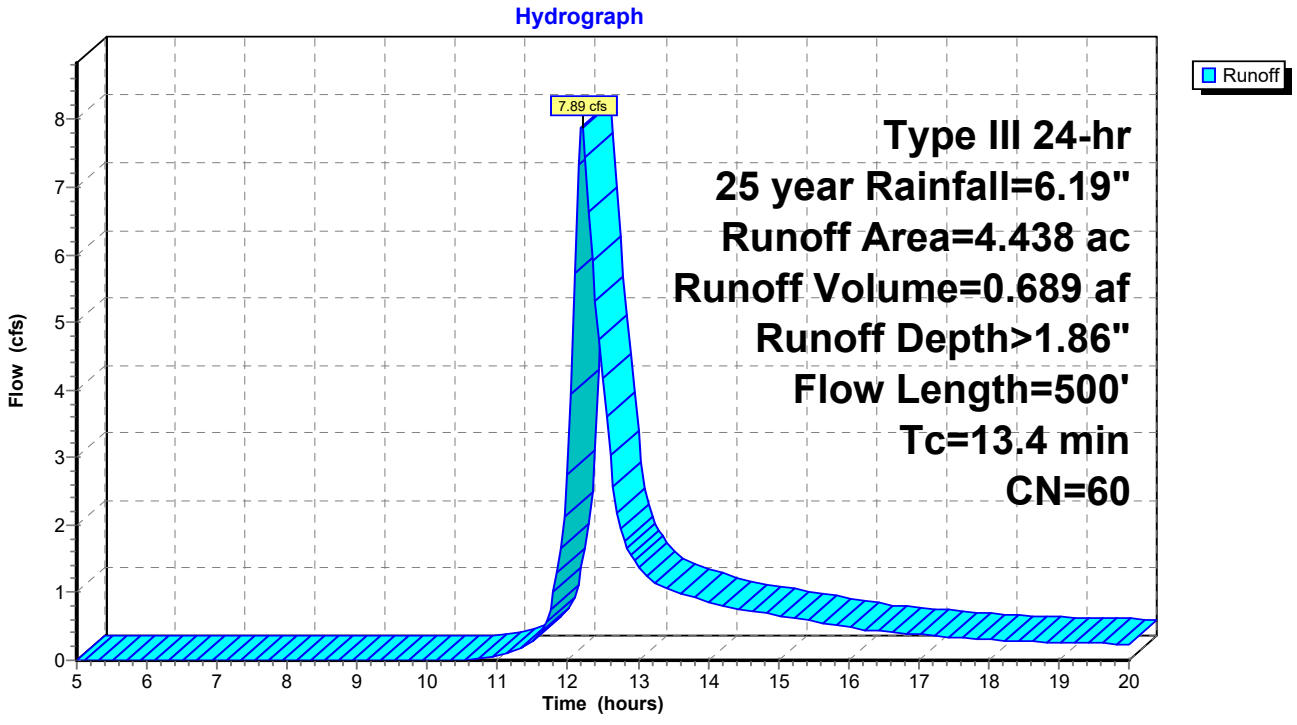
Runoff = 7.89 cfs @ 12.20 hrs, Volume= 0.689 af, Depth> 1.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
4.438	60	Woods, Fair, HSG B
4.438		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	50	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
1.9	160	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.7	180	0.1300	1.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.8	110	0.2000	2.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.4	500	Total			

Subcatchment 14: Subcat 14



Summary for Subcatchment 16: Subcat 16

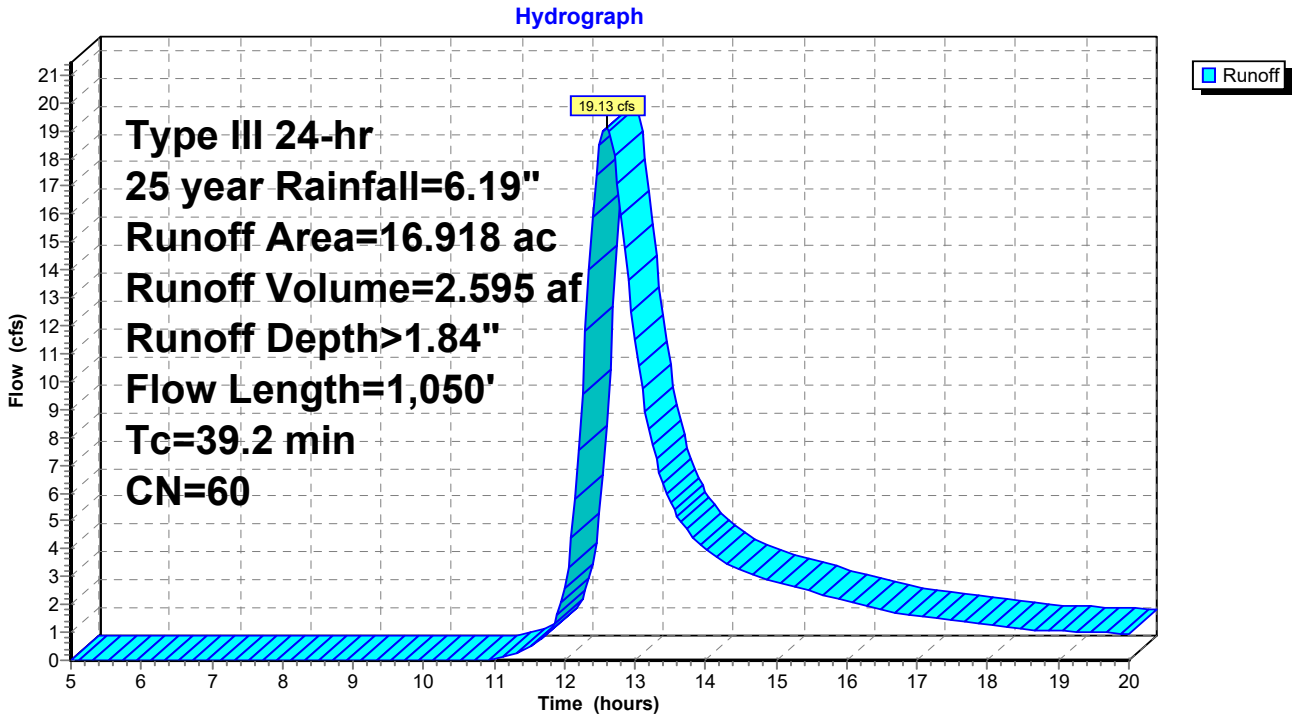
Runoff = 19.13 cfs @ 12.59 hrs, Volume= 2.595 af, Depth> 1.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
16.918	60	Woods, Fair, HSG B
16.918	60	Weighted Average
16.918		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	50	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
16.7	500	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.8	500	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
39.2	1,050	Total			

Subcatchment 16: Subcat 16



Summary for Subcatchment 16A: Subcat 16A

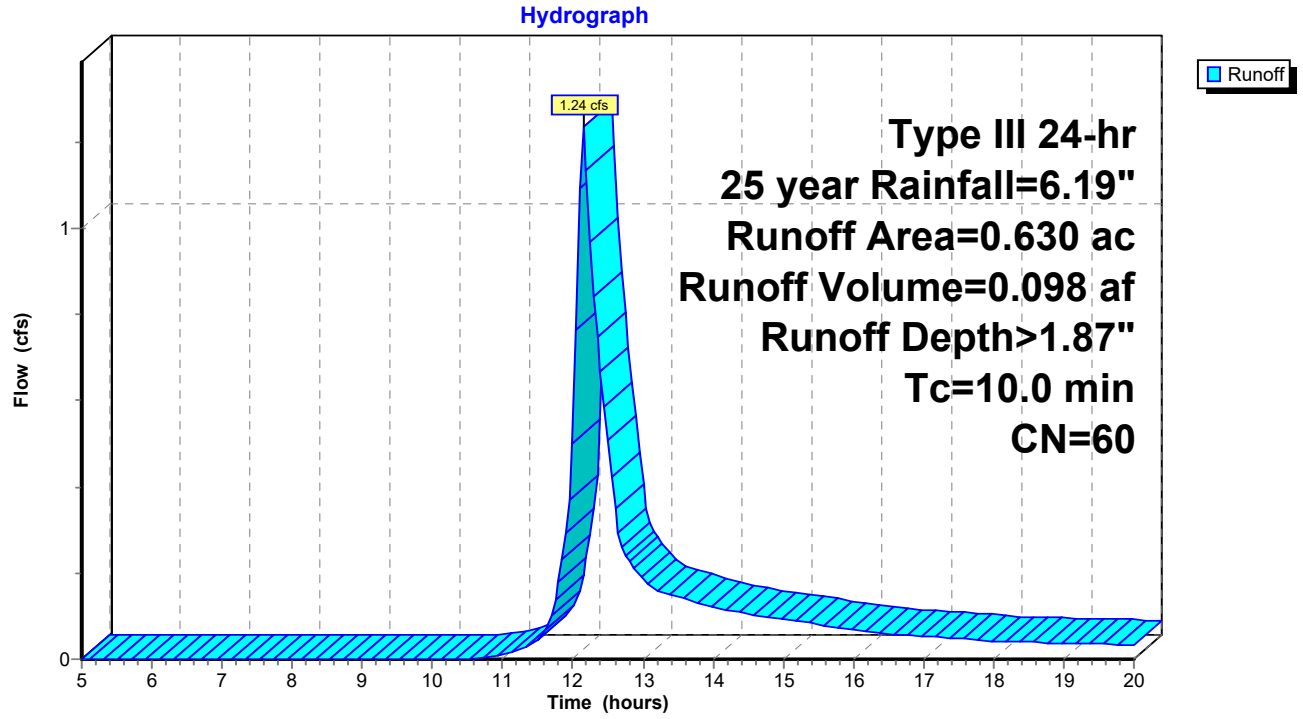
Runoff = 1.24 cfs @ 12.15 hrs, Volume= 0.098 af, Depth> 1.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.630	60	Woods, Fair, HSG B
0.630		100.00% Pervious Area

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

Subcatchment 16A: Subcat 16A



Summary for Reach 13.1R: Reach 13.1

[91] Warning: Storage range exceeded by 0.12'
[55] Hint: Peak inflow is 340% of Manning's capacity
[81] Warning: Exceeded Pond 13.1P by 0.06' @ 12.55 hrs

Inflow Area = 3.118 ac, 0.00% Impervious, Inflow Depth > 1.50" for 25 year event
Inflow = 3.24 cfs @ 12.41 hrs, Volume= 0.390 af
Outflow = 3.15 cfs @ 12.53 hrs, Volume= 0.388 af, Atten= 3%, Lag= 7.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.38 fps, Min. Travel Time= 3.5 min
Avg. Velocity = 1.52 fps, Avg. Travel Time= 5.5 min

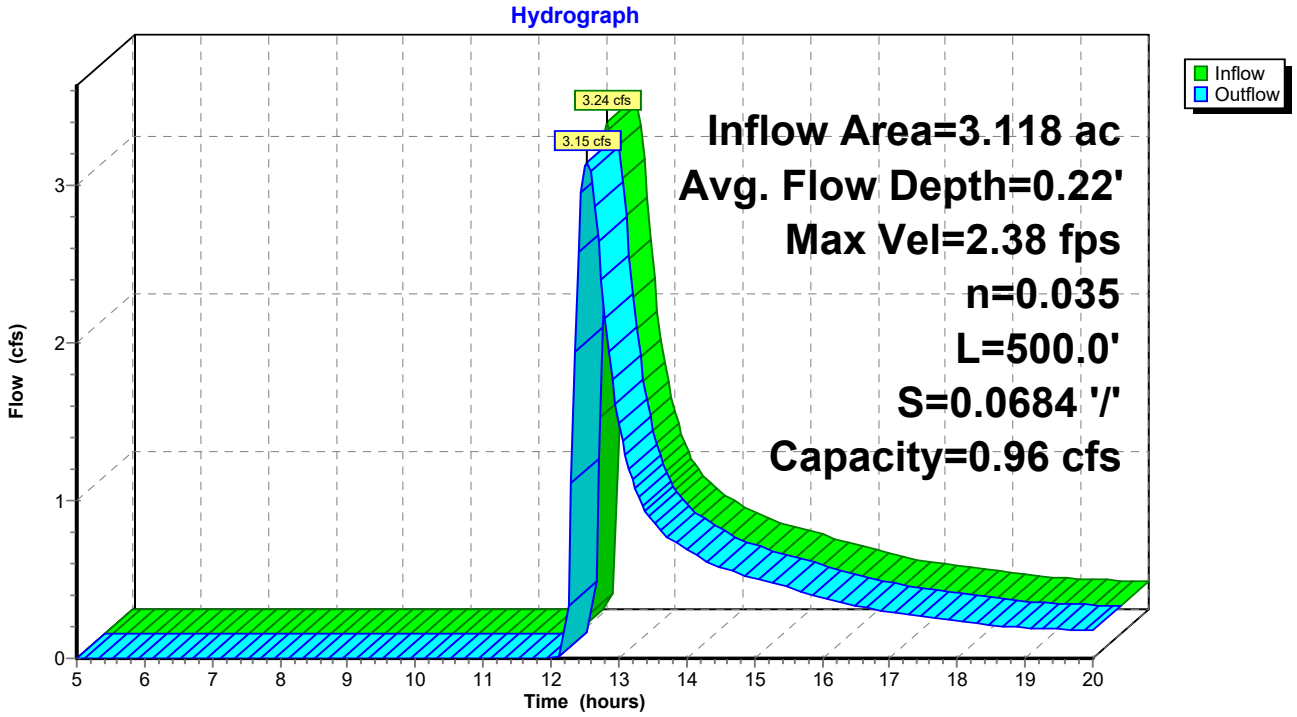
Peak Storage= 665 cf @ 12.47 hrs
Average Depth at Peak Storage= 0.22'
Bank-Full Depth= 0.10' Flow Area= 0.5 sf, Capacity= 0.96 cfs

3.00' x 0.10' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 20.0 '/' Top Width= 7.00'
Length= 500.0' Slope= 0.0684 '/'
Inlet Invert= 224.20', Outlet Invert= 190.00'



‡

Reach 13.1R: Reach 13.1



Summary for Pond 13.1P: Pond 13.1

Inflow Area = 3.118 ac, 0.00% Impervious, Inflow Depth > 1.87" for 25 year event
Inflow = 6.13 cfs @ 12.15 hrs, Volume= 0.485 af
Outflow = 3.24 cfs @ 12.41 hrs, Volume= 0.390 af, Atten= 47%, Lag= 15.4 min
Primary = 3.24 cfs @ 12.41 hrs, Volume= 0.390 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 224.37' @ 12.41 hrs Surf.Area= 16,012 sf Storage= 6,365 cf

Plug-Flow detention time= 89.4 min calculated for 0.390 af (81% of inflow)
Center-of-Mass det. time= 36.4 min (856.8 - 820.5)

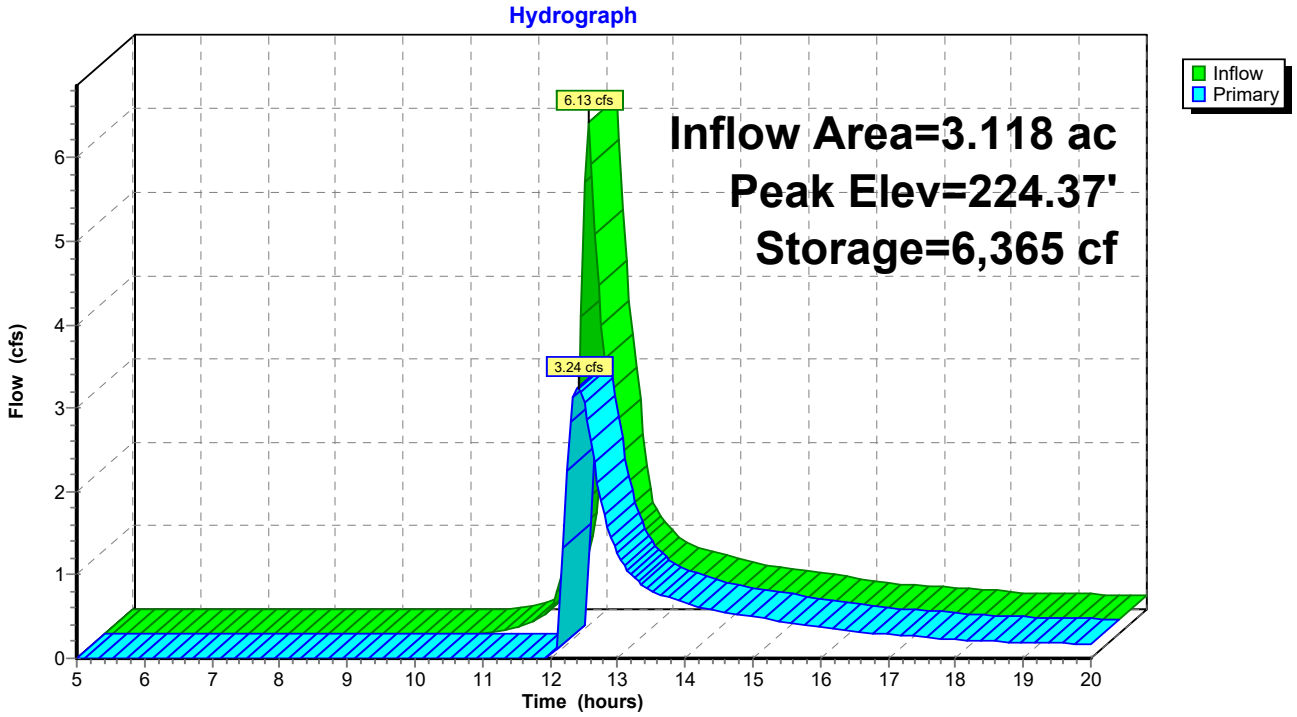
Volume	Invert	Avail.Storage	Storage Description
#1	223.70'	21,750 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
223.70	0	0	0
224.20	15,000	3,750	3,750
225.20	21,000	18,000	21,750

Device	Routing	Invert	Outlet Devices
#1	Primary	224.20'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=3.23 cfs @ 12.41 hrs HW=224.37' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 3.23 cfs @ 0.96 fps)

Pond 13.1P: Pond 13.1



Summary for Pond 13.2P: Pond 13.2

Inflow Area = 7.029 ac, 0.00% Impervious, Inflow Depth > 1.86" for 25 year event
Inflow = 11.67 cfs @ 12.24 hrs, Volume= 1.090 af
Outflow = 8.50 cfs @ 12.44 hrs, Volume= 0.925 af, Atten= 27%, Lag= 11.8 min
Discarded = 0.73 cfs @ 12.44 hrs, Volume= 0.423 af
Primary = 7.77 cfs @ 12.44 hrs, Volume= 0.502 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 190.35' @ 12.44 hrs Surf.Area= 10,297 sf Storage= 11,993 cf

Plug-Flow detention time= 81.9 min calculated for 0.922 af (85% of inflow)
Center-of-Mass det. time= 38.8 min (863.8 - 825.0)

Volume	Invert	Avail.Storage	Storage Description
#1	187.70'	34,621 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

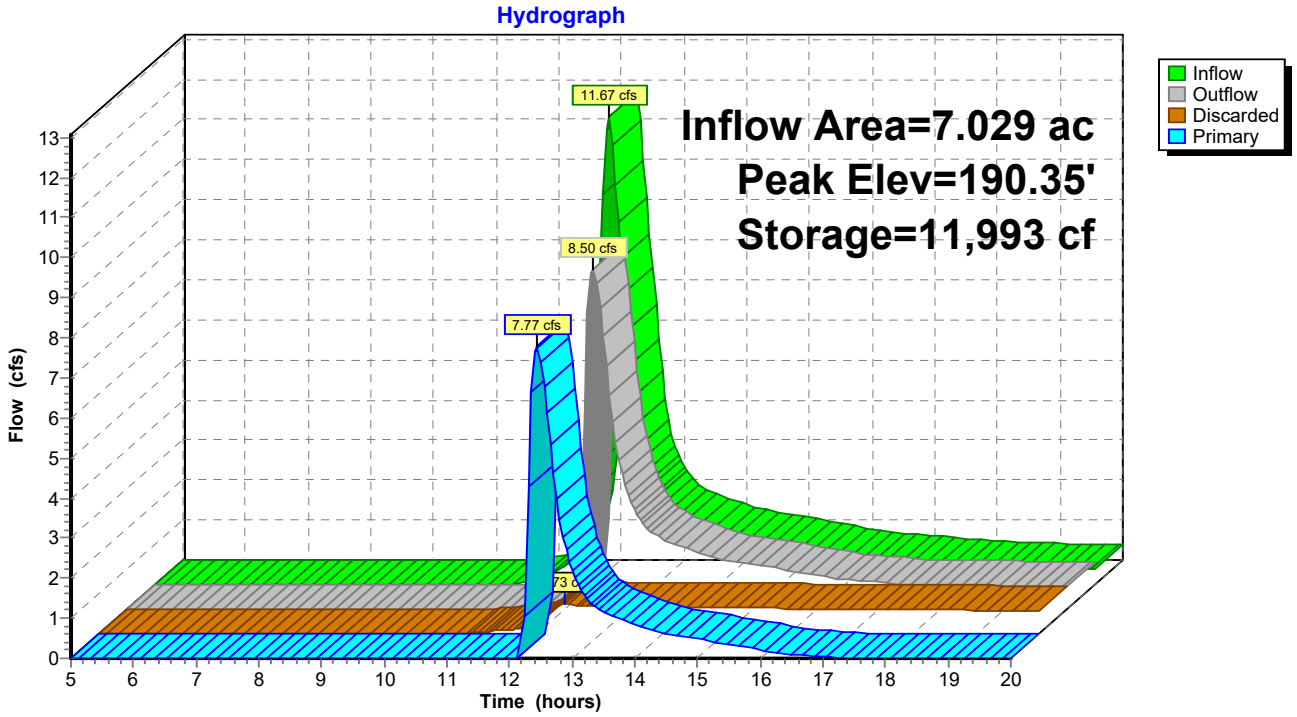
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
187.70	0	0	0	0
188.00	900	90	90	900
190.00	9,000	8,497	8,587	9,012
192.00	17,500	26,033	34,621	17,550

Device	Routing	Invert	Outlet Devices
#1	Primary	190.00'	**15.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Discarded	187.70'	**2.700 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 180.00'

Discarded OutFlow Max=0.73 cfs @ 12.44 hrs HW=190.35' (Free Discharge)
↑**2=Exfiltration** (Controls 0.73 cfs)

Primary OutFlow Max=7.71 cfs @ 12.44 hrs HW=190.35' (Free Discharge)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 7.71 cfs @ 1.46 fps)

Pond 13.2P: Pond 13.2

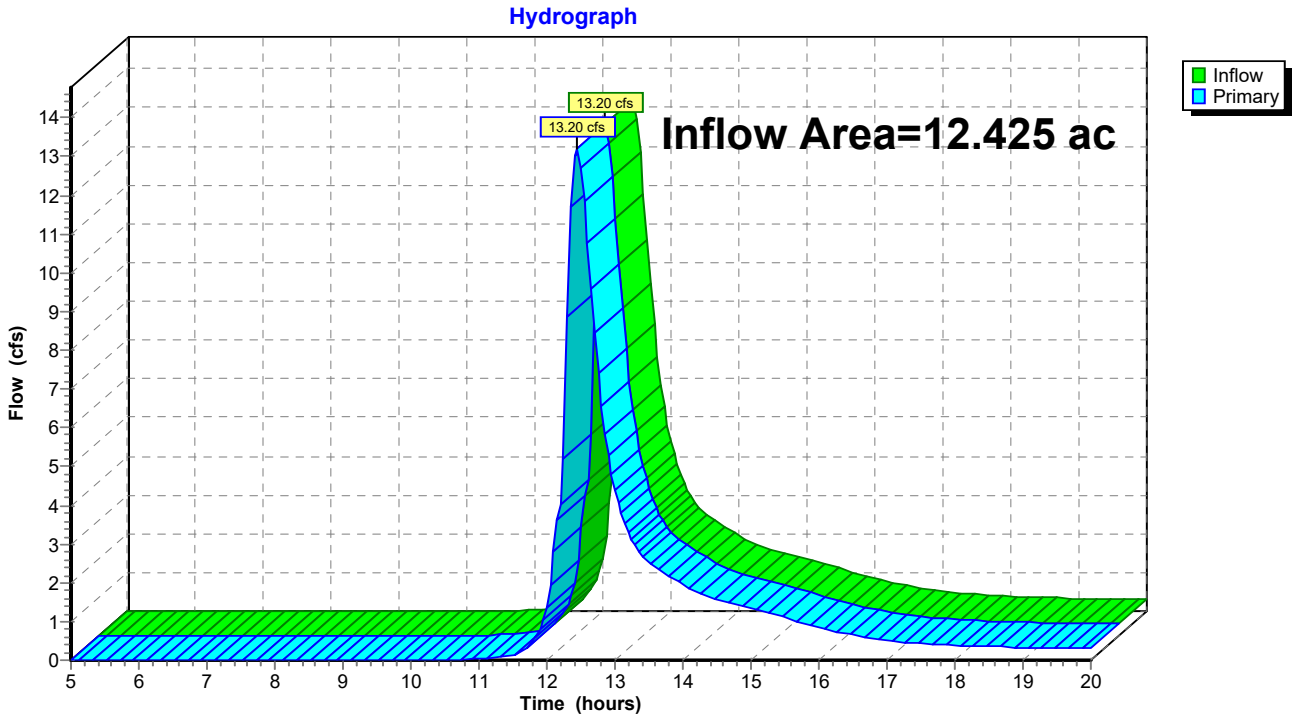


Summary for Link 13: 13

Inflow Area = 12.425 ac, 0.00% Impervious, Inflow Depth > 1.20" for 25 year event
Inflow = 13.20 cfs @ 12.44 hrs, Volume= 1.243 af
Primary = 13.20 cfs @ 12.44 hrs, Volume= 1.243 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 13: 13



50-Year Storm Event- Existing

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=3.006 ac 0.00% Impervious Runoff Depth>2.36"
Flow Length=540' Slope=0.0800 '/' Tc=12.6 min CN=60 Runoff=7.01 cfs 0.592 af

Subcatchment2: Subcat 2 Runoff Area=2.551 ac 0.00% Impervious Runoff Depth>2.36"
Flow Length=440' Tc=18.0 min CN=60 Runoff=5.23 cfs 0.501 af

Subcatchment2A: Subcat 2A Runoff Area=0.775 ac 0.00% Impervious Runoff Depth>3.04"
Tc=10.0 min CN=67 Runoff=2.56 cfs 0.196 af

Subcatchment3: Subcat 3 Runoff Area=2.550 ac 0.00% Impervious Runoff Depth>2.36"
Flow Length=700' Tc=19.2 min CN=60 Runoff=5.08 cfs 0.500 af

Subcatchment3A: Subcat 3A Runoff Area=0.324 ac 0.00% Impervious Runoff Depth>4.17"
Tc=10.0 min CN=78 Runoff=1.45 cfs 0.112 af

Subcatchment4: Subcat 4 Runoff Area=5.870 ac 0.00% Impervious Runoff Depth>2.73"
Flow Length=950' Tc=26.2 min CN=64 Runoff=12.09 cfs 1.334 af

Subcatchment5: Subcat 5 Runoff Area=2.637 ac 0.00% Impervious Runoff Depth>2.36"
Flow Length=510' Slope=0.0500 '/' Tc=15.1 min CN=60 Runoff=5.79 cfs 0.518 af

Subcatchment6: Subcat 6 Runoff Area=3.200 ac 0.00% Impervious Runoff Depth>2.84"
Flow Length=480' Slope=0.0700 '/' Tc=12.6 min CN=65 Runoff=9.10 cfs 0.757 af

Subcatchment6A: Subcat 6A Runoff Area=0.919 ac 0.00% Impervious Runoff Depth>3.14"
Tc=10.0 min CN=68 Runoff=3.14 cfs 0.240 af

Subcatchment6B: Subcat 6B Runoff Area=0.030 ac 0.00% Impervious Runoff Depth>2.36"
Tc=10.0 min CN=60 Runoff=0.08 cfs 0.006 af

Subcatchment6C: Subcat 6C Runoff Area=0.694 ac 0.00% Impervious Runoff Depth>2.36"
Tc=10.0 min CN=60 Runoff=1.76 cfs 0.137 af

Subcatchment7: Subcat 7 Runoff Area=1.170 ac 0.00% Impervious Runoff Depth>2.36"
Flow Length=300' Tc=10.5 min CN=60 Runoff=2.92 cfs 0.230 af

Subcatchment7A: Subcat 7A Runoff Area=0.202 ac 0.00% Impervious Runoff Depth>2.36"
Tc=10.0 min CN=60 Runoff=0.51 cfs 0.040 af

Subcatchment8: Subcat 8 Runoff Area=4.689 ac 0.00% Impervious Runoff Depth>2.36"
Flow Length=720' Tc=15.8 min CN=60 Runoff=10.07 cfs 0.922 af

Subcatchment8A: Subcat 8A Runoff Area=0.770 ac 0.00% Impervious Runoff Depth>2.36"
Tc=10.0 min CN=60 Runoff=1.95 cfs 0.152 af

Subcatchment9: Subcat 9 Runoff Area=1.520 ac 0.00% Impervious Runoff Depth>2.36"
Flow Length=310' Slope=0.0700 '/' Tc=10.5 min CN=60 Runoff=3.80 cfs 0.300 af

Subcatchment9A: Subcat 9A Runoff Area=0.285 ac 0.00% Impervious Runoff Depth>2.36"
Tc=10.0 min CN=60 Runoff=0.72 cfs 0.056 af

Subcatchment10: Subcat 10 Runoff Area=2.304 ac 0.00% Impervious Runoff Depth>2.36"
Flow Length=490' Tc=17.5 min CN=60 Runoff=4.78 cfs 0.453 af

Subcatchment10A: Subcat 10A Runoff Area=0.287 ac 0.00% Impervious Runoff Depth>2.36"
Tc=10.0 min CN=60 Runoff=0.73 cfs 0.057 af

Subcatchment11: Subcat 11 Runoff Area=1.127 ac 0.00% Impervious Runoff Depth>2.37"
Flow Length=250' Slope=0.1000 '/' Tc=8.3 min CN=60 Runoff=2.98 cfs 0.222 af

Subcatchment11A: Subcat 11A Runoff Area=0.428 ac 0.00% Impervious Runoff Depth>2.36"
Tc=10.0 min CN=60 Runoff=1.08 cfs 0.084 af

Subcatchment12: Subcat 12 Runoff Area=3.677 ac 0.00% Impervious Runoff Depth>2.36"
Flow Length=590' Slope=0.0900 '/' Tc=12.5 min CN=60 Runoff=8.60 cfs 0.724 af

Subcatchment13.1: Subcat 13.1 Runoff Area=3.118 ac 0.00% Impervious Runoff Depth>2.36"
Flow Length=320' Slope=0.0800 '/' Tc=10.0 min CN=60 Runoff=7.89 cfs 0.614 af

Subcatchment13.2: Subcat 13.2 Runoff Area=7.029 ac 0.00% Impervious Runoff Depth>2.36"
Flow Length=800' Tc=16.0 min CN=60 Runoff=15.03 cfs 1.382 af

Subcatchment13.3: Subcat 13.3 Runoff Area=2.278 ac 0.00% Impervious Runoff Depth>2.36"
Flow Length=510' Slope=0.0600 '/' Tc=14.0 min CN=60 Runoff=5.14 cfs 0.448 af

Subcatchment14: Subcat 14 Runoff Area=4.438 ac 0.00% Impervious Runoff Depth>2.36"
Flow Length=500' Tc=13.4 min CN=60 Runoff=10.16 cfs 0.873 af

Subcatchment16: Subcat 16 Runoff Area=16.918 ac 0.00% Impervious Runoff Depth>2.34"
Flow Length=1,050' Tc=39.2 min CN=60 Runoff=24.60 cfs 3.292 af

Subcatchment16A: Subcat 16A Runoff Area=0.630 ac 0.00% Impervious Runoff Depth>2.36"
Tc=10.0 min CN=60 Runoff=1.60 cfs 0.124 af

Reach 13.1R: Reach 13.1 Avg. Flow Depth=0.31' Max Vel=2.46 fps Inflow=4.93 cfs 0.519 af
n=0.035 L=500.0' S=0.0684 '/' Capacity=0.96 cfs Outflow=4.76 cfs 0.516 af

Pond 13.1P: Pond 13.1 Peak Elev=224.42' Storage=7,225 cf Inflow=7.89 cfs 0.614 af
Outflow=4.93 cfs 0.519 af

Pond 13.2P: Pond 13.2 Peak Elev=190.46' Storage=13,071 cf Inflow=15.03 cfs 1.382 af
Discarded=0.76 cfs 0.440 af Primary=11.81 cfs 0.761 af Outflow=12.57 cfs 1.201 af

Link 13: 13 Inflow=19.91 cfs 1.726 af
Primary=19.91 cfs 1.726 af

Total Runoff Area = 73.426 ac Runoff Volume = 14.866 af Average Runoff Depth = 2.43"
100.00% Pervious = 73.426 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1: Subcat 1

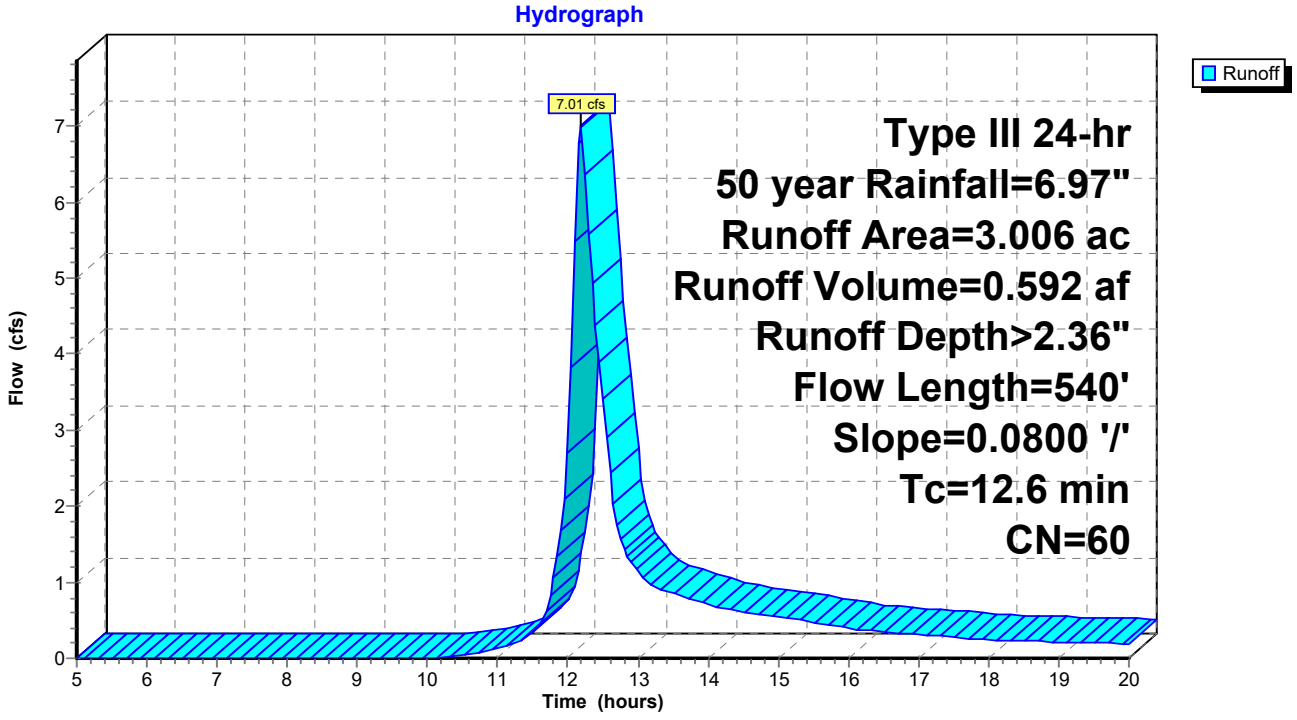
Runoff = 7.01 cfs @ 12.19 hrs, Volume= 0.592 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
3.005	60	Woods, Fair, HSG B
3.006	60	Weighted Average
3.006		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
5.8	490	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.6	540	Total			

Subcatchment 1: Subcat 1



Summary for Subcatchment 2: Subcat 2

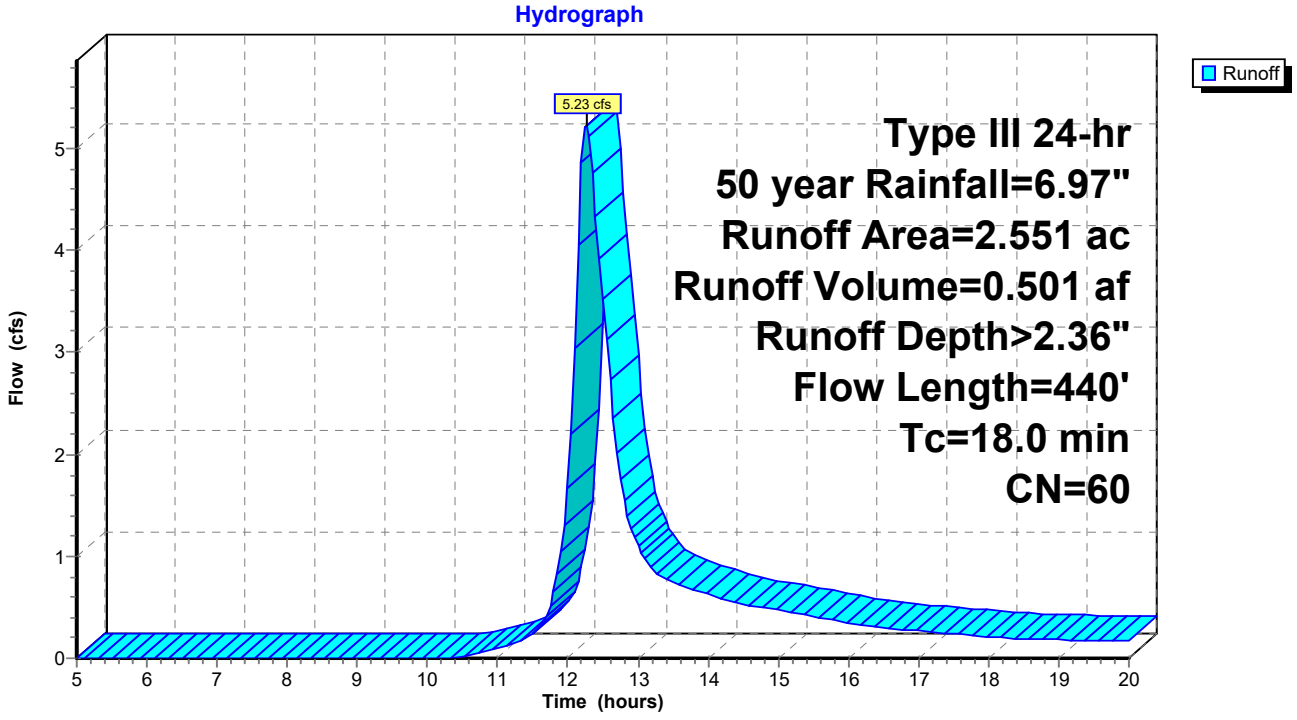
Runoff = 5.23 cfs @ 12.26 hrs, Volume= 0.501 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
2.551	60	Woods, Fair, HSG B
2.551		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
5.7	340	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.4	50	0.2000	2.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
18.0	440	Total			

Subcatchment 2: Subcat 2



Summary for Subcatchment 2A: Subcat 2A

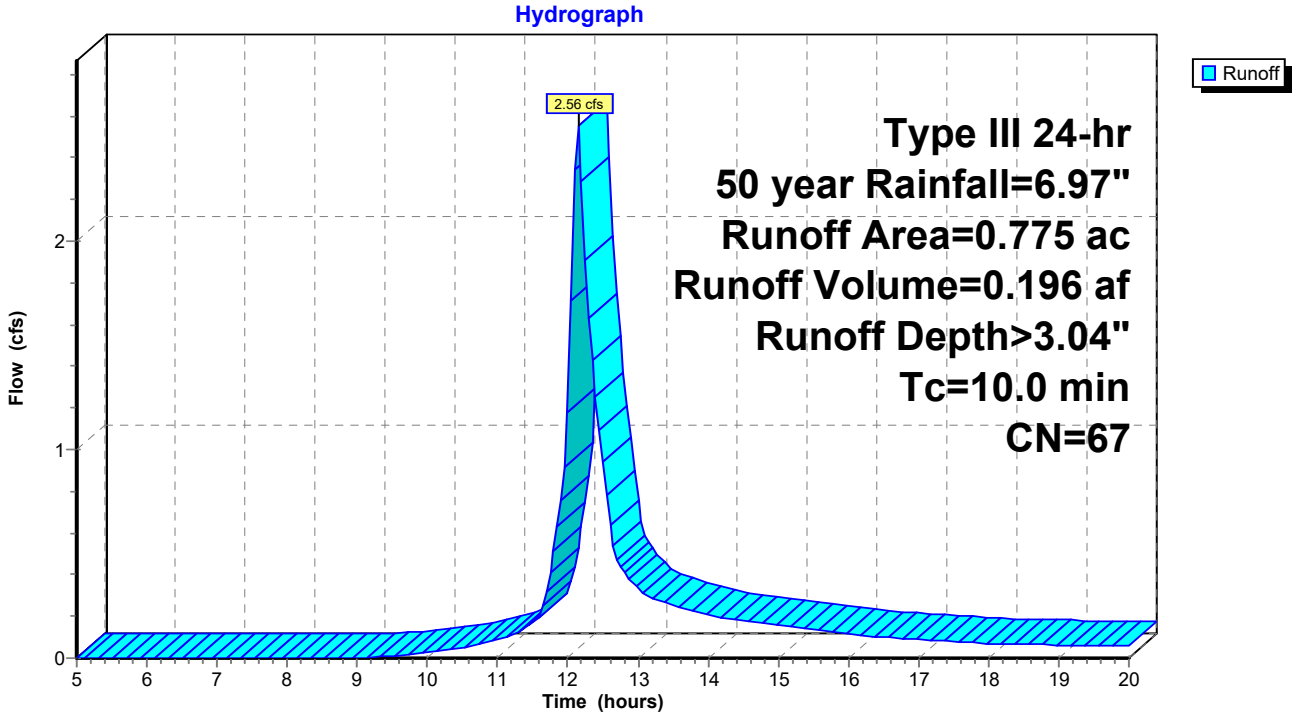
Runoff = 2.56 cfs @ 12.15 hrs, Volume= 0.196 af, Depth> 3.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.488	60	Woods, Fair, HSG B
0.287	79	Woods, Fair, HSG D
0.775	67	Weighted Average
0.775		100.00% Pervious Area

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

Subcatchment 2A: Subcat 2A



Summary for Subcatchment 3: Subcat 3

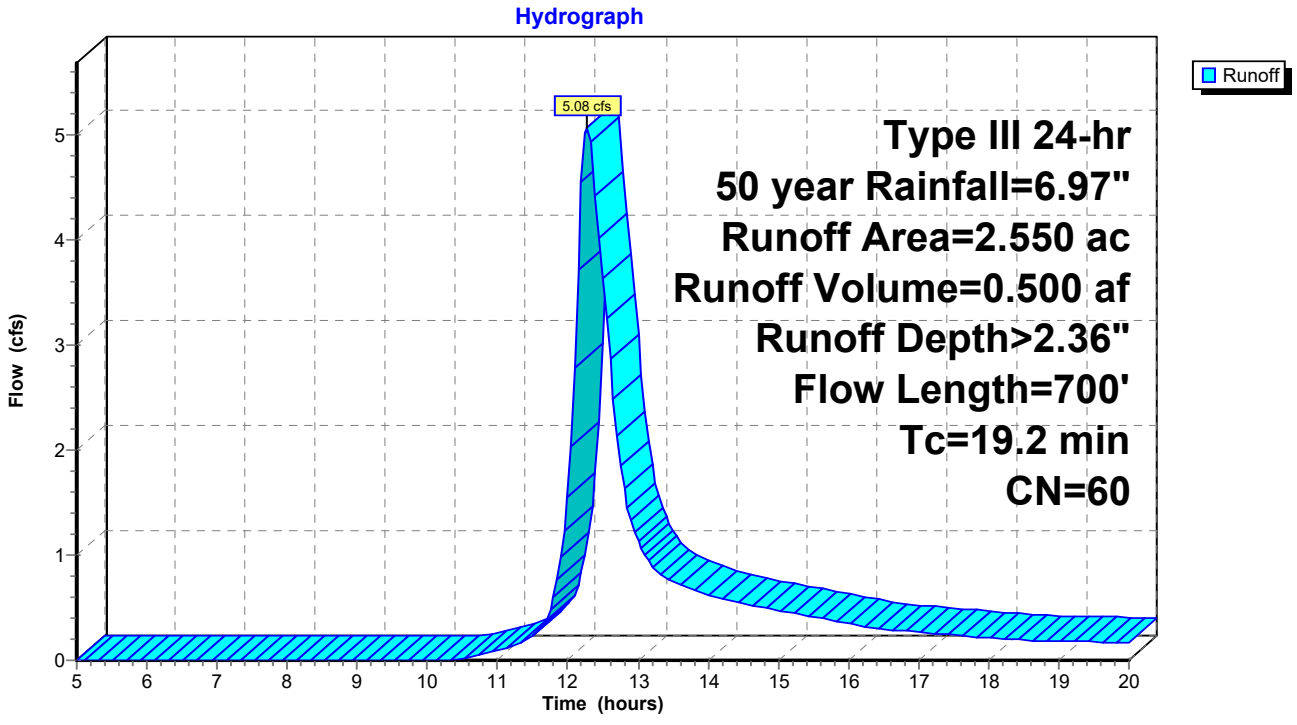
Runoff = 5.08 cfs @ 12.28 hrs, Volume= 0.500 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
2.515	60	Woods, Fair, HSG B
0.034	79	Woods, Fair, HSG D
2.550	60	Weighted Average
2.550		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	50	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
8.3	500	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.9	150	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
19.2	700	Total			

Subcatchment 3: Subcat 3



Summary for Subcatchment 3A: Subcat 3A

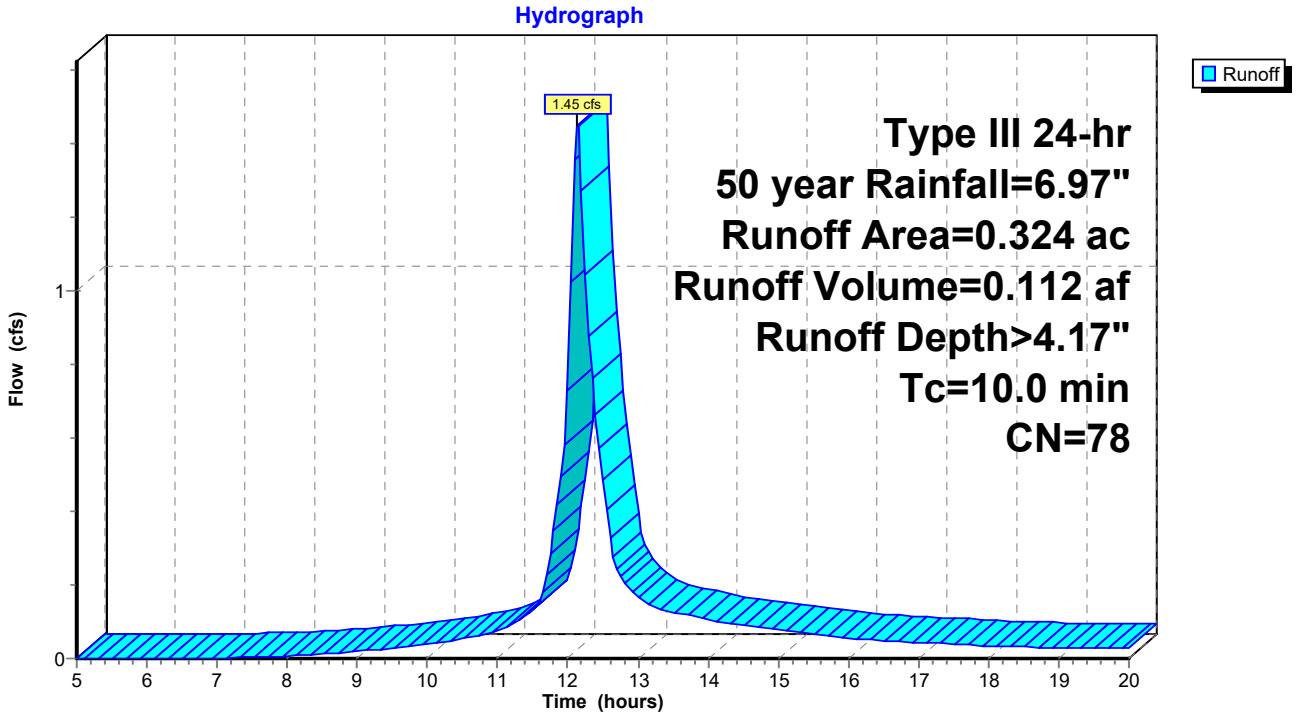
Runoff = 1.45 cfs @ 12.14 hrs, Volume= 0.112 af, Depth> 4.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.008	60	Woods, Fair, HSG B
0.002	60	Woods, Fair, HSG B
0.315	79	Woods, Fair, HSG D
0.324	78	Weighted Average
0.324		100.00% Pervious Area

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

Subcatchment 3A: Subcat 3A



Summary for Subcatchment 4: Subcat 4

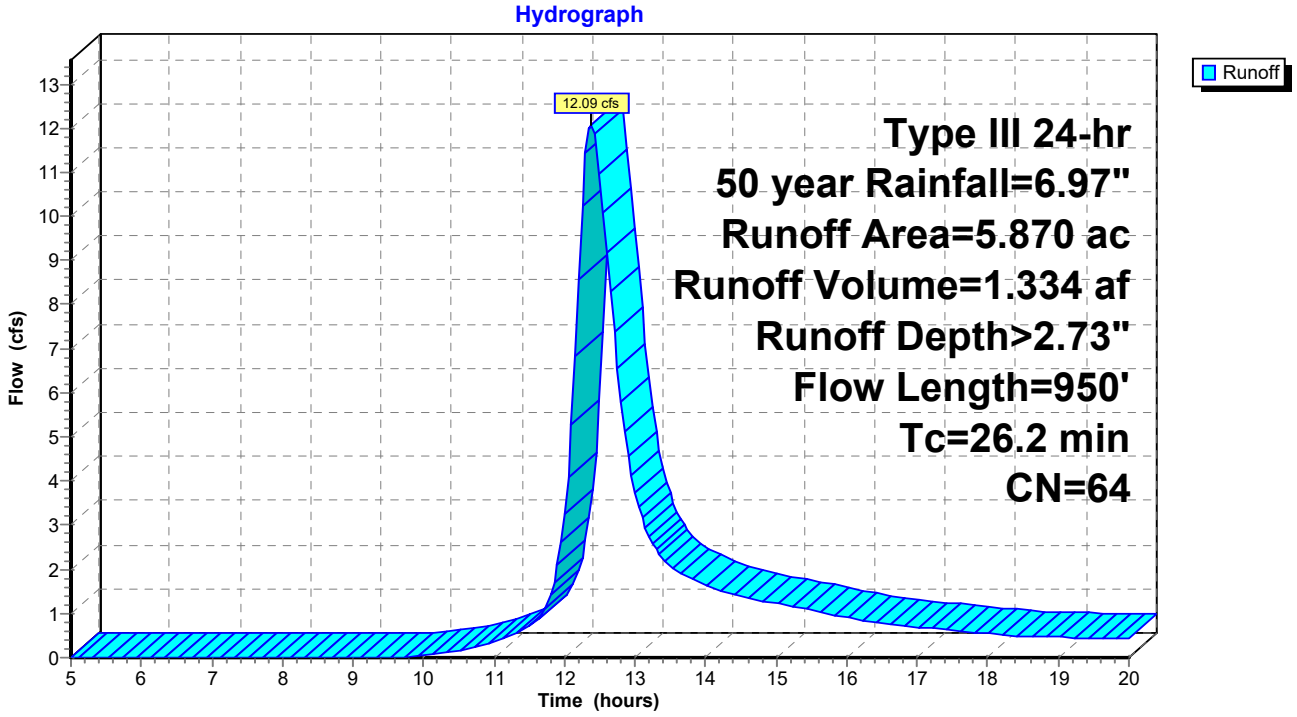
Runoff = 12.09 cfs @ 12.38 hrs, Volume= 1.334 af, Depth> 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
4.578	60	Woods, Fair, HSG B
1.292	79	Woods, Fair, HSG D
5.870	64	Weighted Average
5.870		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	50	0.0150	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
6.0	360	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.2	400	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.7	140	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
26.2	950	Total			

Subcatchment 4: Subcat 4



Summary for Subcatchment 5: Subcat 5

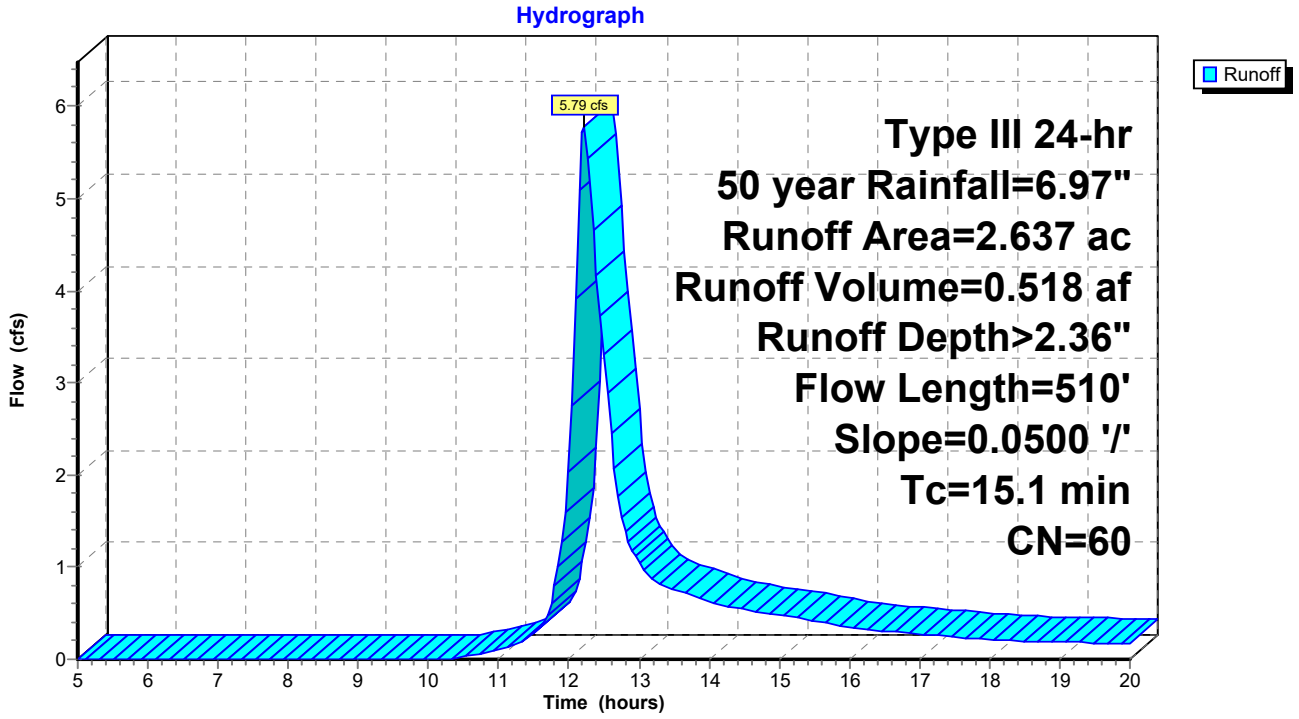
Runoff = 5.79 cfs @ 12.22 hrs, Volume= 0.518 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
2.637	60	Woods, Fair, HSG B
2.637		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
6.9	460	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
15.1	510	Total			

Subcatchment 5: Subcat 5



Summary for Subcatchment 6: Subcat 6

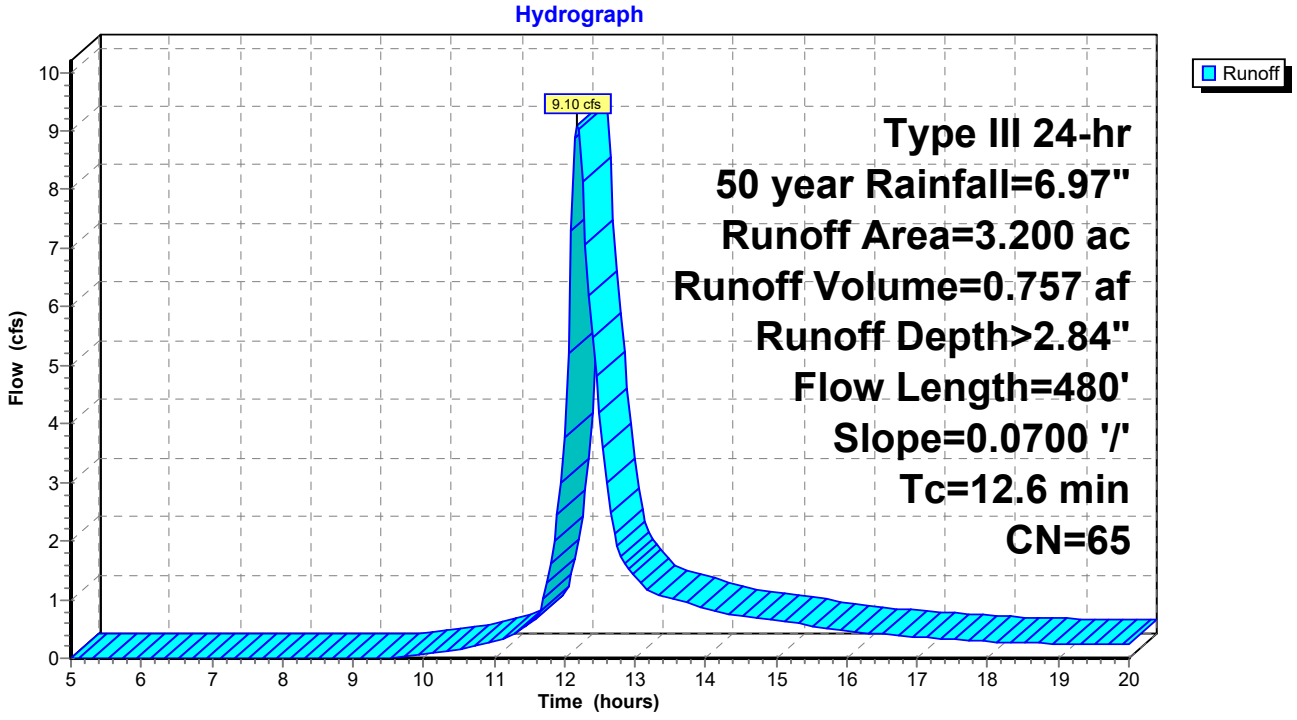
Runoff = 9.10 cfs @ 12.18 hrs, Volume= 0.757 af, Depth> 2.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
2.281	60	Woods, Fair, HSG B
0.919	79	Woods, Fair, HSG D
3.200	65	Weighted Average
3.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0700	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
5.4	430	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.6	480	Total			

Subcatchment 6: Subcat 6



Summary for Subcatchment 6A: Subcat 6A

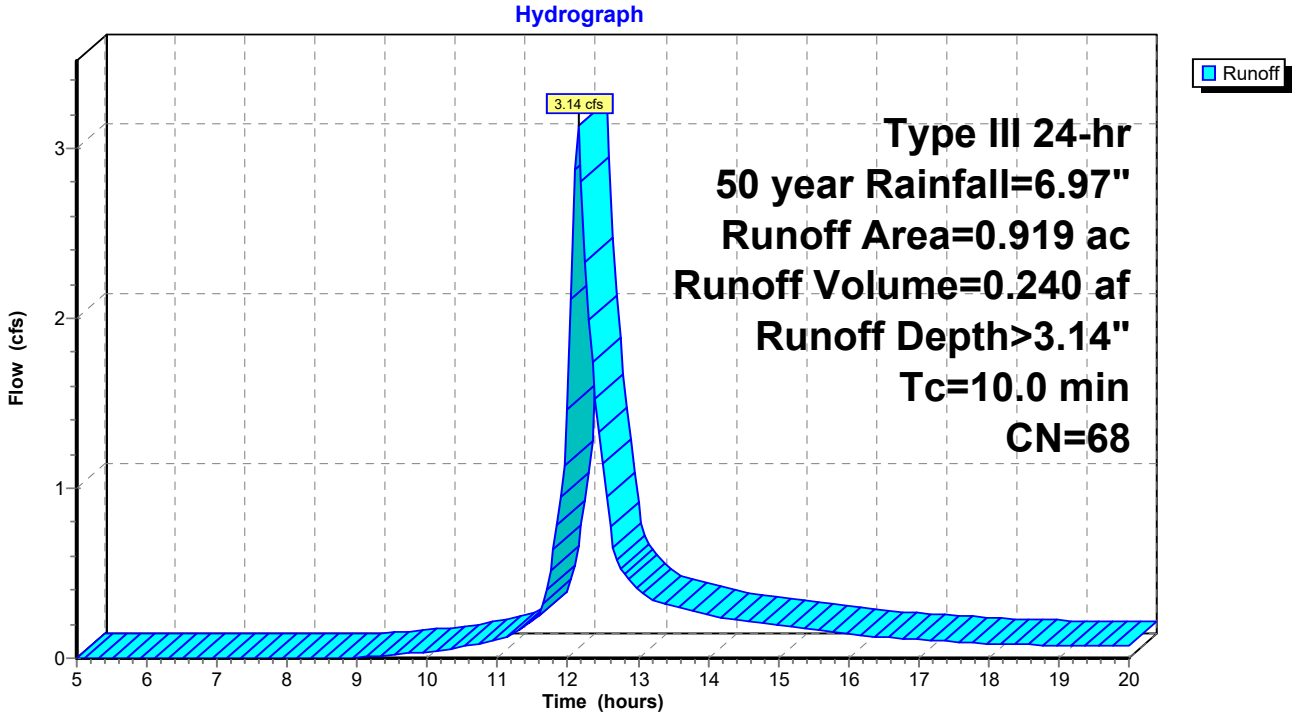
Runoff = 3.14 cfs @ 12.15 hrs, Volume= 0.240 af, Depth> 3.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.003	60	Woods, Fair, HSG B
0.517	60	Woods, Fair, HSG B
0.000	79	Woods, Fair, HSG D
0.400	79	Woods, Fair, HSG D
0.919	68	Weighted Average
0.919		100.00% Pervious Area

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

Subcatchment 6A: Subcat 6A



Summary for Subcatchment 6B: Subcat 6B

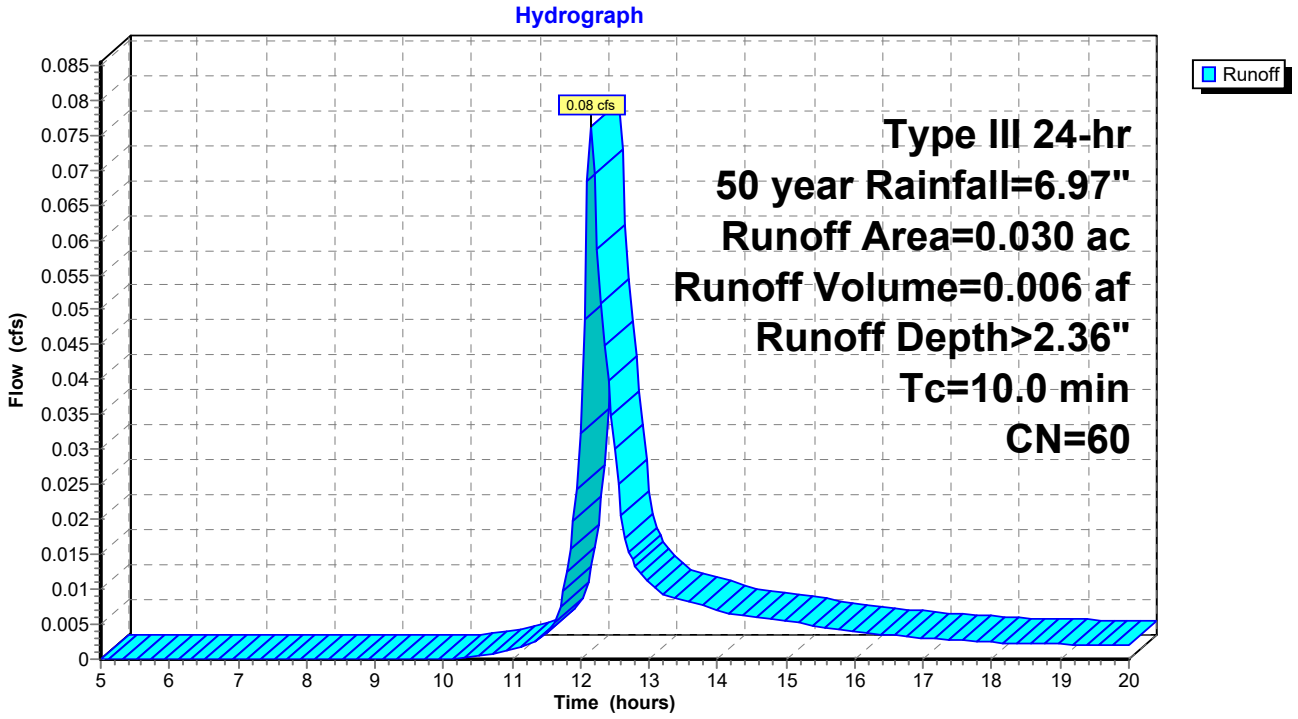
Runoff = 0.08 cfs @ 12.15 hrs, Volume= 0.006 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.030	60	Woods, Fair, HSG B
0.030		100.00% Pervious Area

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

Subcatchment 6B: Subcat 6B



Summary for Subcatchment 6C: Subcat 6C

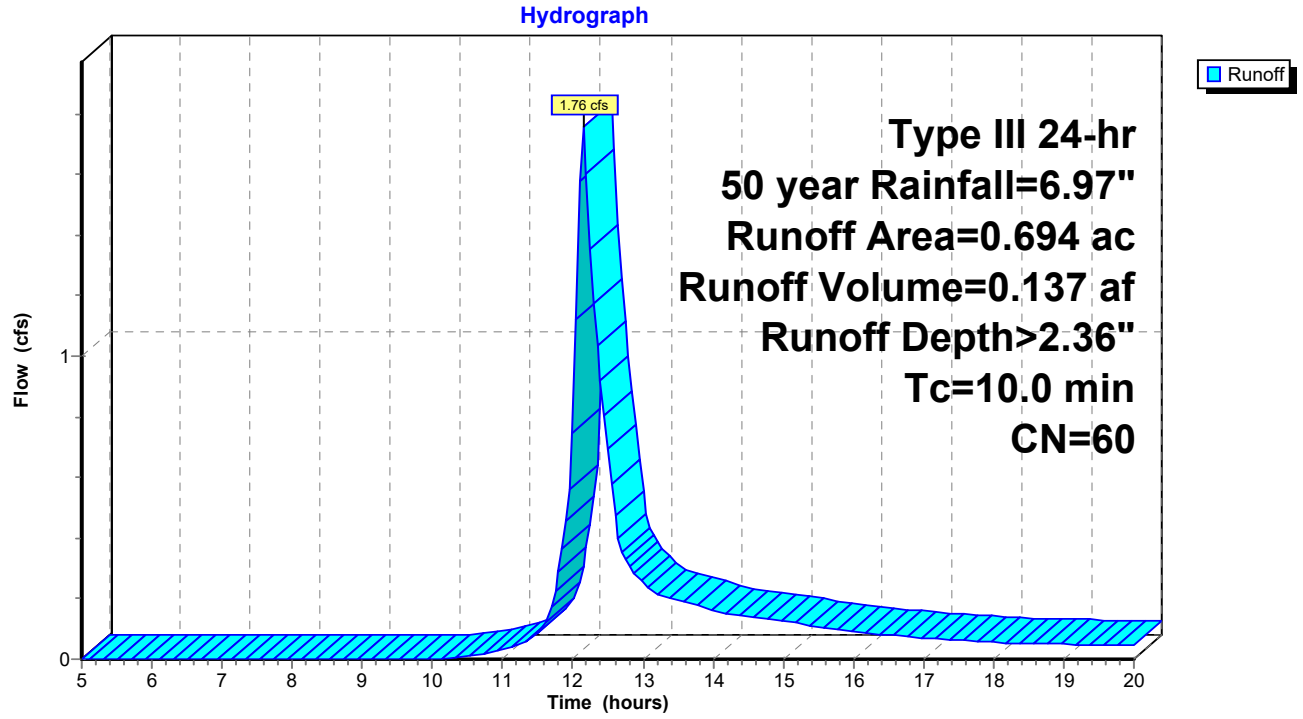
Runoff = 1.76 cfs @ 12.15 hrs, Volume= 0.137 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.694	60	Woods, Fair, HSG B
0.694		100.00% Pervious Area

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

Subcatchment 6C: Subcat 6C



Summary for Subcatchment 7: Subcat 7

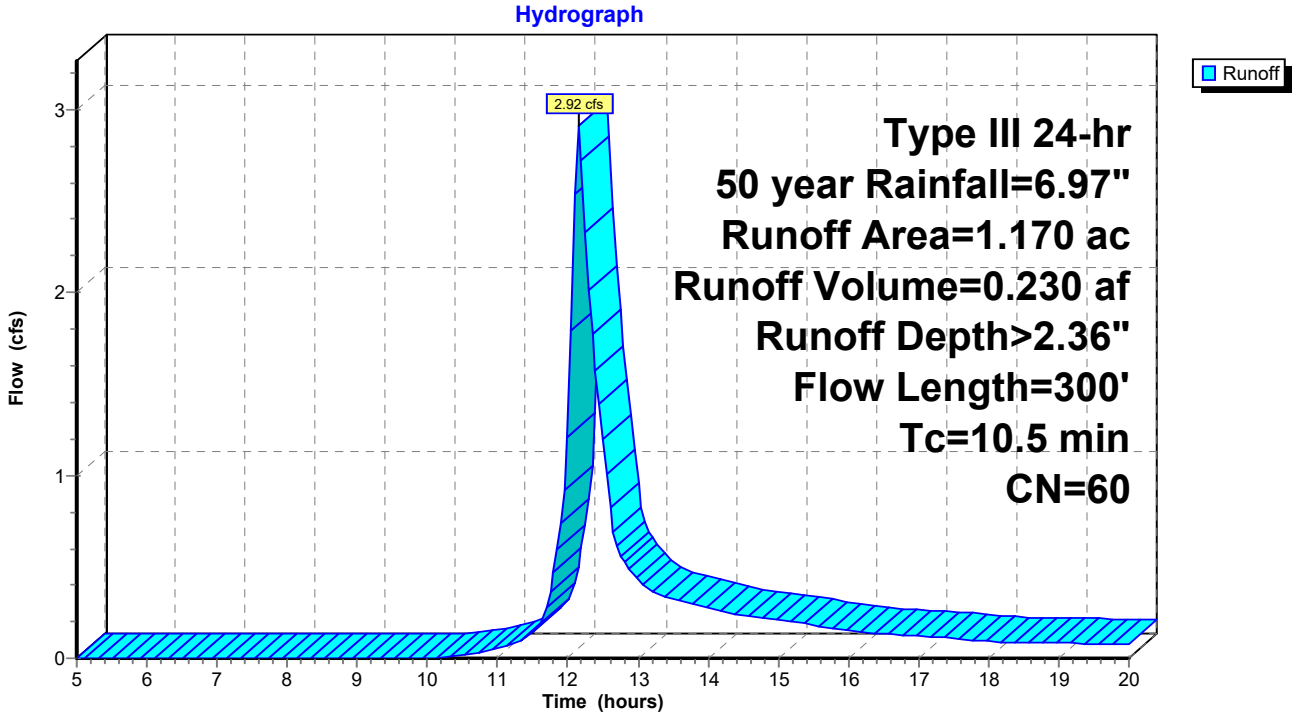
Runoff = 2.92 cfs @ 12.16 hrs, Volume= 0.230 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
1.170	60	Woods, Fair, HSG B
1.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
1.8	150	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.9	100	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.5	300	Total			

Subcatchment 7: Subcat 7



Summary for Subcatchment 7A: Subcat 7A

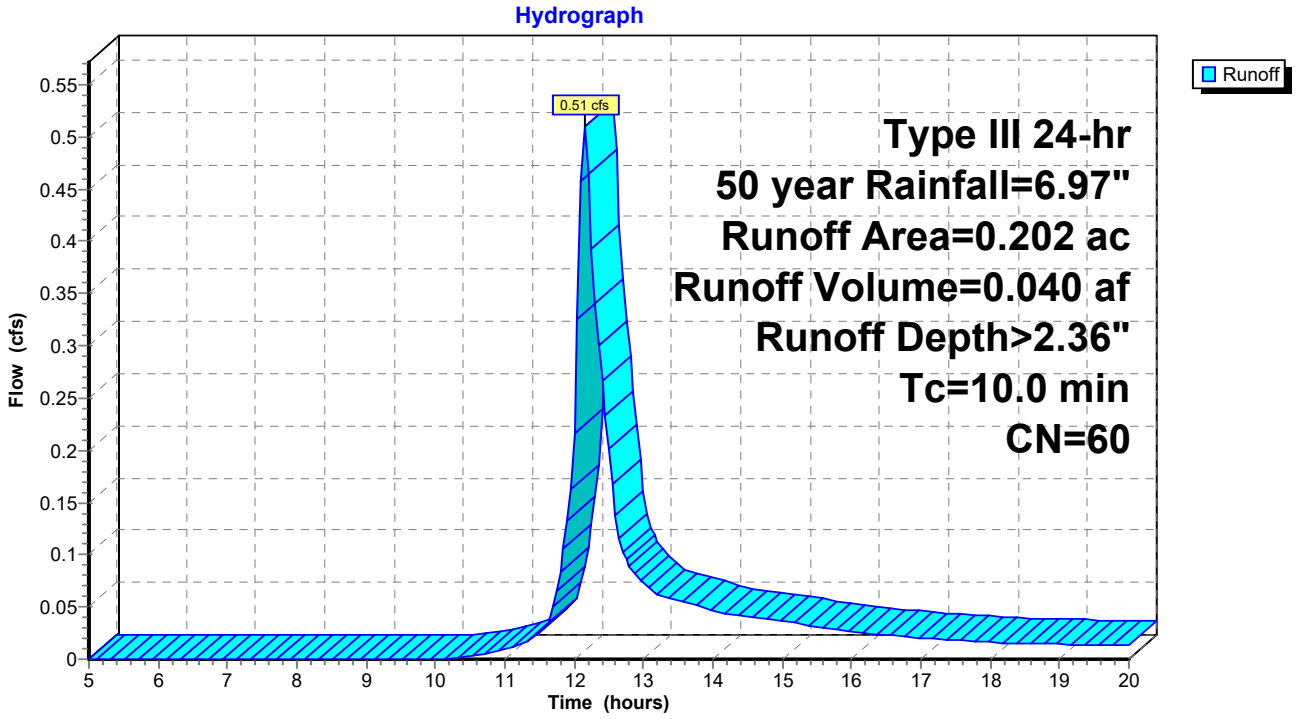
Runoff = 0.51 cfs @ 12.15 hrs, Volume= 0.040 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.202	60	Woods, Fair, HSG B
0.202		100.00% Pervious Area

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

Subcatchment 7A: Subcat 7A



Summary for Subcatchment 8: Subcat 8

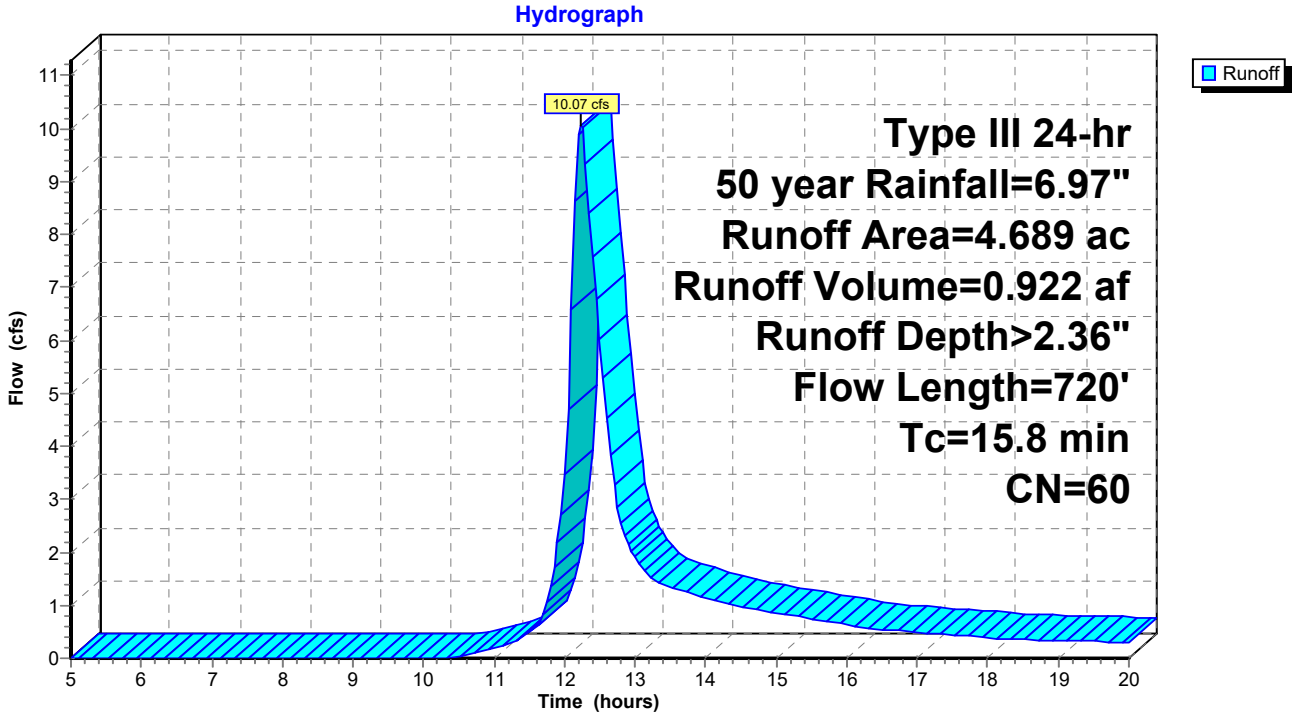
Runoff = 10.07 cfs @ 12.23 hrs, Volume= 0.922 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
4.689	60	Woods, Fair, HSG B
4.689		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.1100	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
2.7	270	0.1100	1.66		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.1	400	0.0350	0.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
15.8	720	Total			

Subcatchment 8: Subcat 8



Summary for Subcatchment 8A: Subcat 8A

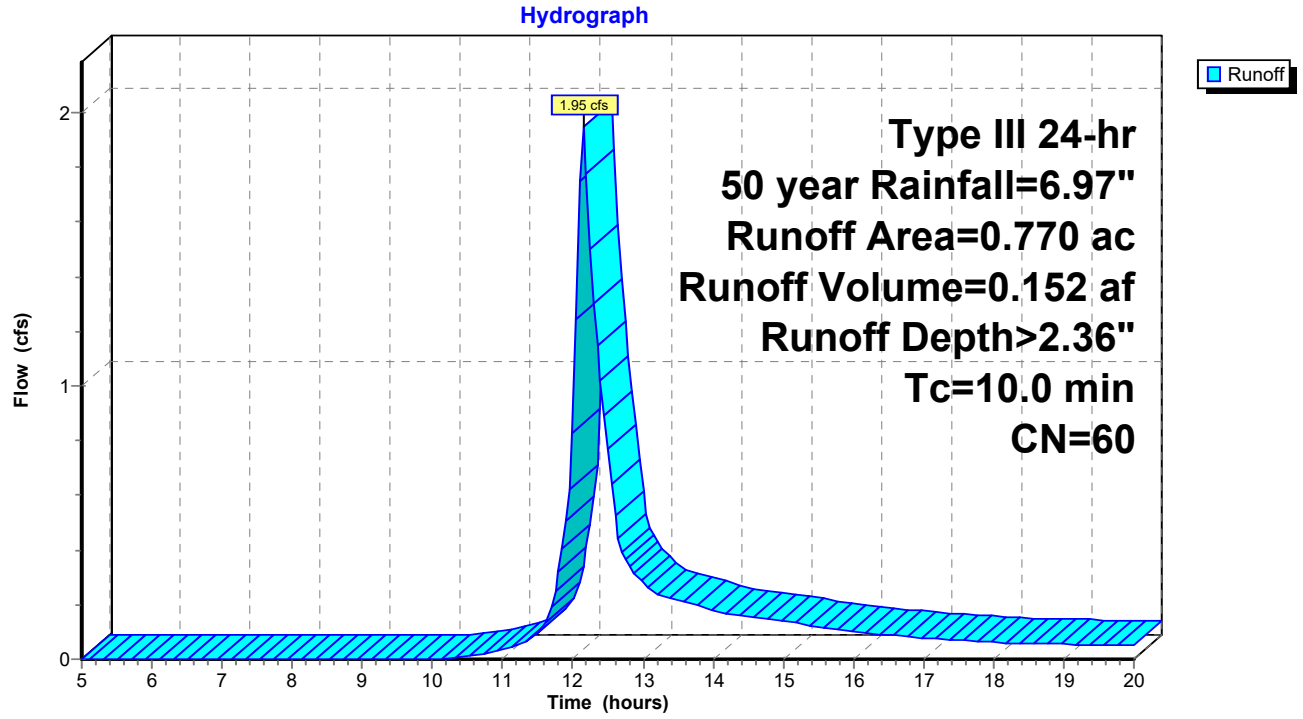
Runoff = 1.95 cfs @ 12.15 hrs, Volume= 0.152 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.770	60	Woods, Fair, HSG B
0.770		100.00% Pervious Area

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

Subcatchment 8A: Subcat 8A



Summary for Subcatchment 9: Subcat 9

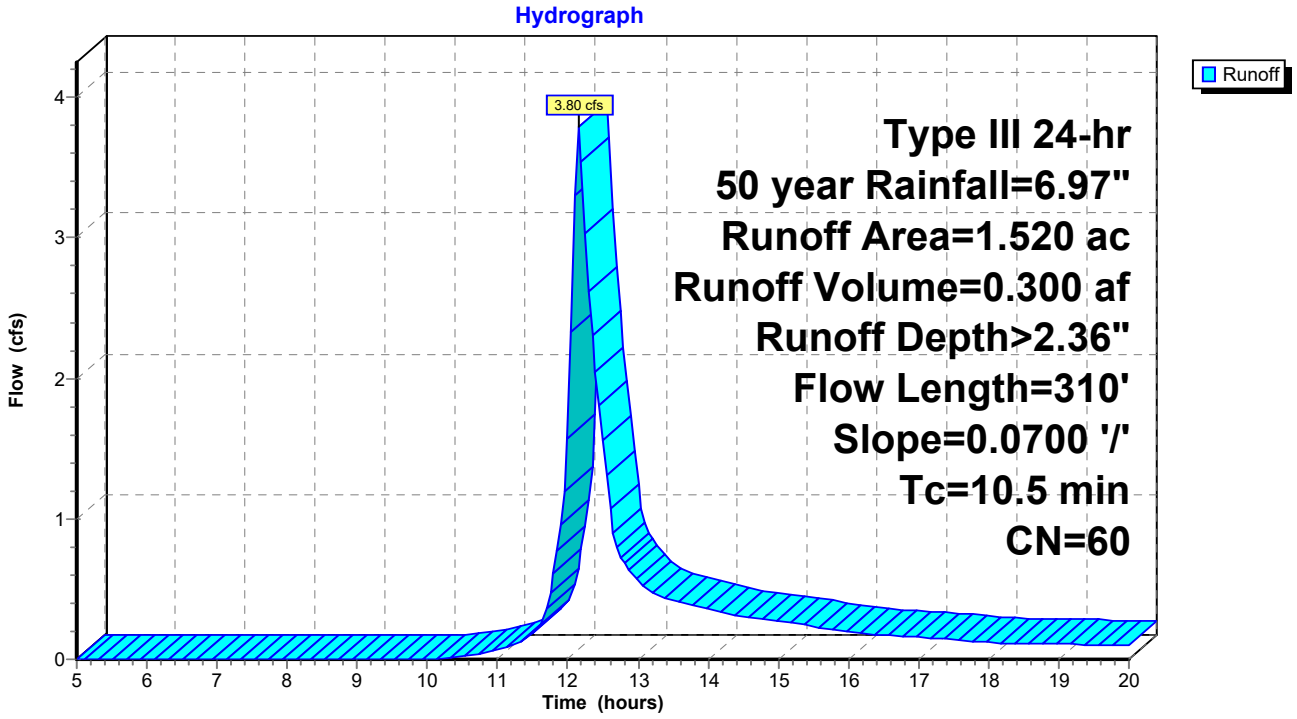
Runoff = 3.80 cfs @ 12.16 hrs, Volume= 0.300 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
1.520	60	Woods, Fair, HSG B
1.520		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0700	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
3.3	260	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.5	310	Total			

Subcatchment 9: Subcat 9



Summary for Subcatchment 9A: Subcat 9A

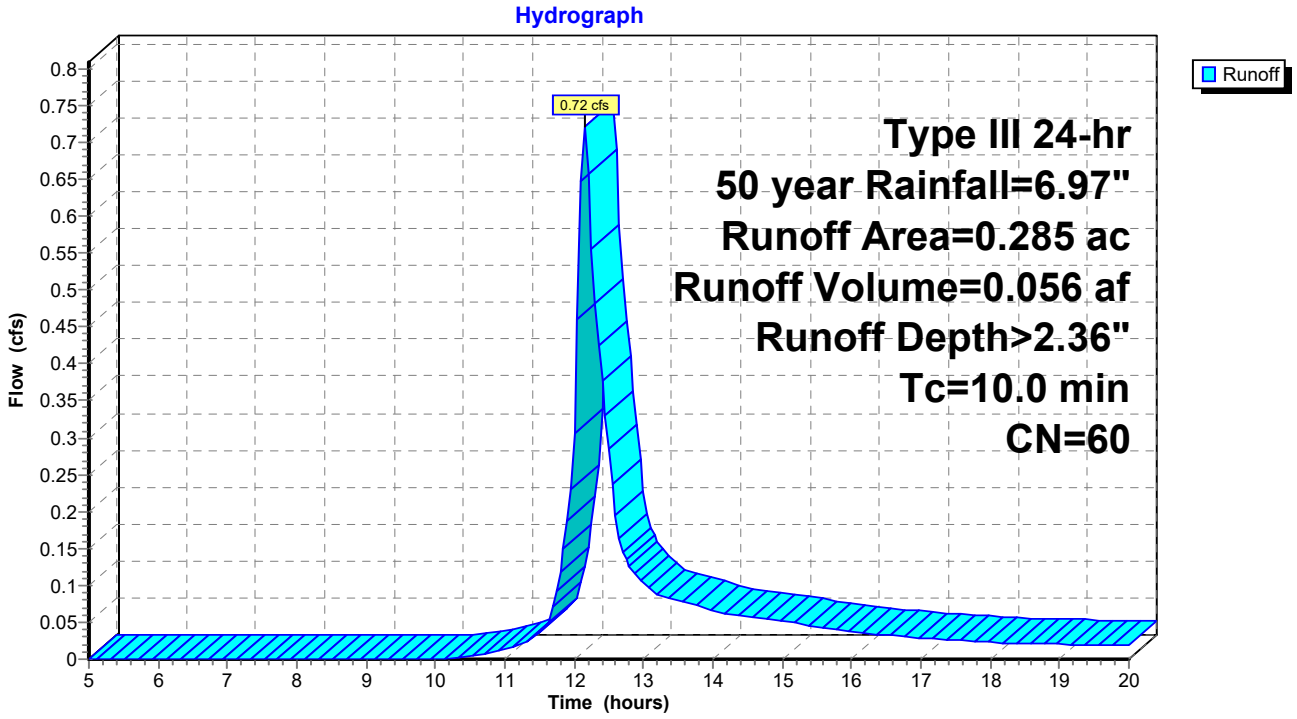
Runoff = 0.72 cfs @ 12.15 hrs, Volume= 0.056 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.285	60	Woods, Fair, HSG B
0.285		100.00% Pervious Area

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

Subcatchment 9A: Subcat 9A



Summary for Subcatchment 10: Subcat 10

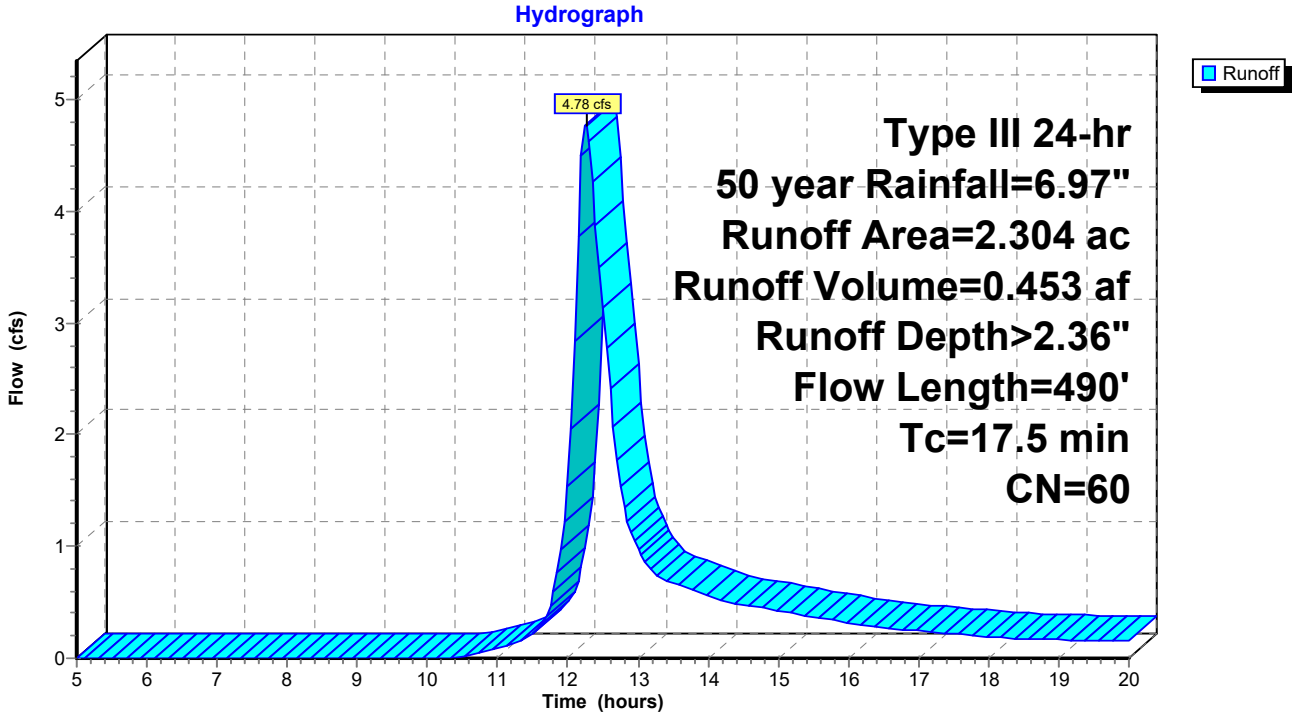
Runoff = 4.78 cfs @ 12.26 hrs, Volume= 0.453 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
2.304	60	Woods, Fair, HSG B
2.304		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
2.8	270	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.8	170	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.5	490	Total			

Subcatchment 10: Subcat 10



Summary for Subcatchment 10A: Subcat 10A

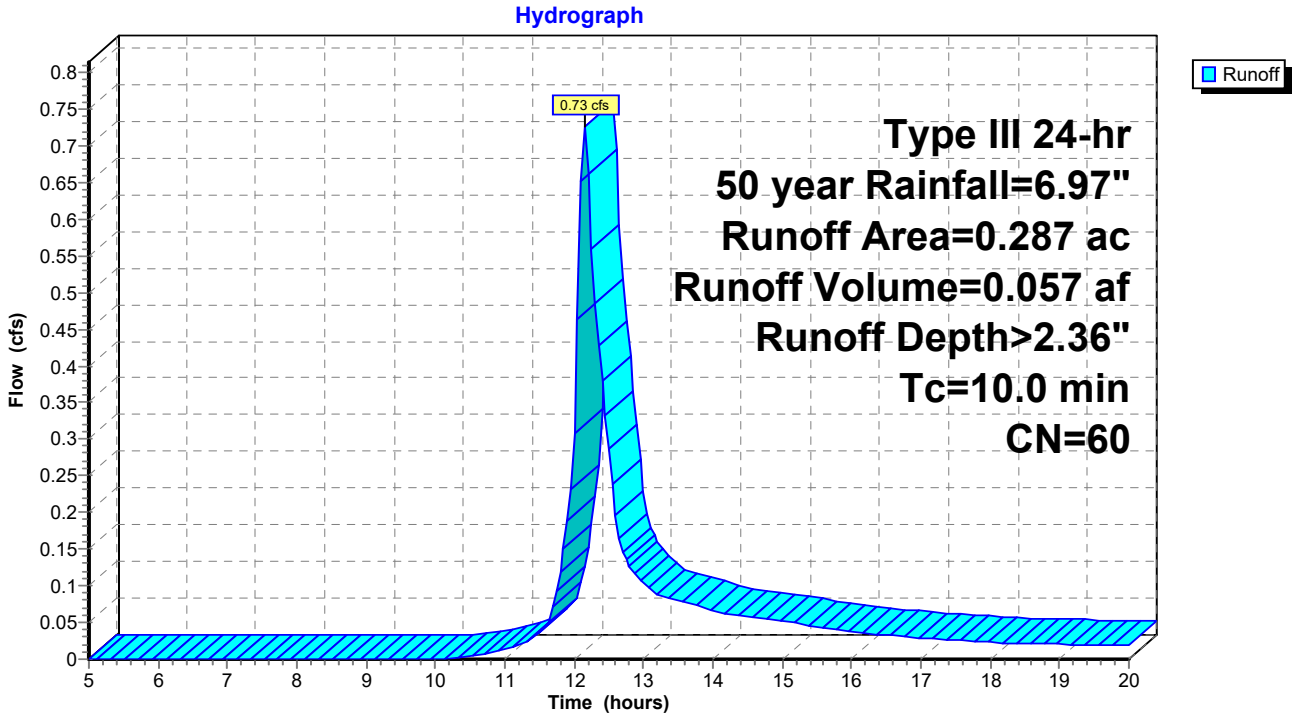
Runoff = 0.73 cfs @ 12.15 hrs, Volume= 0.057 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.287	60	Woods, Fair, HSG B
0.287		100.00% Pervious Area

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

Subcatchment 10A: Subcat 10A



Summary for Subcatchment 11: Subcat 11

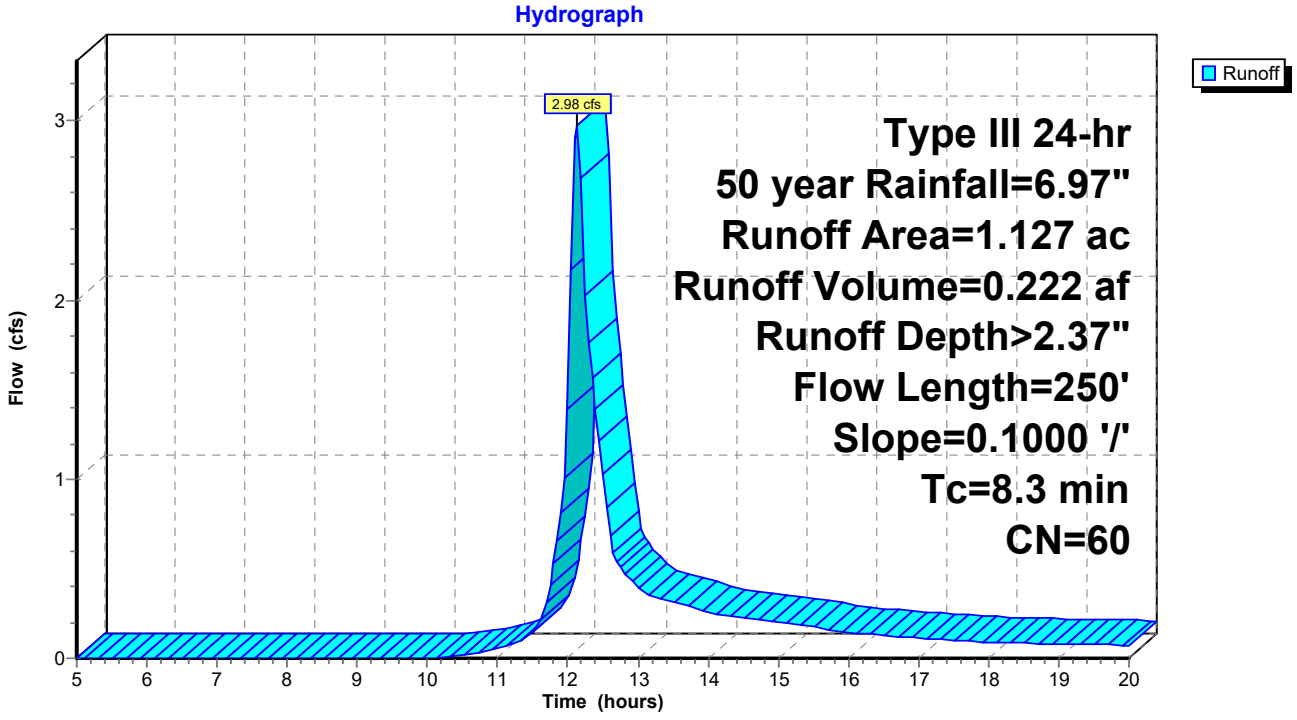
Runoff = 2.98 cfs @ 12.13 hrs, Volume= 0.222 af, Depth> 2.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
1.127	60	Woods, Fair, HSG B
1.127	60	Weighted Average
1.127		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.1000	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
2.1	200	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.3	250	Total			

Subcatchment 11: Subcat 11



Summary for Subcatchment 11A: Subcat 11A

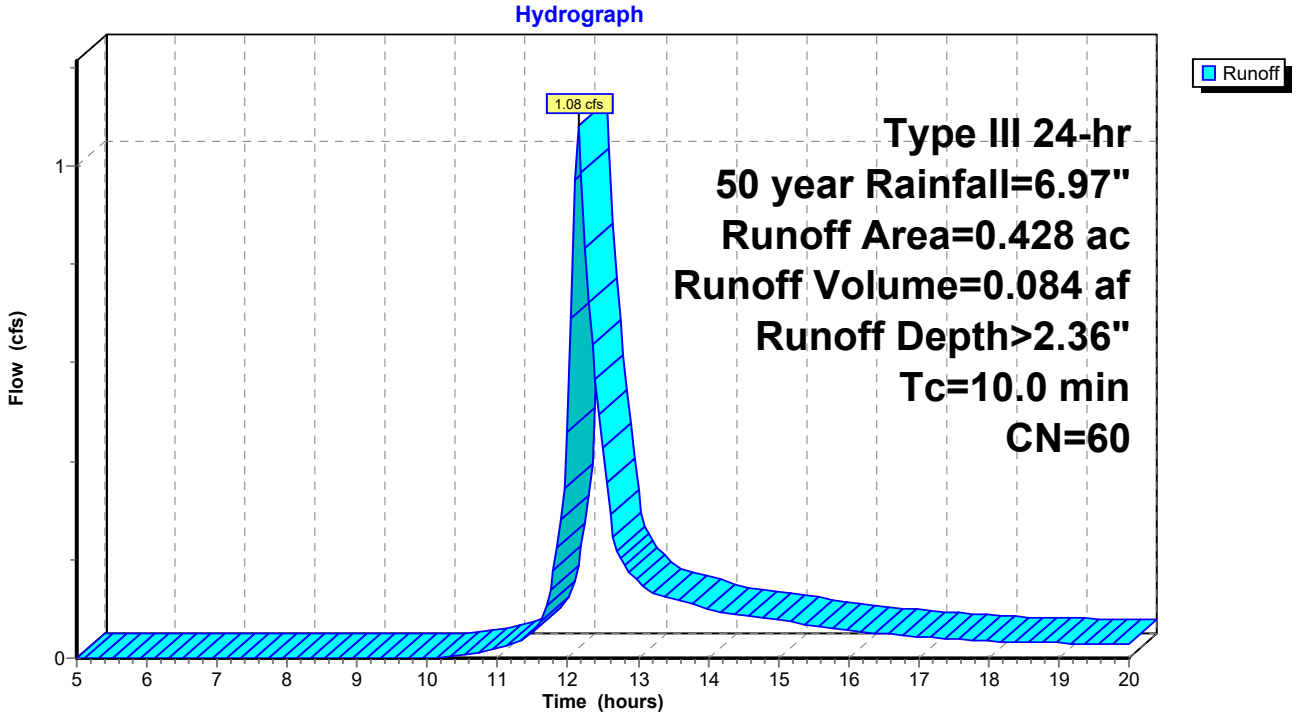
Runoff = 1.08 cfs @ 12.15 hrs, Volume= 0.084 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
0.428	60	Woods, Fair, HSG B
0.428	60	Weighted Average
0.428		100.00% Pervious Area

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

Subcatchment 11A: Subcat 11A



Summary for Subcatchment 12: Subcat 12

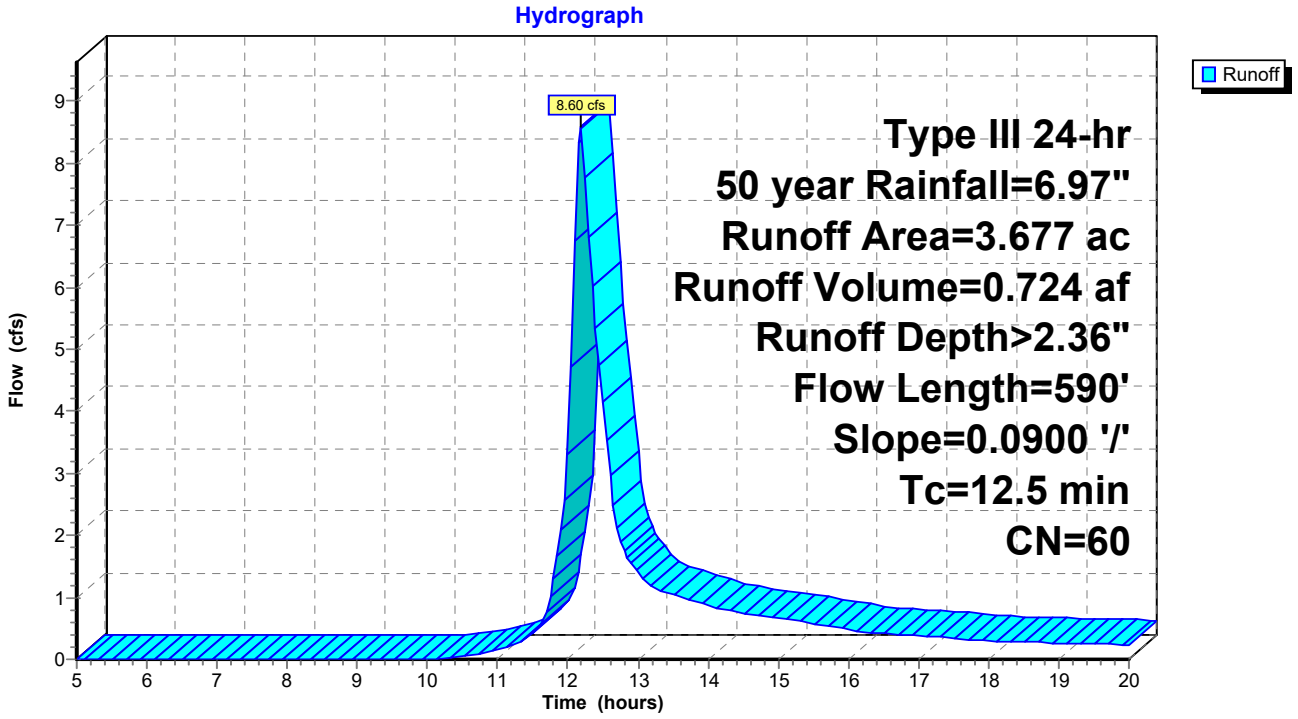
Runoff = 8.60 cfs @ 12.19 hrs, Volume= 0.724 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
3.677	60	Woods, Fair, HSG B
3.677		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	50	0.0900	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
6.0	540	0.0900	1.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.5	590	Total			

Subcatchment 12: Subcat 12



Summary for Subcatchment 13.1: Subcat 13.1

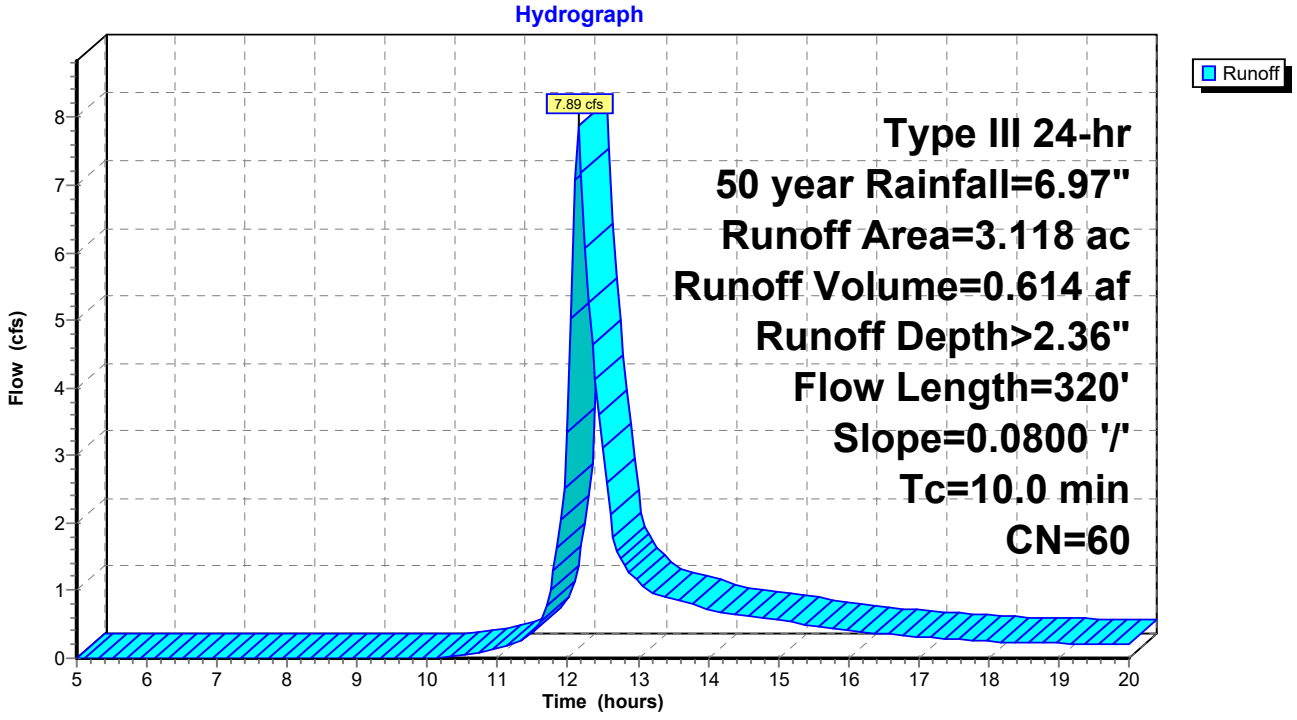
Runoff = 7.89 cfs @ 12.15 hrs, Volume= 0.614 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
3.092	60	Woods, Fair, HSG B
0.026	79	Woods, Fair, HSG D
3.118	60	Weighted Average
3.118		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
3.2	270	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.0	320	Total			

Subcatchment 13.1: Subcat 13.1



Summary for Subcatchment 13.2: Subcat 13.2

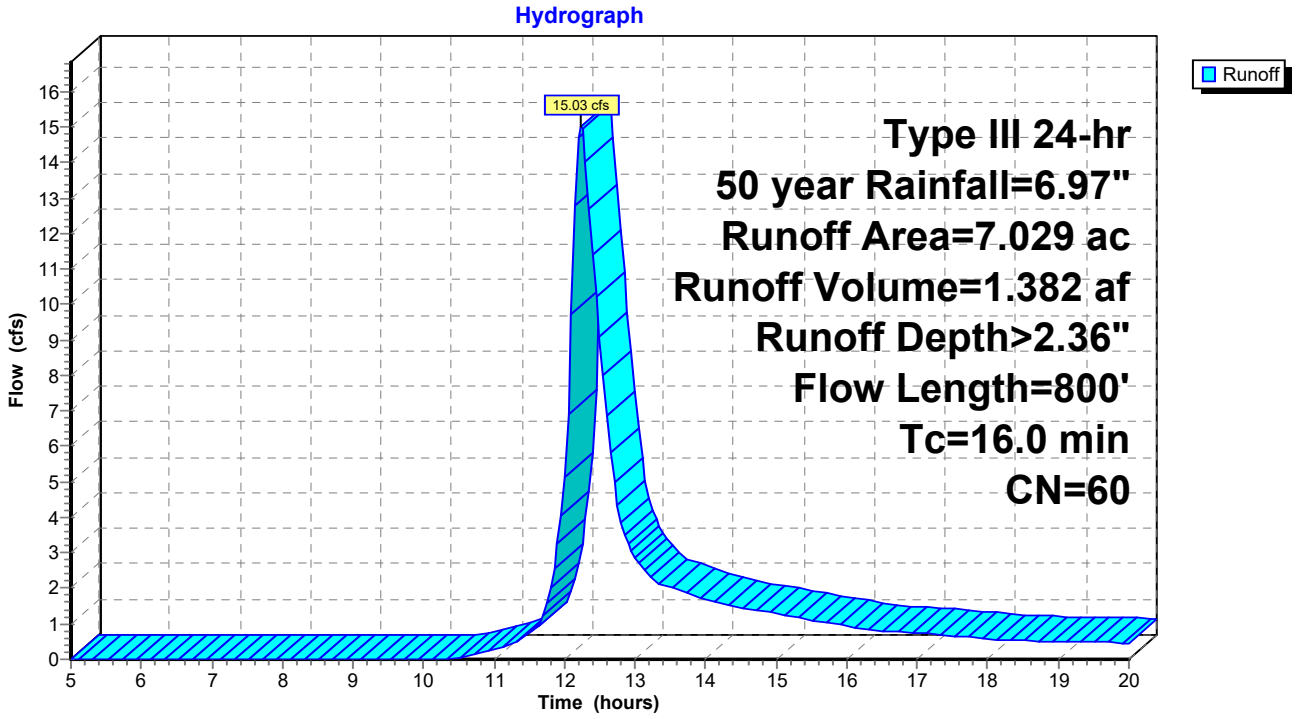
Runoff = 15.03 cfs @ 12.24 hrs, Volume= 1.382 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
7.029	60	Woods, Fair, HSG B
7.029		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0700	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
8.8	750	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.0	800	Total			

Subcatchment 13.2: Subcat 13.2



Summary for Subcatchment 13.3: Subcat 13.3

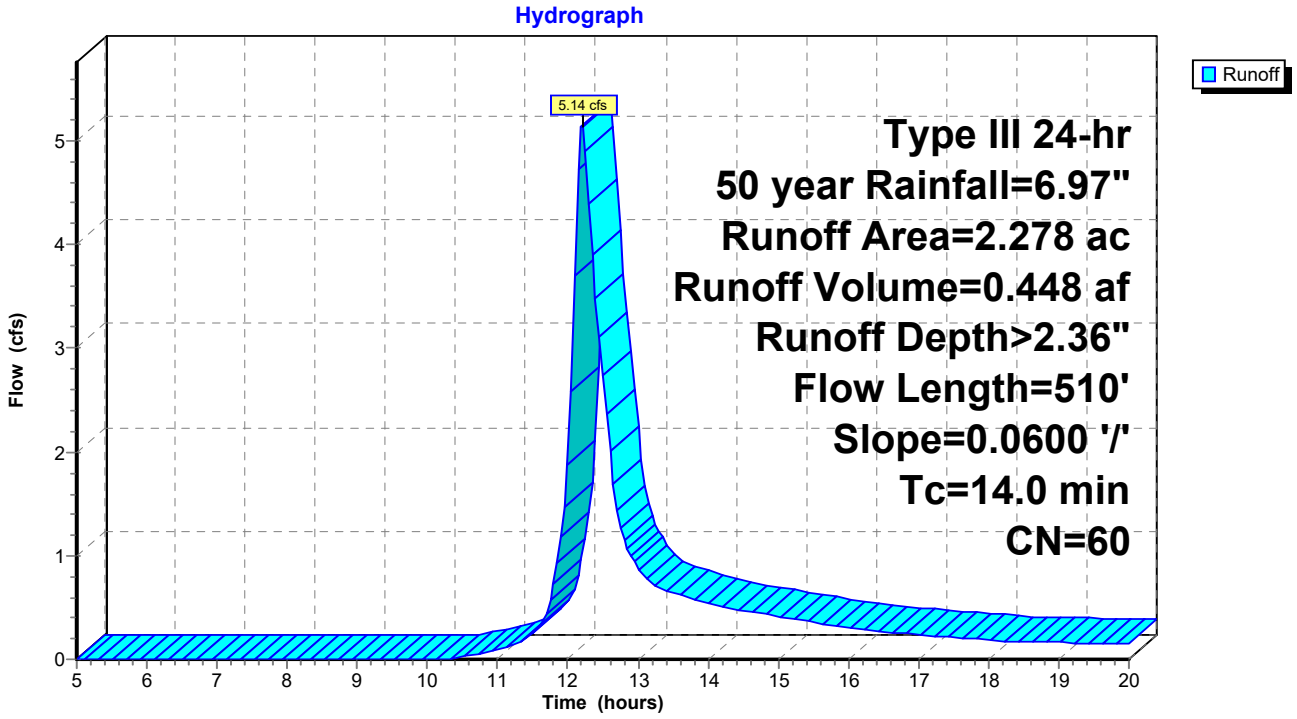
Runoff = 5.14 cfs @ 12.21 hrs, Volume= 0.448 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
2.278	60	Woods, Fair, HSG B
2.278		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	50	0.0600	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
6.3	460	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
14.0	510	Total			

Subcatchment 13.3: Subcat 13.3



Summary for Subcatchment 14: Subcat 14

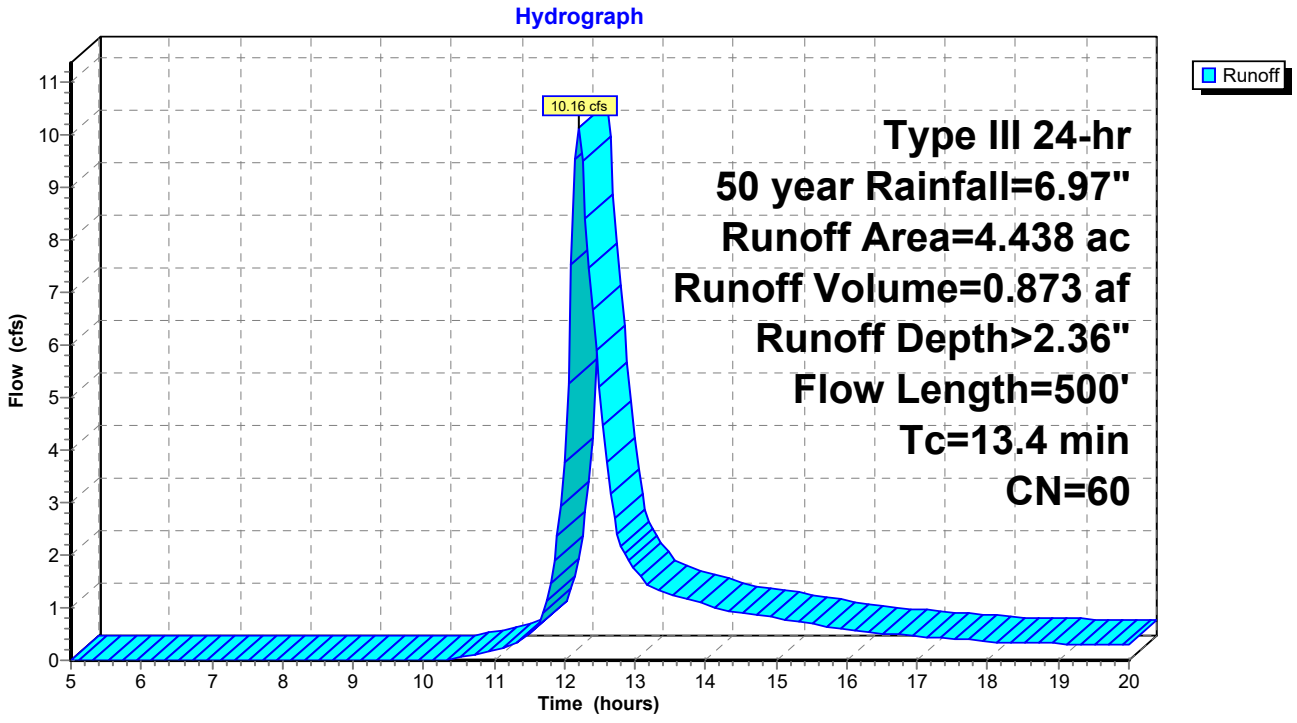
Runoff = 10.16 cfs @ 12.20 hrs, Volume= 0.873 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
4.438	60	Woods, Fair, HSG B
4.438		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	50	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
1.9	160	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.7	180	0.1300	1.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.8	110	0.2000	2.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.4	500	Total			

Subcatchment 14: Subcat 14



Summary for Subcatchment 16: Subcat 16

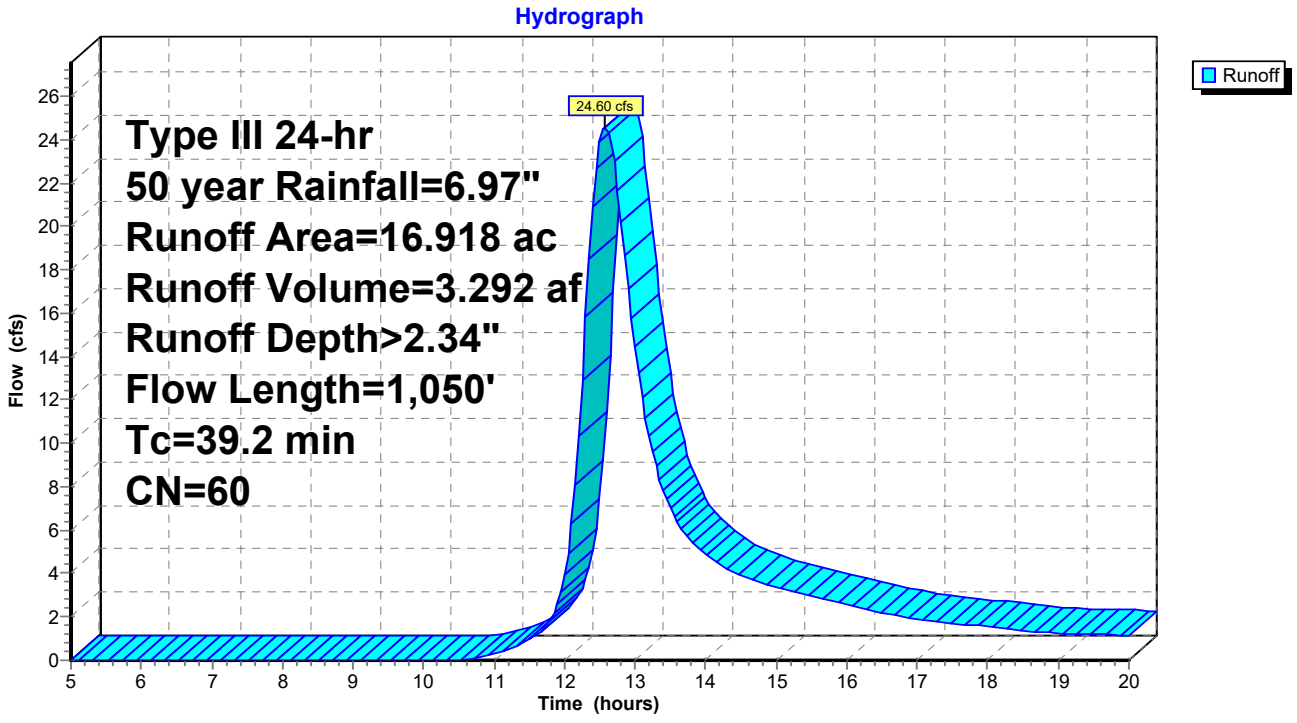
Runoff = 24.60 cfs @ 12.58 hrs, Volume= 3.292 af, Depth> 2.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
16.918	60	Woods, Fair, HSG B
16.918	60	Weighted Average
16.918		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	50	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
16.7	500	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.8	500	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
39.2	1,050	Total			

Subcatchment 16: Subcat 16



Summary for Subcatchment 16A: Subcat 16A

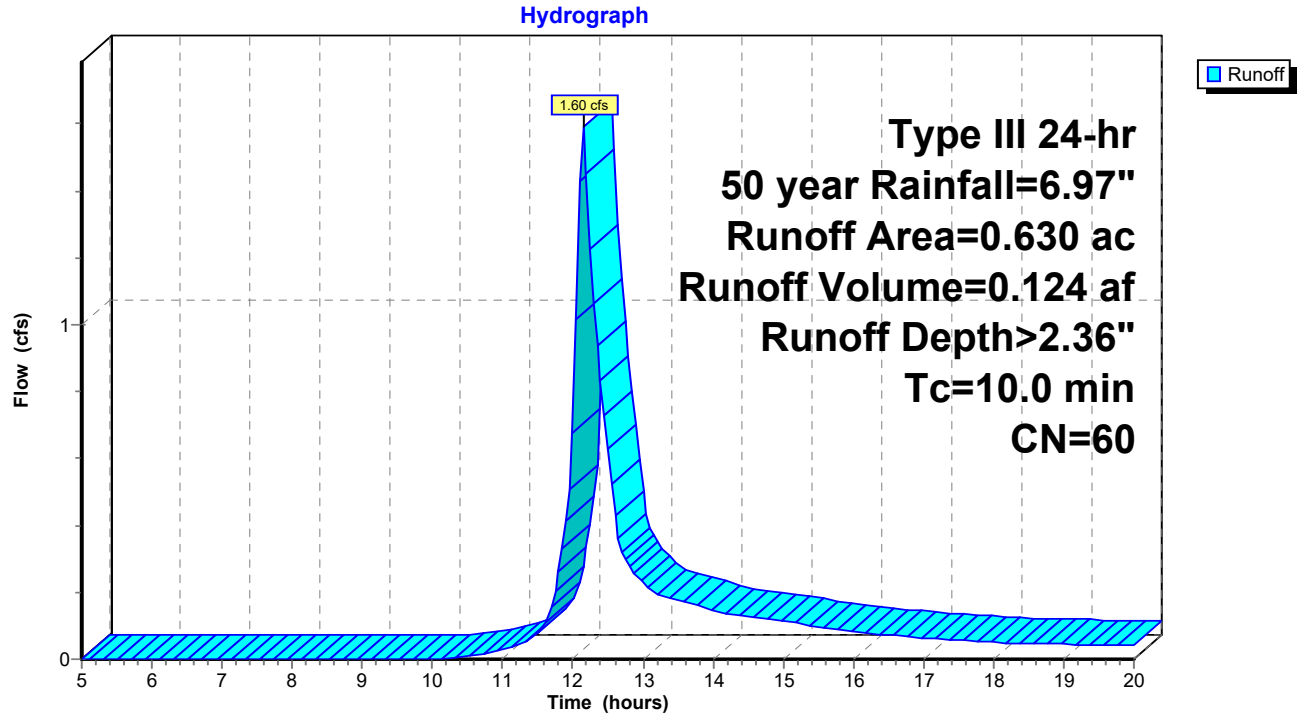
Runoff = 1.60 cfs @ 12.15 hrs, Volume= 0.124 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.630	60	Woods, Fair, HSG B
0.630		100.00% Pervious Area

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

Subcatchment 16A: Subcat 16A



Summary for Reach 13.1R: Reach 13.1

[91] Warning: Storage range exceeded by 0.21'
[55] Hint: Peak inflow is 516% of Manning's capacity
[81] Warning: Exceeded Pond 13.1P by 0.09' @ 12.45 hrs

Inflow Area = 3.118 ac, 0.00% Impervious, Inflow Depth > 2.00" for 50 year event
Inflow = 4.93 cfs @ 12.33 hrs, Volume= 0.519 af
Outflow = 4.76 cfs @ 12.46 hrs, Volume= 0.516 af, Atten= 3%, Lag= 7.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.46 fps, Min. Travel Time= 3.4 min
Avg. Velocity = 1.61 fps, Avg. Travel Time= 5.2 min

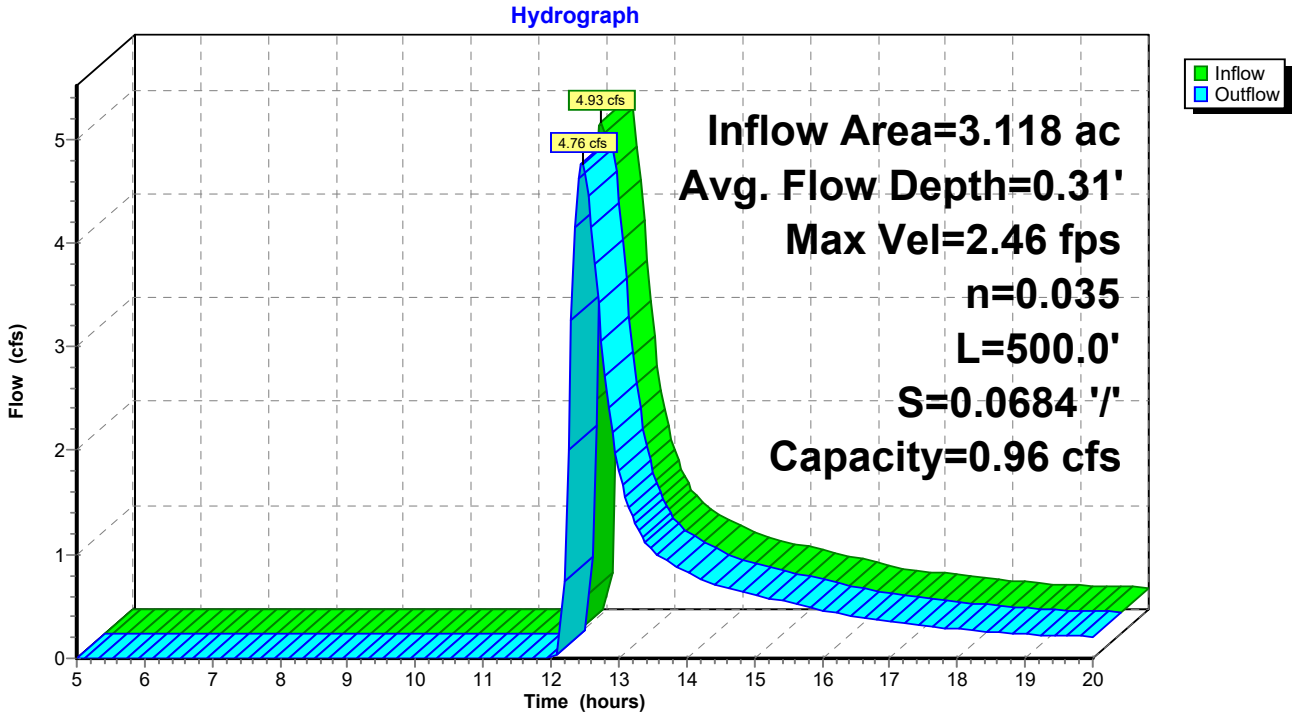
Peak Storage= 968 cf @ 12.40 hrs
Average Depth at Peak Storage= 0.31'
Bank-Full Depth= 0.10' Flow Area= 0.5 sf, Capacity= 0.96 cfs

3.00' x 0.10' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 20.0 '/' Top Width= 7.00'
Length= 500.0' Slope= 0.0684 '/'
Inlet Invert= 224.20', Outlet Invert= 190.00'



‡

Reach 13.1R: Reach 13.1



Summary for Pond 13.1P: Pond 13.1

Inflow Area = 3.118 ac, 0.00% Impervious, Inflow Depth > 2.36" for 50 year event
Inflow = 7.89 cfs @ 12.15 hrs, Volume= 0.614 af
Outflow = 4.93 cfs @ 12.33 hrs, Volume= 0.519 af, Atten= 38%, Lag= 10.7 min
Primary = 4.93 cfs @ 12.33 hrs, Volume= 0.519 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 224.42' @ 12.33 hrs Surf.Area= 16,331 sf Storage= 7,225 cf

Plug-Flow detention time= 74.5 min calculated for 0.517 af (84% of inflow)
Center-of-Mass det. time= 30.2 min (845.4 - 815.2)

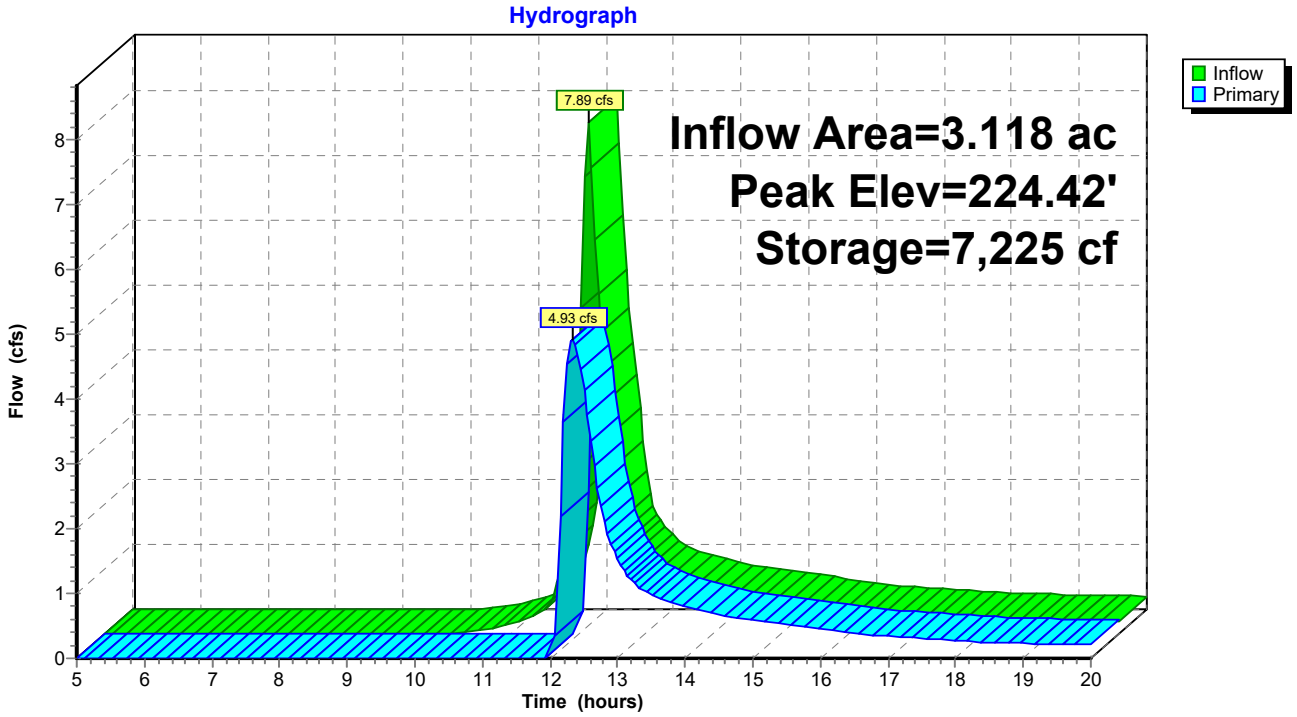
Volume	Invert	Avail.Storage	Storage Description
#1	223.70'	21,750 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
223.70	0	0	0
224.20	15,000	3,750	3,750
225.20	21,000	18,000	21,750

Device	Routing	Invert	Outlet Devices
#1	Primary	224.20'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=4.90 cfs @ 12.33 hrs HW=224.42' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 4.90 cfs @ 1.11 fps)

Pond 13.1P: Pond 13.1



Summary for Pond 13.2P: Pond 13.2

Inflow Area = 7.029 ac, 0.00% Impervious, Inflow Depth > 2.36" for 50 year event
Inflow = 15.03 cfs @ 12.24 hrs, Volume= 1.382 af
Outflow = 12.57 cfs @ 12.36 hrs, Volume= 1.201 af, Atten= 16%, Lag= 7.7 min
Discarded = 0.76 cfs @ 12.36 hrs, Volume= 0.440 af
Primary = 11.81 cfs @ 12.36 hrs, Volume= 0.761 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 190.46' @ 12.36 hrs Surf.Area= 10,691 sf Storage= 13,071 cf

Plug-Flow detention time= 67.3 min calculated for 1.201 af (87% of inflow)
Center-of-Mass det. time= 28.3 min (848.0 - 819.8)

Volume	Invert	Avail.Storage	Storage Description
#1	187.70'	34,621 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

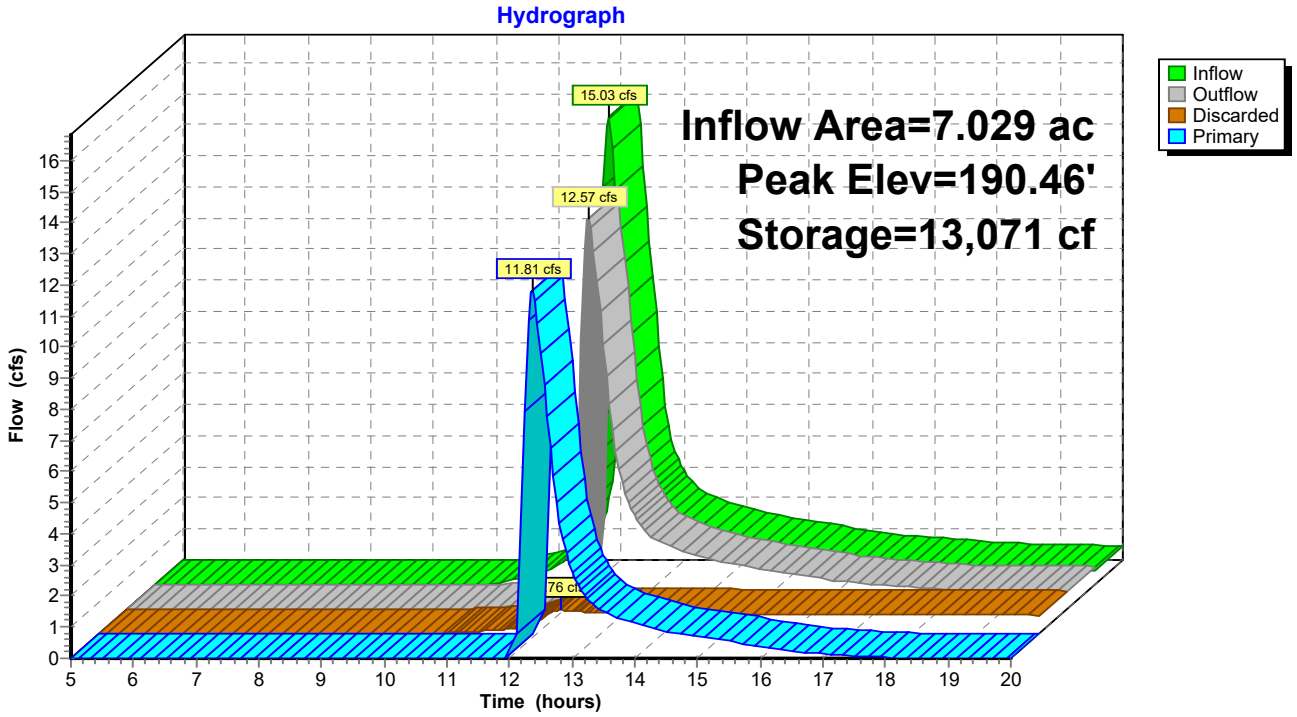
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
187.70	0	0	0	0
188.00	900	90	90	900
190.00	9,000	8,497	8,587	9,012
192.00	17,500	26,033	34,621	17,550

Device	Routing	Invert	Outlet Devices
#1	Primary	190.00'	**15.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Discarded	187.70'	**2.700 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 180.00'

Discarded OutFlow Max=0.76 cfs @ 12.36 hrs HW=190.45' (Free Discharge)
↑**2=Exfiltration** (Controls 0.76 cfs)

Primary OutFlow Max=11.68 cfs @ 12.36 hrs HW=190.45' (Free Discharge)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 11.68 cfs @ 1.72 fps)

Pond 13.2P: Pond 13.2

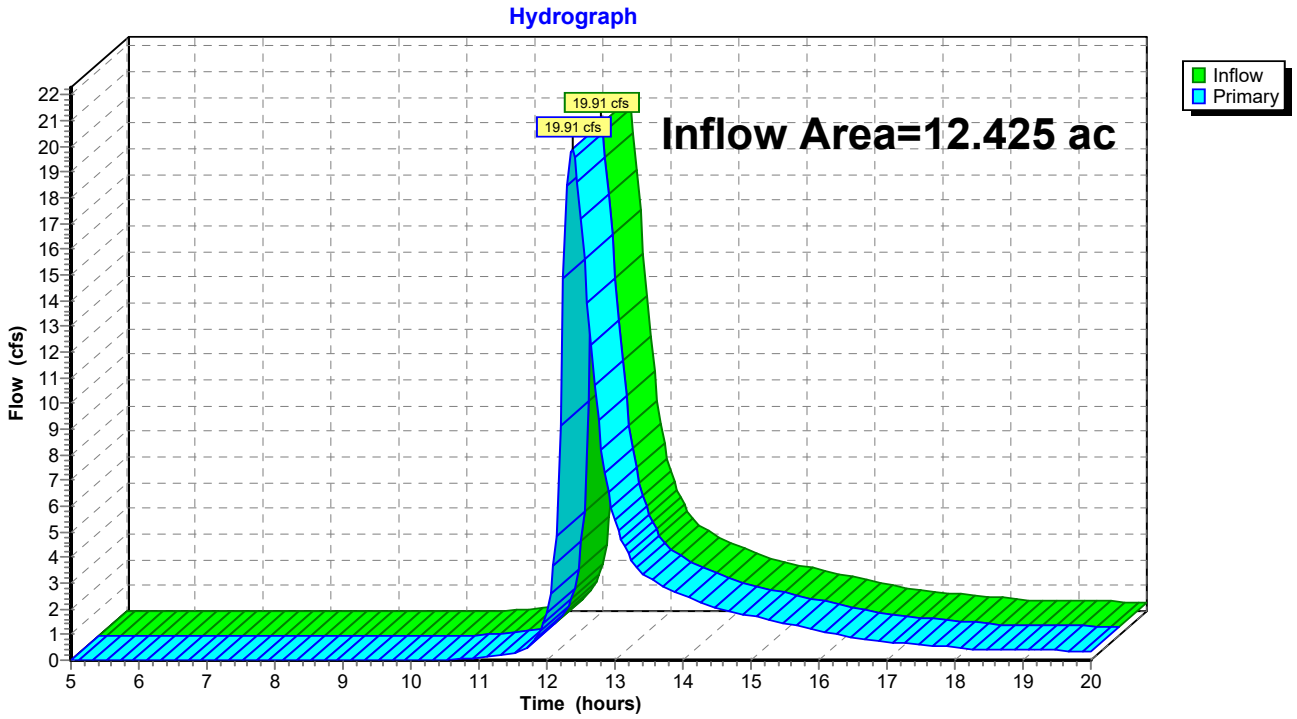


Summary for Link 13: 13

Inflow Area = 12.425 ac, 0.00% Impervious, Inflow Depth > 1.67" for 50 year event
Inflow = 19.91 cfs @ 12.37 hrs, Volume= 1.726 af
Primary = 19.91 cfs @ 12.37 hrs, Volume= 1.726 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 13: 13



100-Year Storm Event – Existing

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=3.006 ac 0.00% Impervious Runoff Depth>2.93"
Flow Length=540' Slope=0.0800 '/' Tc=12.6 min CN=60 Runoff=8.79 cfs 0.734 af

Subcatchment2: Subcat 2 Runoff Area=2.551 ac 0.00% Impervious Runoff Depth>2.93"
Flow Length=440' Tc=18.0 min CN=60 Runoff=6.55 cfs 0.622 af

Subcatchment2A: Subcat 2A Runoff Area=0.775 ac 0.00% Impervious Runoff Depth>3.68"
Tc=10.0 min CN=67 Runoff=3.11 cfs 0.238 af

Subcatchment3: Subcat 3 Runoff Area=2.550 ac 0.00% Impervious Runoff Depth>2.92"
Flow Length=700' Tc=19.2 min CN=60 Runoff=6.37 cfs 0.621 af

Subcatchment3A: Subcat 3A Runoff Area=0.324 ac 0.00% Impervious Runoff Depth>4.89"
Tc=10.0 min CN=78 Runoff=1.70 cfs 0.132 af

Subcatchment4: Subcat 4 Runoff Area=5.870 ac 0.00% Impervious Runoff Depth>3.34"
Flow Length=950' Tc=26.2 min CN=64 Runoff=14.86 cfs 1.632 af

Subcatchment5: Subcat 5 Runoff Area=2.637 ac 0.00% Impervious Runoff Depth>2.93"
Flow Length=510' Slope=0.0500 '/' Tc=15.1 min CN=60 Runoff=7.26 cfs 0.644 af

Subcatchment6: Subcat 6 Runoff Area=3.200 ac 0.00% Impervious Runoff Depth>3.46"
Flow Length=480' Slope=0.0700 '/' Tc=12.6 min CN=65 Runoff=11.13 cfs 0.923 af

Subcatchment6A: Subcat 6A Runoff Area=0.919 ac 0.00% Impervious Runoff Depth>3.79"
Tc=10.0 min CN=68 Runoff=3.79 cfs 0.290 af

Subcatchment6B: Subcat 6B Runoff Area=0.030 ac 0.00% Impervious Runoff Depth>2.93"
Tc=10.0 min CN=60 Runoff=0.10 cfs 0.007 af

Subcatchment6C: Subcat 6C Runoff Area=0.694 ac 0.00% Impervious Runoff Depth>2.93"
Tc=10.0 min CN=60 Runoff=2.20 cfs 0.170 af

Subcatchment7: Subcat 7 Runoff Area=1.170 ac 0.00% Impervious Runoff Depth>2.93"
Flow Length=300' Tc=10.5 min CN=60 Runoff=3.66 cfs 0.286 af

Subcatchment7A: Subcat 7A Runoff Area=0.202 ac 0.00% Impervious Runoff Depth>2.93"
Tc=10.0 min CN=60 Runoff=0.64 cfs 0.049 af

Subcatchment8: Subcat 8 Runoff Area=4.689 ac 0.00% Impervious Runoff Depth>2.93"
Flow Length=720' Tc=15.8 min CN=60 Runoff=12.62 cfs 1.144 af

Subcatchment8A: Subcat 8A Runoff Area=0.770 ac 0.00% Impervious Runoff Depth>2.93"
Tc=10.0 min CN=60 Runoff=2.44 cfs 0.188 af

Subcatchment9: Subcat 9 Runoff Area=1.520 ac 0.00% Impervious Runoff Depth>2.93"
Flow Length=310' Slope=0.0700 '/' Tc=10.5 min CN=60 Runoff=4.76 cfs 0.372 af

Subcatchment9A: Subcat 9A Runoff Area=0.285 ac 0.00% Impervious Runoff Depth>2.93"
Tc=10.0 min CN=60 Runoff=0.90 cfs 0.070 af

Subcatchment10: Subcat 10 Runoff Area=2.304 ac 0.00% Impervious Runoff Depth>2.93"
Flow Length=490' Tc=17.5 min CN=60 Runoff=5.98 cfs 0.562 af

Subcatchment10A: Subcat 10A Runoff Area=0.287 ac 0.00% Impervious Runoff Depth>2.93"
Tc=10.0 min CN=60 Runoff=0.91 cfs 0.070 af

Subcatchment11: Subcat 11 Runoff Area=1.127 ac 0.00% Impervious Runoff Depth>2.94"
Flow Length=250' Slope=0.1000 '/' Tc=8.3 min CN=60 Runoff=3.77 cfs 0.276 af

Subcatchment11A: Subcat 11A Runoff Area=0.428 ac 0.00% Impervious Runoff Depth>2.93"
Tc=10.0 min CN=60 Runoff=1.36 cfs 0.105 af

Subcatchment12: Subcat 12 Runoff Area=3.677 ac 0.00% Impervious Runoff Depth>2.93"
Flow Length=590' Slope=0.0900 '/' Tc=12.5 min CN=60 Runoff=10.77 cfs 0.898 af

Subcatchment13.1: Subcat 13.1 Runoff Area=3.118 ac 0.00% Impervious Runoff Depth>2.93"
Flow Length=320' Slope=0.0800 '/' Tc=10.0 min CN=60 Runoff=9.89 cfs 0.762 af

Subcatchment13.2: Subcat 13.2 Runoff Area=7.029 ac 0.00% Impervious Runoff Depth>2.93"
Flow Length=800' Tc=16.0 min CN=60 Runoff=18.84 cfs 1.715 af

Subcatchment13.3: Subcat 13.3 Runoff Area=2.278 ac 0.00% Impervious Runoff Depth>2.93"
Flow Length=510' Slope=0.0600 '/' Tc=14.0 min CN=60 Runoff=6.44 cfs 0.556 af

Subcatchment14: Subcat 14 Runoff Area=4.438 ac 0.00% Impervious Runoff Depth>2.93"
Flow Length=500' Tc=13.4 min CN=60 Runoff=12.73 cfs 1.084 af

Subcatchment16: Subcat 16 Runoff Area=16.918 ac 0.00% Impervious Runoff Depth>2.90"
Flow Length=1,050' Tc=39.2 min CN=60 Runoff=30.79 cfs 4.088 af

Subcatchment16A: Subcat 16A Runoff Area=0.630 ac 0.00% Impervious Runoff Depth>2.93"
Tc=10.0 min CN=60 Runoff=2.00 cfs 0.154 af

Reach 13.1R: Reach 13.1 Avg. Flow Depth=0.41' Max Vel=2.52 fps Inflow=6.98 cfs 0.666 af
n=0.035 L=500.0' S=0.0684 '/' Capacity=0.96 cfs Outflow=6.69 cfs 0.663 af

Pond 13.1P: Pond 13.1 Peak Elev=224.48' Storage=8,125 cf Inflow=9.89 cfs 0.762 af
Outflow=6.98 cfs 0.666 af

Pond 13.2P: Pond 13.2 Peak Elev=190.55' Storage=14,099 cf Inflow=18.84 cfs 1.715 af
Discarded=0.79 cfs 0.457 af Primary=16.25 cfs 1.066 af Outflow=17.04 cfs 1.522 af

Link 13: 13 Inflow=27.53 cfs 2.285 af
Primary=27.53 cfs 2.285 af

Total Runoff Area = 73.426 ac Runoff Volume = 18.392 af Average Runoff Depth = 3.01"
100.00% Pervious = 73.426 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1: Subcat 1

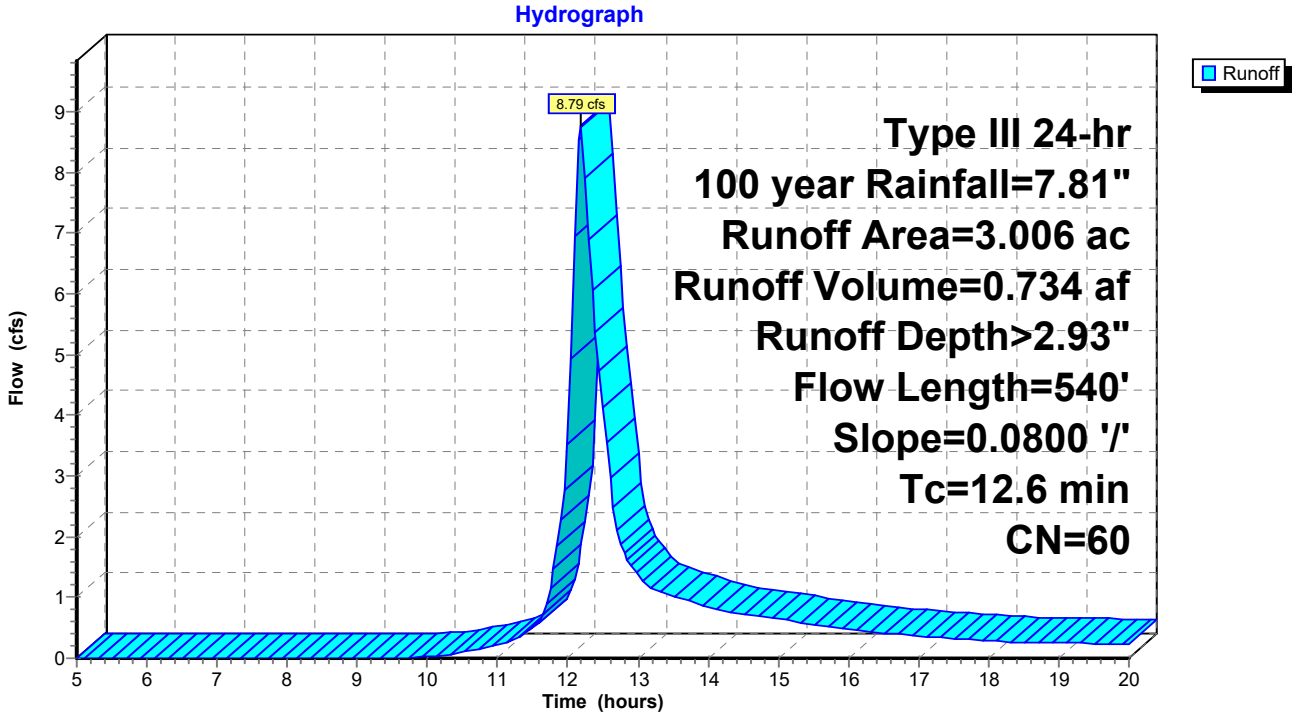
Runoff = 8.79 cfs @ 12.18 hrs, Volume= 0.734 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
3.005	60	Woods, Fair, HSG B
3.006	60	Weighted Average
3.006		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
5.8	490	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.6	540	Total			

Subcatchment 1: Subcat 1



Summary for Subcatchment 2: Subcat 2

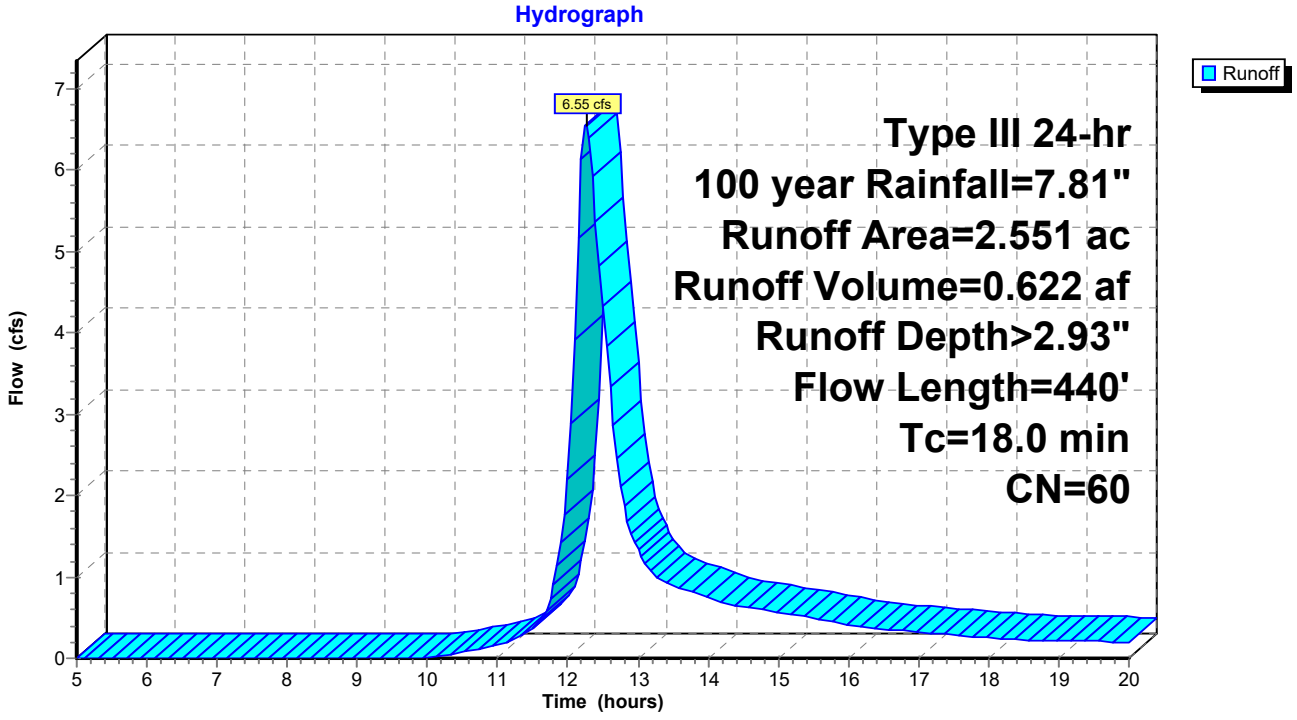
Runoff = 6.55 cfs @ 12.26 hrs, Volume= 0.622 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
2.551	60	Woods, Fair, HSG B
2.551		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
5.7	340	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.4	50	0.2000	2.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
18.0	440	Total			

Subcatchment 2: Subcat 2



Summary for Subcatchment 2A: Subcat 2A

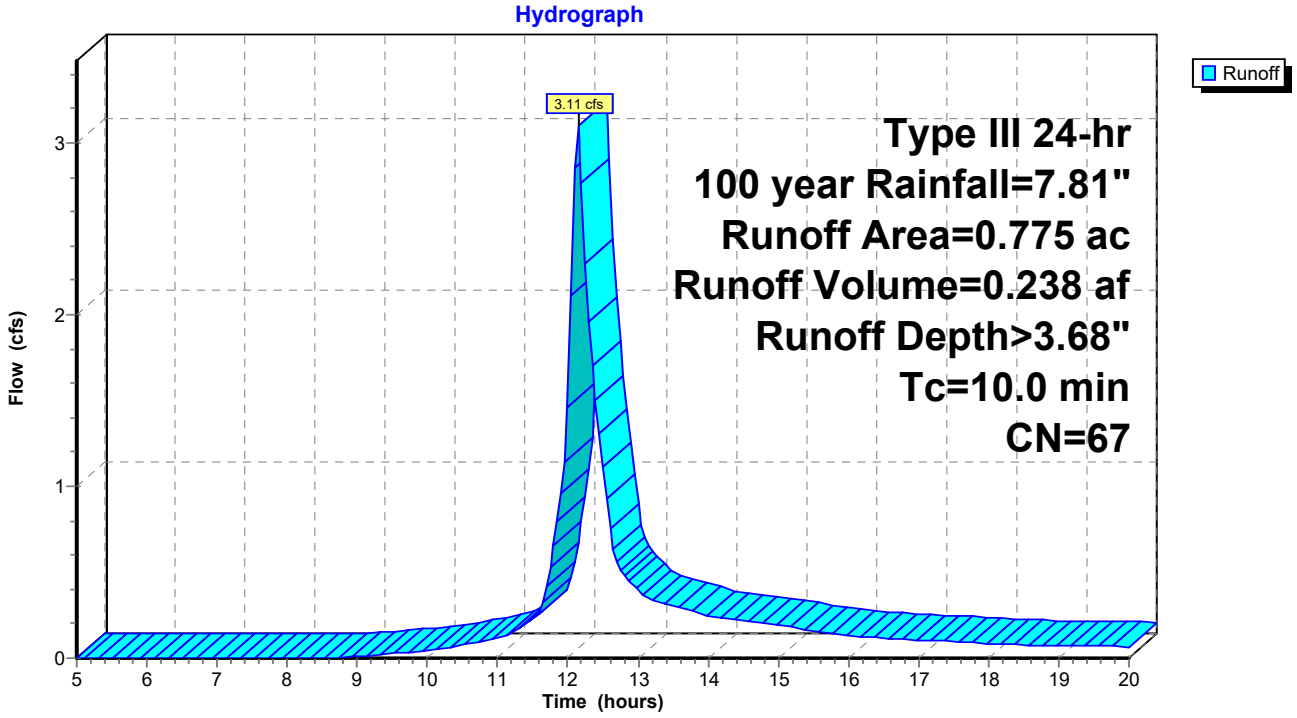
Runoff = 3.11 cfs @ 12.15 hrs, Volume= 0.238 af, Depth> 3.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.488	60	Woods, Fair, HSG B
0.287	79	Woods, Fair, HSG D
0.775	67	Weighted Average
0.775		100.00% Pervious Area

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

Subcatchment 2A: Subcat 2A



Summary for Subcatchment 3: Subcat 3

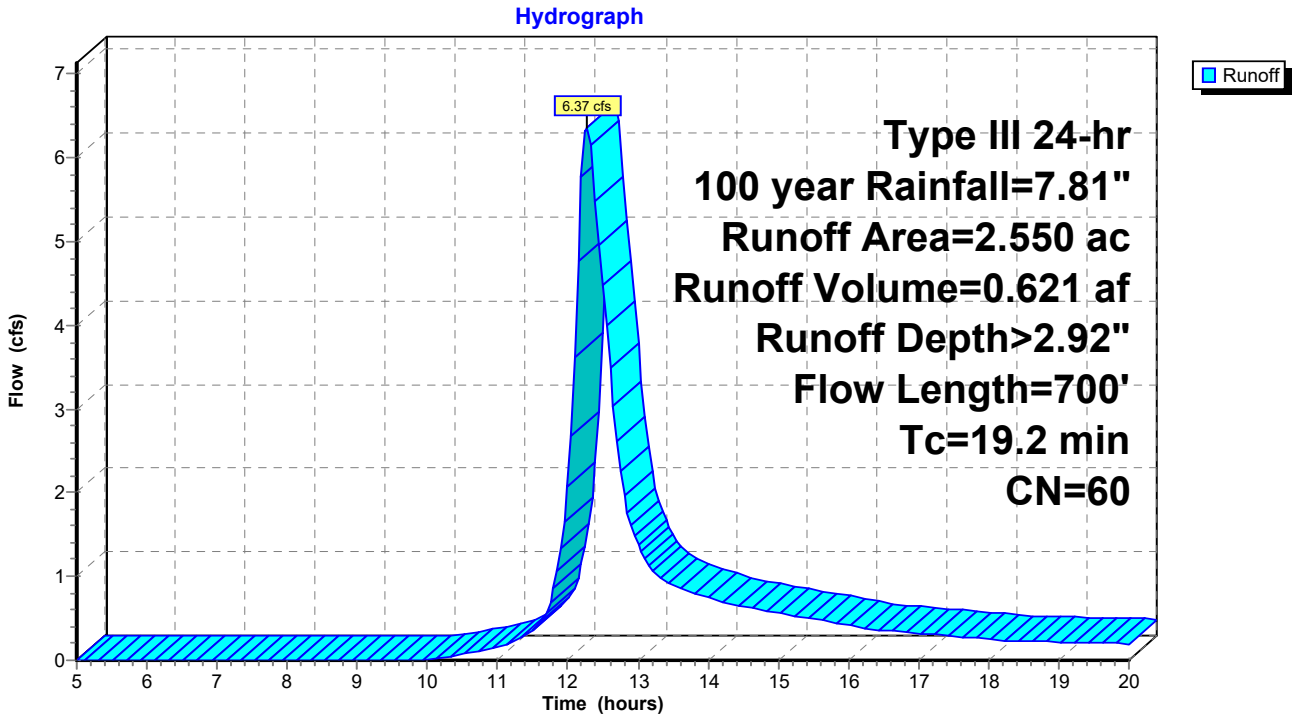
Runoff = 6.37 cfs @ 12.28 hrs, Volume= 0.621 af, Depth> 2.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
2.515	60	Woods, Fair, HSG B
0.034	79	Woods, Fair, HSG D
2.550	60	Weighted Average
2.550		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	50	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
8.3	500	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.9	150	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
19.2	700	Total			

Subcatchment 3: Subcat 3



Summary for Subcatchment 3A: Subcat 3A

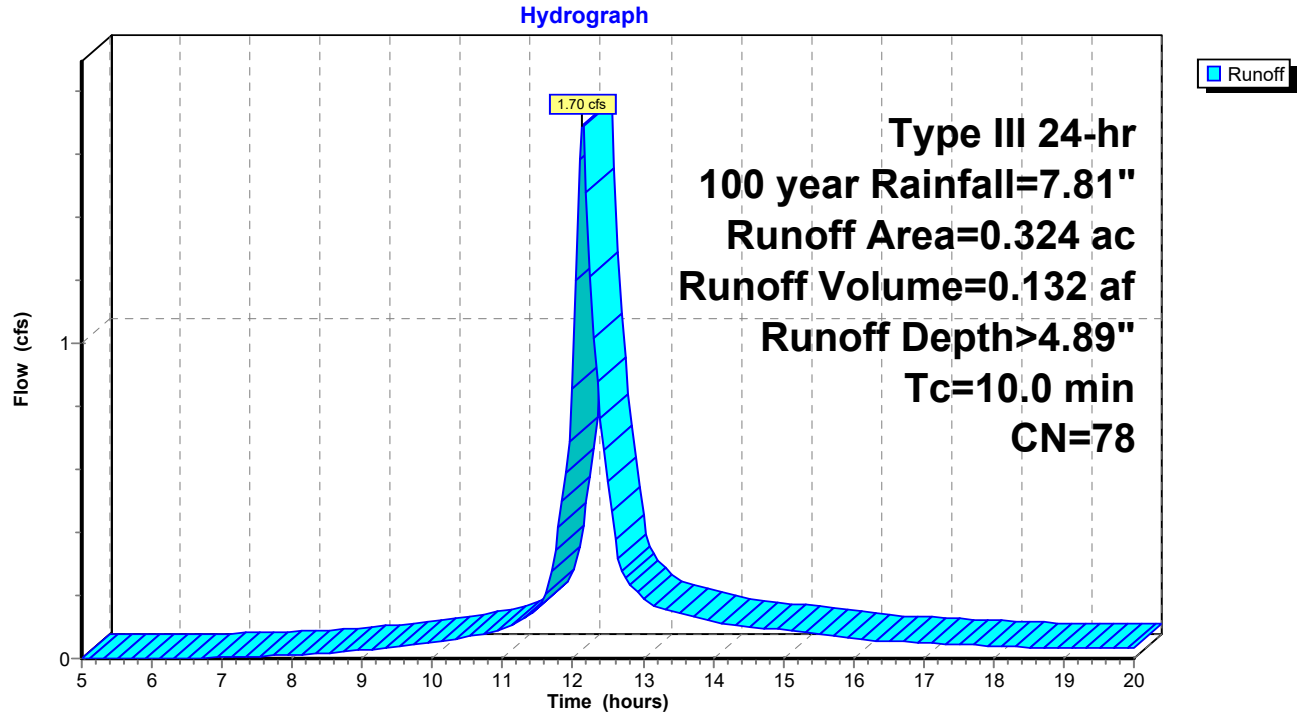
Runoff = 1.70 cfs @ 12.14 hrs, Volume= 0.132 af, Depth> 4.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.008	60	Woods, Fair, HSG B
0.002	60	Woods, Fair, HSG B
0.315	79	Woods, Fair, HSG D
0.324	78	Weighted Average
0.324		100.00% Pervious Area

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

Subcatchment 3A: Subcat 3A



Summary for Subcatchment 4: Subcat 4

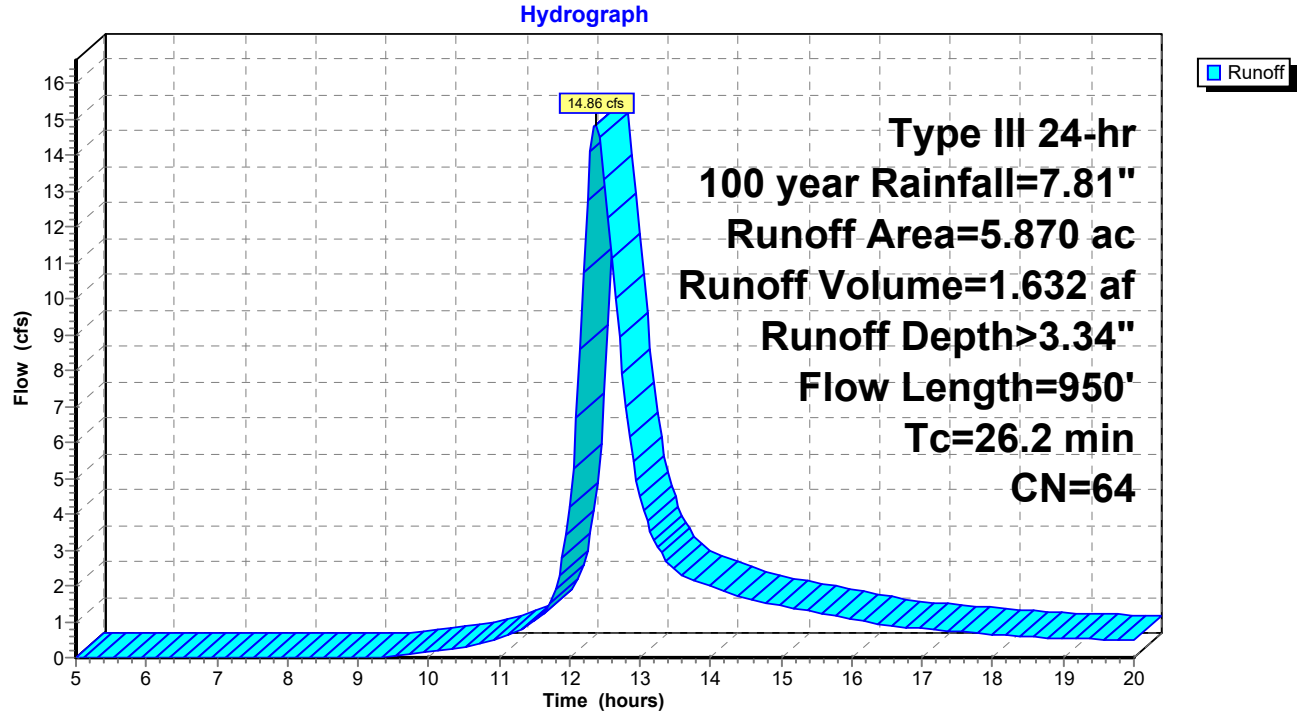
Runoff = 14.86 cfs @ 12.37 hrs, Volume= 1.632 af, Depth> 3.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
4.578	60	Woods, Fair, HSG B
1.292	79	Woods, Fair, HSG D
5.870	64	Weighted Average
5.870		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	50	0.0150	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
6.0	360	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.2	400	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.7	140	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
26.2	950	Total			

Subcatchment 4: Subcat 4



Summary for Subcatchment 5: Subcat 5

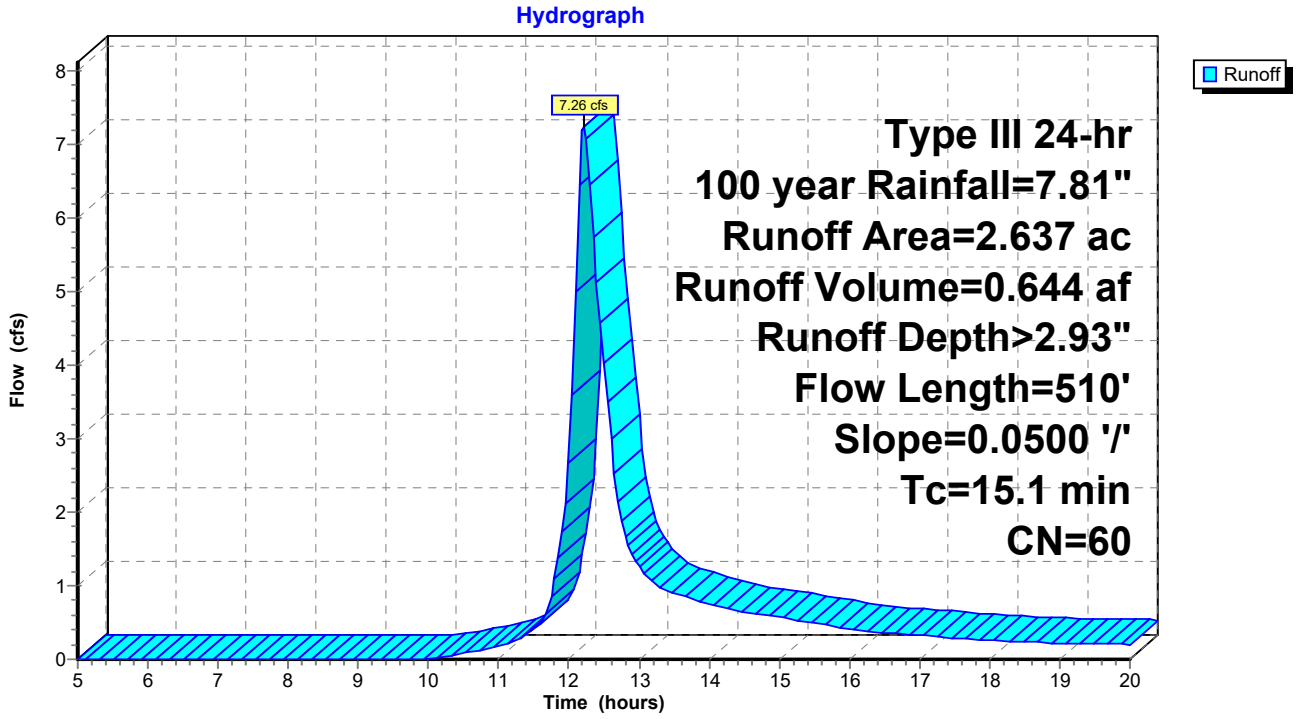
Runoff = 7.26 cfs @ 12.22 hrs, Volume= 0.644 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
2.637	60	Woods, Fair, HSG B
2.637		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
6.9	460	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
15.1	510	Total			

Subcatchment 5: Subcat 5



Summary for Subcatchment 6: Subcat 6

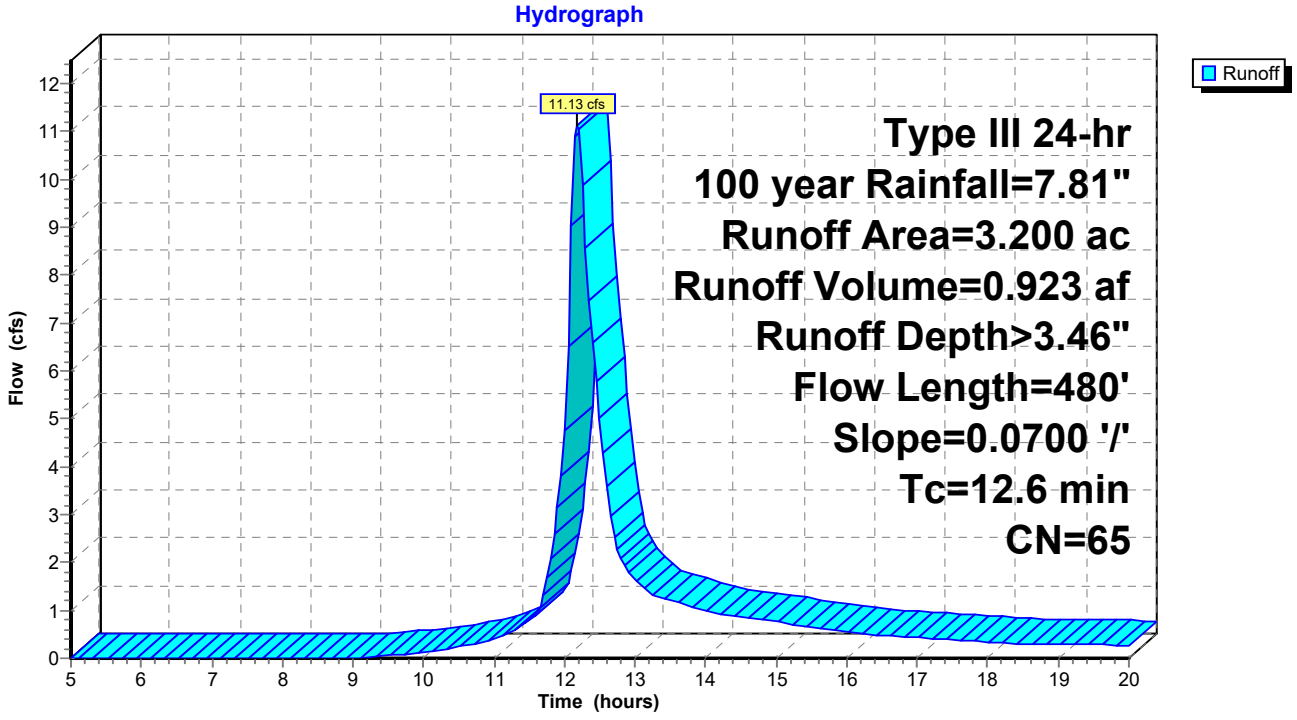
Runoff = 11.13 cfs @ 12.18 hrs, Volume= 0.923 af, Depth> 3.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
2.281	60	Woods, Fair, HSG B
0.919	79	Woods, Fair, HSG D
3.200	65	Weighted Average
3.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0700	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
5.4	430	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.6	480	Total			

Subcatchment 6: Subcat 6



Summary for Subcatchment 6A: Subcat 6A

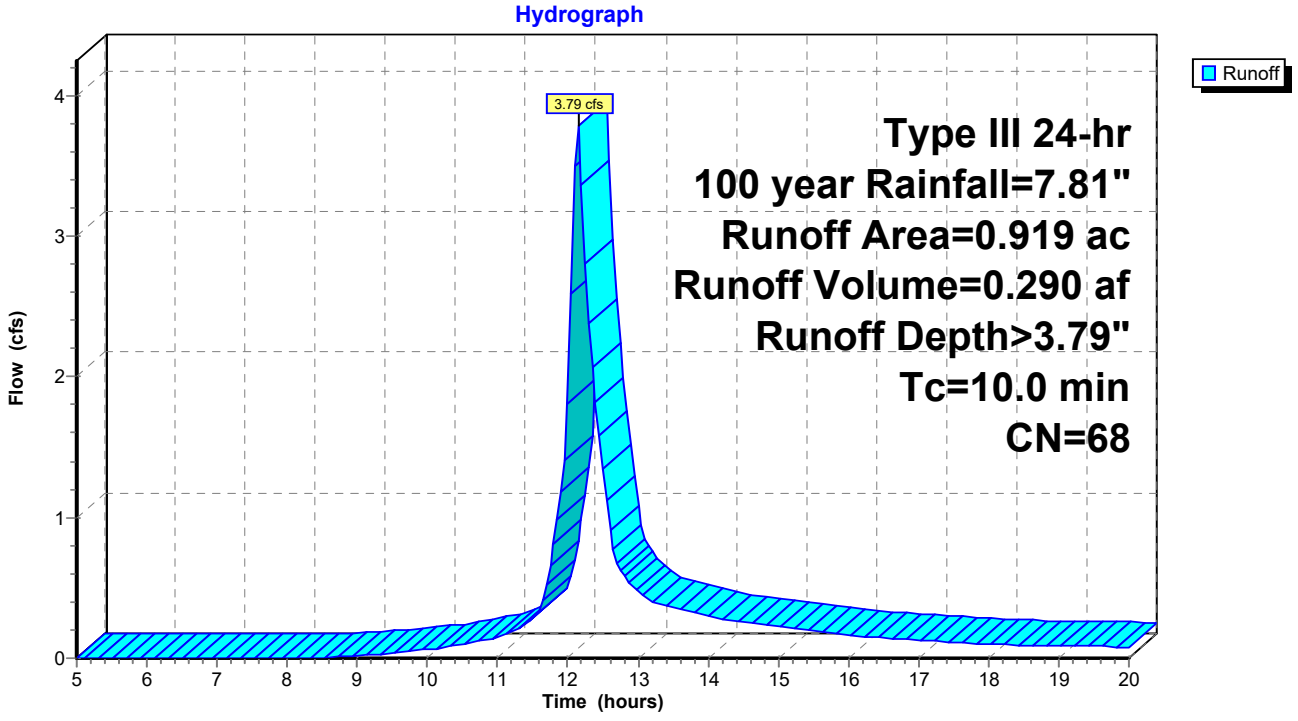
Runoff = 3.79 cfs @ 12.15 hrs, Volume= 0.290 af, Depth> 3.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.003	60	Woods, Fair, HSG B
0.517	60	Woods, Fair, HSG B
0.000	79	Woods, Fair, HSG D
0.400	79	Woods, Fair, HSG D
0.919	68	Weighted Average
0.919		100.00% Pervious Area

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

Subcatchment 6A: Subcat 6A



Summary for Subcatchment 6B: Subcat 6B

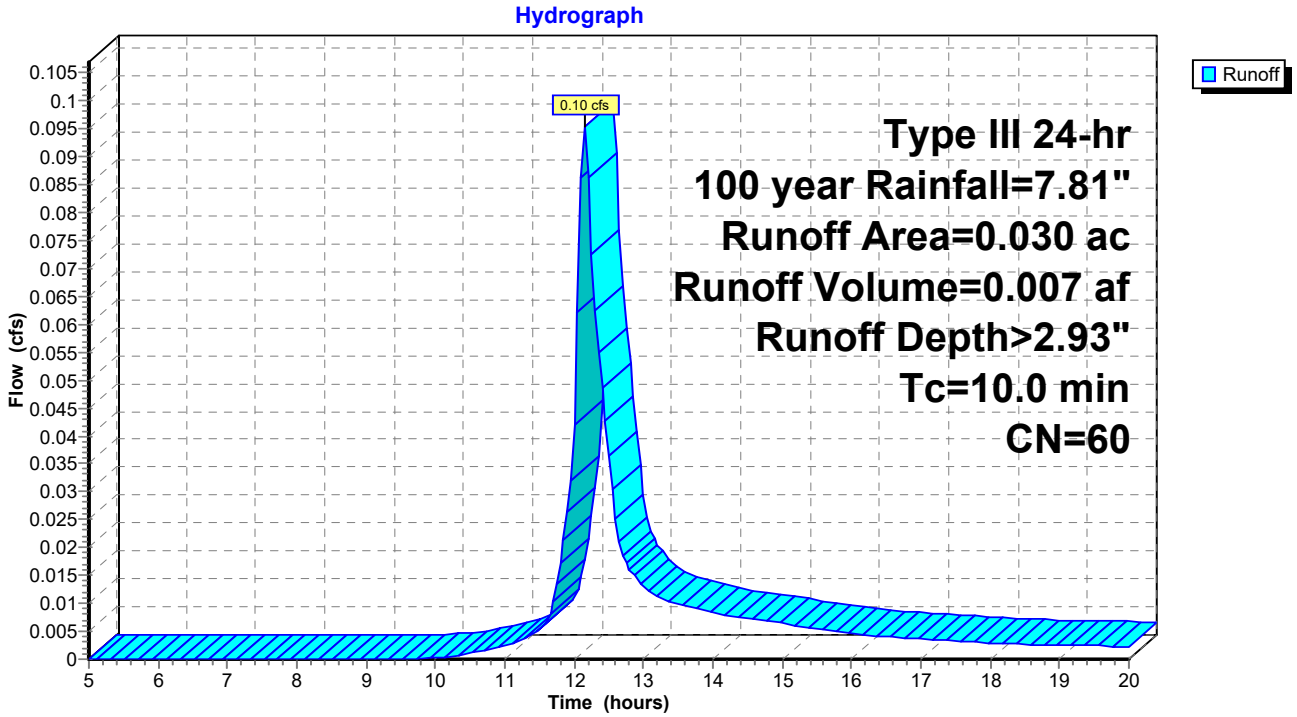
Runoff = 0.10 cfs @ 12.15 hrs, Volume= 0.007 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.030	60	Woods, Fair, HSG B
0.030		100.00% Pervious Area

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

Subcatchment 6B: Subcat 6B



Summary for Subcatchment 6C: Subcat 6C

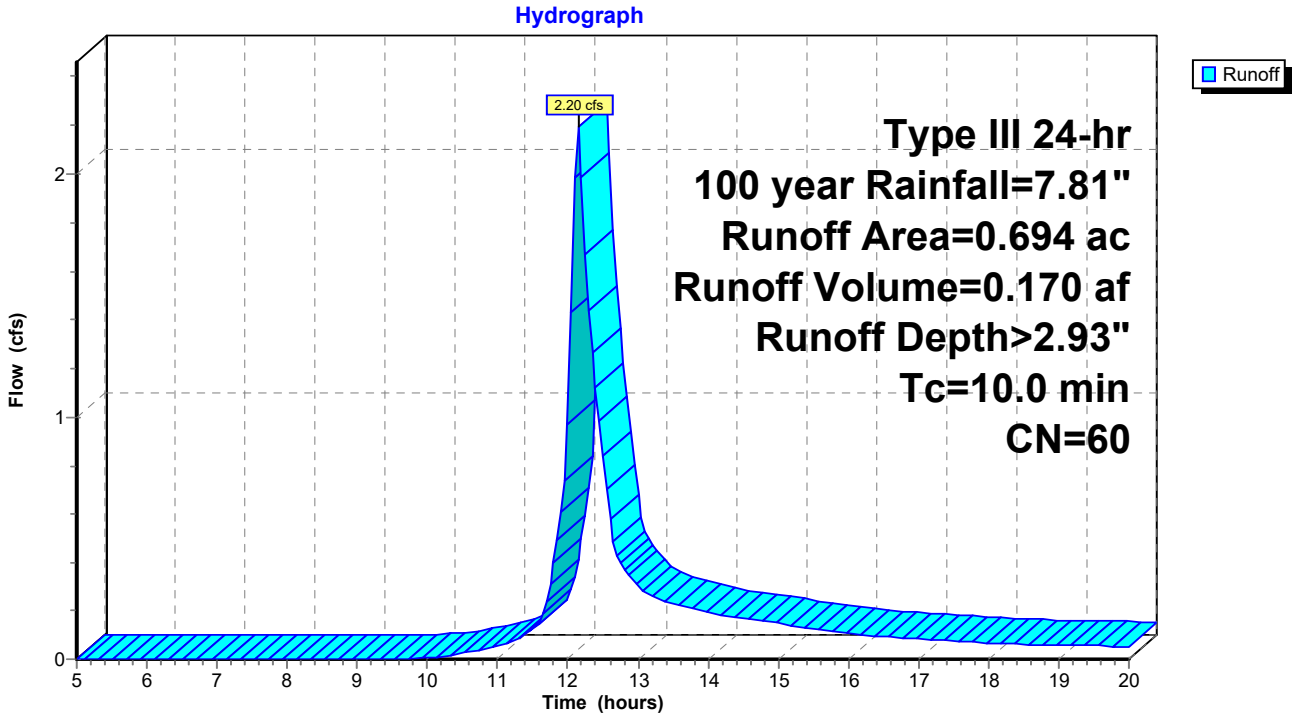
Runoff = 2.20 cfs @ 12.15 hrs, Volume= 0.170 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.694	60	Woods, Fair, HSG B
0.694		100.00% Pervious Area

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

Subcatchment 6C: Subcat 6C



Summary for Subcatchment 7: Subcat 7

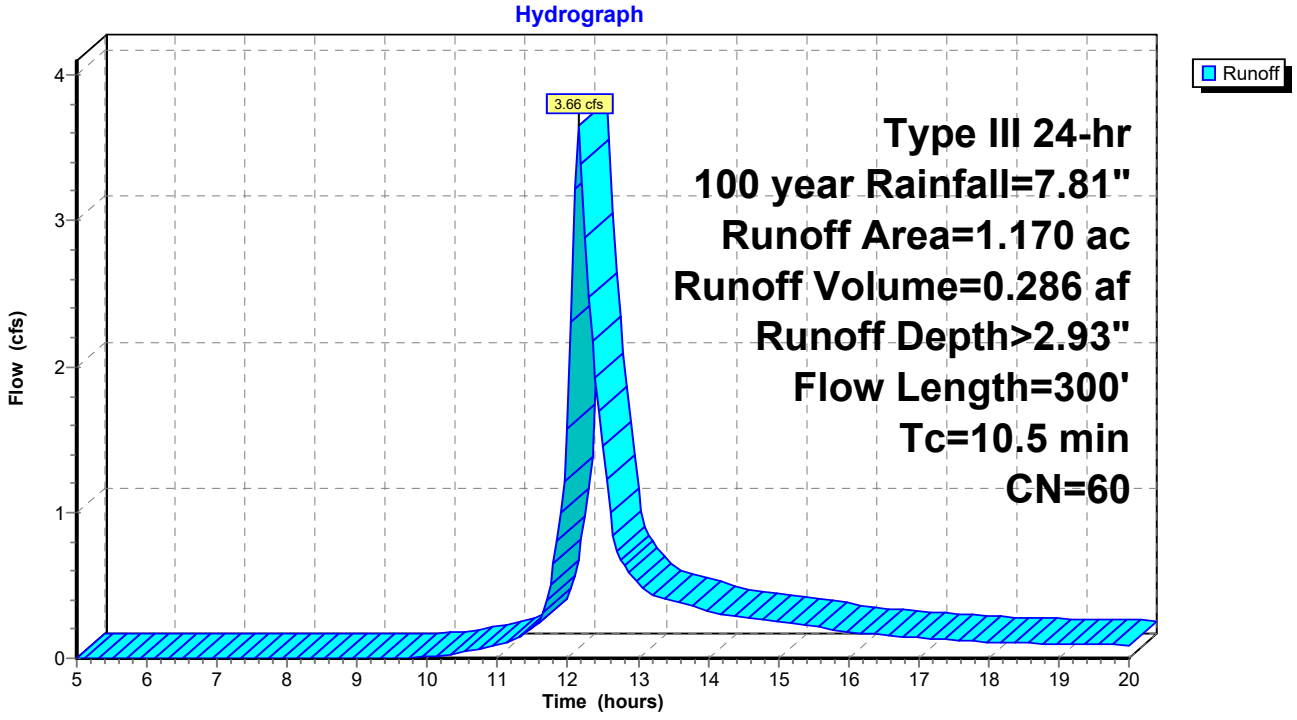
Runoff = 3.66 cfs @ 12.16 hrs, Volume= 0.286 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
1.170	60	Woods, Fair, HSG B
1.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
1.8	150	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.9	100	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.5	300	Total			

Subcatchment 7: Subcat 7



Summary for Subcatchment 7A: Subcat 7A

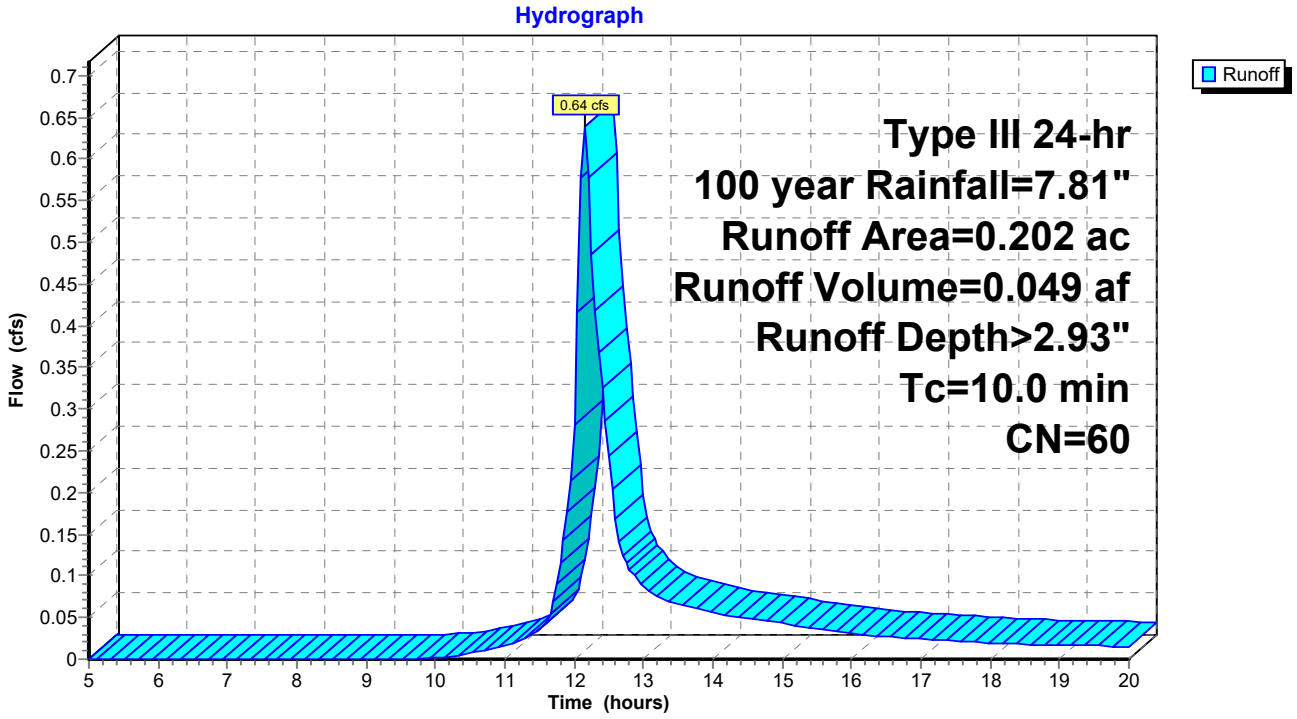
Runoff = 0.64 cfs @ 12.15 hrs, Volume= 0.049 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.202	60	Woods, Fair, HSG B
0.202		100.00% Pervious Area

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

Subcatchment 7A: Subcat 7A



Summary for Subcatchment 8: Subcat 8

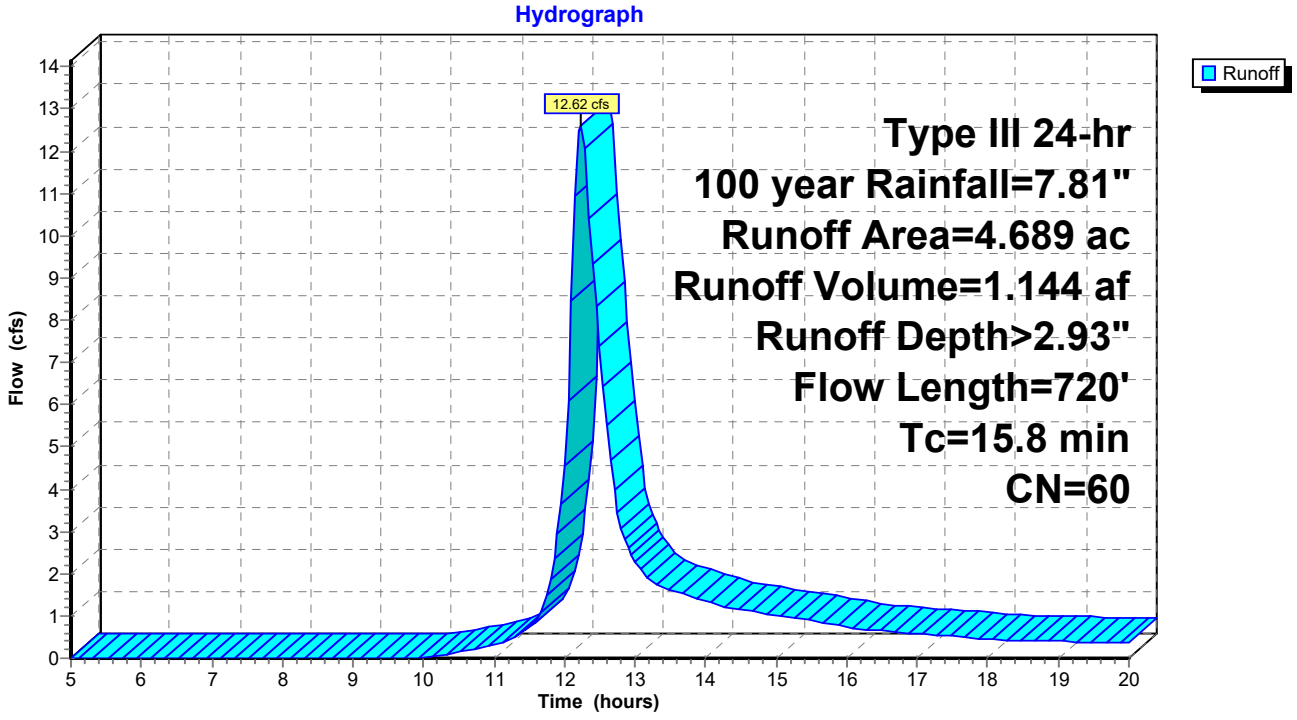
Runoff = 12.62 cfs @ 12.23 hrs, Volume= 1.144 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
4.689	60	Woods, Fair, HSG B
4.689		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.1100	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
2.7	270	0.1100	1.66		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.1	400	0.0350	0.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
15.8	720	Total			

Subcatchment 8: Subcat 8



Summary for Subcatchment 8A: Subcat 8A

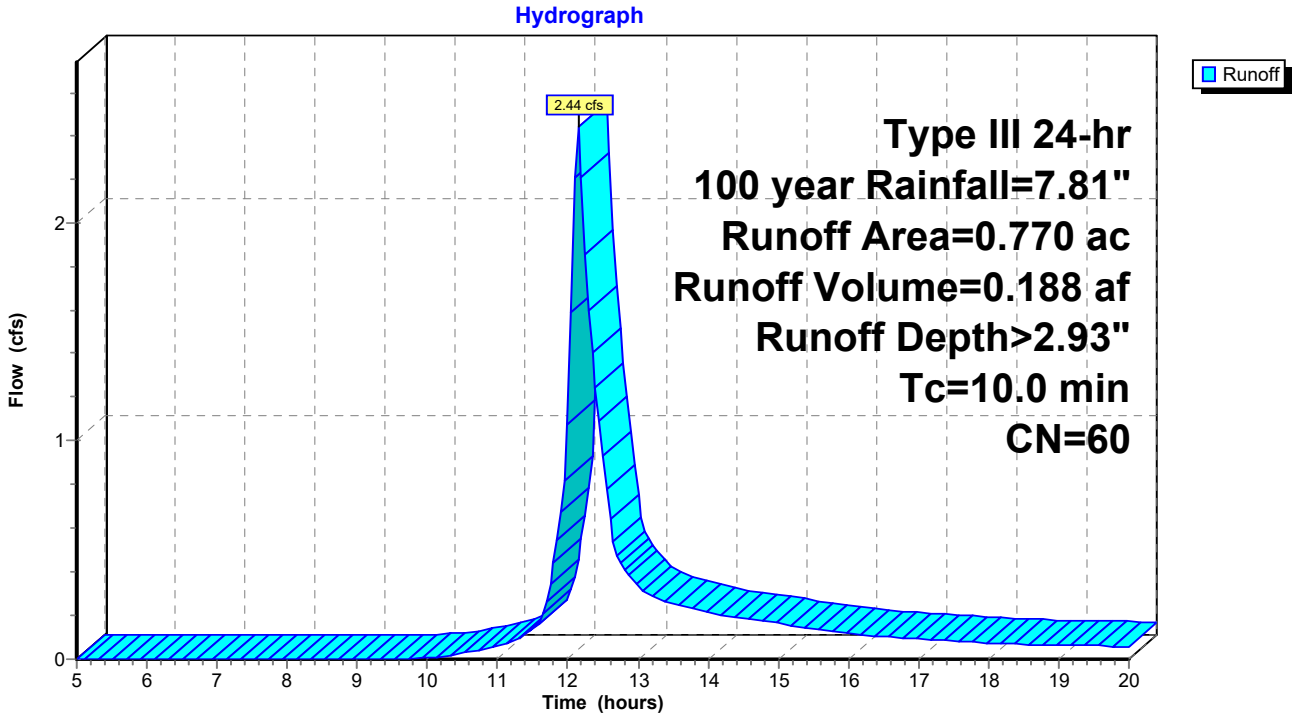
Runoff = 2.44 cfs @ 12.15 hrs, Volume= 0.188 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.770	60	Woods, Fair, HSG B
0.770		100.00% Pervious Area

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

Subcatchment 8A: Subcat 8A



Summary for Subcatchment 9: Subcat 9

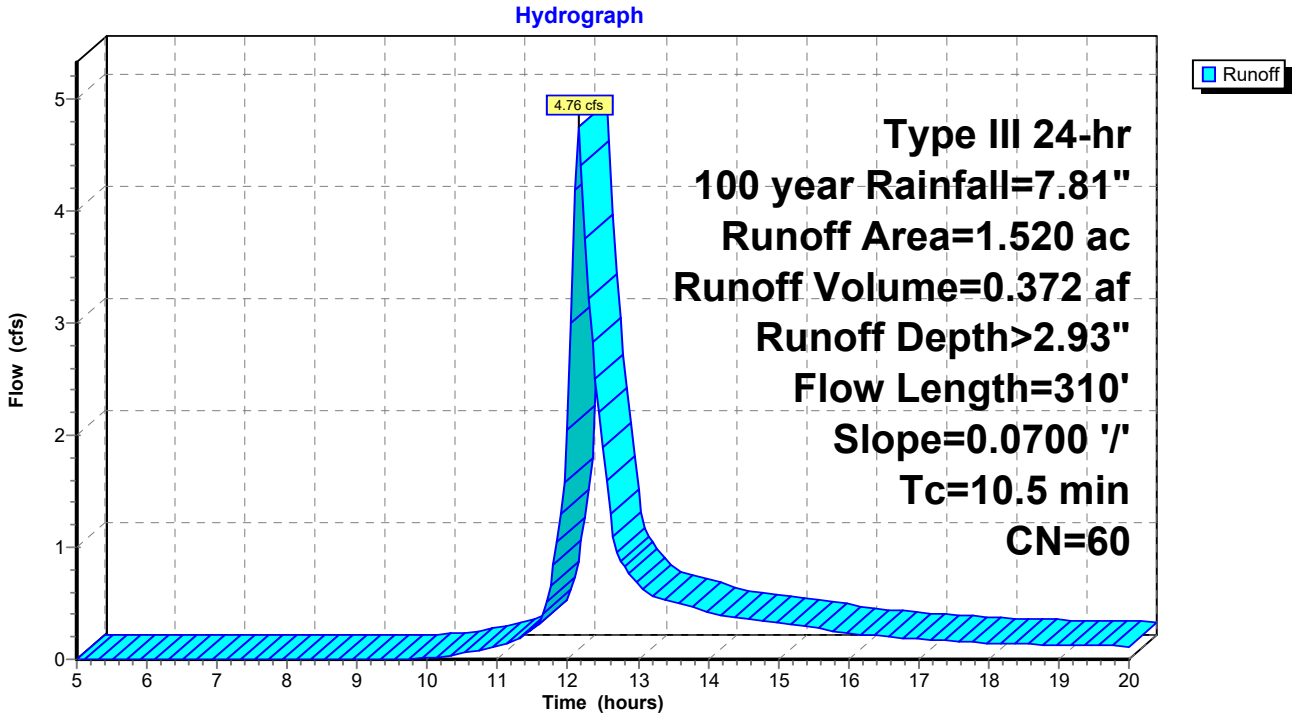
Runoff = 4.76 cfs @ 12.16 hrs, Volume= 0.372 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
1.520	60	Woods, Fair, HSG B
1.520		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0700	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
3.3	260	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.5	310	Total			

Subcatchment 9: Subcat 9



Summary for Subcatchment 9A: Subcat 9A

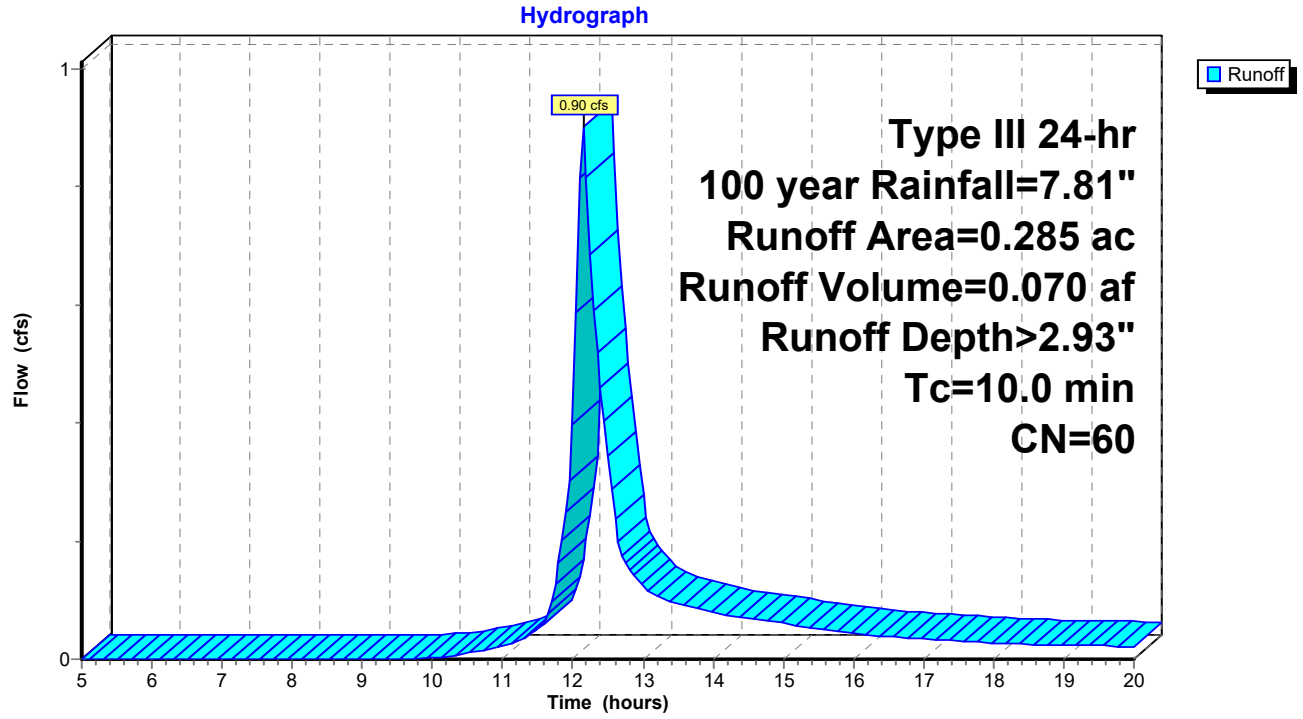
Runoff = 0.90 cfs @ 12.15 hrs, Volume= 0.070 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.285	60	Woods, Fair, HSG B
0.285		100.00% Pervious Area

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

Subcatchment 9A: Subcat 9A



Summary for Subcatchment 10: Subcat 10

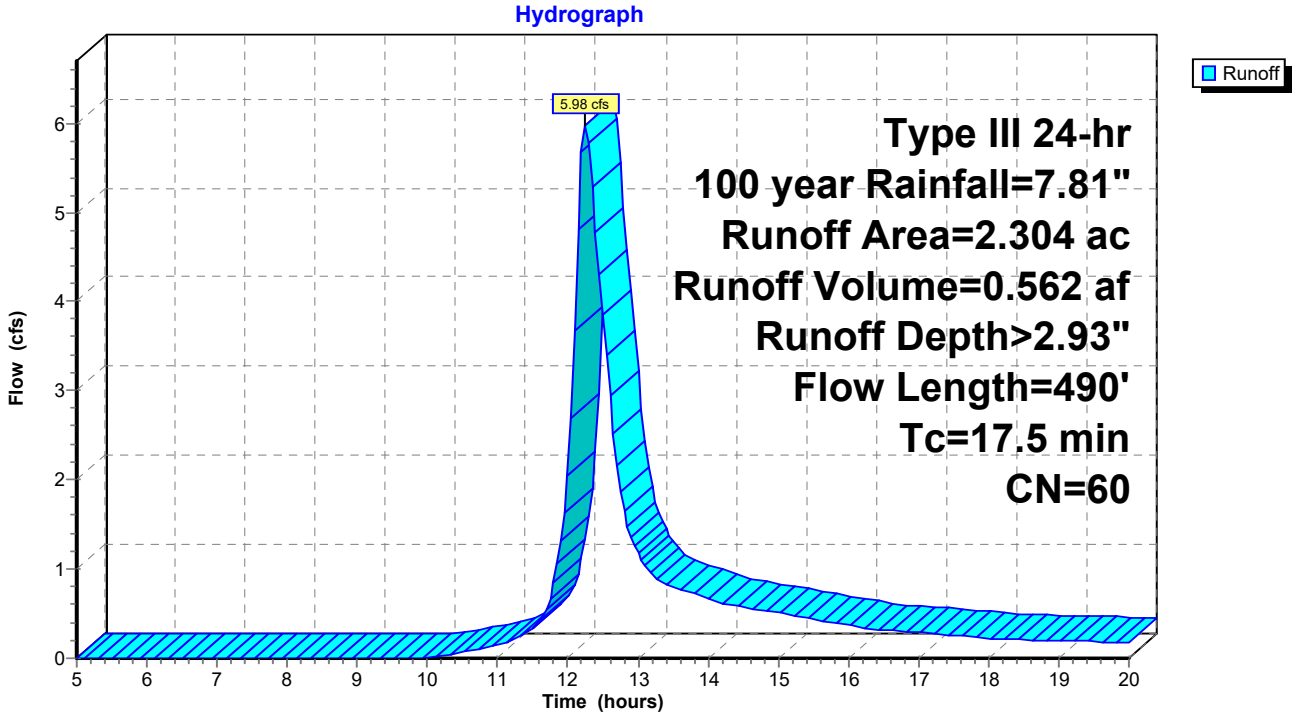
Runoff = 5.98 cfs @ 12.25 hrs, Volume= 0.562 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
2.304	60	Woods, Fair, HSG B
2.304		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
2.8	270	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.8	170	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.5	490	Total			

Subcatchment 10: Subcat 10



Summary for Subcatchment 10A: Subcat 10A

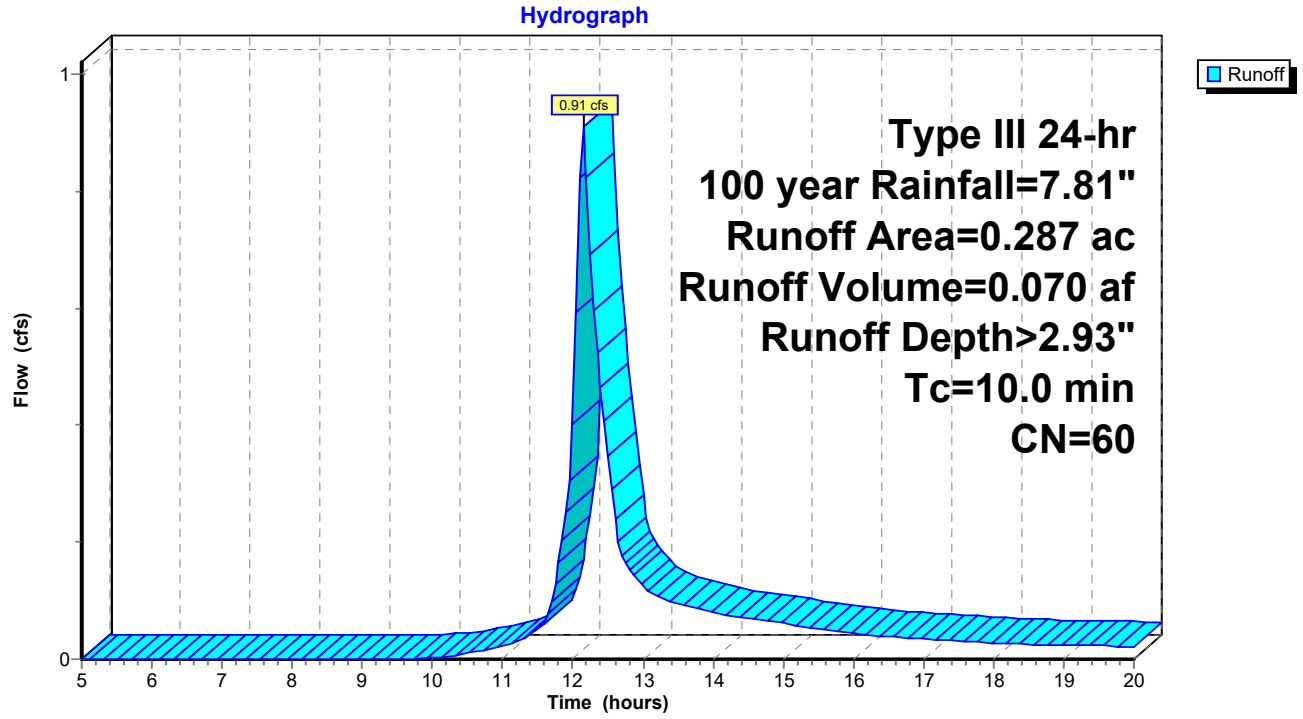
Runoff = 0.91 cfs @ 12.15 hrs, Volume= 0.070 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.287	60	Woods, Fair, HSG B
0.287		100.00% Pervious Area

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

Subcatchment 10A: Subcat 10A



Summary for Subcatchment 11: Subcat 11

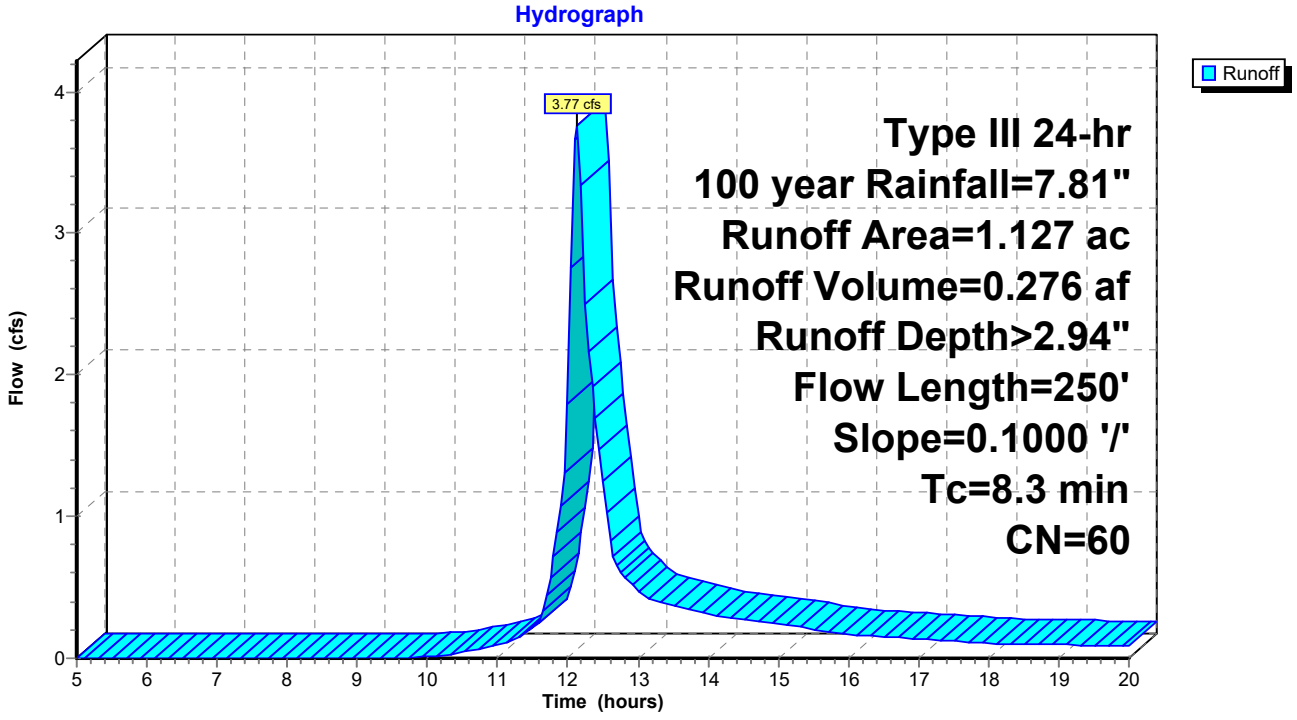
Runoff = 3.77 cfs @ 12.12 hrs, Volume= 0.276 af, Depth> 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
1.127	60	Woods, Fair, HSG B
1.127	60	Weighted Average
1.127		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.1000	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
2.1	200	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.3	250	Total			

Subcatchment 11: Subcat 11



Summary for Subcatchment 11A: Subcat 11A

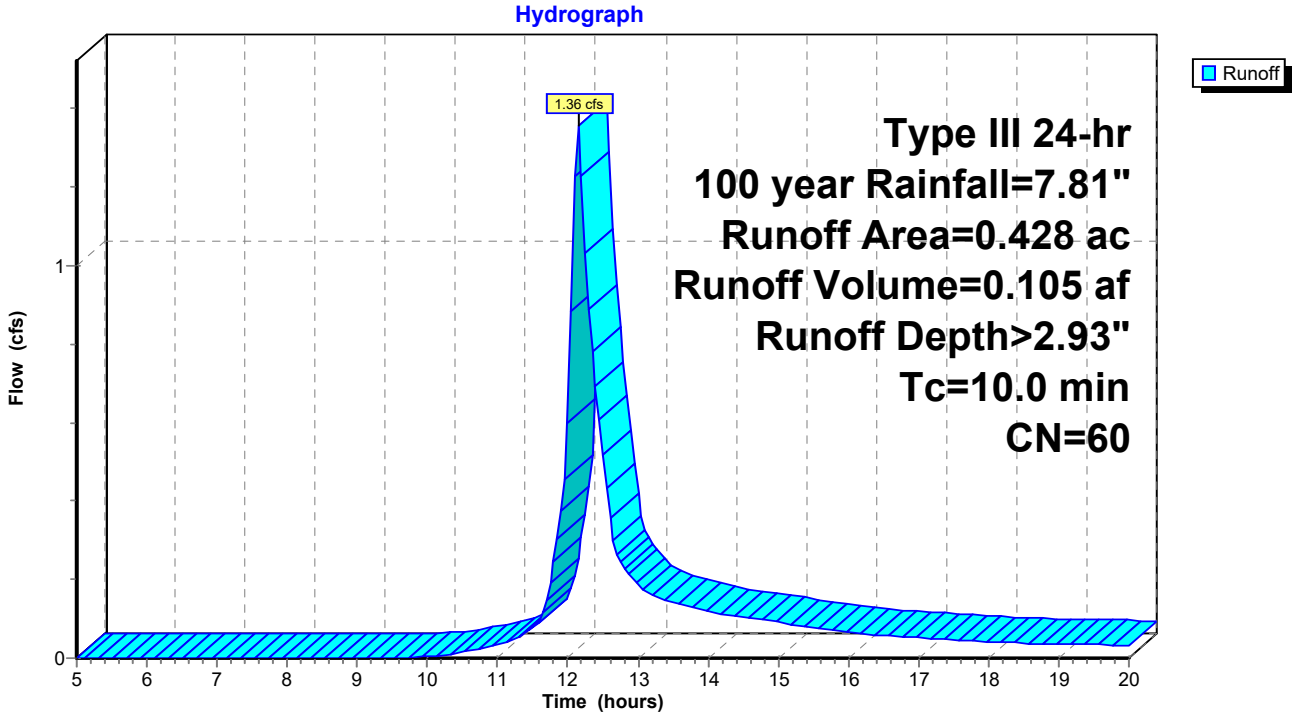
Runoff = 1.36 cfs @ 12.15 hrs, Volume= 0.105 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
0.428	60	Woods, Fair, HSG B
0.428	60	Weighted Average
0.428		100.00% Pervious Area

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

Subcatchment 11A: Subcat 11A



Summary for Subcatchment 12: Subcat 12

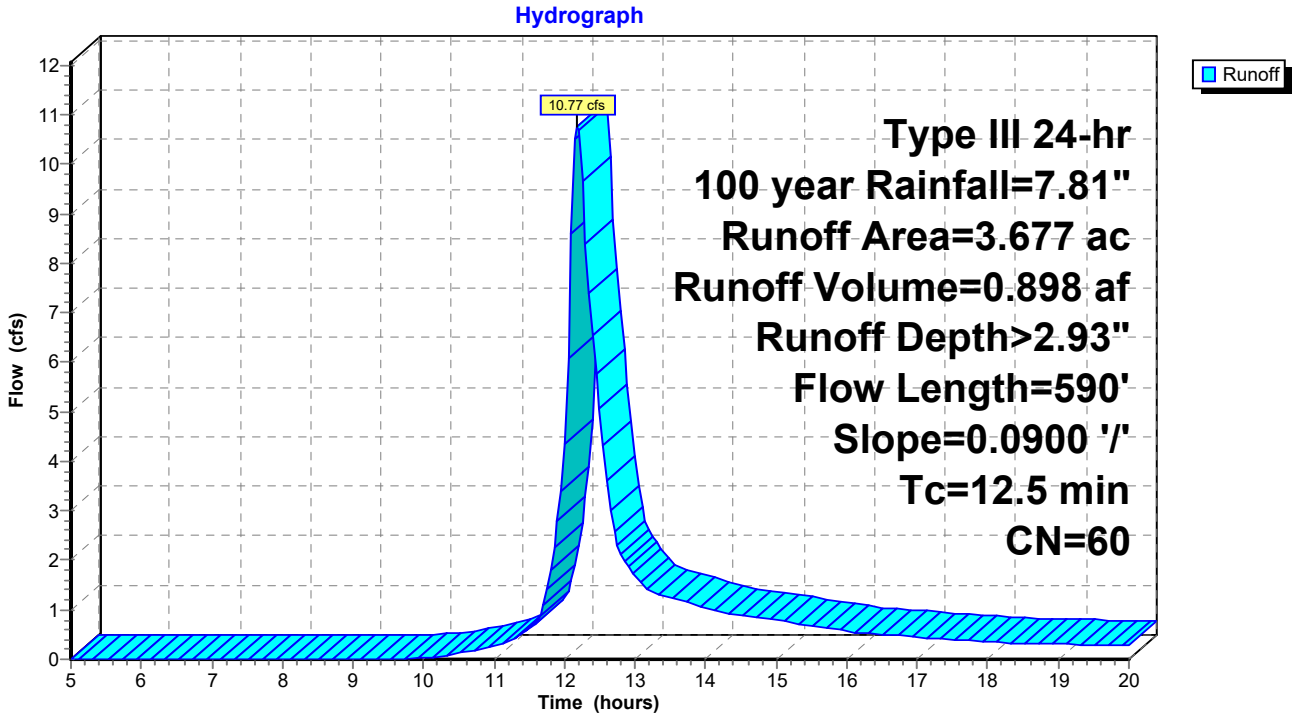
Runoff = 10.77 cfs @ 12.18 hrs, Volume= 0.898 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
3.677	60	Woods, Fair, HSG B
3.677		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	50	0.0900	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
6.0	540	0.0900	1.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.5	590	Total			

Subcatchment 12: Subcat 12



Summary for Subcatchment 13.1: Subcat 13.1

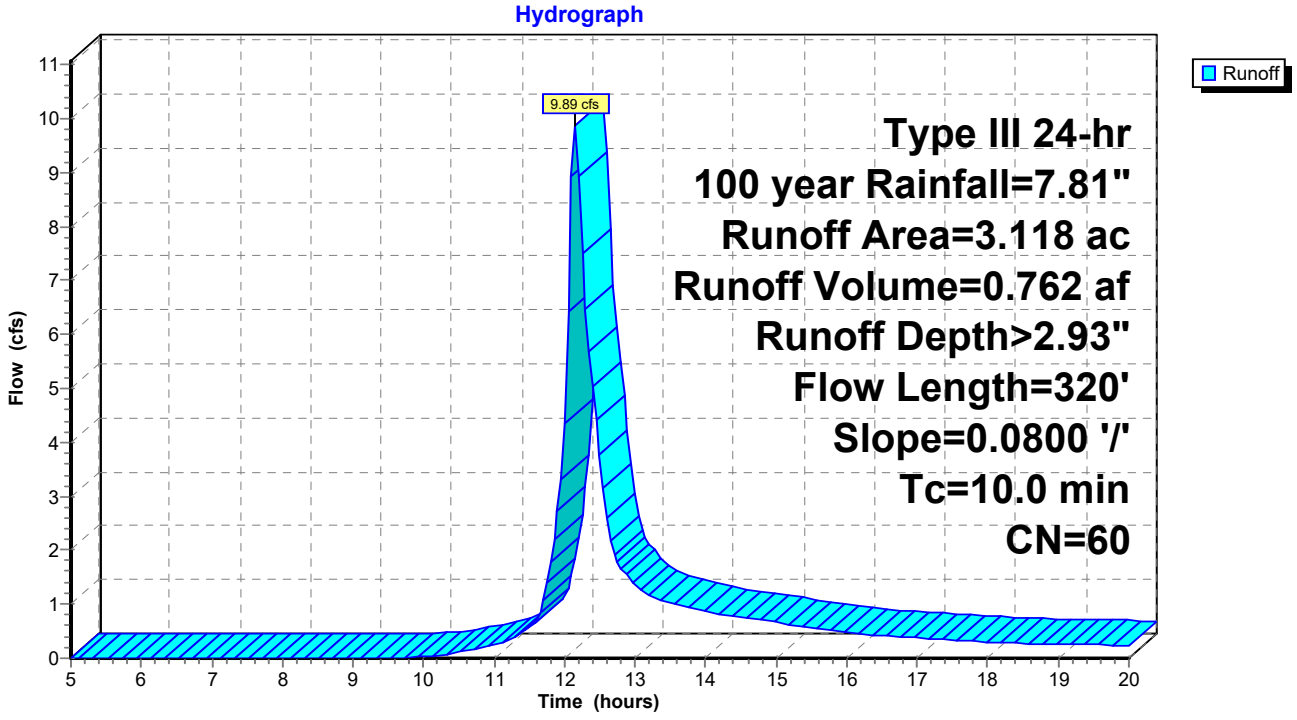
Runoff = 9.89 cfs @ 12.15 hrs, Volume= 0.762 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
3.092	60	Woods, Fair, HSG B
0.026	79	Woods, Fair, HSG D
3.118	60	Weighted Average
3.118		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
3.2	270	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.0	320	Total			

Subcatchment 13.1: Subcat 13.1



Summary for Subcatchment 13.2: Subcat 13.2

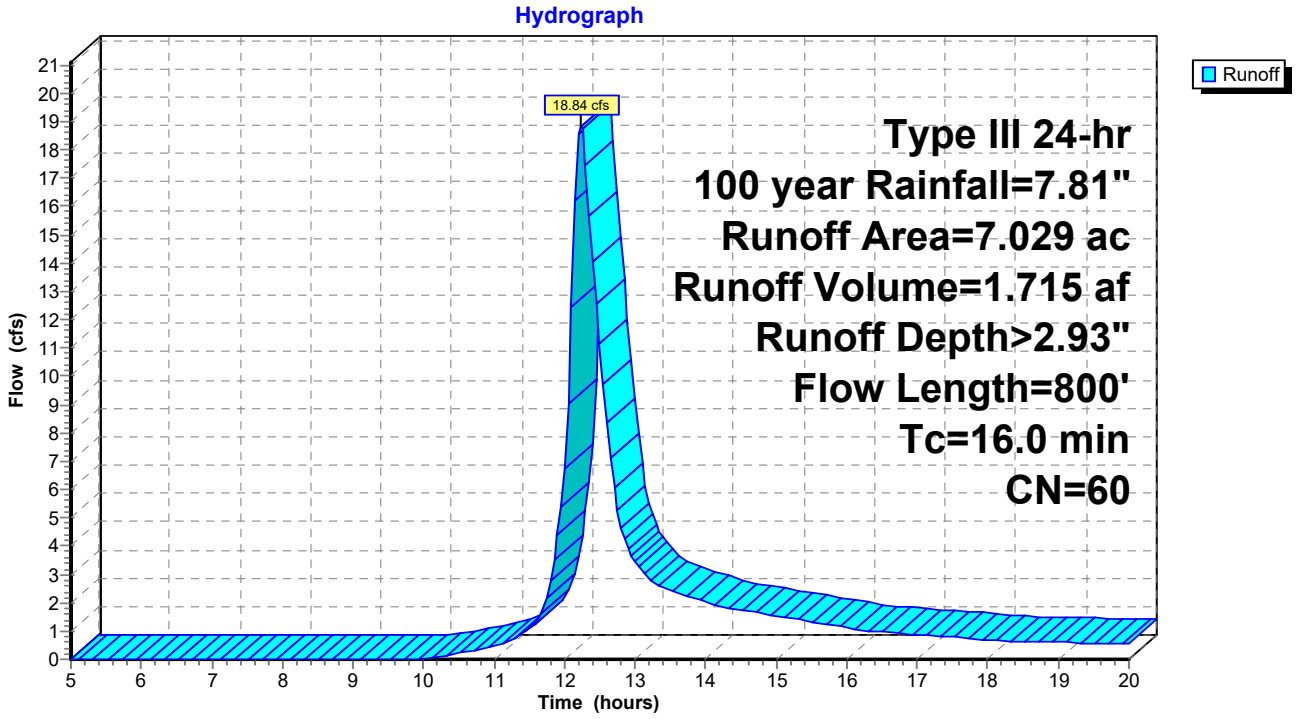
Runoff = 18.84 cfs @ 12.23 hrs, Volume= 1.715 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
7.029	60	Woods, Fair, HSG B
7.029		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0700	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
8.8	750	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.0	800	Total			

Subcatchment 13.2: Subcat 13.2



Summary for Subcatchment 13.3: Subcat 13.3

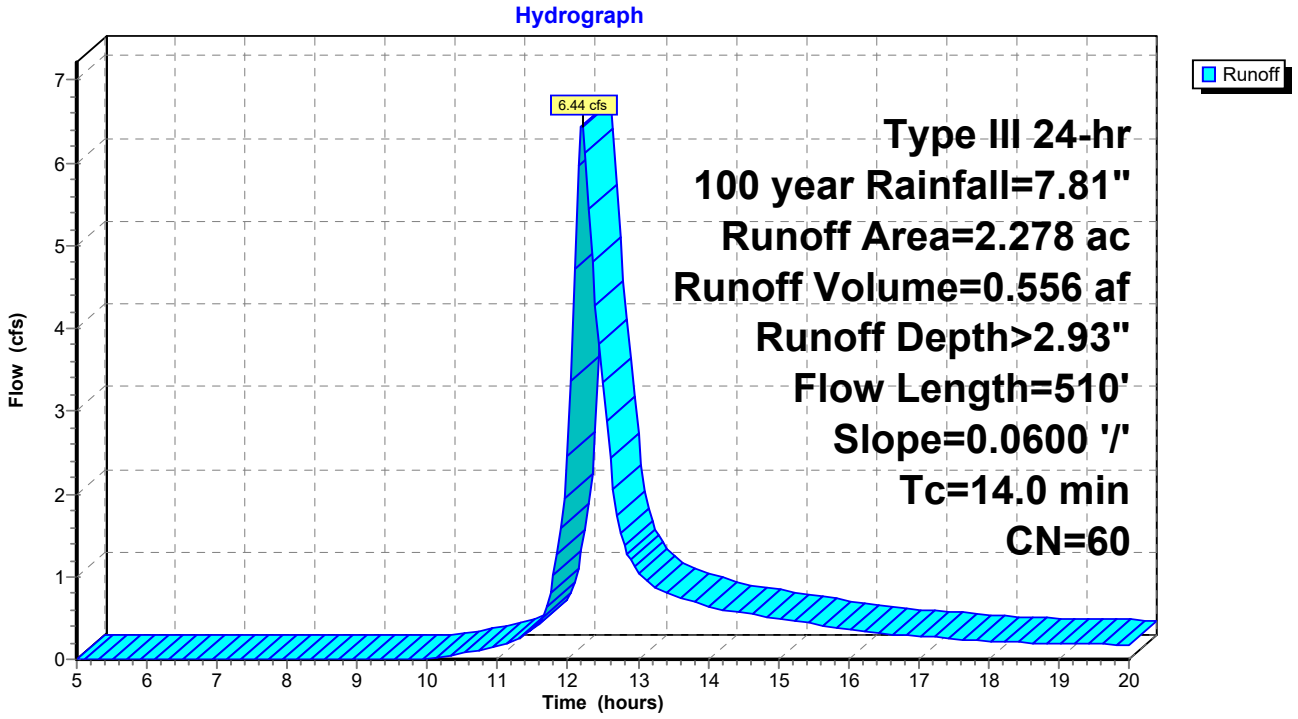
Runoff = 6.44 cfs @ 12.20 hrs, Volume= 0.556 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
2.278	60	Woods, Fair, HSG B
2.278		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	50	0.0600	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
6.3	460	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
14.0	510	Total			

Subcatchment 13.3: Subcat 13.3



Summary for Subcatchment 14: Subcat 14

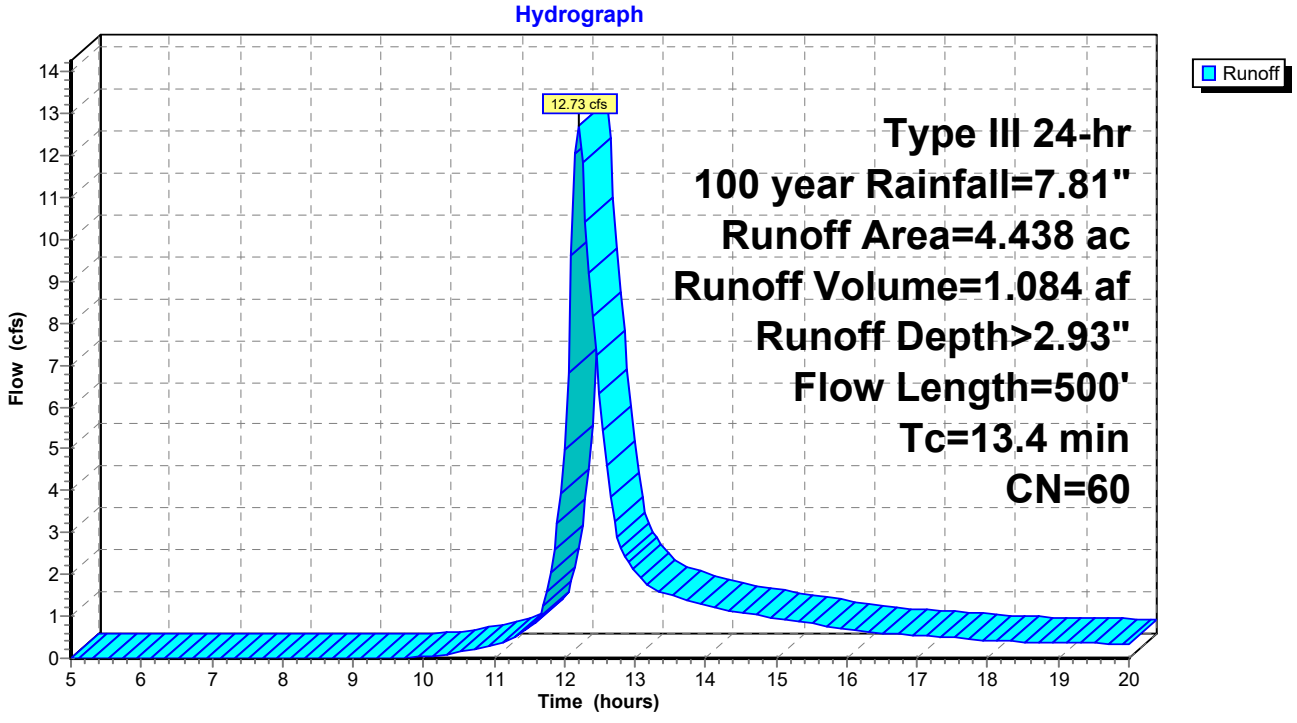
Runoff = 12.73 cfs @ 12.20 hrs, Volume= 1.084 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
4.438	60	Woods, Fair, HSG B
4.438		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	50	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
1.9	160	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.7	180	0.1300	1.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.8	110	0.2000	2.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.4	500	Total			

Subcatchment 14: Subcat 14



Summary for Subcatchment 16: Subcat 16

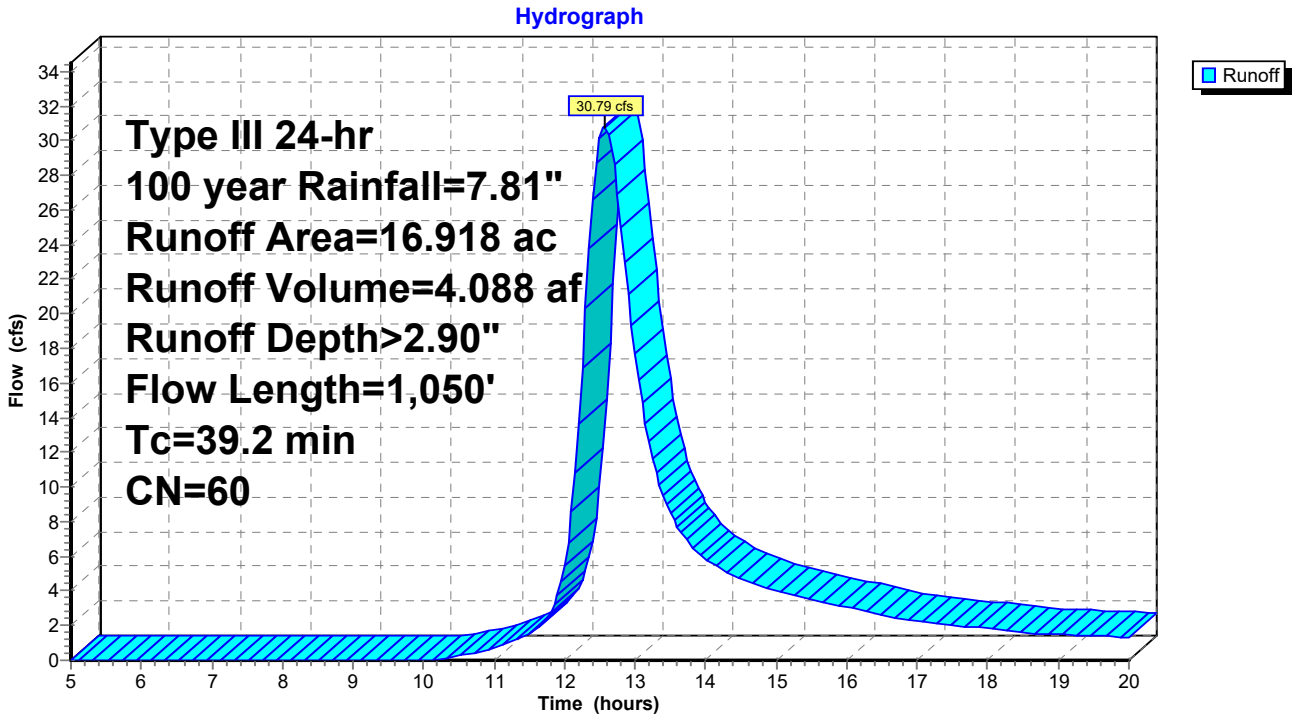
Runoff = 30.79 cfs @ 12.57 hrs, Volume= 4.088 af, Depth> 2.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
16.918	60	Woods, Fair, HSG B
16.918	60	Weighted Average
16.918		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	50	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
16.7	500	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.8	500	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
39.2	1,050	Total			

Subcatchment 16: Subcat 16



Summary for Subcatchment 16A: Subcat 16A

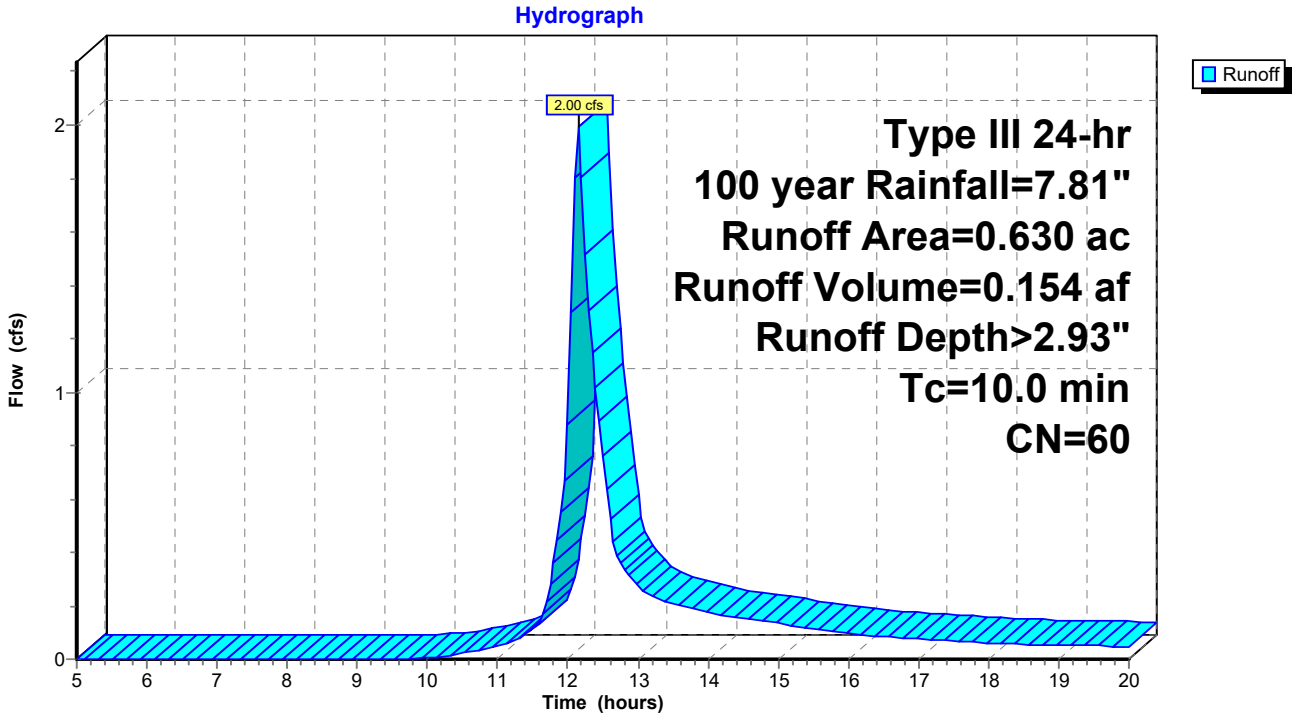
Runoff = 2.00 cfs @ 12.15 hrs, Volume= 0.154 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.630	60	Woods, Fair, HSG B
0.630		100.00% Pervious Area

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

Subcatchment 16A: Subcat 16A



Summary for Reach 13.1R: Reach 13.1

[91] Warning: Storage range exceeded by 0.31'
[55] Hint: Peak inflow is 731% of Manning's capacity
[81] Warning: Exceeded Pond 13.1P by 0.14' @ 12.40 hrs

Inflow Area = 3.118 ac, 0.00% Impervious, Inflow Depth > 2.56" for 100 year event
Inflow = 6.98 cfs @ 12.28 hrs, Volume= 0.666 af
Outflow = 6.69 cfs @ 12.40 hrs, Volume= 0.663 af, Atten= 4%, Lag= 7.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.52 fps, Min. Travel Time= 3.3 min
Avg. Velocity = 1.68 fps, Avg. Travel Time= 4.9 min

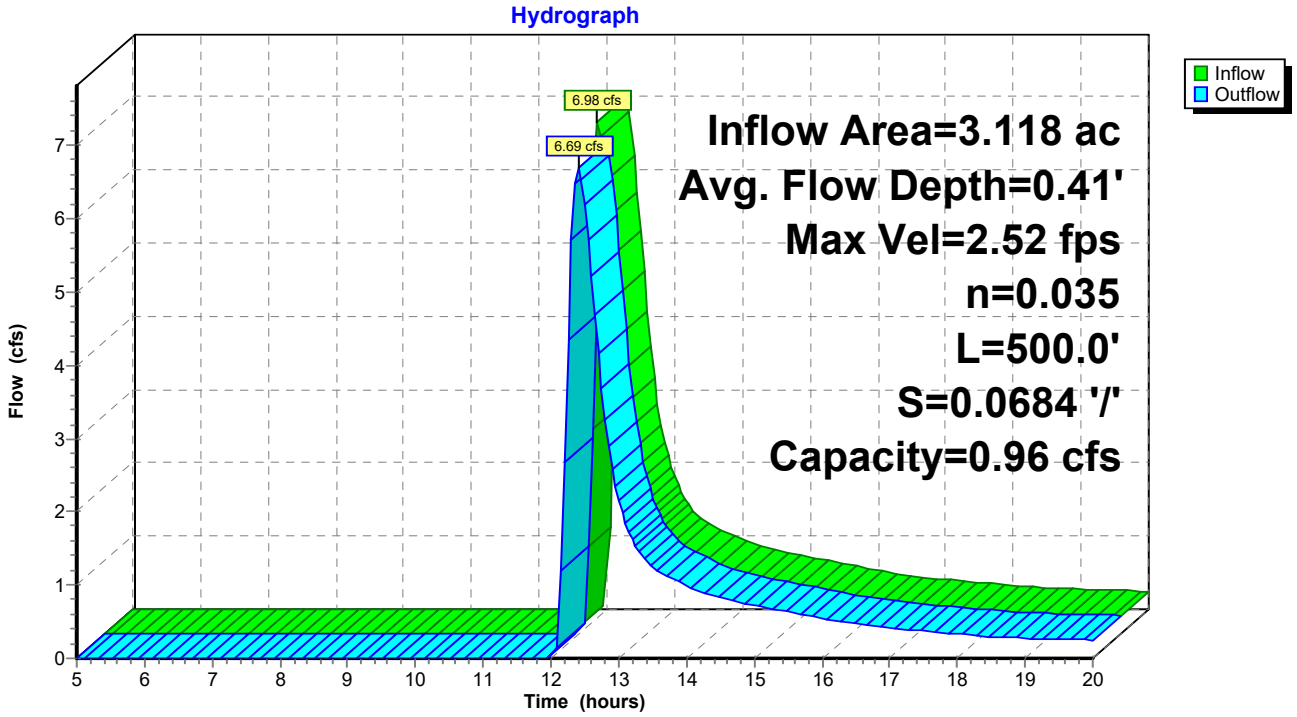
Peak Storage= 1,333 cf @ 12.35 hrs
Average Depth at Peak Storage= 0.41'
Bank-Full Depth= 0.10' Flow Area= 0.5 sf, Capacity= 0.96 cfs

3.00' x 0.10' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 20.0 '/' Top Width= 7.00'
Length= 500.0' Slope= 0.0684 '/'
Inlet Invert= 224.20', Outlet Invert= 190.00'



‡

Reach 13.1R: Reach 13.1



Summary for Pond 13.1P: Pond 13.1

Inflow Area = 3.118 ac, 0.00% Impervious, Inflow Depth > 2.93" for 100 year event
Inflow = 9.89 cfs @ 12.15 hrs, Volume= 0.762 af
Outflow = 6.98 cfs @ 12.28 hrs, Volume= 0.666 af, Atten= 29%, Lag= 7.7 min
Primary = 6.98 cfs @ 12.28 hrs, Volume= 0.666 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 224.48' @ 12.28 hrs Surf.Area= 16,658 sf Storage= 8,125 cf

Plug-Flow detention time= 64.6 min calculated for 0.666 af (87% of inflow)
Center-of-Mass det. time= 26.3 min (836.7 - 810.4)

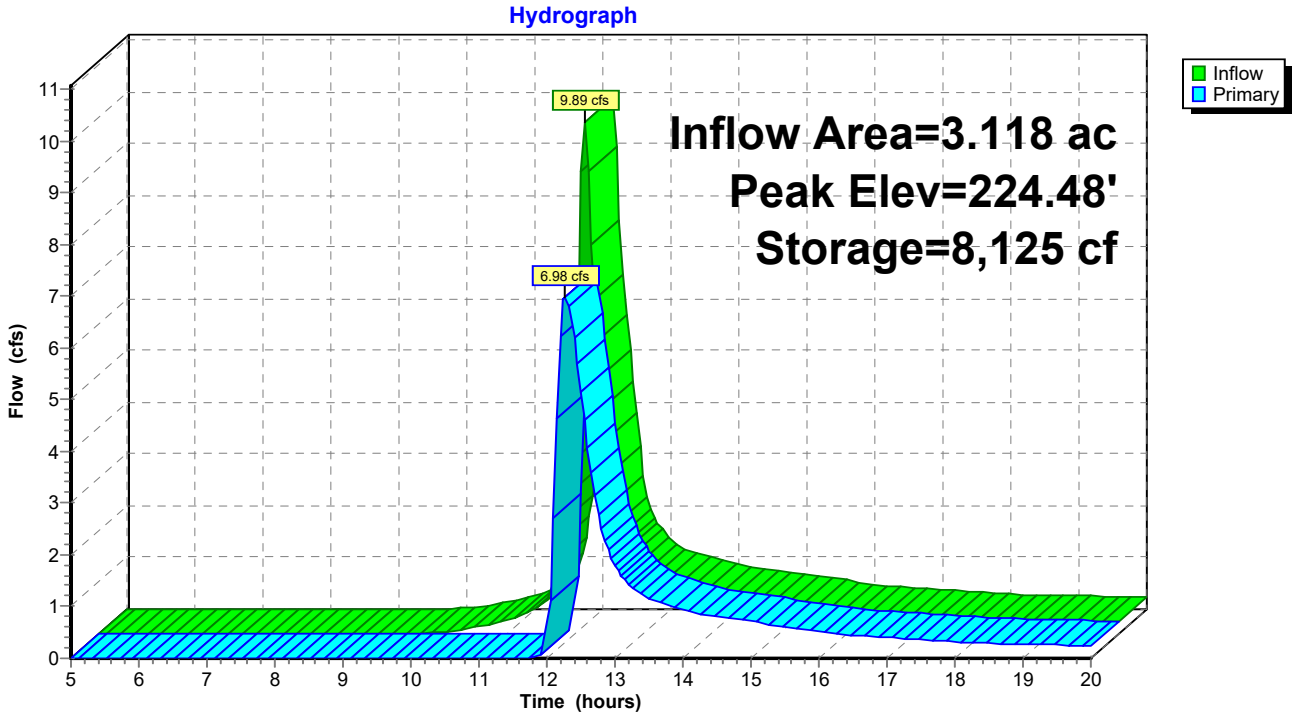
Volume	Invert	Avail.Storage	Storage Description
#1	223.70'	21,750 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
223.70	0	0	0
224.20	15,000	3,750	3,750
225.20	21,000	18,000	21,750

Device	Routing	Invert	Outlet Devices
#1	Primary	224.20'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=6.94 cfs @ 12.28 hrs HW=224.48' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 6.94 cfs @ 1.26 fps)

Pond 13.1P: Pond 13.1



Summary for Pond 13.2P: Pond 13.2

Inflow Area = 7.029 ac, 0.00% Impervious, Inflow Depth > 2.93" for 100 year event
Inflow = 18.84 cfs @ 12.23 hrs, Volume= 1.715 af
Outflow = 17.04 cfs @ 12.32 hrs, Volume= 1.522 af, Atten= 10%, Lag= 5.3 min
Discarded = 0.79 cfs @ 12.32 hrs, Volume= 0.457 af
Primary = 16.25 cfs @ 12.32 hrs, Volume= 1.066 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 190.55' @ 12.32 hrs Surf.Area= 11,060 sf Storage= 14,099 cf

Plug-Flow detention time= 56.0 min calculated for 1.517 af (88% of inflow)
Center-of-Mass det. time= 21.8 min (836.8 - 815.0)

Volume	Invert	Avail.Storage	Storage Description
#1	187.70'	34,621 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

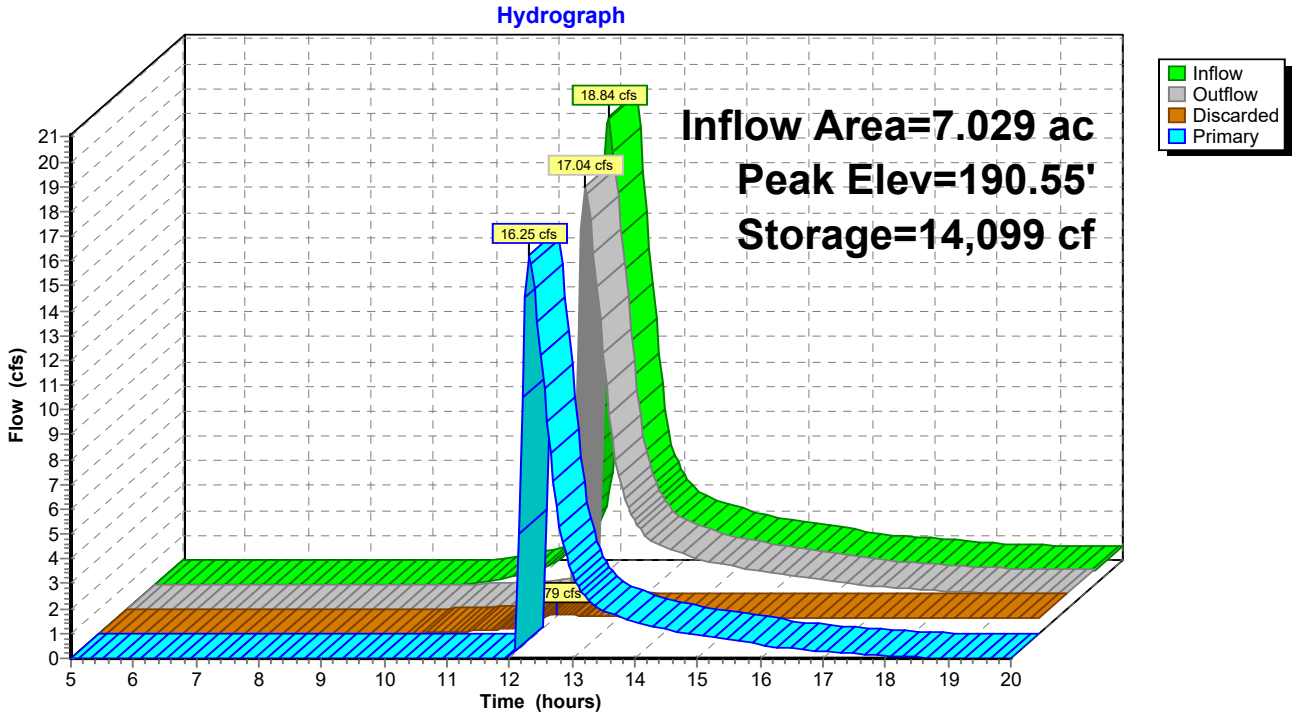
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
187.70	0	0	0	0
188.00	900	90	90	900
190.00	9,000	8,497	8,587	9,012
192.00	17,500	26,033	34,621	17,550

Device	Routing	Invert	Outlet Devices
#1	Primary	190.00'	**15.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Discarded	187.70'	**2.700 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 180.00'

Discarded OutFlow Max=0.79 cfs @ 12.32 hrs HW=190.55' (Free Discharge)
↑**2=Exfiltration** (Controls 0.79 cfs)

Primary OutFlow Max=16.02 cfs @ 12.32 hrs HW=190.55' (Free Discharge)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 16.02 cfs @ 1.96 fps)

Pond 13.2P: Pond 13.2

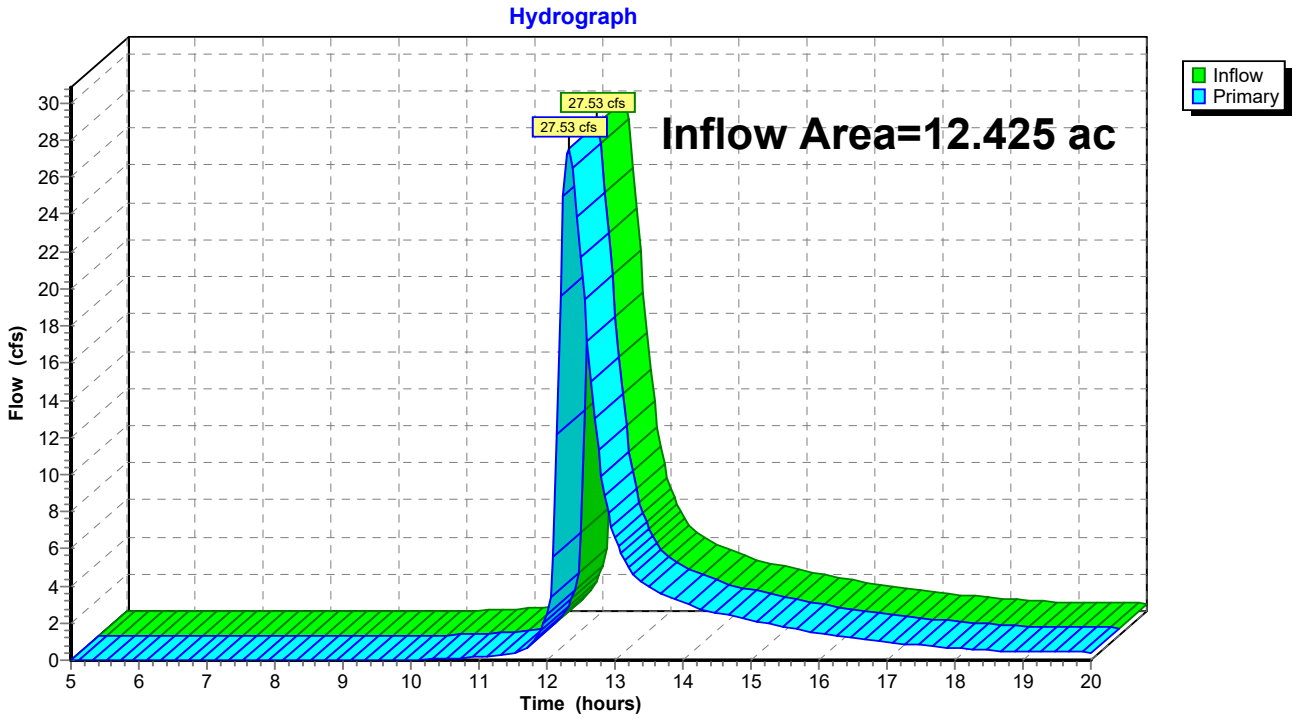


Summary for Link 13: 13

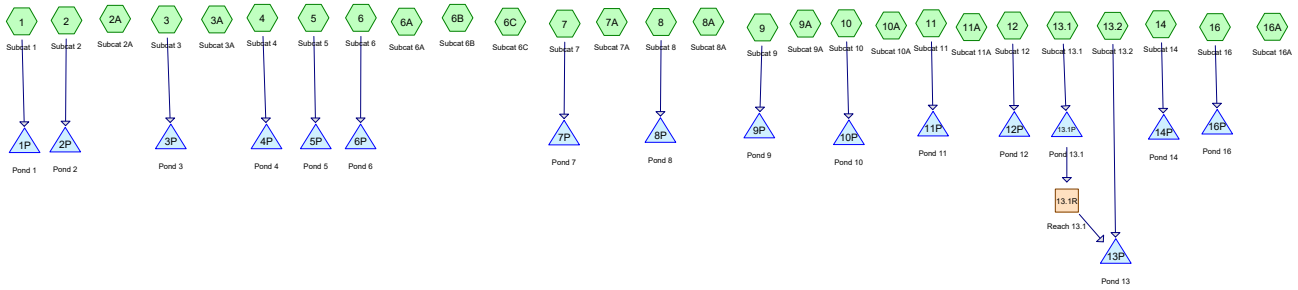
Inflow Area = 12.425 ac, 0.00% Impervious, Inflow Depth > 2.21" for 100 year event
Inflow = 27.53 cfs @ 12.32 hrs, Volume= 2.285 af
Primary = 27.53 cfs @ 12.32 hrs, Volume= 2.285 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 13: 13



HydroCAD Analysis: Proposed Conditions



Subcat Reach Pond Link

Routing Diagram for 42496.00 HydroCAD Proposed
Prepared by VHB, Printed 12/3/2019
HydroCAD® 10.00-22 s/n 01038 © 2018 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
48.441	74	>75% Grass cover, Good, HSG C (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13.1, 13.2, 14, 16)
0.313	80	>75% Grass cover, Good, HSG D (4, 6, 13.1)
0.003	96	Gravel surface, HSG B (8A)
4.122	96	Gravel surface, HSG C (1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13.1, 13.2, 14, 16)
0.096	96	Gravel surface, HSG D (4, 6)
17.514	58	Meadow, non-grazed, HSG B (1, 2, 2A, 3, 3A, 4, 5, 6, 6A, 6B, 6C, 7, 7A, 8, 8A, 9, 9A, 10, 10A, 11, 11A, 12, 13.1, 13.2, 14, 16, 16A)
2.545	78	Meadow, non-grazed, HSG D (2A, 3, 3A, 4, 6, 6A, 13.1)
0.032	60	Woods, Fair, HSG B (6)
0.319	79	Woods, Fair, HSG D (6)
73.385	**72**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
17.549	HSG B	1, 2, 2A, 3, 3A, 4, 5, 6, 6A, 6B, 6C, 7, 7A, 8, 8A, 9, 9A, 10, 10A, 11, 11A, 12, 13.1, 13.2, 14, 16, 16A
52.563	HSG C	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13.1, 13.2, 14, 16
3.273	HSG D	2A, 3, 3A, 4, 6, 6A, 13.1
0.000	Other	
73.385		**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	48.441	0.313	0.000	48.754	>75% Grass cover, Good	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13.1, 13.2, 14, 16
0.000	0.003	4.122	0.096	0.000	4.221	Gravel surface	1, 2, 3, 4, 6, 7, 8, 8A, 9, 10, 11, 12, 13.1, 13.2, 14, 16
0.000	17.514	0.000	2.545	0.000	20.059	Meadow, non-grazed	1, 2, 2A, 3, 3A, 4, 5, 6, 6A, 6B, 6C, 7, 7A, 8, 8A, 9, 9A, 10, 10A, 11, 11A, 12, 13.1, 13.2, 14, 16, 16A
0.000	0.032	0.000	0.319	0.000	0.351	Woods, Fair	6
0.000	**17.549**	**52.563**	**3.273**	**0.000**	**73.385**	**TOTAL AREA**	

2-Year Storm Event – Proposed

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=3.006 ac 0.00% Impervious Runoff Depth>0.89"
Flow Length=470' Slope=0.0800 '/' Tc=8.0 min CN=70 Runoff=2.87 cfs 0.222 af

Subcatchment2: Subcat 2 Runoff Area=2.551 ac 0.00% Impervious Runoff Depth>0.99"
Flow Length=430' Tc=12.4 min CN=72 Runoff=2.45 cfs 0.210 af

Subcatchment2A: Subcat 2A Runoff Area=0.775 ac 0.00% Impervious Runoff Depth>0.65"
Tc=10.0 min CN=65 Runoff=0.47 cfs 0.042 af

Subcatchment3: Subcat 3 Runoff Area=2.550 ac 0.00% Impervious Runoff Depth>1.04"
Flow Length=620' Tc=12.6 min CN=73 Runoff=2.59 cfs 0.222 af

Subcatchment3A: Subcat 3A Runoff Area=0.324 ac 0.00% Impervious Runoff Depth>1.28"
Tc=10.0 min CN=77 Runoff=0.45 cfs 0.035 af

Subcatchment4: Subcat 4 Runoff Area=5.871 ac 0.00% Impervious Runoff Depth>1.04"
Flow Length=810' Tc=16.2 min CN=73 Runoff=5.44 cfs 0.510 af

Subcatchment5: Subcat 5 Runoff Area=2.637 ac 0.00% Impervious Runoff Depth>0.79"
Flow Length=510' Slope=0.0500 '/' Tc=10.4 min CN=68 Runoff=2.04 cfs 0.173 af

Subcatchment6: Subcat 6 Runoff Area=3.201 ac 0.00% Impervious Runoff Depth>1.05"
Flow Length=420' Slope=0.0700 '/' Tc=8.1 min CN=73 Runoff=3.70 cfs 0.279 af

Subcatchment6A: Subcat 6A Runoff Area=0.915 ac 0.00% Impervious Runoff Depth>0.74"
Tc=10.0 min CN=67 Runoff=0.66 cfs 0.056 af

Subcatchment6B: Subcat 6B Runoff Area=0.030 ac 0.00% Impervious Runoff Depth>0.38"
Tc=10.0 min CN=58 Runoff=0.01 cfs 0.001 af

Subcatchment6C: Subcat 6C Runoff Area=0.694 ac 0.00% Impervious Runoff Depth>0.38"
Tc=10.0 min CN=58 Runoff=0.17 cfs 0.022 af

Subcatchment7: Subcat 7 Runoff Area=1.170 ac 0.00% Impervious Runoff Depth>0.89"
Flow Length=200' Slope=0.0800 '/' Tc=5.8 min CN=70 Runoff=1.22 cfs 0.086 af

Subcatchment7A: Subcat 7A Runoff Area=0.202 ac 0.00% Impervious Runoff Depth>0.38"
Tc=10.0 min CN=58 Runoff=0.05 cfs 0.006 af

Subcatchment8: Subcat 8 Runoff Area=4.686 ac 0.00% Impervious Runoff Depth>0.99"
Flow Length=650' Tc=10.1 min CN=72 Runoff=4.84 cfs 0.386 af

Subcatchment8A: Subcat 8A Runoff Area=0.770 ac 0.00% Impervious Runoff Depth>0.38"
Tc=10.0 min CN=58 Runoff=0.19 cfs 0.024 af

Subcatchment9: Subcat 9 Runoff Area=1.521 ac 0.00% Impervious Runoff Depth>1.05"
Flow Length=230' Slope=0.0700 '/' Tc=6.4 min CN=73 Runoff=1.89 cfs 0.133 af

Subcatchment9A: Subcat 9A Runoff Area=0.259 ac 0.00% Impervious Runoff Depth>0.38"
Tc=10.0 min CN=58 Runoff=0.06 cfs 0.008 af

Subcatchment10: Subcat 10 Runoff Area=2.304 ac 0.00% Impervious Runoff Depth>0.99"
Flow Length=410' Tc=11.0 min CN=72 Runoff=2.32 cfs 0.190 af

Subcatchment10A: Subcat 10A Runoff Area=0.287 ac 0.00% Impervious Runoff Depth>0.38"
Tc=10.0 min CN=58 Runoff=0.07 cfs 0.009 af

Subcatchment11: Subcat 11 Runoff Area=1.126 ac 0.00% Impervious Runoff Depth>1.10"
Flow Length=210' Slope=0.1000 '/' Tc=5.3 min CN=74 Runoff=1.53 cfs 0.104 af

Subcatchment11A: Subcat 11A Runoff Area=0.428 ac 0.00% Impervious Runoff Depth>0.38"
Tc=10.0 min CN=58 Runoff=0.11 cfs 0.013 af

Subcatchment12: Subcat 12 Runoff Area=3.677 ac 0.00% Impervious Runoff Depth>0.94"
Flow Length=500' Slope=0.0900 '/' Tc=7.9 min CN=71 Runoff=3.81 cfs 0.287 af

Subcatchment13.1: Subcat 13.1 Runoff Area=3.117 ac 0.00% Impervious Runoff Depth>1.16"
Flow Length=320' Slope=0.0800 '/' Tc=6.8 min CN=75 Runoff=4.30 cfs 0.302 af

Subcatchment13.2: Subcat 13.2 Runoff Area=9.308 ac 0.00% Impervious Runoff Depth>1.04"
Flow Length=800' Slope=0.0700 '/' Tc=11.5 min CN=73 Runoff=9.81 cfs 0.810 af

Subcatchment14: Subcat 14 Runoff Area=4.438 ac 0.00% Impervious Runoff Depth>0.74"
Flow Length=500' Tc=9.1 min CN=67 Runoff=3.29 cfs 0.273 af

Subcatchment16: Subcat 16 Runoff Area=16.919 ac 0.00% Impervious Runoff Depth>1.09"
Flow Length=910' Slope=0.0100 '/' Tc=30.9 min CN=74 Runoff=12.75 cfs 1.538 af

Subcatchment16A: Subcat 16A Runoff Area=0.619 ac 0.00% Impervious Runoff Depth>0.38"
Tc=10.0 min CN=58 Runoff=0.15 cfs 0.019 af

Reach 13.1R: Reach 13.1 Avg. Flow Depth=0.04' Max Vel=1.19 fps Inflow=0.20 cfs 0.067 af
n=0.035 L=500.0' S=0.0684 '/' Capacity=0.96 cfs Outflow=0.20 cfs 0.065 af

Pond 1P: Pond 1 Peak Elev=193.14' Storage=11,380 cf Inflow=2.87 cfs 0.222 af
Outflow=0.25 cfs 0.091 af

Pond 2P: Pond 2 Peak Elev=229.53' Storage=4,555 cf Inflow=2.45 cfs 0.210 af
Discarded=0.23 cfs 0.145 af Primary=0.00 cfs 0.000 af Outflow=0.23 cfs 0.145 af

Pond 3P: Pond 3 Peak Elev=226.70' Storage=6,537 cf Inflow=2.59 cfs 0.222 af
Outflow=0.21 cfs 0.081 af

Pond 4P: Pond 4 Peak Elev=187.75' Storage=42,620 cf Inflow=5.44 cfs 0.510 af
Outflow=0.00 cfs 0.000 af

Pond 5P: Pond 5 Peak Elev=218.02' Storage=7,497 cf Inflow=2.04 cfs 0.173 af
Outflow=0.02 cfs 0.000 af

Pond 6P: Pond 6 Peak Elev=209.09' Storage=16,047 cf Inflow=3.70 cfs 0.279 af
Outflow=0.19 cfs 0.059 af

Pond 7P: Pond 7 Peak Elev=224.42' Storage=1,533 cf Inflow=1.22 cfs 0.086 af
Discarded=0.13 cfs 0.079 af Primary=0.00 cfs 0.000 af Outflow=0.13 cfs 0.079 af

Pond 8P: Pond 8 Peak Elev=188.75' Storage=10,191 cf Inflow=4.84 cfs 0.386 af
Outflow=0.45 cfs 0.172 af

Pond 9P: Pond 9 Peak Elev=189.76' Storage=9,888 cf Inflow=1.89 cfs 0.133 af
Outflow=0.00 cfs 0.000 af

Pond 10P: Pond 10 Peak Elev=168.45' Storage=8,267 cf Inflow=2.32 cfs 0.190 af
Outflow=0.00 cfs 0.000 af

Pond 11P: Pond 11 Peak Elev=151.40' Storage=6,549 cf Inflow=1.53 cfs 0.104 af
Outflow=0.00 cfs 0.000 af

Pond 12P: Pond 12 Peak Elev=158.65' Storage=15,492 cf Inflow=3.81 cfs 0.287 af
Outflow=0.27 cfs 0.098 af

Pond 13.1P: Pond 13.1 Peak Elev=224.25' Storage=10,445 cf Inflow=4.30 cfs 0.302 af
Outflow=0.20 cfs 0.067 af

Pond 13P: Pond 13 Peak Elev=185.08' Storage=15,595 cf Inflow=9.81 cfs 0.875 af
Discarded=1.07 cfs 0.708 af Primary=0.00 cfs 0.000 af Outflow=1.07 cfs 0.708 af

Pond 14P: Pond 14 Peak Elev=188.84' Storage=5,450 cf Inflow=3.29 cfs 0.273 af
Discarded=0.33 cfs 0.202 af Primary=0.00 cfs 0.000 af Outflow=0.33 cfs 0.202 af

Pond 16P: Pond 16 Peak Elev=194.21' Storage=98,214 cf Inflow=12.75 cfs 1.538 af
Outflow=0.00 cfs 0.000 af

Total Runoff Area = 73.385 ac Runoff Volume = 5.959 af Average Runoff Depth = 0.97"
100.00% Pervious = 73.385 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1: Subcat 1

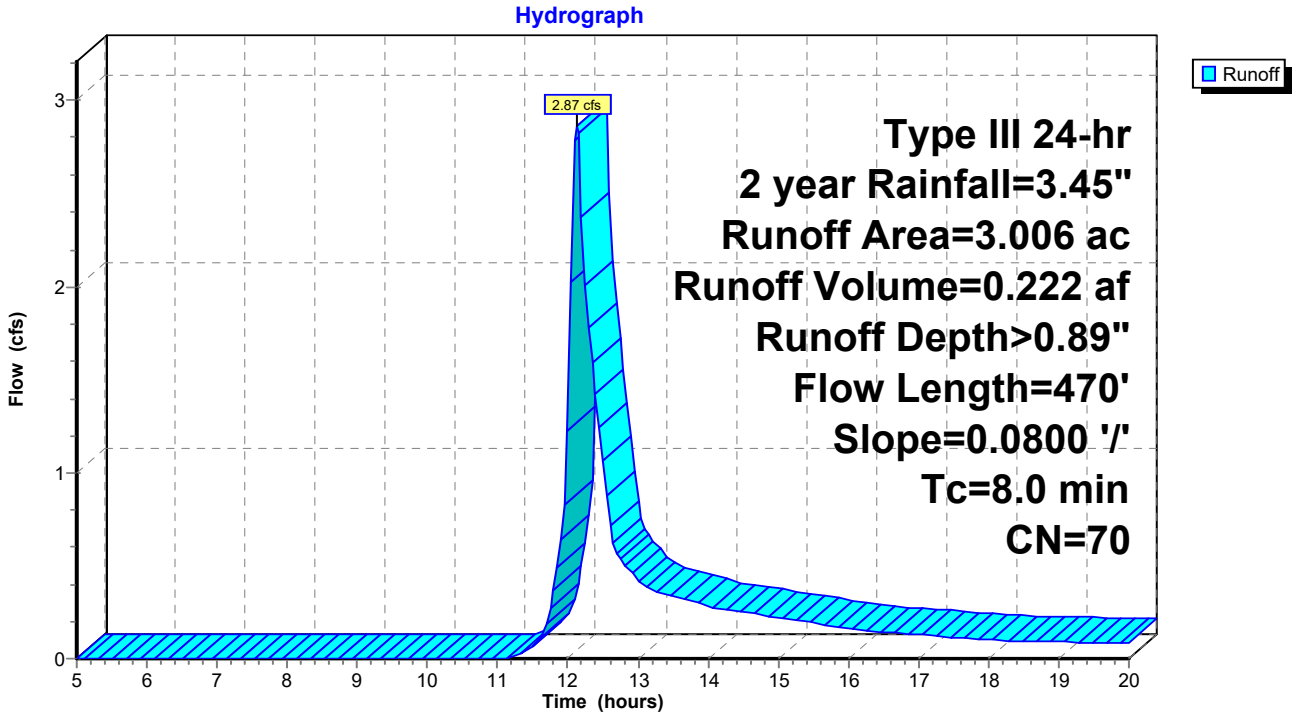
Runoff = 2.87 cfs @ 12.13 hrs, Volume= 0.222 af, Depth> 0.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
1.756	74	>75% Grass cover, Good, HSG C
0.217	96	Gravel surface, HSG C
1.033	58	Meadow, non-grazed, HSG B
3.006	70	Weighted Average
3.006		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
3.5	420	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.0	470	Total			

Subcatchment 1: Subcat 1



Summary for Subcatchment 2: Subcat 2

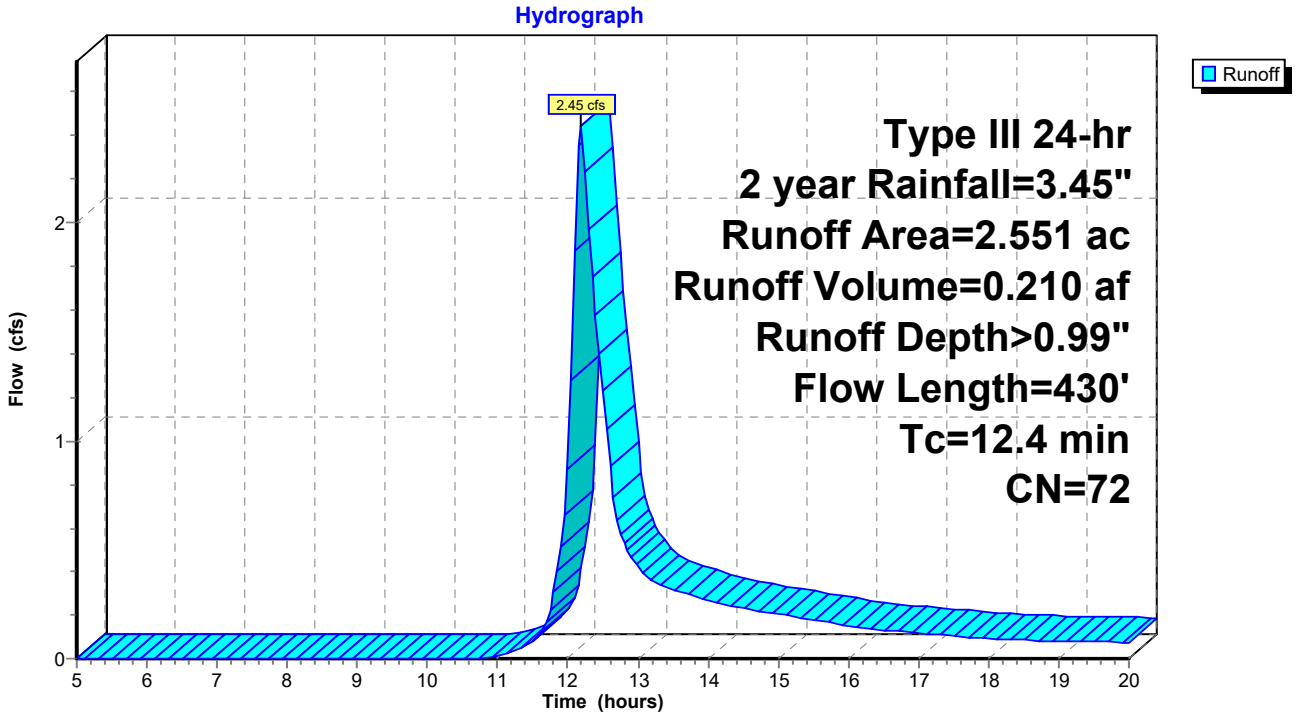
Runoff = 2.45 cfs @ 12.19 hrs, Volume= 0.210 af, Depth> 0.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
1.748	74	>75% Grass cover, Good, HSG C
0.237	96	Gravel surface, HSG C
0.566	58	Meadow, non-grazed, HSG B
2.551	72	Weighted Average
2.551		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0200	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
4.5	380	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.4	430	Total			

Subcatchment 2: Subcat 2



Summary for Subcatchment 2A: Subcat 2A

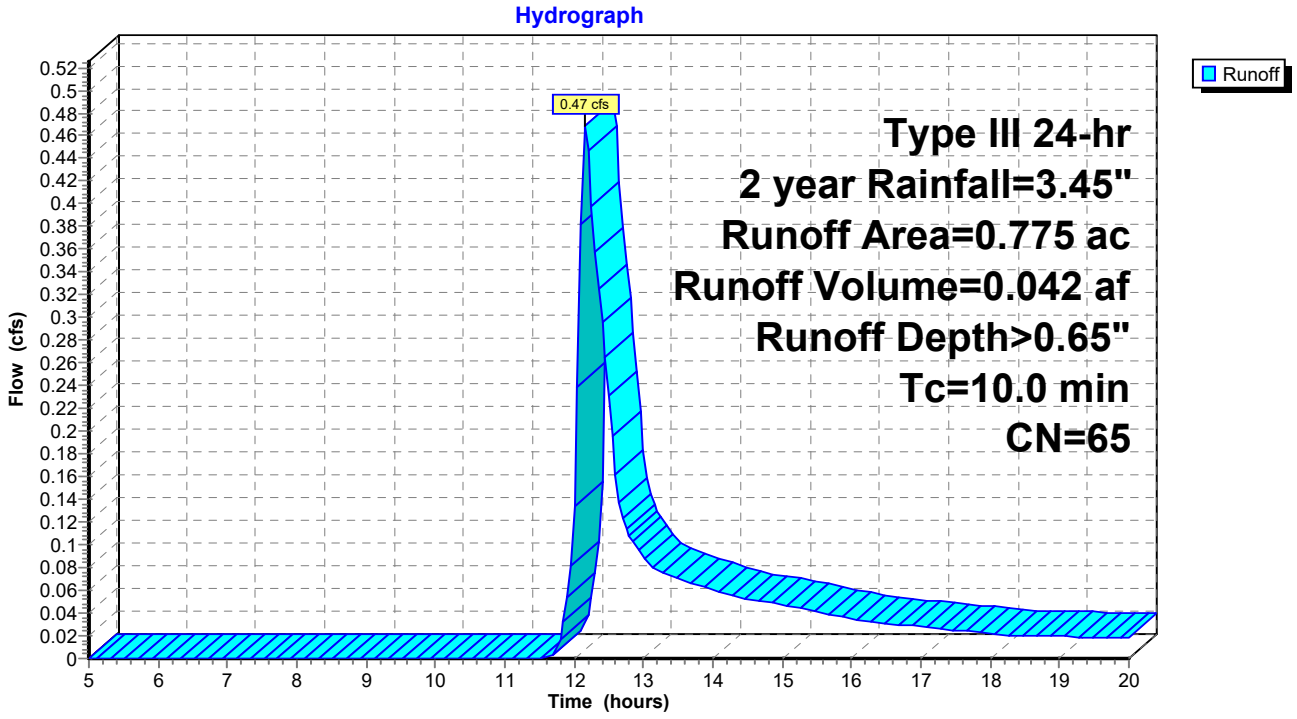
Runoff = 0.47 cfs @ 12.17 hrs, Volume= 0.042 af, Depth> 0.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.000	96	Gravel surface, HSG B
0.488	58	Meadow, non-grazed, HSG B
0.287	78	Meadow, non-grazed, HSG D
0.775	65	Weighted Average
0.775		100.00% Pervious Area

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

Subcatchment 2A: Subcat 2A



Summary for Subcatchment 3: Subcat 3

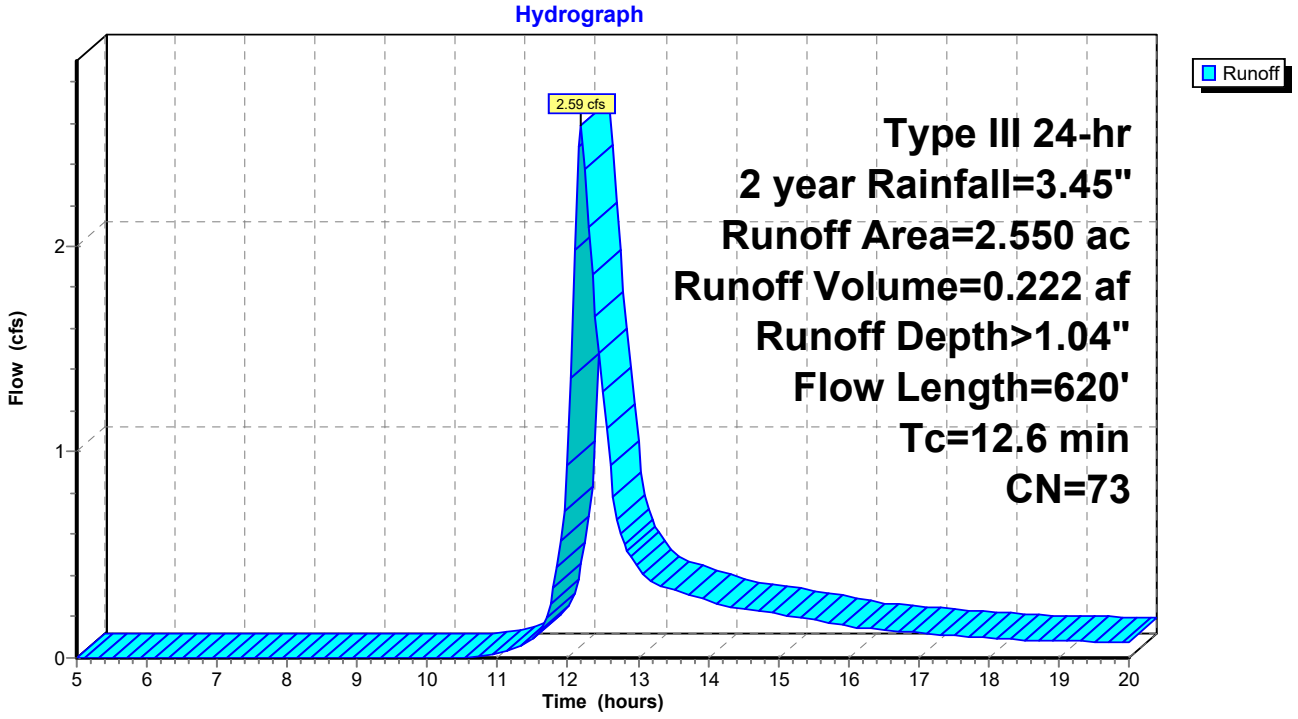
Runoff = 2.59 cfs @ 12.19 hrs, Volume= 0.222 af, Depth> 1.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
2.135	74	>75% Grass cover, Good, HSG C
0.110	96	Gravel surface, HSG C
0.271	58	Meadow, non-grazed, HSG B
0.034	78	Meadow, non-grazed, HSG D
2.550	73	Weighted Average
2.550		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
6.0	500	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	70	0.0700	1.85		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.6	620	Total			

Subcatchment 3: Subcat 3



Summary for Subcatchment 3A: Subcat 3A

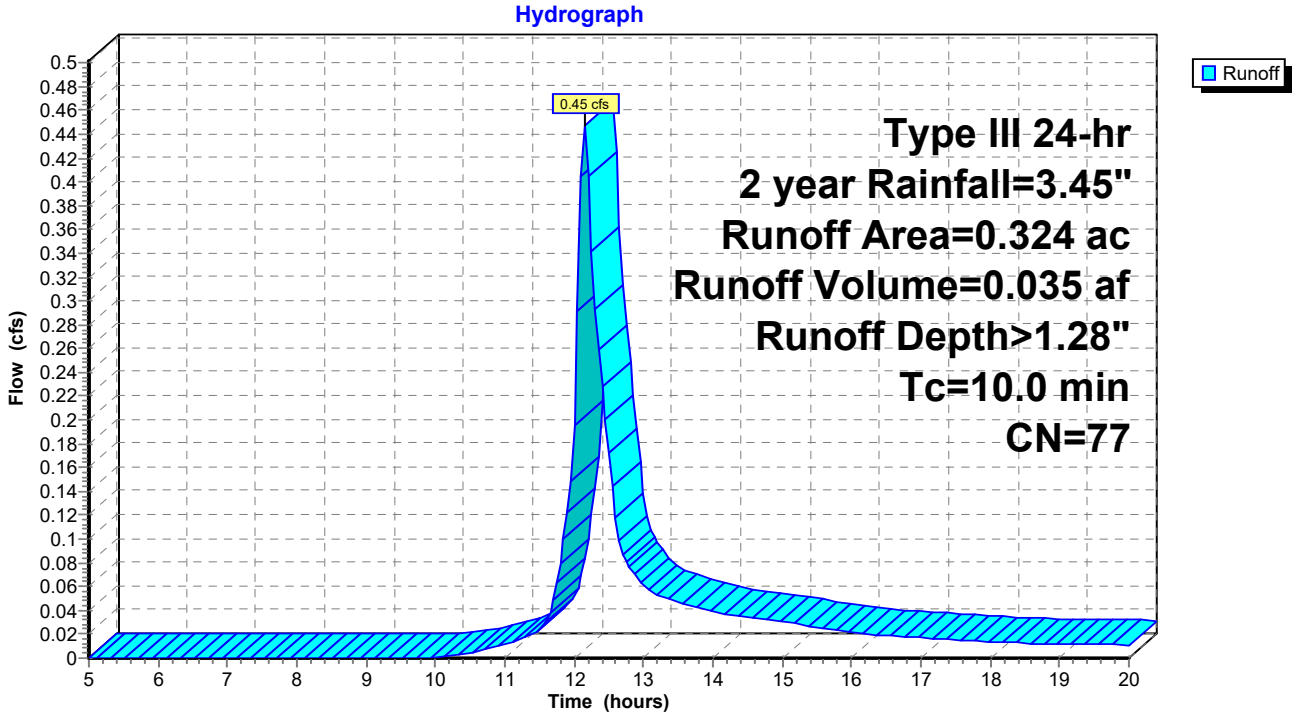
Runoff = 0.45 cfs @ 12.15 hrs, Volume= 0.035 af, Depth> 1.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.009	58	Meadow, non-grazed, HSG B
0.315	78	Meadow, non-grazed, HSG D
0.324	77	Weighted Average
0.324		100.00% Pervious Area

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

Subcatchment 3A: Subcat 3A



Summary for Subcatchment 4: Subcat 4

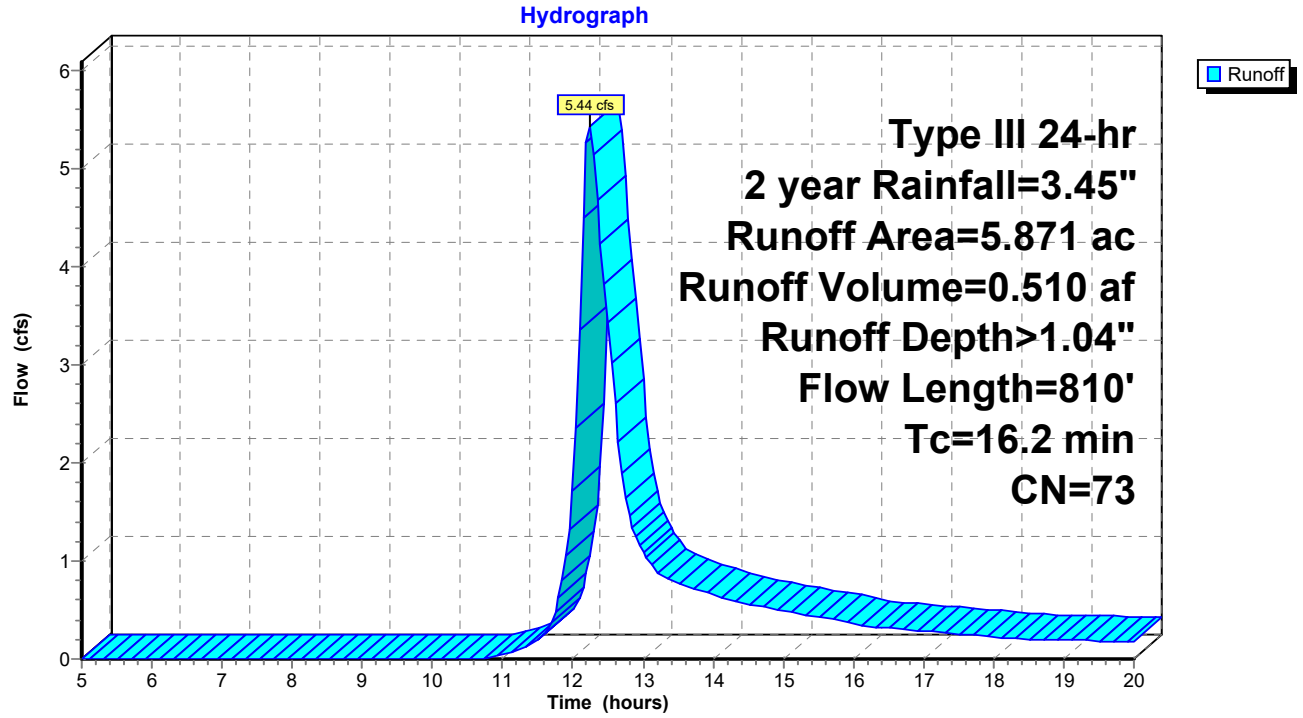
Runoff = 5.44 cfs @ 12.24 hrs, Volume= 0.510 af, Depth> 1.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
3.281	74	>75% Grass cover, Good, HSG C
0.192	80	>75% Grass cover, Good, HSG D
0.197	96	Gravel surface, HSG C
0.095	96	Gravel surface, HSG D
1.100	58	Meadow, non-grazed, HSG B
1.006	78	Meadow, non-grazed, HSG D
5.871	73	Weighted Average
5.871		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	50	0.0150	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
4.3	360	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.0	400	0.1000	2.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
16.2	810	Total			

Subcatchment 4: Subcat 4



Summary for Subcatchment 5: Subcat 5

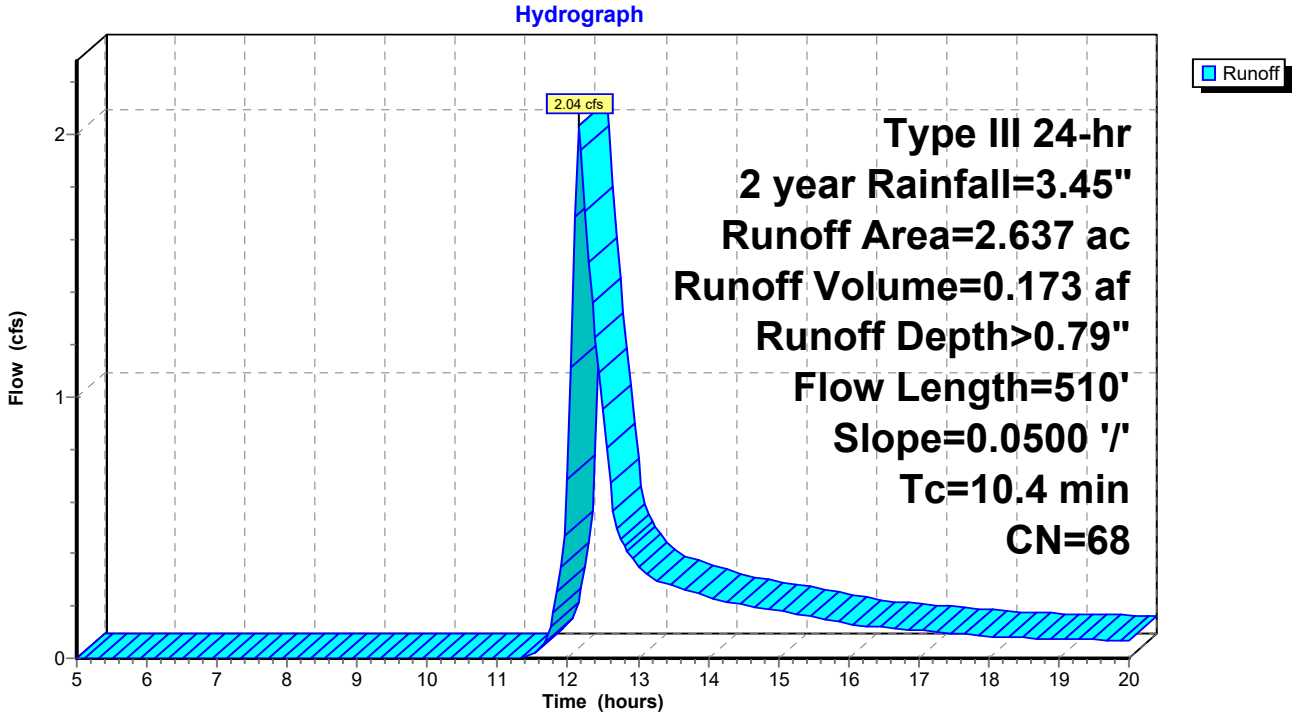
Runoff = 2.04 cfs @ 12.17 hrs, Volume= 0.173 af, Depth> 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
1.616	74	>75% Grass cover, Good, HSG C
1.021	58	Meadow, non-grazed, HSG B
2.637	68	Weighted Average
2.637		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	50	0.0500	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
4.9	460	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.4	510	Total			

Subcatchment 5: Subcat 5



Summary for Subcatchment 6: Subcat 6

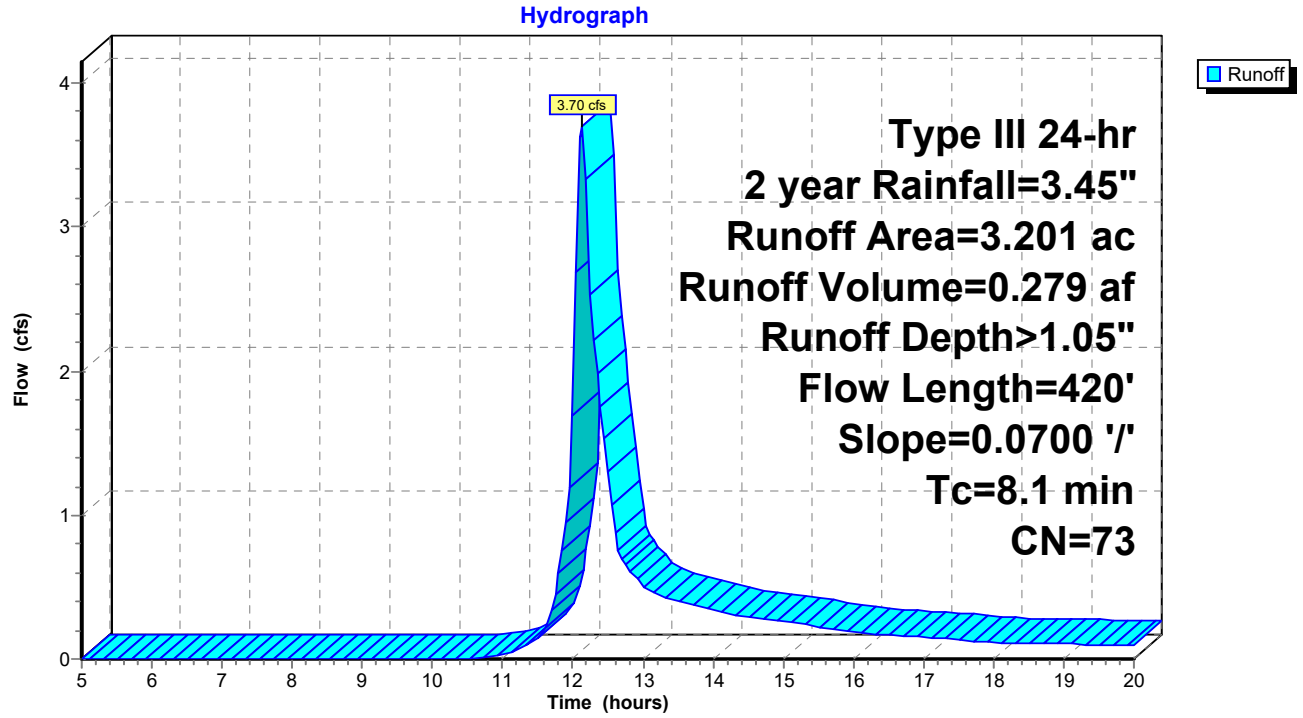
Runoff = 3.70 cfs @ 12.13 hrs, Volume= 0.279 af, Depth> 1.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
1.401	74	>75% Grass cover, Good, HSG C
0.111	80	>75% Grass cover, Good, HSG D
0.211	96	Gravel surface, HSG C
0.001	96	Gravel surface, HSG D
0.637	58	Meadow, non-grazed, HSG B
0.489	78	Meadow, non-grazed, HSG D
0.032	60	Woods, Fair, HSG B
0.319	79	Woods, Fair, HSG D
3.201	73	Weighted Average
3.201		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	50	0.0700	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
3.3	370	0.0700	1.85		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.1	420	Total			

Subcatchment 6: Subcat 6



Summary for Subcatchment 6A: Subcat 6A

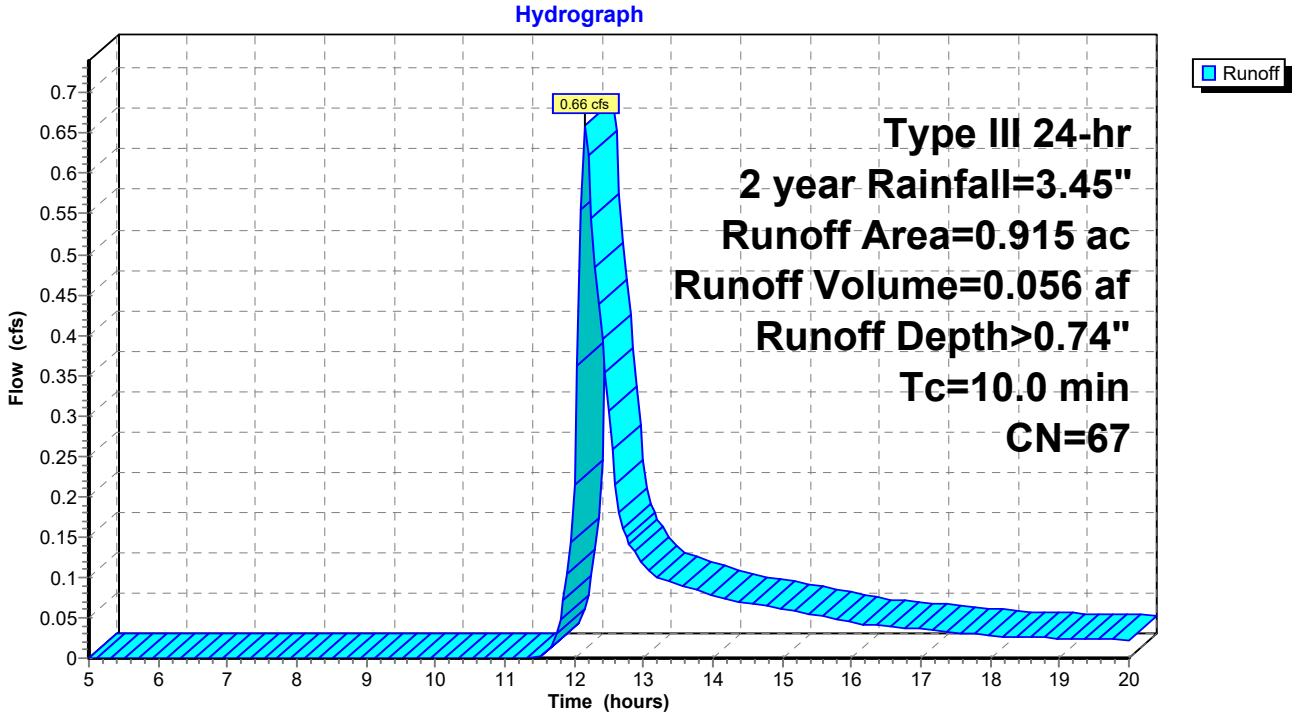
Runoff = 0.66 cfs @ 12.16 hrs, Volume= 0.056 af, Depth> 0.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.517	58	Meadow, non-grazed, HSG B
0.398	78	Meadow, non-grazed, HSG D
0.915	67	Weighted Average
0.915		100.00% Pervious Area

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

Subcatchment 6A: Subcat 6A



Summary for Subcatchment 6B: Subcat 6B

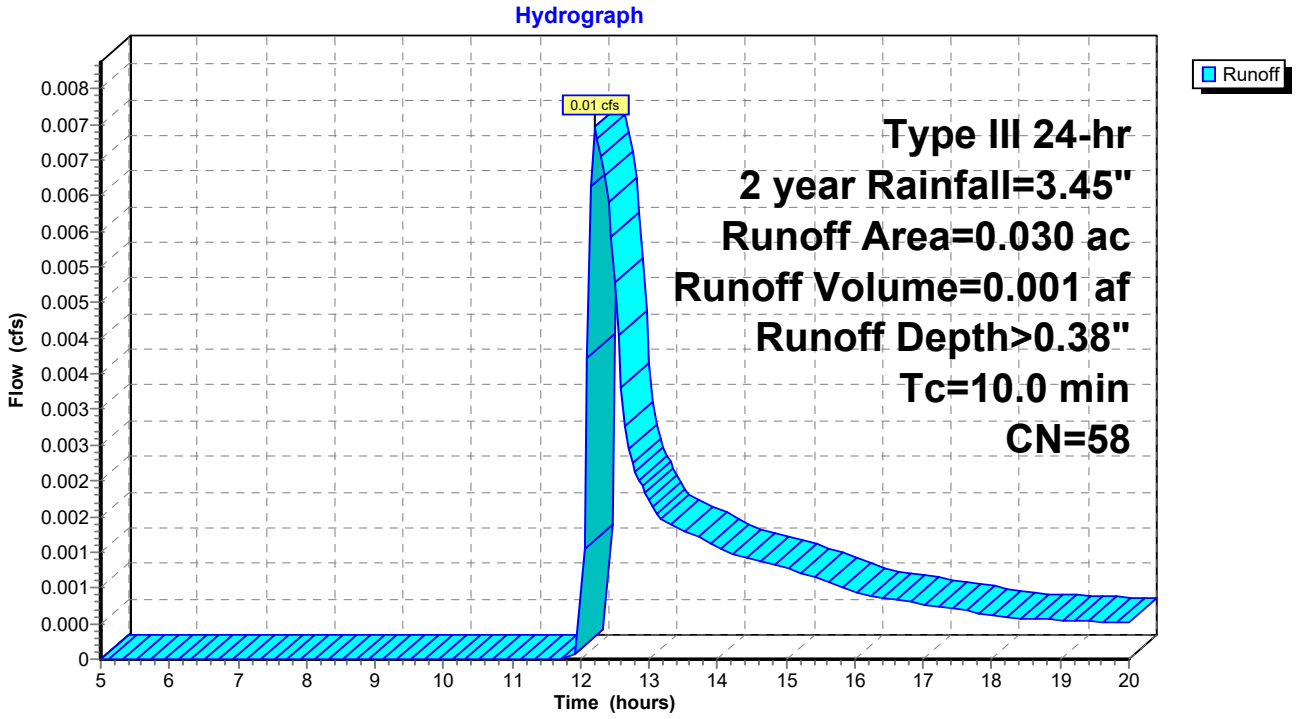
Runoff = 0.01 cfs @ 12.22 hrs, Volume= 0.001 af, Depth> 0.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.030	58	Meadow, non-grazed, HSG B
0.030		100.00% Pervious Area

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

Subcatchment 6B: Subcat 6B



Summary for Subcatchment 6C: Subcat 6C

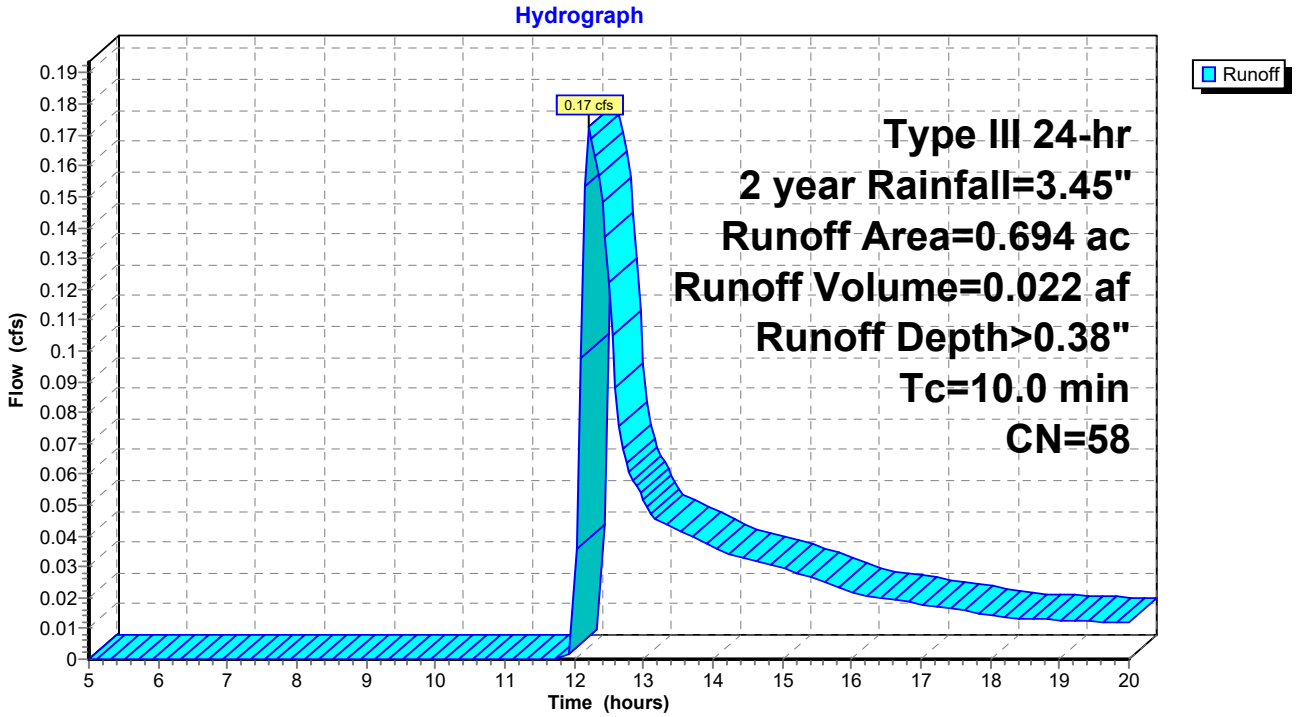
Runoff = 0.17 cfs @ 12.22 hrs, Volume= 0.022 af, Depth> 0.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.694	58	Meadow, non-grazed, HSG B
0.694		100.00% Pervious Area

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

Subcatchment 6C: Subcat 6C



Summary for Subcatchment 7: Subcat 7

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

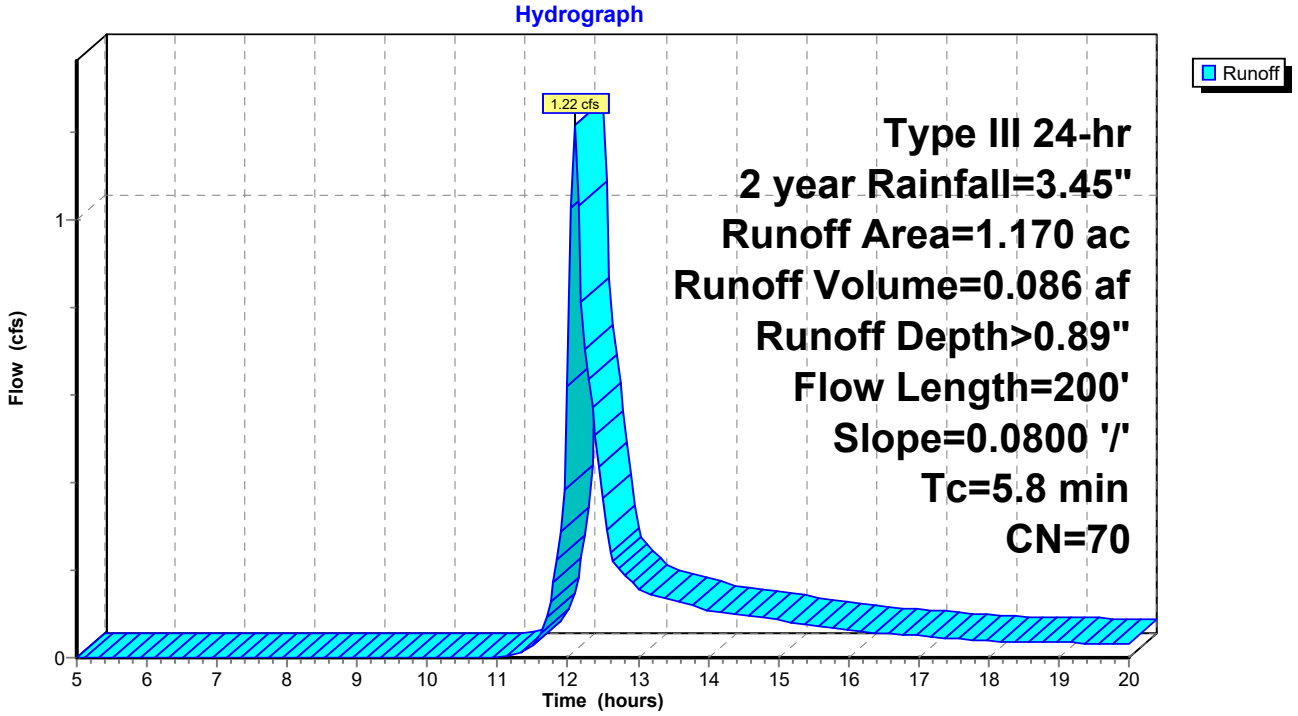
Runoff = 1.22 cfs @ 12.10 hrs, Volume= 0.086 af, Depth> 0.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.634	74	>75% Grass cover, Good, HSG C
0.117	96	Gravel surface, HSG C
0.419	58	Meadow, non-grazed, HSG B
1.170	70	Weighted Average
1.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.3	150	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.8	200	Total			

Subcatchment 7: Subcat 7



Summary for Subcatchment 7A: Subcat 7A

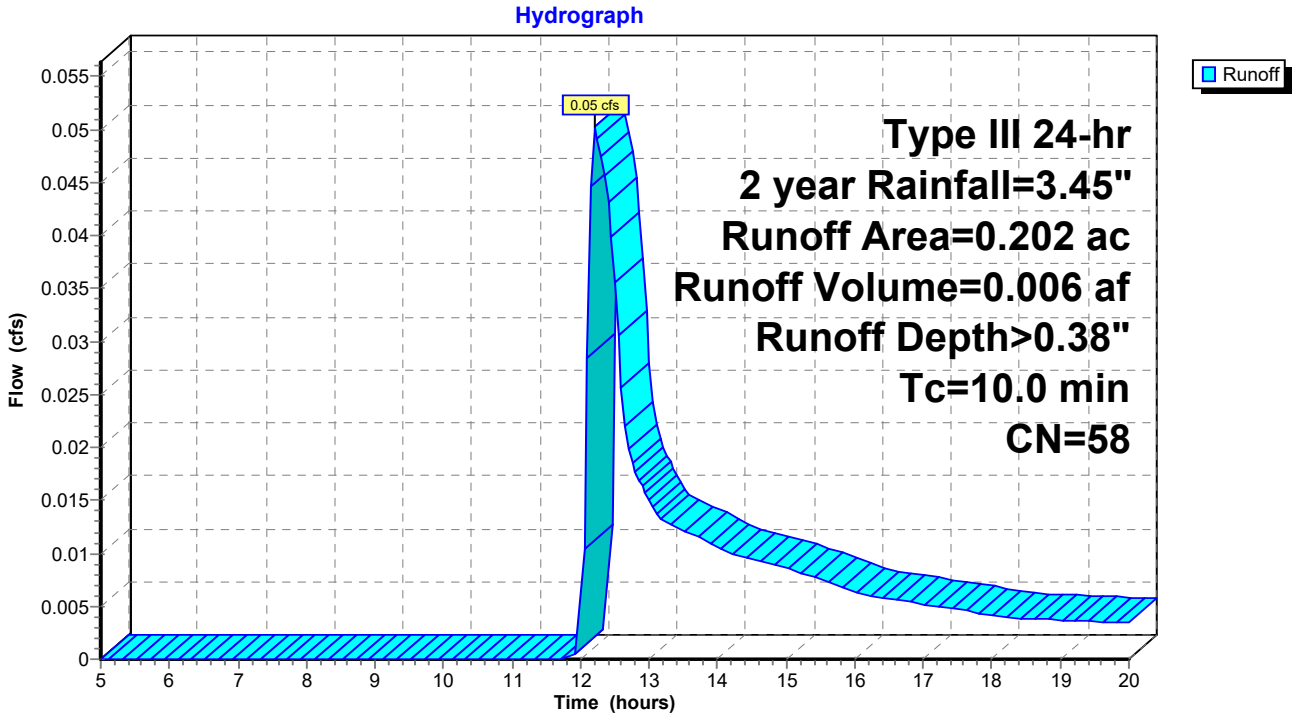
Runoff = 0.05 cfs @ 12.22 hrs, Volume= 0.006 af, Depth> 0.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.202	58	Meadow, non-grazed, HSG B
0.202		100.00% Pervious Area

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

Subcatchment 7A: Subcat 7A



Summary for Subcatchment 8: Subcat 8

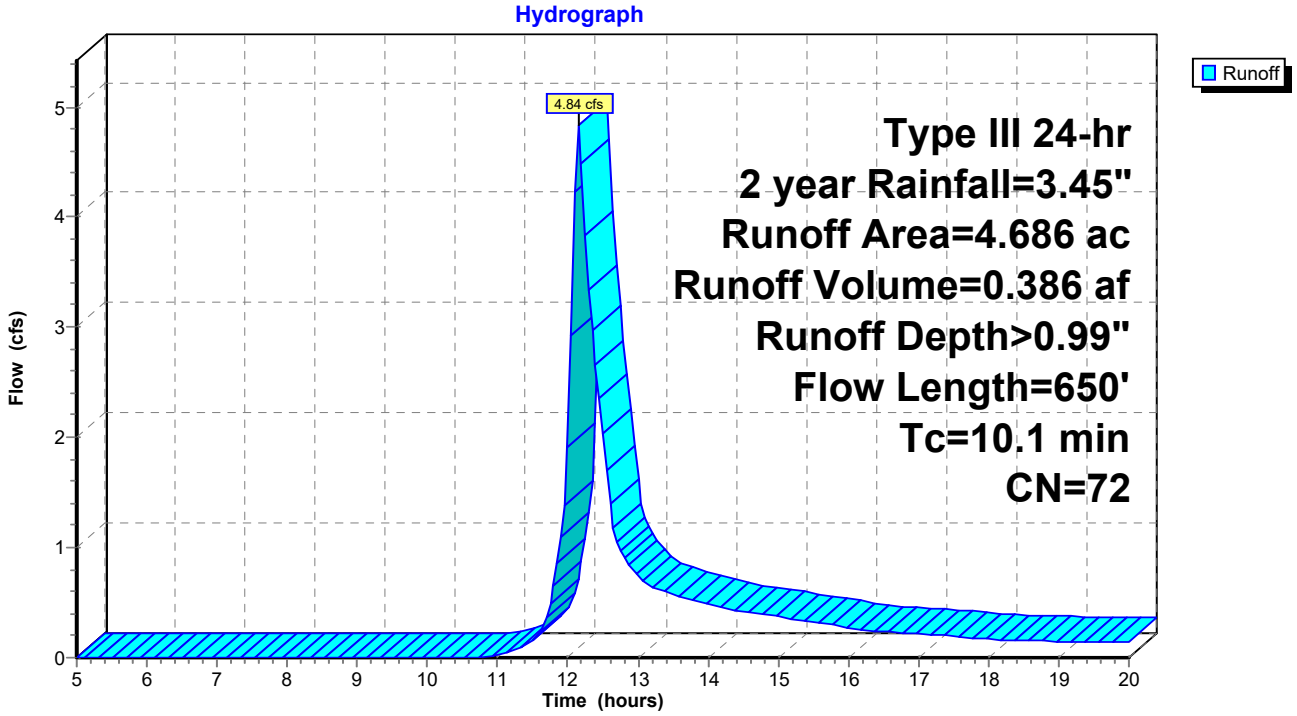
Runoff = 4.84 cfs @ 12.16 hrs, Volume= 0.386 af, Depth> 0.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
3.284	74	>75% Grass cover, Good, HSG C
0.293	96	Gravel surface, HSG C
1.109	58	Meadow, non-grazed, HSG B
4.686	72	Weighted Average
4.686		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	50	0.1100	0.21		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.9	270	0.1100	2.32		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.2	330	0.0350	1.31		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.1	650	Total			

Subcatchment 8: Subcat 8



Summary for Subcatchment 8A: Subcat 8A

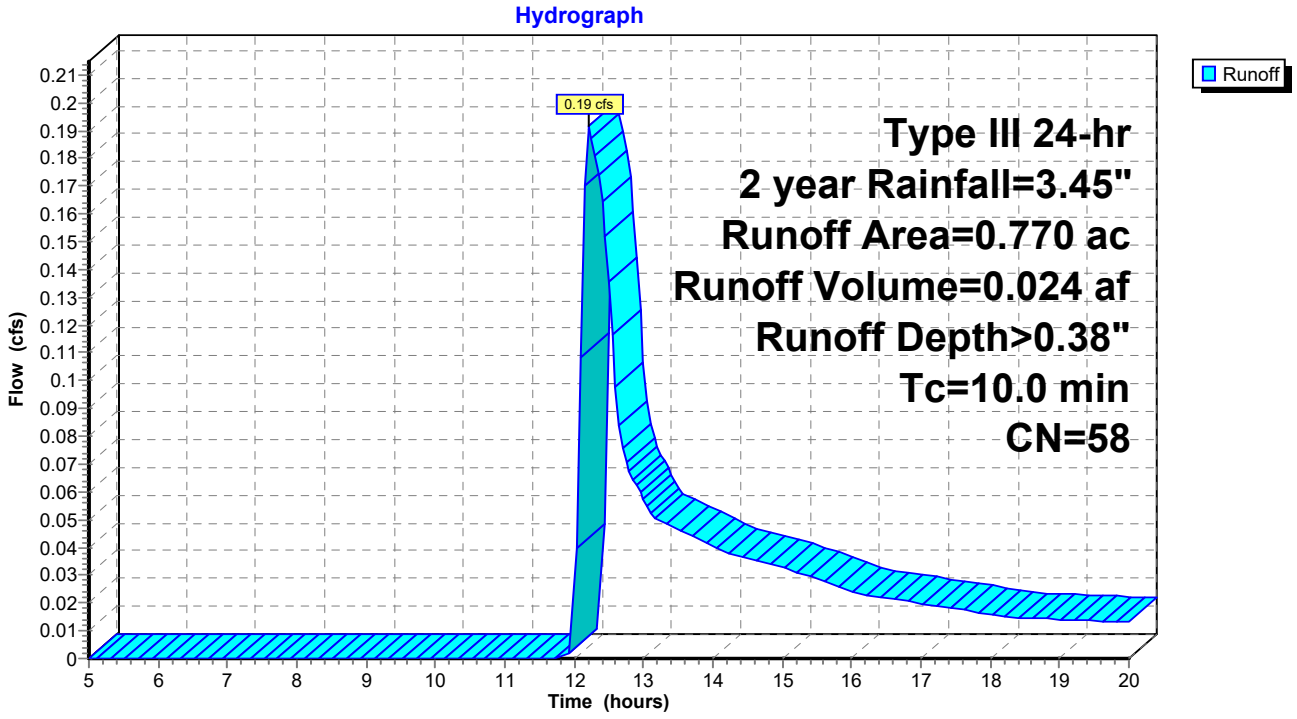
Runoff = 0.19 cfs @ 12.22 hrs, Volume= 0.024 af, Depth> 0.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.000	61	>75% Grass cover, Good, HSG B
0.003	96	Gravel surface, HSG B
0.767	58	Meadow, non-grazed, HSG B
0.770	58	Weighted Average
0.770		100.00% Pervious Area

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

Subcatchment 8A: Subcat 8A



Summary for Subcatchment 9: Subcat 9

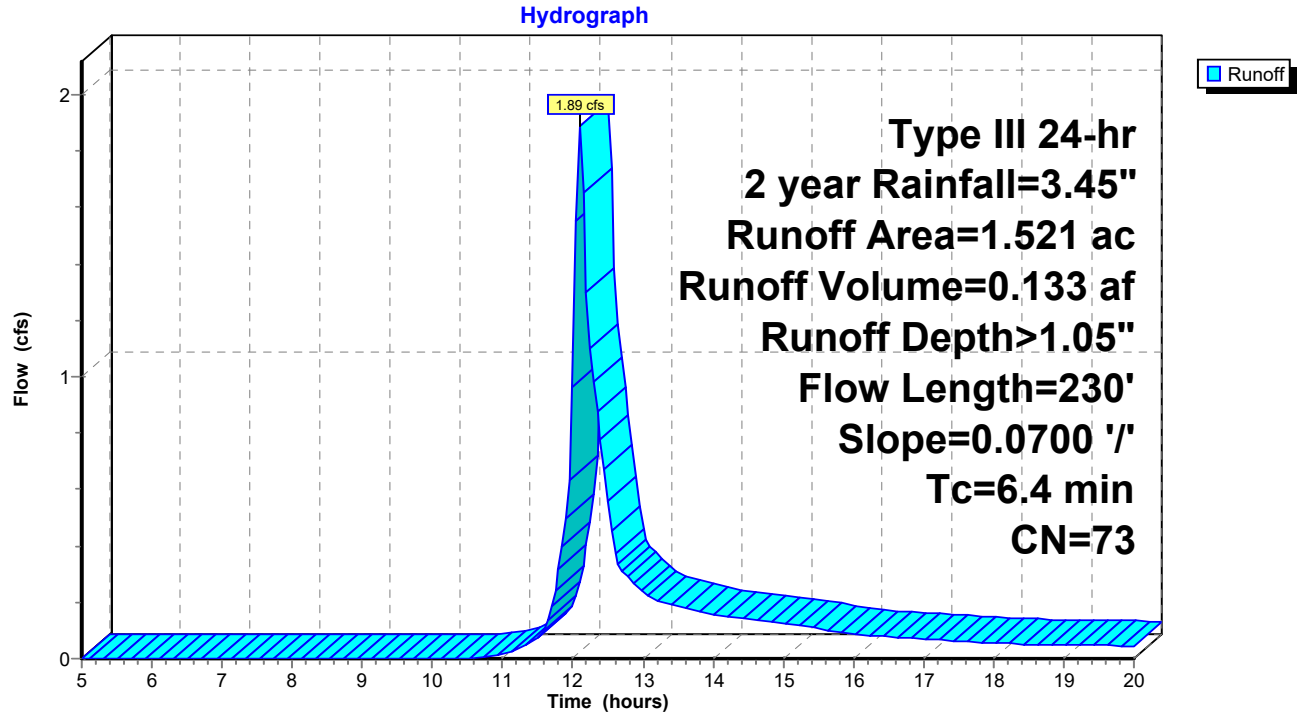
Runoff = 1.89 cfs @ 12.10 hrs, Volume= 0.133 af, Depth> 1.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.918	74	>75% Grass cover, Good, HSG C
0.199	96	Gravel surface, HSG C
0.404	58	Meadow, non-grazed, HSG B
1.521	73	Weighted Average
1.521		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	50	0.0700	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.6	180	0.0700	1.85		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.4	230	Total			

Subcatchment 9: Subcat 9



Summary for Subcatchment 9A: Subcat 9A

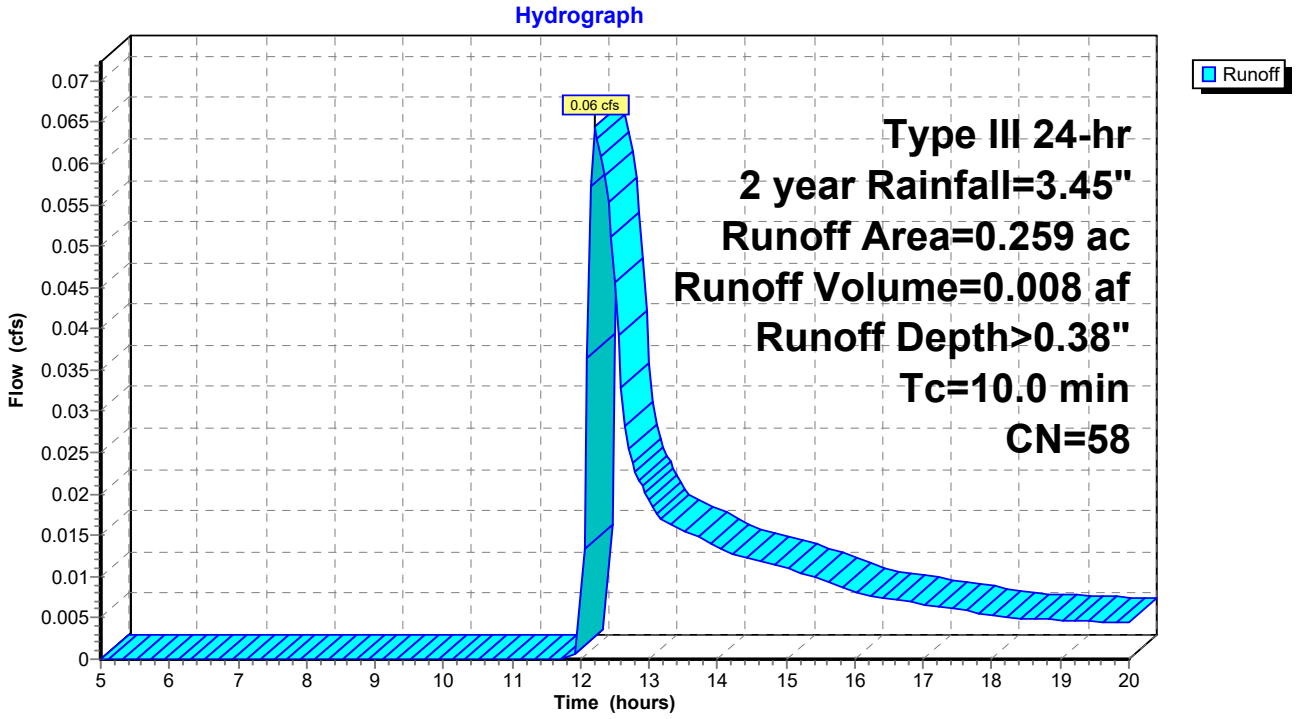
Runoff = 0.06 cfs @ 12.22 hrs, Volume= 0.008 af, Depth> 0.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.259	58	Meadow, non-grazed, HSG B
0.259		100.00% Pervious Area

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

Subcatchment 9A: Subcat 9A



Summary for Subcatchment 10: Subcat 10

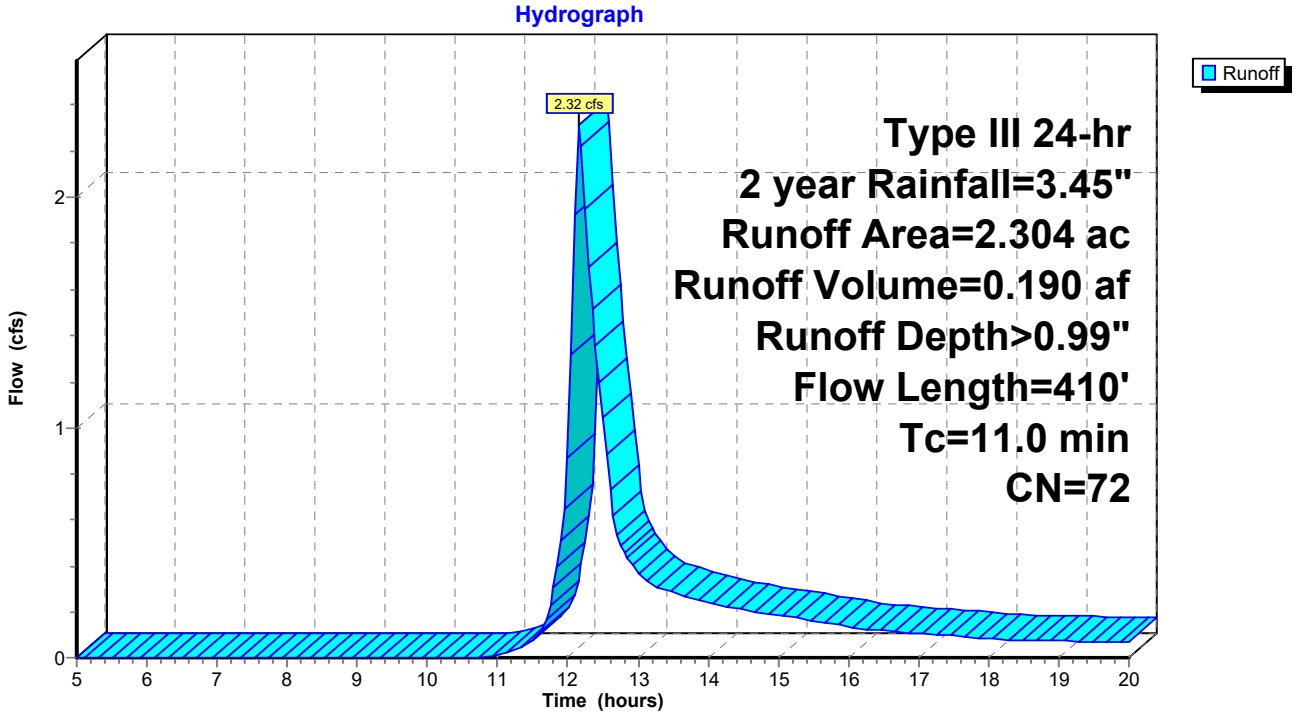
Runoff = 2.32 cfs @ 12.17 hrs, Volume= 0.190 af, Depth> 0.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
1.640	74	>75% Grass cover, Good, HSG C
0.157	96	Gravel surface, HSG C
0.507	58	Meadow, non-grazed, HSG B
2.304	72	Weighted Average
2.304		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0200	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
2.0	270	0.1000	2.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.1	90	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.0	410	Total			

Subcatchment 10: Subcat 10



Summary for Subcatchment 10A: Subcat 10A

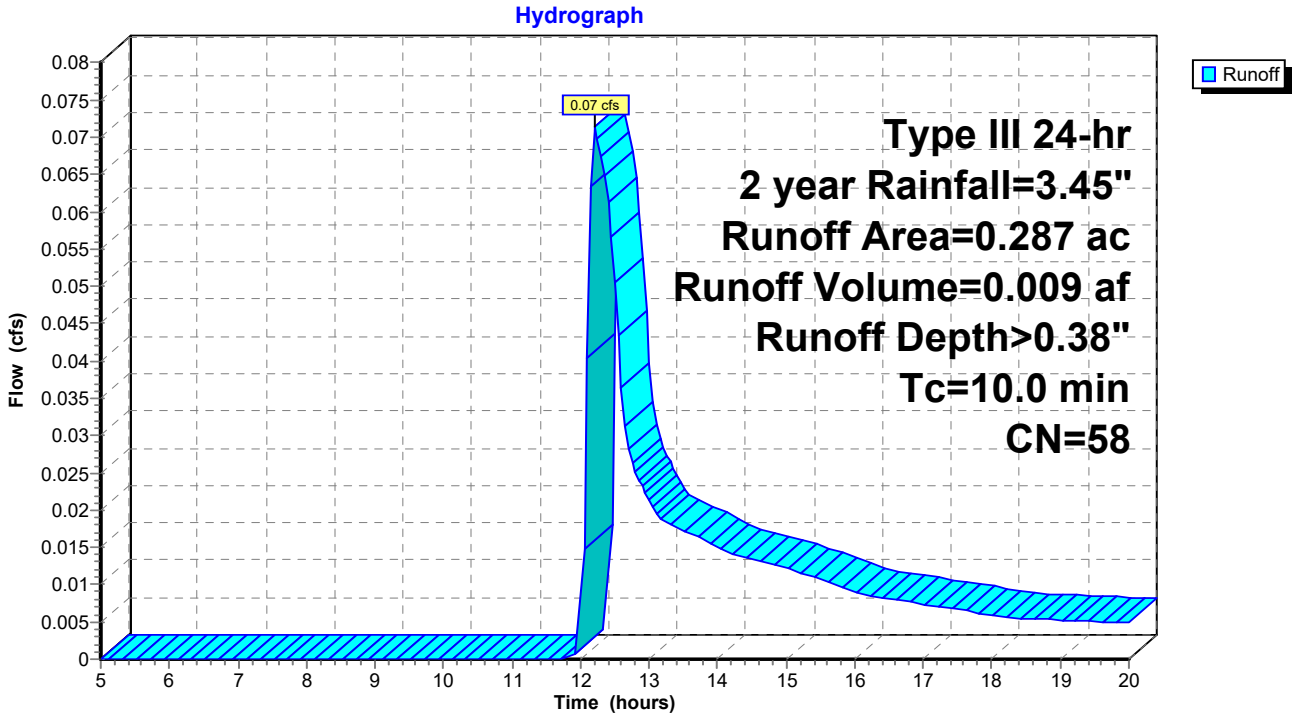
Runoff = 0.07 cfs @ 12.22 hrs, Volume= 0.009 af, Depth> 0.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.287	58	Meadow, non-grazed, HSG B
0.287		100.00% Pervious Area

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

Subcatchment 10A: Subcat 10A



Summary for Subcatchment 11: Subcat 11

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

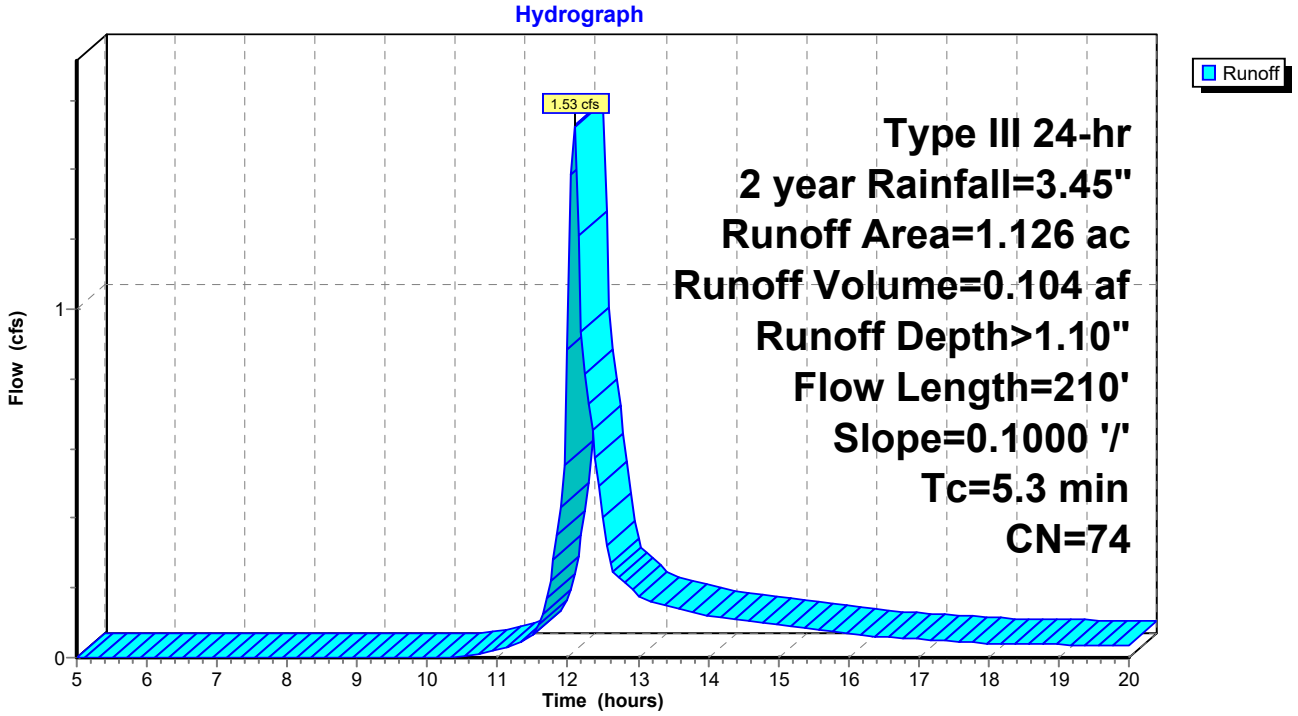
Runoff = 1.53 cfs @ 12.09 hrs, Volume= 0.104 af, Depth> 1.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.813	74	>75% Grass cover, Good, HSG C
0.144	96	Gravel surface, HSG C
0.169	58	Meadow, non-grazed, HSG B
1.126	74	Weighted Average
1.126		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.1000	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.2	160	0.1000	2.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.3	210	Total			

Subcatchment 11: Subcat 11



Summary for Subcatchment 11A: Subcat 11A

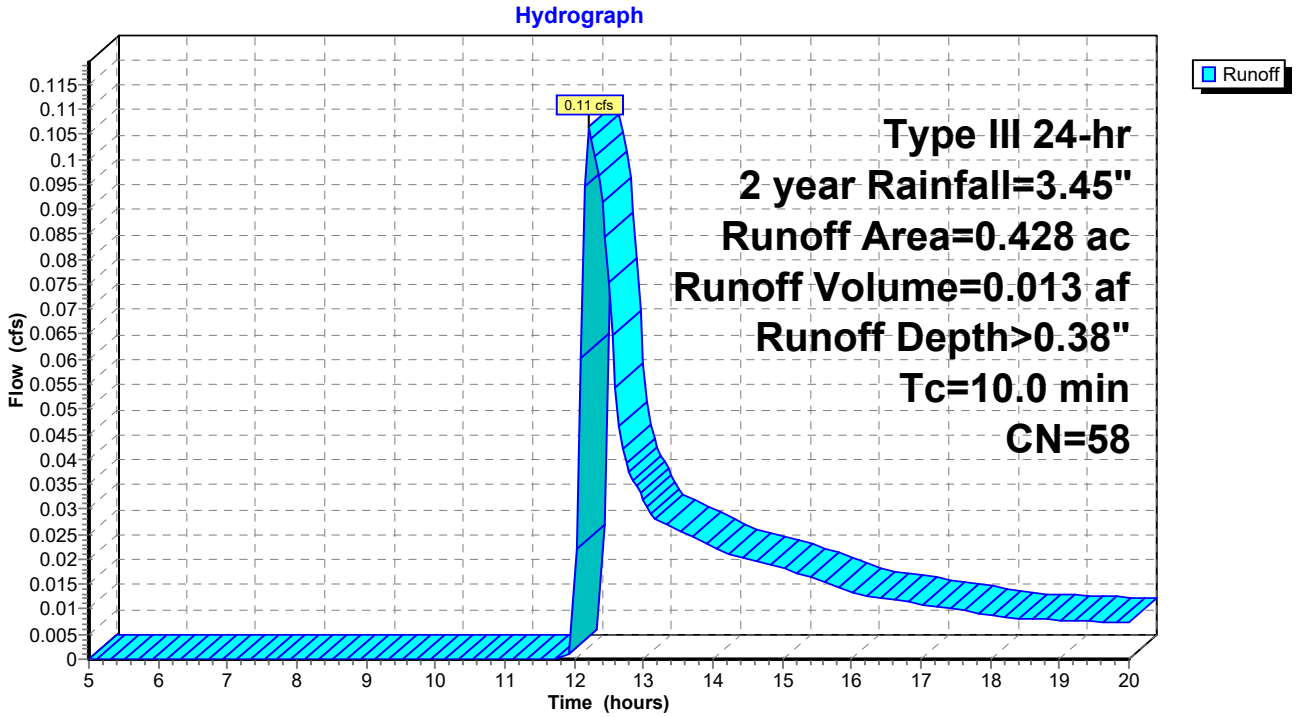
Runoff = 0.11 cfs @ 12.22 hrs, Volume= 0.013 af, Depth> 0.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.428	58	Meadow, non-grazed, HSG B
0.428		100.00% Pervious Area

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

Subcatchment 11A: Subcat 11A



Summary for Subcatchment 12: Subcat 12

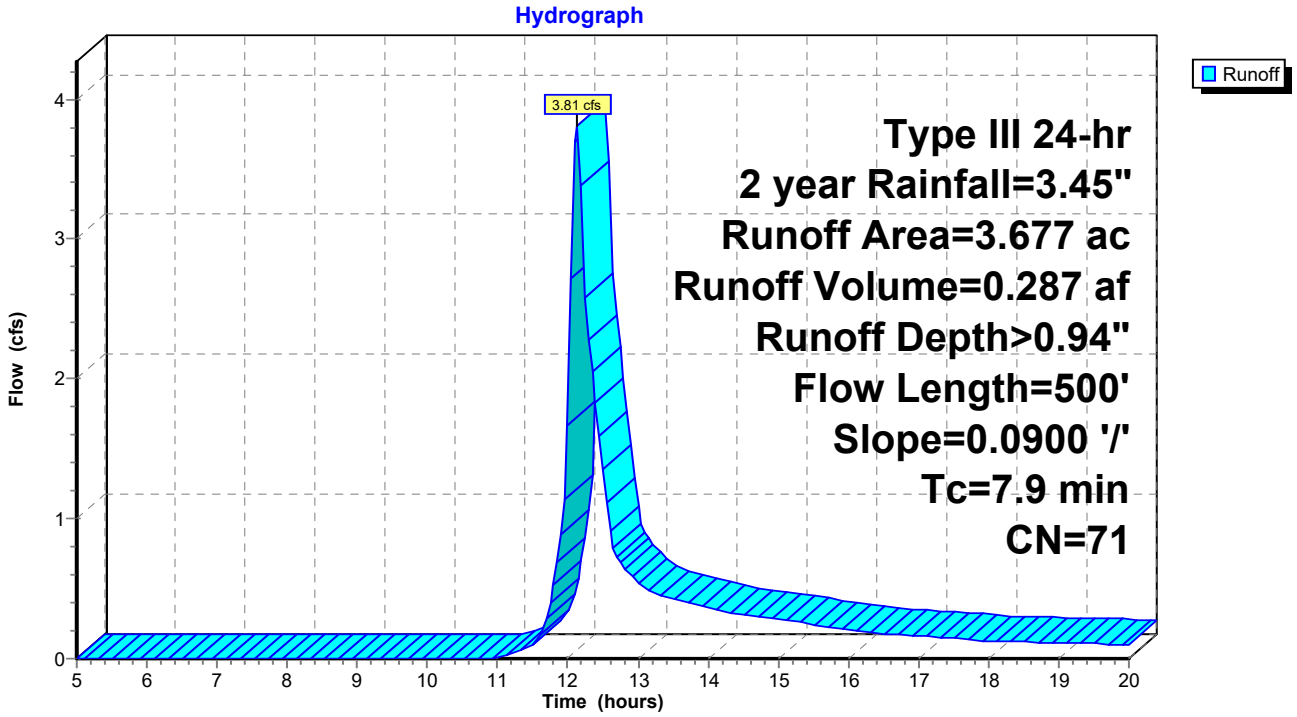
Runoff = 3.81 cfs @ 12.12 hrs, Volume= 0.287 af, Depth> 0.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
2.738	74	>75% Grass cover, Good, HSG C
0.100	96	Gravel surface, HSG C
0.839	58	Meadow, non-grazed, HSG B
3.677	71	Weighted Average
3.677		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0900	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
3.6	450	0.0900	2.10		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.9	500	Total			

Subcatchment 12: Subcat 12



Summary for Subcatchment 13.1: Subcat 13.1

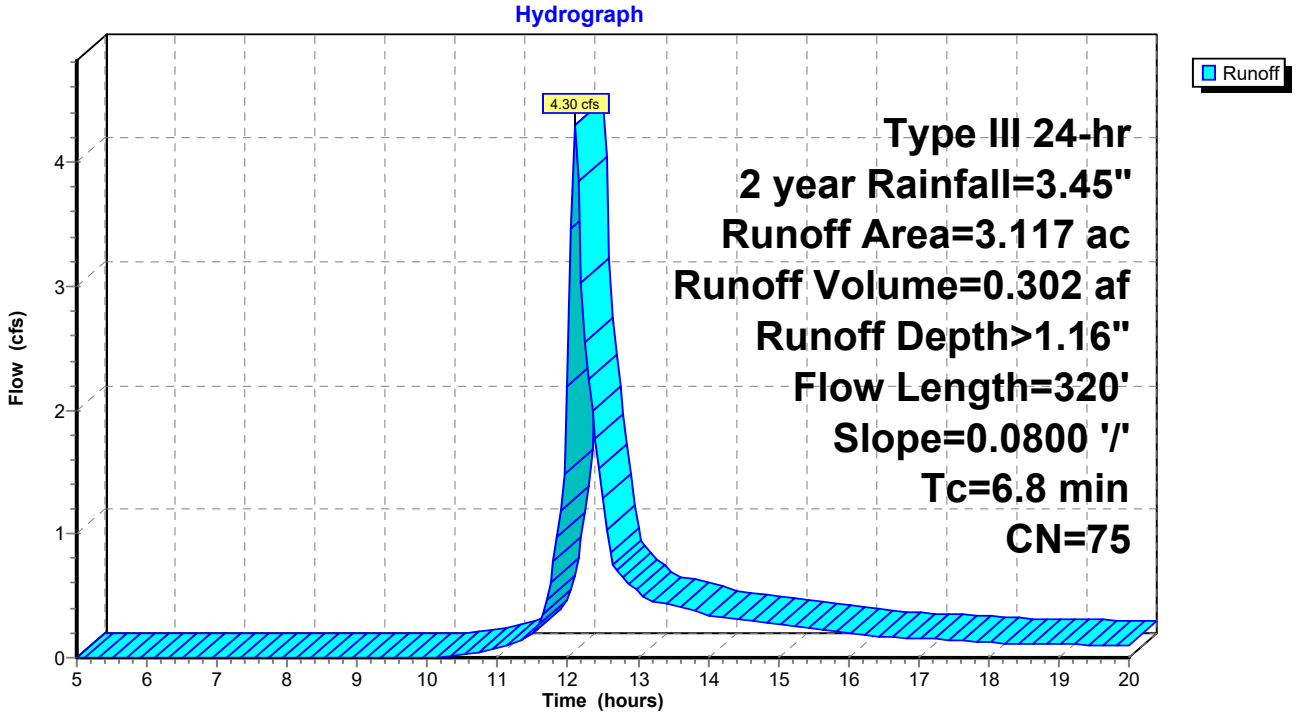
Runoff = 4.30 cfs @ 12.11 hrs, Volume= 0.302 af, Depth> 1.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
2.825	74	>75% Grass cover, Good, HSG C
0.010	80	>75% Grass cover, Good, HSG D
0.216	96	Gravel surface, HSG C
0.050	58	Meadow, non-grazed, HSG B
0.016	78	Meadow, non-grazed, HSG D
3.117	75	Weighted Average
3.117		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
2.3	270	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.8	320	Total			

Subcatchment 13.1: Subcat 13.1



Summary for Subcatchment 13.2: Subcat 13.2

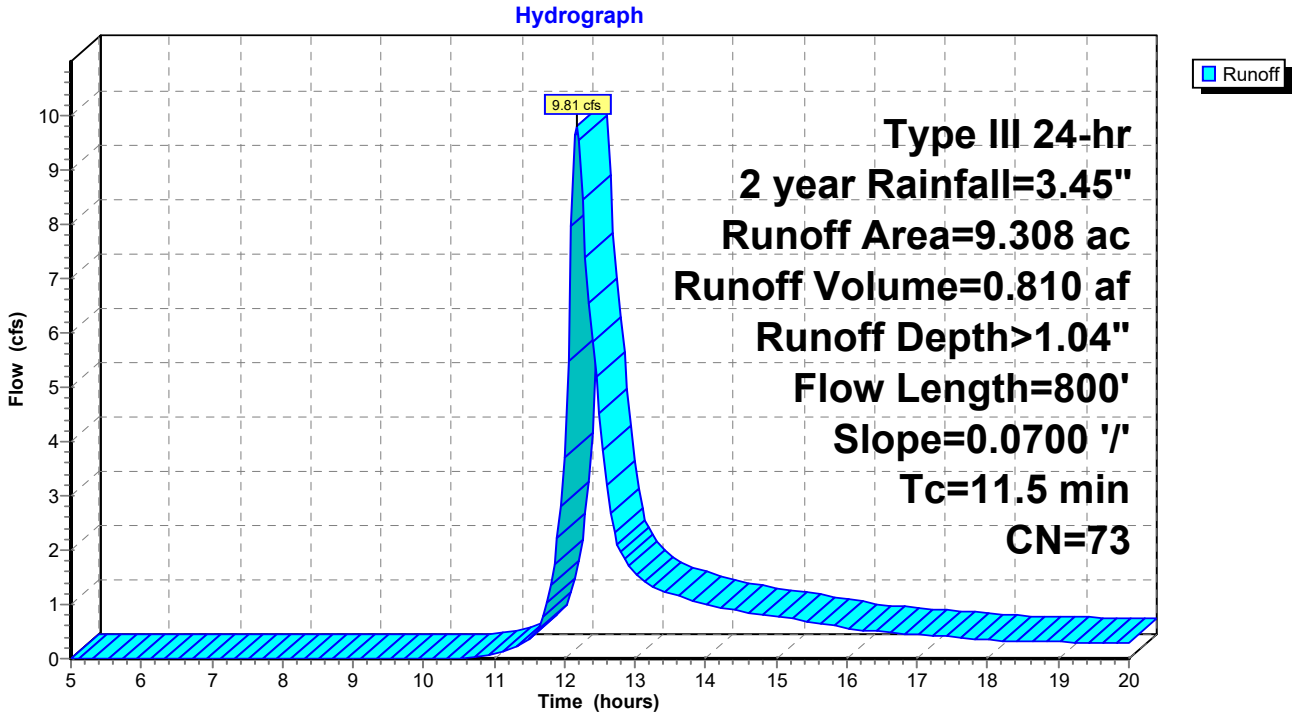
Runoff = 9.81 cfs @ 12.17 hrs, Volume= 0.810 af, Depth> 1.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
7.145	74	>75% Grass cover, Good, HSG C
0.662	96	Gravel surface, HSG C
1.501	58	Meadow, non-grazed, HSG B
9.308	73	Weighted Average
9.308		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	50	0.0700	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
6.7	750	0.0700	1.85		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.5	800	Total			

Subcatchment 13.2: Subcat 13.2



Summary for Subcatchment 14: Subcat 14

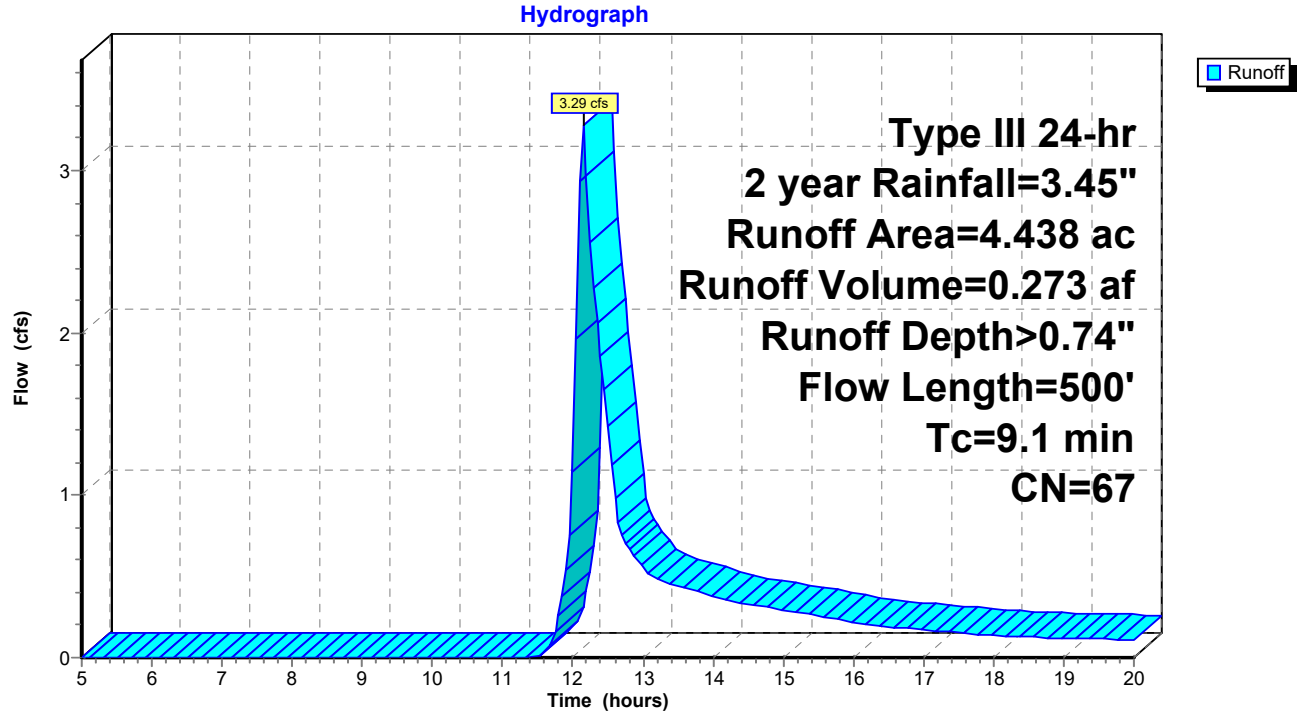
Runoff = 3.29 cfs @ 12.15 hrs, Volume= 0.273 af, Depth> 0.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
1.956	74	>75% Grass cover, Good, HSG C
0.193	96	Gravel surface, HSG C
2.289	58	Meadow, non-grazed, HSG B
4.438	67	Weighted Average
4.438		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.3	160	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.2	180	0.1300	2.52		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	110	0.2000	3.13		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.1	500	Total			

Subcatchment 14: Subcat 14



Summary for Subcatchment 16: Subcat 16

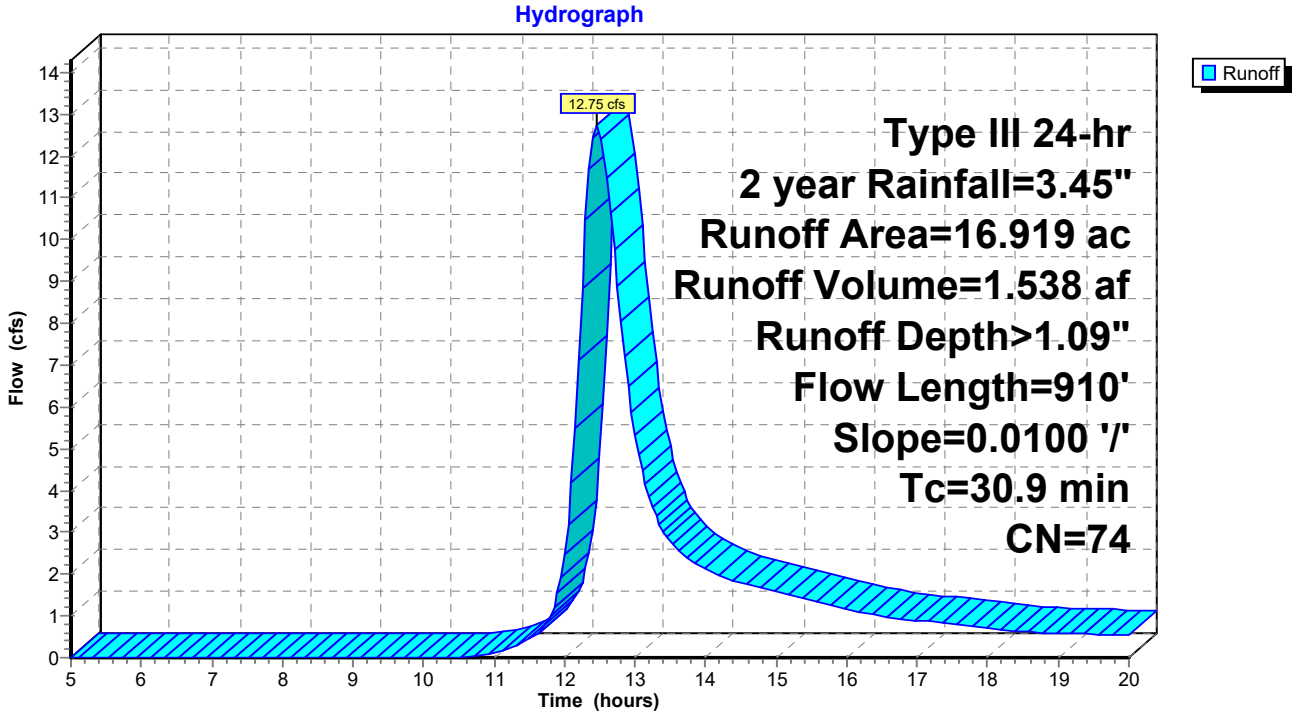
Runoff = 12.75 cfs @ 12.46 hrs, Volume= 1.538 af, Depth> 1.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
14.551	74	>75% Grass cover, Good, HSG C
1.069	96	Gravel surface, HSG C
1.299	58	Meadow, non-grazed, HSG B
16.919	74	Weighted Average
16.919		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	50	0.0100	0.08		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
11.9	500	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.6	360	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
30.9	910	Total			

Subcatchment 16: Subcat 16



Summary for Subcatchment 16A: Subcat 16A

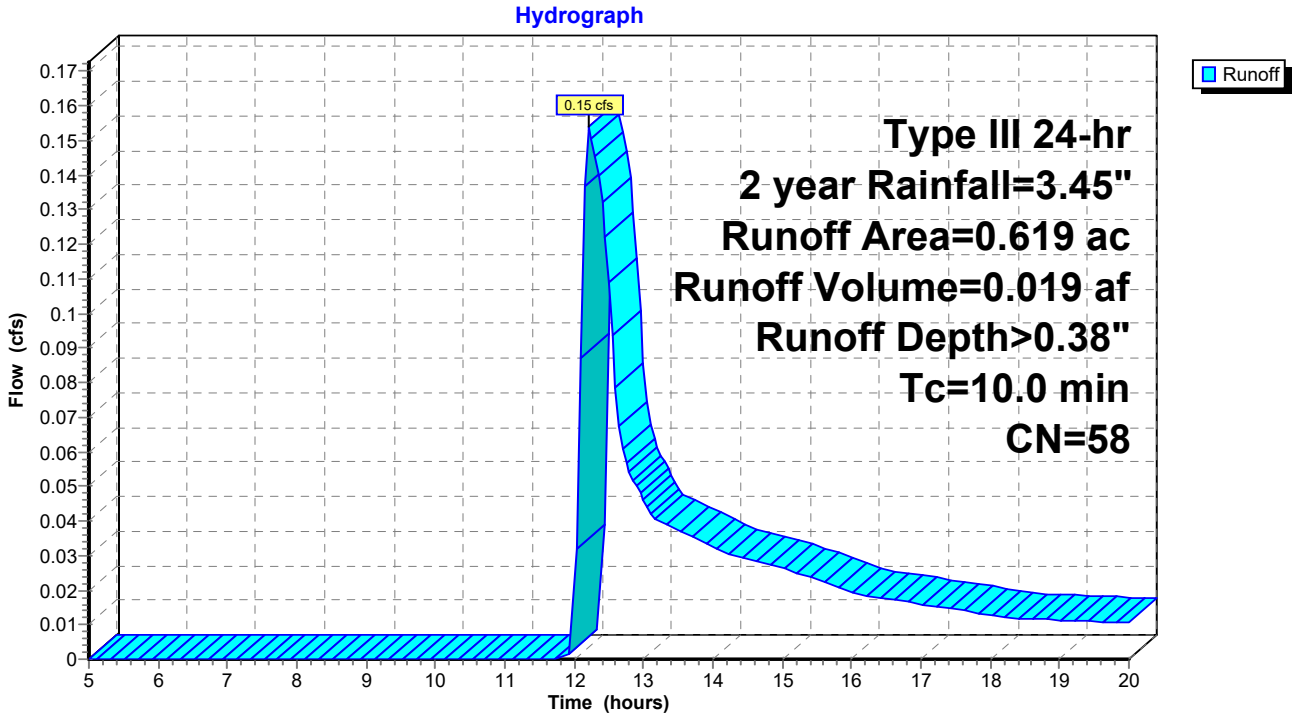
Runoff = 0.15 cfs @ 12.22 hrs, Volume= 0.019 af, Depth> 0.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.619	58	Meadow, non-grazed, HSG B
0.619		100.00% Pervious Area

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

Subcatchment 16A: Subcat 16A



Summary for Reach 13.1R: Reach 13.1

[79] Warning: Submerged Pond 13.1P Primary device # 1 by 0.04'

Inflow Area = 3.117 ac, 0.00% Impervious, Inflow Depth > 0.26" for 2 year event
Inflow = 0.20 cfs @ 15.94 hrs, Volume= 0.067 af
Outflow = 0.20 cfs @ 16.14 hrs, Volume= 0.065 af, Atten= 0%, Lag= 12.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.19 fps, Min. Travel Time= 7.0 min
Avg. Velocity = 1.04 fps, Avg. Travel Time= 8.0 min

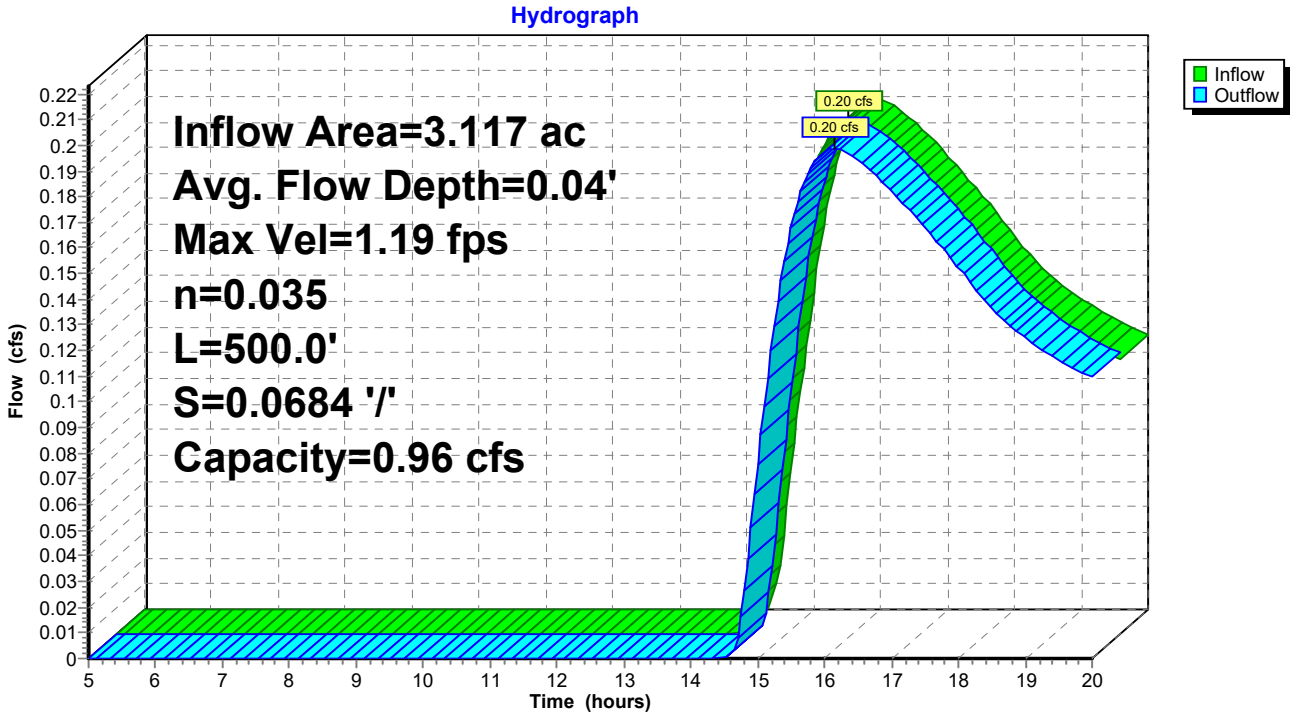
Peak Storage= 83 cf @ 16.03 hrs
Average Depth at Peak Storage= 0.04'
Bank-Full Depth= 0.10' Flow Area= 0.5 sf, Capacity= 0.96 cfs

3.00' x 0.10' deep channel, n= 0.035
Side Slope Z-value= 20.0 '/' Top Width= 7.00'
Length= 500.0' Slope= 0.0684 '/'
Inlet Invert= 224.20', Outlet Invert= 190.00'



‡

Reach 13.1R: Reach 13.1



Summary for Pond 1P: Pond 1

Inflow Area = 3.006 ac, 0.00% Impervious, Inflow Depth > 0.89" for 2 year event
Inflow = 2.87 cfs @ 12.13 hrs, Volume= 0.222 af
Outflow = 0.25 cfs @ 14.47 hrs, Volume= 0.091 af, Atten= 91%, Lag= 140.3 min
Primary = 0.25 cfs @ 14.47 hrs, Volume= 0.091 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 191.75' Surf.Area= 3,745 sf Storage= 5,323 cf
Peak Elev= 193.14' @ 14.47 hrs Surf.Area= 4,991 sf Storage= 11,380 cf (6,057 cf above start)

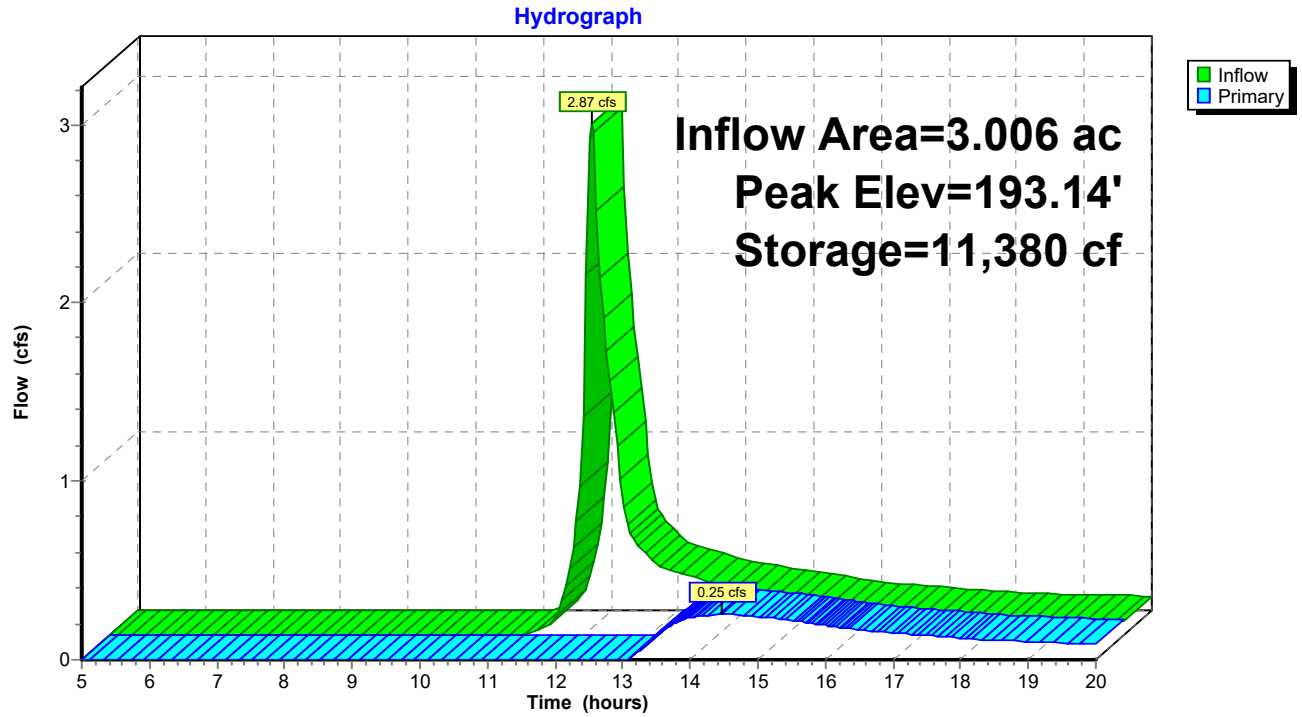
Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 140.3 min (966.2 - 825.9)

Volume	Invert	Avail.Storage	Storage Description
#1	190.00'	22,375 cf	**25.00'W x 95.00'L x 5.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	193.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.25 cfs @ 14.47 hrs HW=193.14' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 0.25 cfs @ 0.89 fps)

Pond 1P: Pond 1



Summary for Pond 2P: Pond 2

Inflow Area = 2.551 ac, 0.00% Impervious, Inflow Depth > 0.99" for 2 year event
Inflow = 2.45 cfs @ 12.19 hrs, Volume= 0.210 af
Outflow = 0.23 cfs @ 14.56 hrs, Volume= 0.145 af, Atten= 91%, Lag= 142.0 min
Discarded = 0.23 cfs @ 14.56 hrs, Volume= 0.145 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 229.53' @ 14.56 hrs Surf.Area= 3,046 sf Storage= 4,555 cf

Plug-Flow detention time= 196.9 min calculated for 0.145 af (69% of inflow)
Center-of-Mass det. time= 125.8 min (950.2 - 824.4)

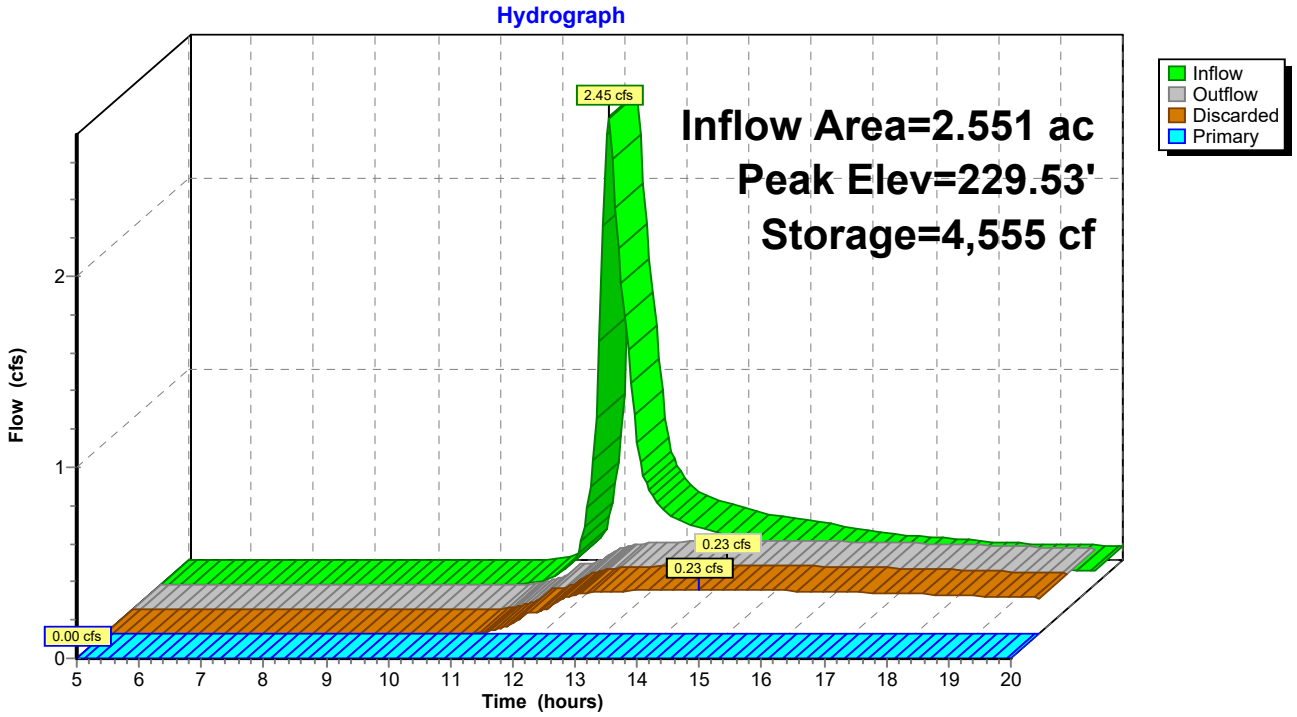
Volume	Invert	Avail.Storage	Storage Description
#1	227.50'	17,625 cf	**15.00'W x 100.00'L x 5.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	231.00'	**4.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	227.50'	**3.000 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 200.00'

Discarded OutFlow Max=0.23 cfs @ 14.56 hrs HW=229.53' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.23 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=227.50' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: Pond 2



Summary for Pond 3P: Pond 3

Inflow Area = 2.550 ac, 0.00% Impervious, Inflow Depth > 1.04" for 2 year event
Inflow = 2.59 cfs @ 12.19 hrs, Volume= 0.222 af
Outflow = 0.21 cfs @ 14.99 hrs, Volume= 0.081 af, Atten= 92%, Lag= 168.2 min
Primary = 0.21 cfs @ 14.99 hrs, Volume= 0.081 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 226.70' @ 14.99 hrs Surf.Area= 4,528 sf Storage= 6,537 cf

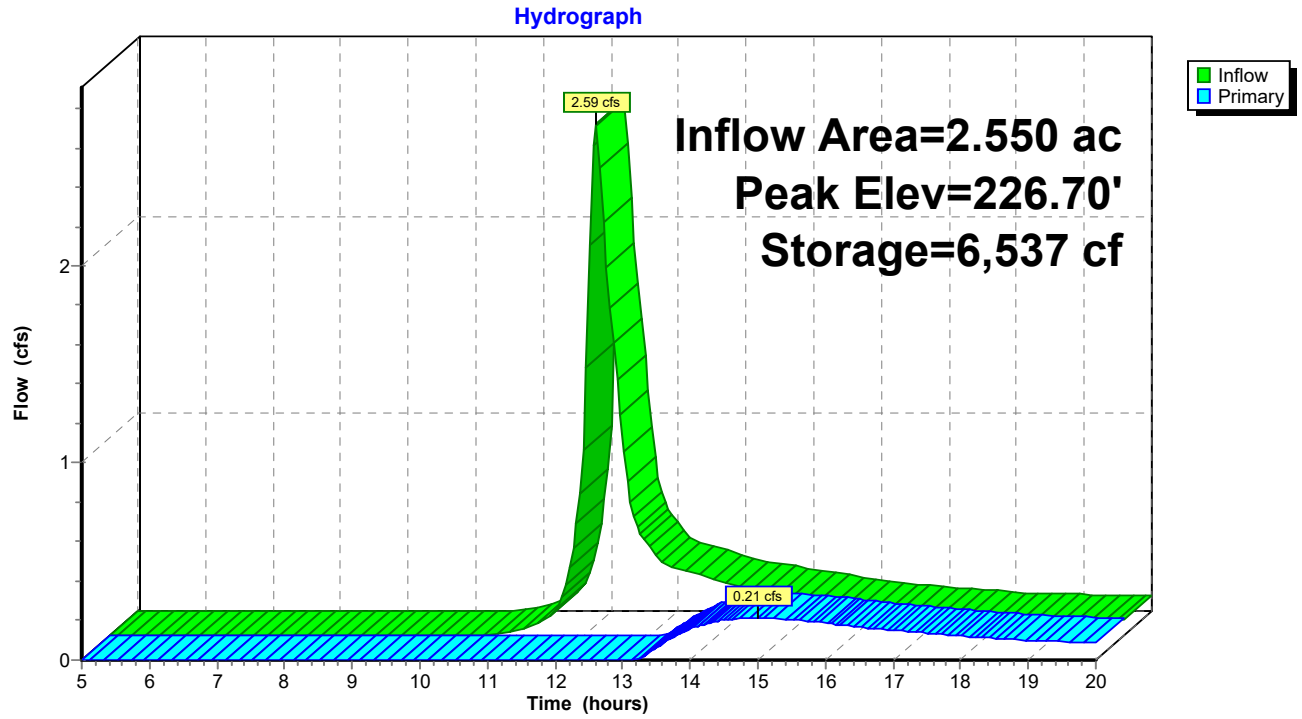
Plug-Flow detention time= 253.4 min calculated for 0.081 af (36% of inflow)
Center-of-Mass det. time= 158.7 min (980.9 - 822.2)

Volume	Invert	Avail.Storage	Storage Description
#1	225.00'	16,125 cf	**40.00'W x 80.00'L x 3.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	226.50'	**1.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.21 cfs @ 14.99 hrs HW=226.70' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 0.21 cfs @ 1.06 fps)

Pond 3P: Pond 3



Summary for Pond 4P: Pond 4

Inflow Area = 5.871 ac, 0.00% Impervious, Inflow Depth > 1.04" for 2 year event
Inflow = 5.44 cfs @ 12.24 hrs, Volume= 0.510 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 186.00' Surf.Area= 11,484 sf Storage= 20,436 cf
Peak Elev= 187.75' @ 20.00 hrs Surf.Area= 13,895 sf Storage= 42,620 cf (22,184 cf above start)

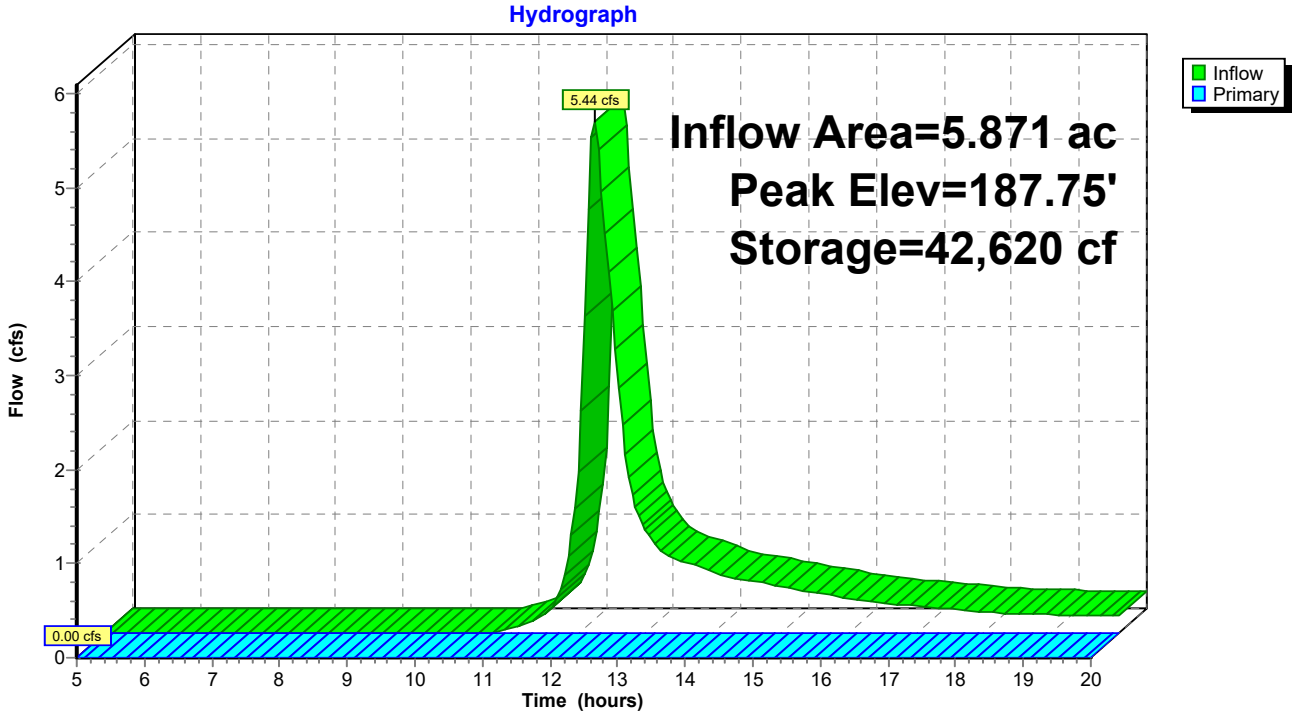
Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	184.00'	77,652 cf	**75.00'W x 120.00'L x 6.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	188.00'	**8.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=186.00' (Free Discharge)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 4P: Pond 4



Summary for Pond 5P: Pond 5

Inflow Area = 2.637 ac, 0.00% Impervious, Inflow Depth > 0.79" for 2 year event
Inflow = 2.04 cfs @ 12.17 hrs, Volume= 0.173 af
Outflow = 0.02 cfs @ 20.00 hrs, Volume= 0.000 af, Atten= 99%, Lag= 470.1 min
Primary = 0.02 cfs @ 20.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 218.02' @ 20.00 hrs Surf.Area= 4,478 sf Storage= 7,497 cf

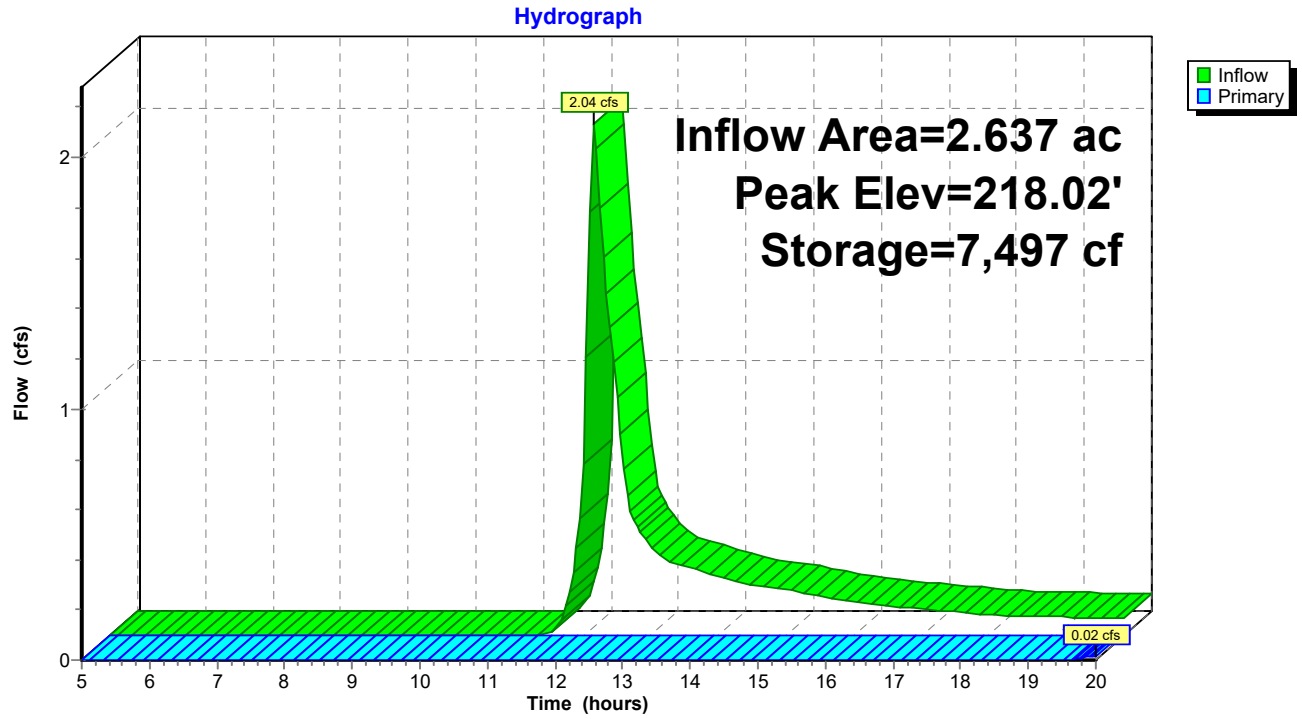
Plug-Flow detention time= 499.1 min calculated for 0.000 af (0% of inflow)
Center-of-Mass det. time= 360.5 min (1,193.2 - 832.7)

Volume	Invert	Avail.Storage	Storage Description
#1	216.00'	18,048 cf	**60.00'W x 50.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	218.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.01 cfs @ 20.00 hrs HW=218.02' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 0.01 cfs @ 0.32 fps)

Pond 5P: Pond 5



Summary for Pond 6P: Pond 6

Inflow Area = 3.201 ac, 0.00% Impervious, Inflow Depth > 1.05" for 2 year event
Inflow = 3.70 cfs @ 12.13 hrs, Volume= 0.279 af
Outflow = 0.19 cfs @ 16.02 hrs, Volume= 0.059 af, Atten= 95%, Lag= 233.4 min
Primary = 0.19 cfs @ 16.02 hrs, Volume= 0.059 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 207.00' Surf.Area= 3,844 sf Storage= 6,296 cf
Peak Elev= 209.09' @ 16.02 hrs Surf.Area= 5,553 sf Storage= 16,047 cf (9,751 cf above start)

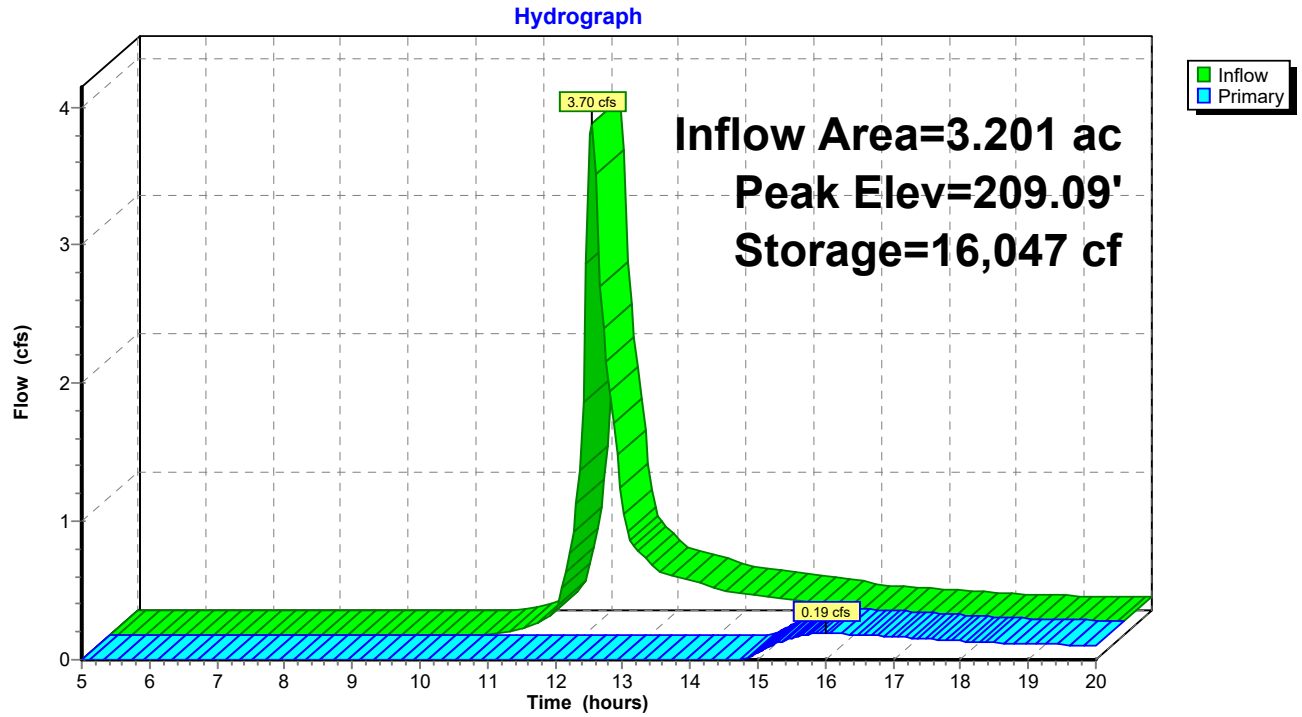
Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 220.5 min (1,039.4 - 818.8)

Volume	Invert	Avail.Storage	Storage Description
#1	205.00'	24,822 cf	**50.00'W x 50.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	209.00'	**3.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.18 cfs @ 16.02 hrs HW=209.09' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 0.18 cfs @ 0.70 fps)

Pond 6P: Pond 6



Summary for Pond 7P: Pond 7

Inflow Area = 1.170 ac, 0.00% Impervious, Inflow Depth > 0.89" for 2 year event
Inflow = 1.22 cfs @ 12.10 hrs, Volume= 0.086 af
Outflow = 0.13 cfs @ 13.42 hrs, Volume= 0.079 af, Atten= 89%, Lag= 79.3 min
Discarded = 0.13 cfs @ 13.42 hrs, Volume= 0.079 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 224.42' @ 13.42 hrs Surf.Area= 1,384 sf Storage= 1,533 cf

Plug-Flow detention time= 141.0 min calculated for 0.079 af (91% of inflow)
Center-of-Mass det. time= 114.0 min (938.2 - 824.2)

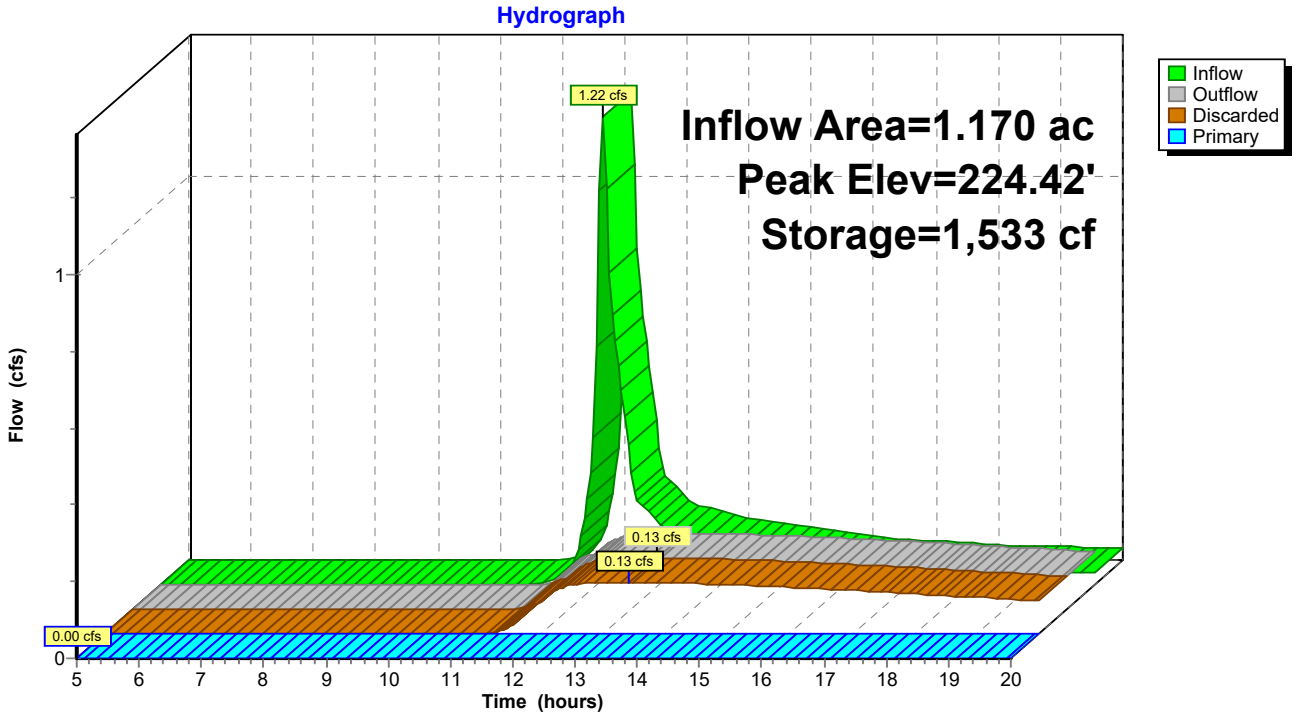
Volume	Invert	Avail.Storage	Storage Description
#1	223.00'	8,339 cf	**20.00'W x 40.00'L x 4.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	226.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	223.00'	**3.900 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 200.00'

Discarded OutFlow Max=0.13 cfs @ 13.42 hrs HW=224.42' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.13 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=223.00' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 7P: Pond 7



Summary for Pond 8P: Pond 8

Inflow Area = 4.686 ac, 0.00% Impervious, Inflow Depth > 0.99" for 2 year event
Inflow = 4.84 cfs @ 12.16 hrs, Volume= 0.386 af
Outflow = 0.45 cfs @ 14.17 hrs, Volume= 0.172 af, Atten= 91%, Lag= 120.9 min
Primary = 0.45 cfs @ 14.17 hrs, Volume= 0.172 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 188.75' @ 14.17 hrs Surf.Area= 6,685 sf Storage= 10,191 cf

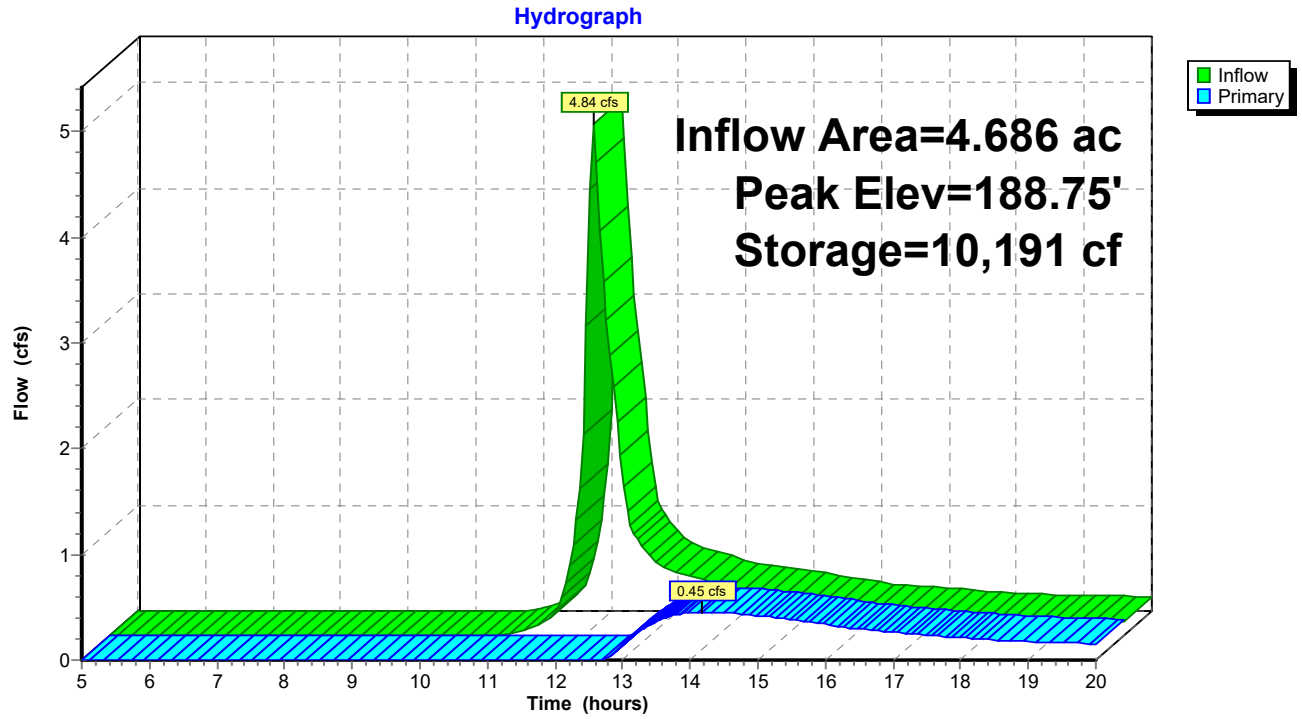
Plug-Flow detention time= 224.7 min calculated for 0.172 af (44% of inflow)
Center-of-Mass det. time= 131.6 min (954.3 - 822.7)

Volume	Invert	Avail.Storage	Storage Description
#1	187.00'	27,968 cf	**50.00'W x 100.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	188.50'	**1.5' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.45 cfs @ 14.17 hrs HW=188.75' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 0.45 cfs @ 1.21 fps)

Pond 8P: Pond 8



Summary for Pond 9P: Pond 9

Inflow Area = 1.521 ac, 0.00% Impervious, Inflow Depth > 1.05" for 2 year event
Inflow = 1.89 cfs @ 12.10 hrs, Volume= 0.133 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 188.00' Surf.Area= 2,664 sf Storage= 4,116 cf
Peak Elev= 189.76' @ 20.00 hrs Surf.Area= 3,928 sf Storage= 9,888 cf (5,772 cf above start)

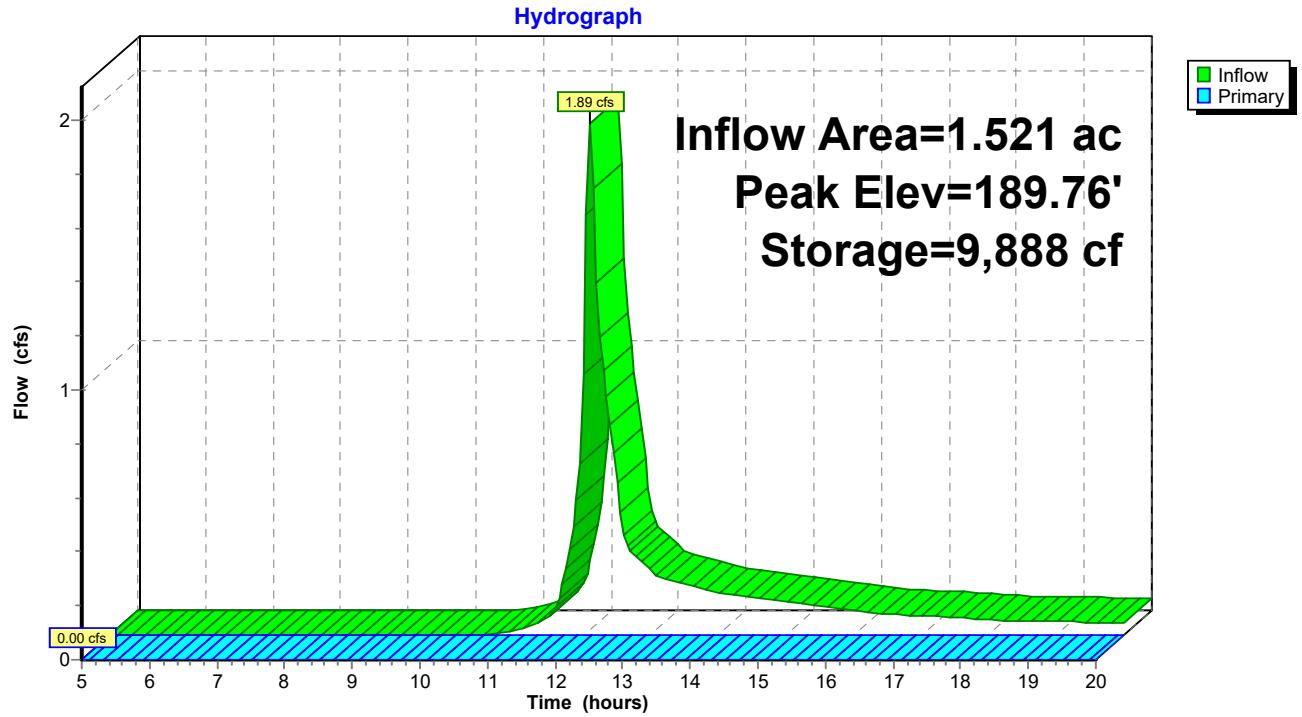
Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	186.00'	17,960 cf	**25.00'W x 60.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	190.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=188.00' (Free Discharge)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 9P: Pond 9



Summary for Pond 10P: Pond 10

Inflow Area = 2.304 ac, 0.00% Impervious, Inflow Depth > 0.99" for 2 year event
Inflow = 2.32 cfs @ 12.17 hrs, Volume= 0.190 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 168.45' @ 20.00 hrs Surf.Area= 5,038 sf Storage= 8,267 cf

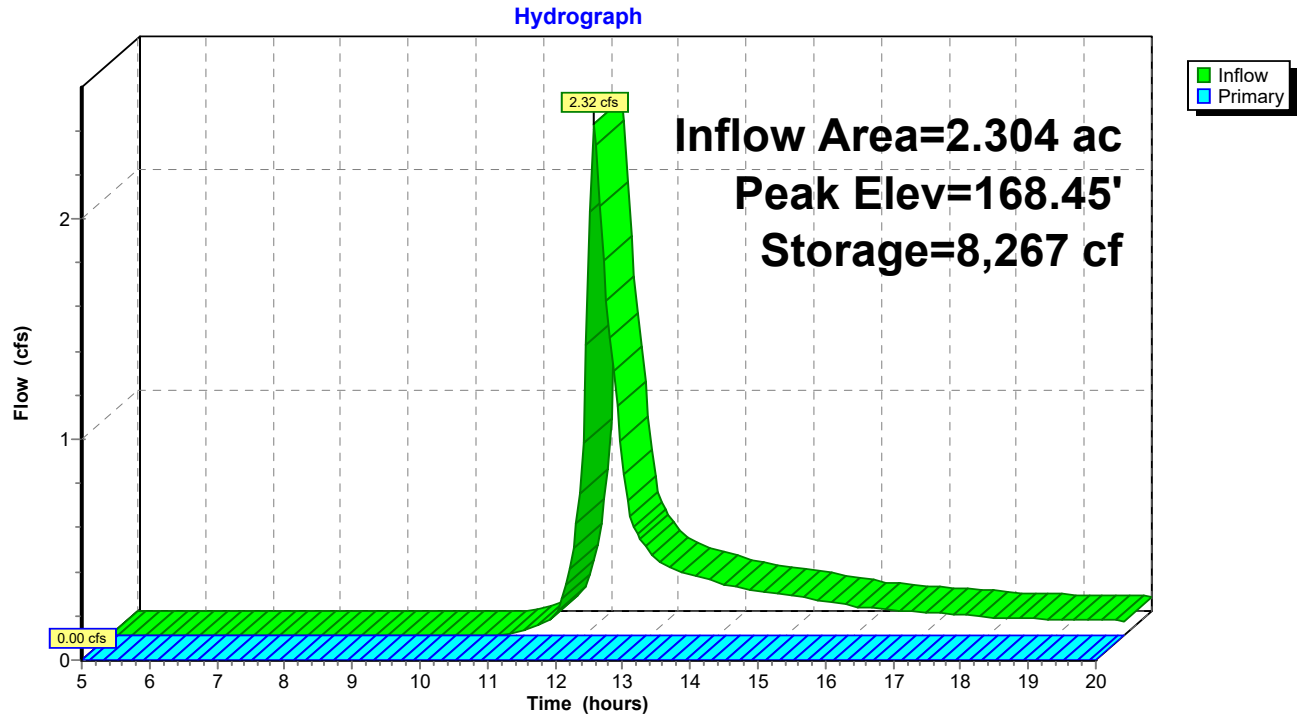
Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	166.50'	17,175 cf	**50.00'W x 70.00'L x 3.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	168.50'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=166.50' (Free Discharge)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 10P: Pond 10



Summary for Pond 11P: Pond 11

Inflow Area = 1.126 ac, 0.00% Impervious, Inflow Depth > 1.10" for 2 year event
Inflow = 1.53 cfs @ 12.09 hrs, Volume= 0.104 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 149.50' Surf.Area= 1,776 sf Storage= 2,043 cf
Peak Elev= 151.40' @ 20.00 hrs Surf.Area= 3,020 sf Storage= 6,549 cf (4,506 cf above start)

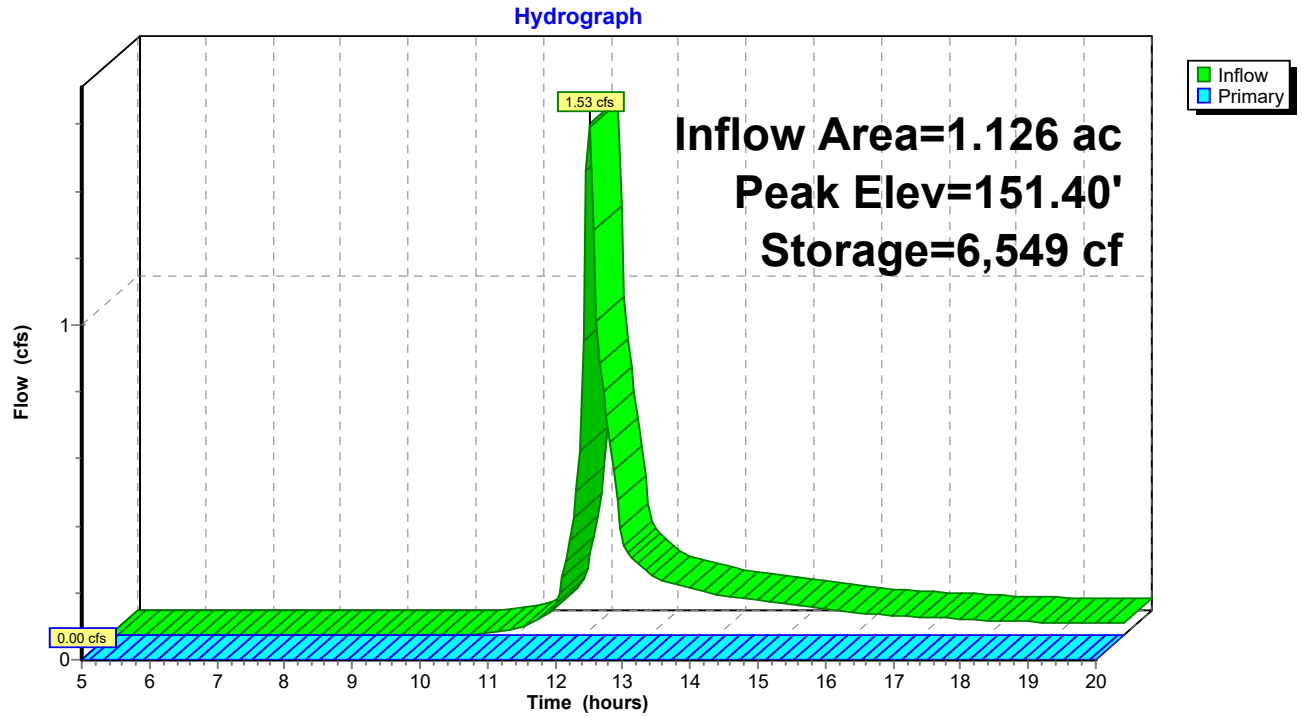
Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	148.00'	14,619 cf	**15.00'W x 65.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	152.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=149.50' (Free Discharge)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 11P: Pond 11



Summary for Pond 12P: Pond 12

Inflow Area = 3.677 ac, 0.00% Impervious, Inflow Depth > 0.94" for 2 year event
Inflow = 3.81 cfs @ 12.12 hrs, Volume= 0.287 af
Outflow = 0.27 cfs @ 15.10 hrs, Volume= 0.098 af, Atten= 93%, Lag= 178.4 min
Primary = 0.27 cfs @ 15.10 hrs, Volume= 0.098 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 157.00' Surf.Area= 4,384 sf Storage= 6,836 cf
Peak Elev= 158.65' @ 15.10 hrs Surf.Area= 6,153 sf Storage= 15,492 cf (8,656 cf above start)

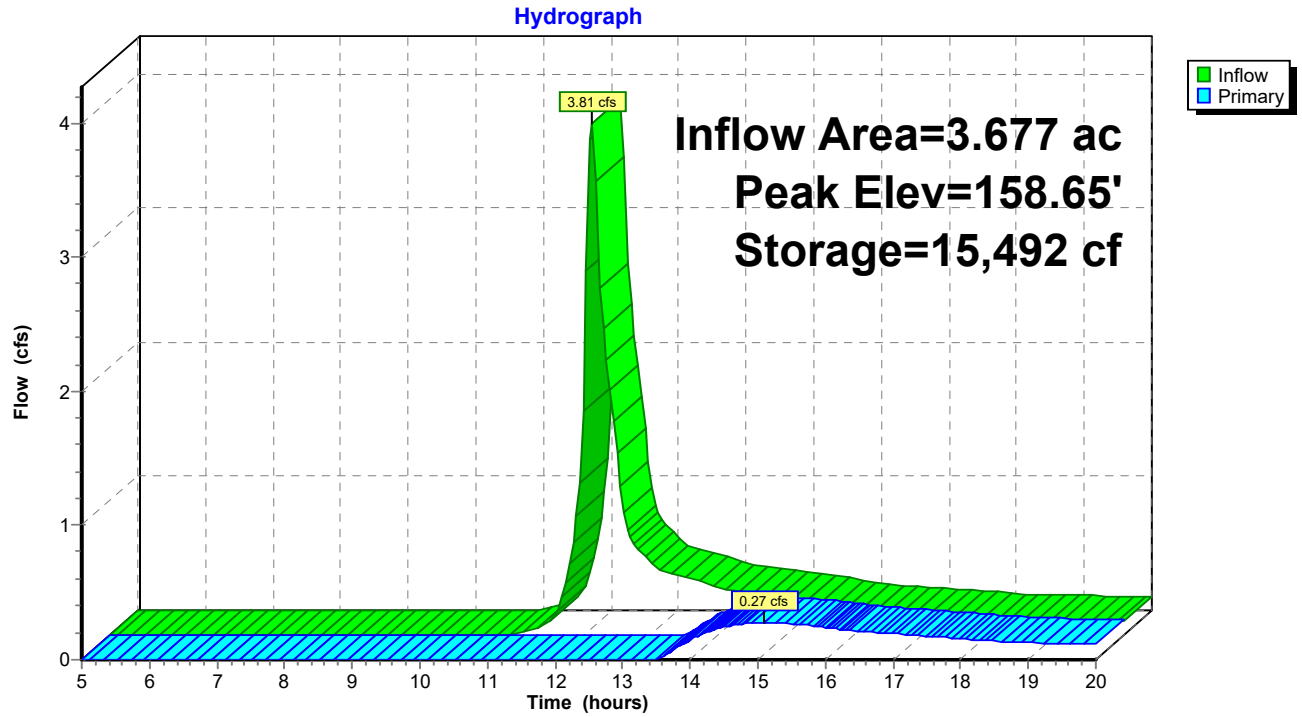
Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 166.3 min (989.7 - 823.4)

Volume	Invert	Avail.Storage	Storage Description
#1	155.00'	28,905 cf	**20.00'W x 125.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	158.50'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.27 cfs @ 15.10 hrs HW=158.65' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 0.27 cfs @ 0.92 fps)

Pond 12P: Pond 12



Summary for Pond 13.1P: Pond 13.1

Inflow Area = 3.117 ac, 0.00% Impervious, Inflow Depth > 1.16" for 2 year event
Inflow = 4.30 cfs @ 12.11 hrs, Volume= 0.302 af
Outflow = 0.20 cfs @ 15.94 hrs, Volume= 0.067 af, Atten= 95%, Lag= 230.1 min
Primary = 0.20 cfs @ 15.94 hrs, Volume= 0.067 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 224.25' @ 15.94 hrs Surf.Area= 15,287 sf Storage= 10,445 cf

Plug-Flow detention time= 317.3 min calculated for 0.067 af (22% of inflow)
Center-of-Mass det. time= 216.0 min (1,029.2 - 813.2)

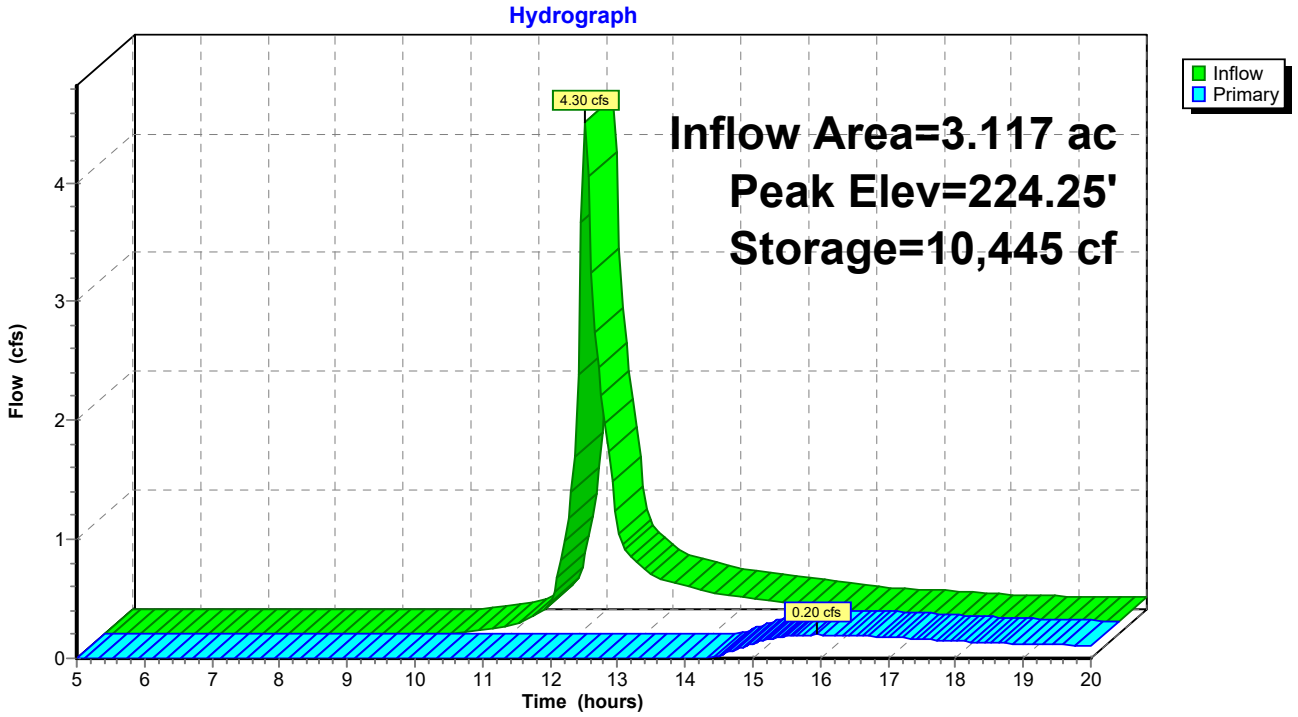
Volume	Invert	Avail.Storage	Storage Description
#1	223.00'	27,720 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
223.00	1,200	0	0
224.20	15,000	9,720	9,720
225.20	21,000	18,000	27,720

Device	Routing	Invert	Outlet Devices
#1	Primary	224.20'	**8.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.20 cfs @ 15.94 hrs HW=224.25' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 0.20 cfs @ 0.51 fps)

Pond 13.1P: Pond 13.1



Summary for Pond 13P: Pond 13

Inflow Area = 12.425 ac, 0.00% Impervious, Inflow Depth > 0.84" for 2 year event
Inflow = 9.81 cfs @ 12.17 hrs, Volume= 0.875 af
Outflow = 1.07 cfs @ 13.84 hrs, Volume= 0.708 af, Atten= 89%, Lag= 100.3 min
Discarded = 1.07 cfs @ 13.84 hrs, Volume= 0.708 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 185.08' @ 13.84 hrs Surf.Area= 15,264 sf Storage= 15,595 cf

Plug-Flow detention time= 165.8 min calculated for 0.708 af (81% of inflow)
Center-of-Mass det. time= 110.5 min (947.9 - 837.5)

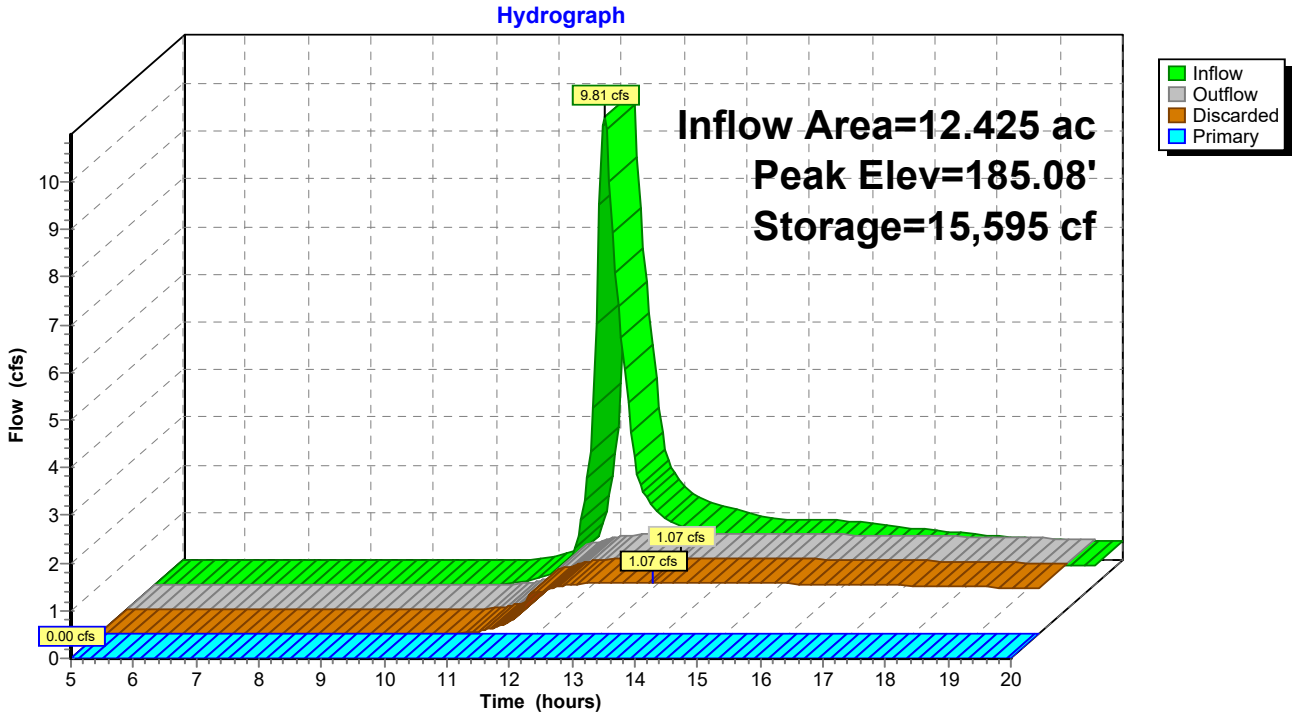
Volume	Invert	Avail.Storage	Storage Description
#1	184.00'	99,484 cf	**80.00'W x 170.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	188.00'	**8.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	184.00'	**2.700 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 175.00'

Discarded OutFlow Max=1.07 cfs @ 13.84 hrs HW=185.08' (Free Discharge)
↑—**2=Exfiltration** (Controls 1.07 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=184.00' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 13P: Pond 13



Summary for Pond 14P: Pond 14

Inflow Area = 4.438 ac, 0.00% Impervious, Inflow Depth > 0.74" for 2 year event
Inflow = 3.29 cfs @ 12.15 hrs, Volume= 0.273 af
Outflow = 0.33 cfs @ 14.51 hrs, Volume= 0.202 af, Atten= 90%, Lag= 141.4 min
Discarded = 0.33 cfs @ 14.51 hrs, Volume= 0.202 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 188.84' @ 14.51 hrs Surf.Area= 3,089 sf Storage= 5,450 cf

Plug-Flow detention time= 184.9 min calculated for 0.202 af (74% of inflow)
Center-of-Mass det. time= 118.8 min (953.1 - 834.3)

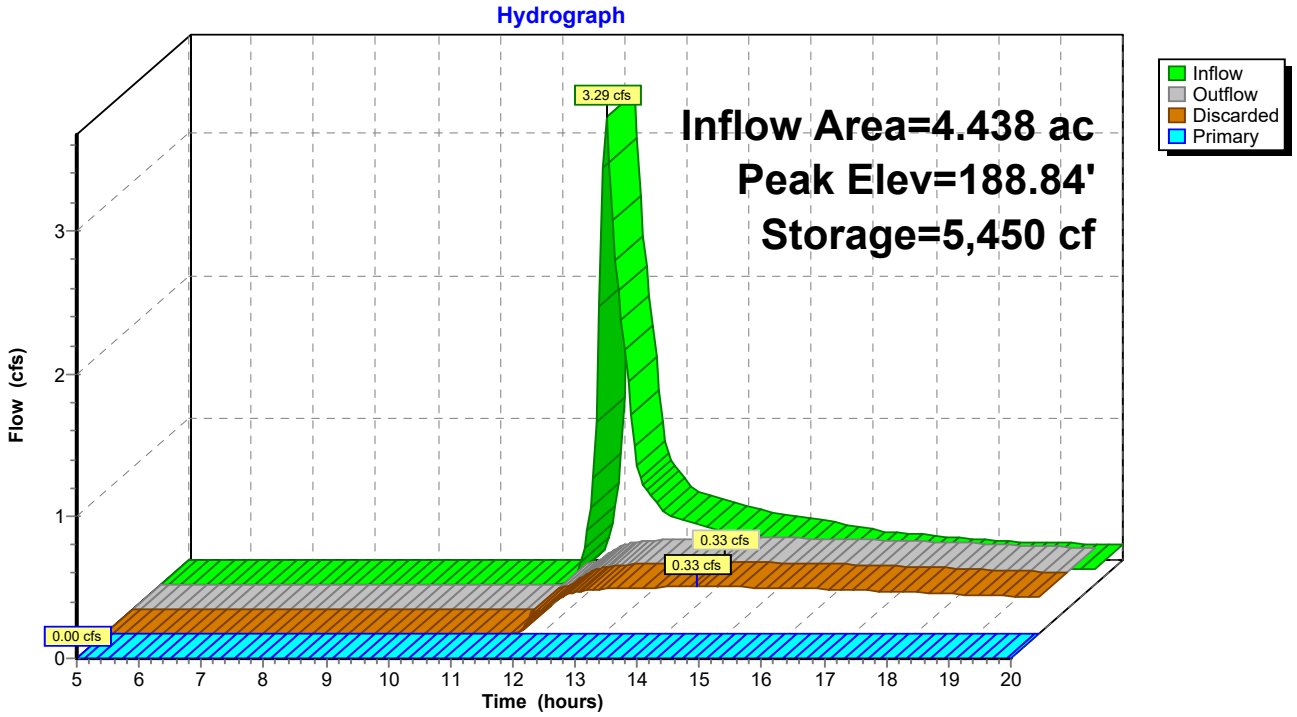
Volume	Invert	Avail.Storage	Storage Description
#1	186.50'	19,102 cf	**25.00'W x 65.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	190.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	186.50'	**3.900 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 175.00'

Discarded OutFlow Max=0.33 cfs @ 14.51 hrs HW=188.84' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.33 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=186.50' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 14P: Pond 14



Summary for Pond 16P: Pond 16

Inflow Area = 16.919 ac, 0.00% Impervious, Inflow Depth > 1.09" for 2 year event
Inflow = 12.75 cfs @ 12.46 hrs, Volume= 1.538 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 191.00' Surf.Area= 17,554 sf Storage= 31,256 cf
Peak Elev= 194.21' @ 20.00 hrs Surf.Area= 24,265 sf Storage= 98,214 cf (66,958 cf above start)

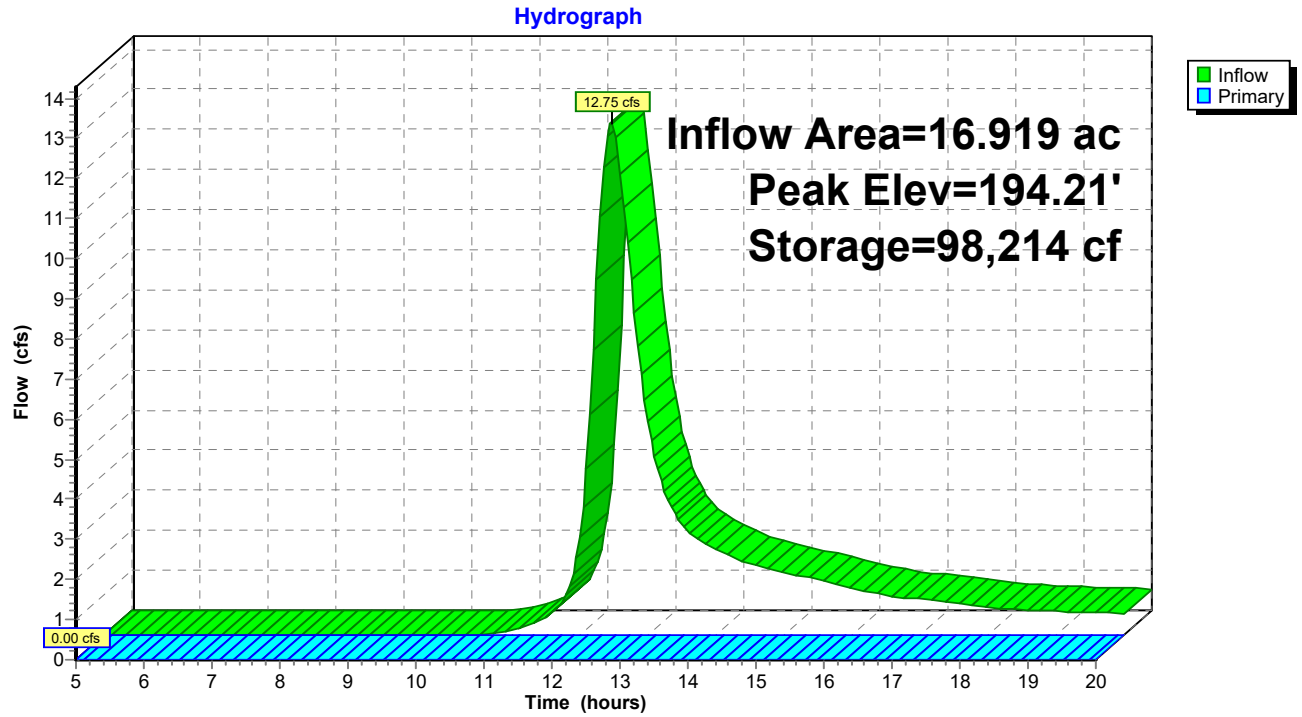
Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	189.00'	174,704 cf	**55.00'W x 250.00'L x 8.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	195.50'	**10.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=191.00' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 16P: Pond 16



25-Year Storm Event- Proposed

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=3.006 ac 0.00% Impervious Runoff Depth>2.74"
Flow Length=470' Slope=0.0800 '/' Tc=8.0 min CN=70 Runoff=9.55 cfs 0.686 af

Subcatchment2: Subcat 2 Runoff Area=2.551 ac 0.00% Impervious Runoff Depth>2.92"
Flow Length=430' Tc=12.4 min CN=72 Runoff=7.58 cfs 0.621 af

Subcatchment2A: Subcat 2A Runoff Area=0.775 ac 0.00% Impervious Runoff Depth>2.29"
Tc=10.0 min CN=65 Runoff=1.91 cfs 0.148 af

Subcatchment3: Subcat 3 Runoff Area=2.550 ac 0.00% Impervious Runoff Depth>3.01"
Flow Length=620' Tc=12.6 min CN=73 Runoff=7.73 cfs 0.640 af

Subcatchment3A: Subcat 3A Runoff Area=0.324 ac 0.00% Impervious Runoff Depth>3.40"
Tc=10.0 min CN=77 Runoff=1.19 cfs 0.092 af

Subcatchment4: Subcat 4 Runoff Area=5.871 ac 0.00% Impervious Runoff Depth>3.01"
Flow Length=810' Tc=16.2 min CN=73 Runoff=16.27 cfs 1.473 af

Subcatchment5: Subcat 5 Runoff Area=2.637 ac 0.00% Impervious Runoff Depth>2.55"
Flow Length=510' Slope=0.0500 '/' Tc=10.4 min CN=68 Runoff=7.24 cfs 0.561 af

Subcatchment6: Subcat 6 Runoff Area=3.201 ac 0.00% Impervious Runoff Depth>3.02"
Flow Length=420' Slope=0.0700 '/' Tc=8.1 min CN=73 Runoff=11.18 cfs 0.805 af

Subcatchment6A: Subcat 6A Runoff Area=0.915 ac 0.00% Impervious Runoff Depth>2.46"
Tc=10.0 min CN=67 Runoff=2.45 cfs 0.188 af

Subcatchment6B: Subcat 6B Runoff Area=0.030 ac 0.00% Impervious Runoff Depth>1.70"
Tc=10.0 min CN=58 Runoff=0.05 cfs 0.004 af

Subcatchment6C: Subcat 6C Runoff Area=0.694 ac 0.00% Impervious Runoff Depth>1.70"
Tc=10.0 min CN=58 Runoff=1.23 cfs 0.098 af

Subcatchment7: Subcat 7 Runoff Area=1.170 ac 0.00% Impervious Runoff Depth>2.74"
Flow Length=200' Slope=0.0800 '/' Tc=5.8 min CN=70 Runoff=3.98 cfs 0.267 af

Subcatchment7A: Subcat 7A Runoff Area=0.202 ac 0.00% Impervious Runoff Depth>1.70"
Tc=10.0 min CN=58 Runoff=0.36 cfs 0.029 af

Subcatchment8: Subcat 8 Runoff Area=4.686 ac 0.00% Impervious Runoff Depth>2.92"
Flow Length=650' Tc=10.1 min CN=72 Runoff=14.88 cfs 1.141 af

Subcatchment8A: Subcat 8A Runoff Area=0.770 ac 0.00% Impervious Runoff Depth>1.70"
Tc=10.0 min CN=58 Runoff=1.36 cfs 0.109 af

Subcatchment9: Subcat 9 Runoff Area=1.521 ac 0.00% Impervious Runoff Depth>3.02"
Flow Length=230' Slope=0.0700 '/' Tc=6.4 min CN=73 Runoff=5.62 cfs 0.383 af

Subcatchment9A: Subcat 9A Runoff Area=0.259 ac 0.00% Impervious Runoff Depth>1.70"
Tc=10.0 min CN=58 Runoff=0.46 cfs 0.037 af

Subcatchment10: Subcat 10 Runoff Area=2.304 ac 0.00% Impervious Runoff Depth>2.92"
Flow Length=410' Tc=11.0 min CN=72 Runoff=7.14 cfs 0.561 af

Subcatchment10A: Subcat 10A Runoff Area=0.287 ac 0.00% Impervious Runoff Depth>1.70"
Tc=10.0 min CN=58 Runoff=0.51 cfs 0.041 af

Subcatchment11: Subcat 11 Runoff Area=1.126 ac 0.00% Impervious Runoff Depth>3.12"
Flow Length=210' Slope=0.1000 '/' Tc=5.3 min CN=74 Runoff=4.39 cfs 0.292 af

Subcatchment11A: Subcat 11A Runoff Area=0.428 ac 0.00% Impervious Runoff Depth>1.70"
Tc=10.0 min CN=58 Runoff=0.76 cfs 0.061 af

Subcatchment12: Subcat 12 Runoff Area=3.677 ac 0.00% Impervious Runoff Depth>2.83"
Flow Length=500' Slope=0.0900 '/' Tc=7.9 min CN=71 Runoff=12.13 cfs 0.868 af

Subcatchment13.1: Subcat 13.1 Runoff Area=3.117 ac 0.00% Impervious Runoff Depth>3.21"
Flow Length=320' Slope=0.0800 '/' Tc=6.8 min CN=75 Runoff=12.08 cfs 0.834 af

Subcatchment13.2: Subcat 13.2 Runoff Area=9.308 ac 0.00% Impervious Runoff Depth>3.02"
Flow Length=800' Slope=0.0700 '/' Tc=11.5 min CN=73 Runoff=29.33 cfs 2.339 af

Subcatchment14: Subcat 14 Runoff Area=4.438 ac 0.00% Impervious Runoff Depth>2.47"
Flow Length=500' Tc=9.1 min CN=67 Runoff=12.13 cfs 0.912 af

Subcatchment16: Subcat 16 Runoff Area=16.919 ac 0.00% Impervious Runoff Depth>3.09"
Flow Length=910' Slope=0.0100 '/' Tc=30.9 min CN=74 Runoff=36.93 cfs 4.356 af

Subcatchment16A: Subcat 16A Runoff Area=0.619 ac 0.00% Impervious Runoff Depth>1.70"
Tc=10.0 min CN=58 Runoff=1.10 cfs 0.088 af

Reach 13.1R: Reach 13.1 Avg. Flow Depth=0.29' Max Vel=2.45 fps Inflow=4.52 cfs 0.592 af
n=0.035 L=500.0' S=0.0684 '/' Capacity=0.96 cfs Outflow=4.44 cfs 0.589 af

Pond 1P: Pond 1 Peak Elev=193.93' Storage=15,624 cf Inflow=9.55 cfs 0.686 af
Outflow=4.80 cfs 0.549 af

Pond 2P: Pond 2 Peak Elev=231.38' Storage=11,717 cf Inflow=7.58 cfs 0.621 af
Discarded=0.37 cfs 0.248 af Primary=2.38 cfs 0.174 af Outflow=2.75 cfs 0.422 af

Pond 3P: Pond 3 Peak Elev=227.67' Storage=11,360 cf Inflow=7.73 cfs 0.640 af
Outflow=3.40 cfs 0.492 af

Pond 4P: Pond 4 Peak Elev=188.43' Storage=52,343 cf Inflow=16.27 cfs 1.473 af
Outflow=5.72 cfs 0.857 af

Pond 5P: Pond 5 Peak Elev=218.64' Storage=10,437 cf Inflow=7.24 cfs 0.561 af
Outflow=2.75 cfs 0.380 af

Pond 6P: Pond 6 Peak Elev=209.76' Storage=20,009 cf Inflow=11.18 cfs 0.805 af
Outflow=5.36 cfs 0.580 af

Pond 7P: Pond 7 Peak Elev=226.29' Storage=4,998 cf Inflow=3.98 cfs 0.267 af
Discarded=0.24 cfs 0.155 af Primary=0.75 cfs 0.048 af Outflow=0.99 cfs 0.202 af

Pond 8P: Pond 8 Peak Elev=189.93' Storage=18,785 cf Inflow=14.88 cfs 1.141 af
Outflow=6.77 cfs 0.914 af

Pond 9P: Pond 9 Peak Elev=190.41' Storage=12,610 cf Inflow=5.62 cfs 0.383 af
Outflow=1.35 cfs 0.221 af

Pond 10P: Pond 10 Peak Elev=169.08' Storage=11,612 cf Inflow=7.14 cfs 0.561 af
Outflow=2.34 cfs 0.352 af

Pond 11P: Pond 11 Peak Elev=152.24' Storage=9,362 cf Inflow=4.39 cfs 0.292 af
Outflow=0.57 cfs 0.139 af

Pond 12P: Pond 12 Peak Elev=159.50' Storage=21,143 cf Inflow=12.13 cfs 0.868 af
Outflow=5.33 cfs 0.670 af

Pond 13.1P: Pond 13.1 Peak Elev=224.57' Storage=15,737 cf Inflow=12.08 cfs 0.834 af
Outflow=4.52 cfs 0.592 af

Pond 13P: Pond 13 Peak Elev=188.19' Storage=70,957 cf Inflow=29.56 cfs 2.928 af
Discarded=1.79 cfs 1.277 af Primary=1.54 cfs 0.257 af Outflow=3.33 cfs 1.535 af

Pond 14P: Pond 14 Peak Elev=190.95' Storage=13,658 cf Inflow=12.13 cfs 0.912 af
Discarded=0.55 cfs 0.329 af Primary=4.99 cfs 0.387 af Outflow=5.53 cfs 0.716 af

Pond 16P: Pond 16 Peak Elev=195.97' Storage=144,272 cf Inflow=36.93 cfs 4.356 af
Outflow=8.28 cfs 1.969 af

Total Runoff Area = 73.385 ac Runoff Volume = 17.634 af Average Runoff Depth = 2.88"
100.00% Pervious = 73.385 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1: Subcat 1

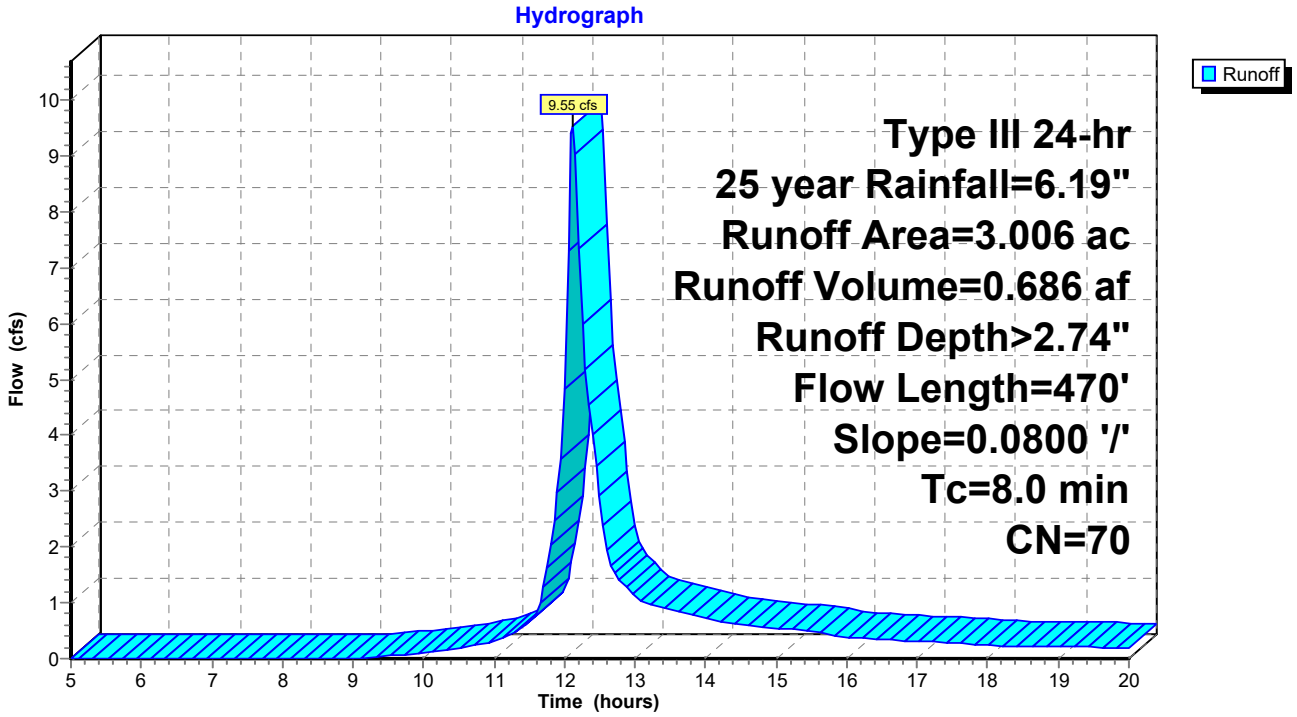
Runoff = 9.55 cfs @ 12.12 hrs, Volume= 0.686 af, Depth> 2.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
1.756	74	>75% Grass cover, Good, HSG C
0.217	96	Gravel surface, HSG C
1.033	58	Meadow, non-grazed, HSG B
3.006	70	Weighted Average
3.006		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
3.5	420	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.0	470	Total			

Subcatchment 1: Subcat 1



Summary for Subcatchment 2: Subcat 2

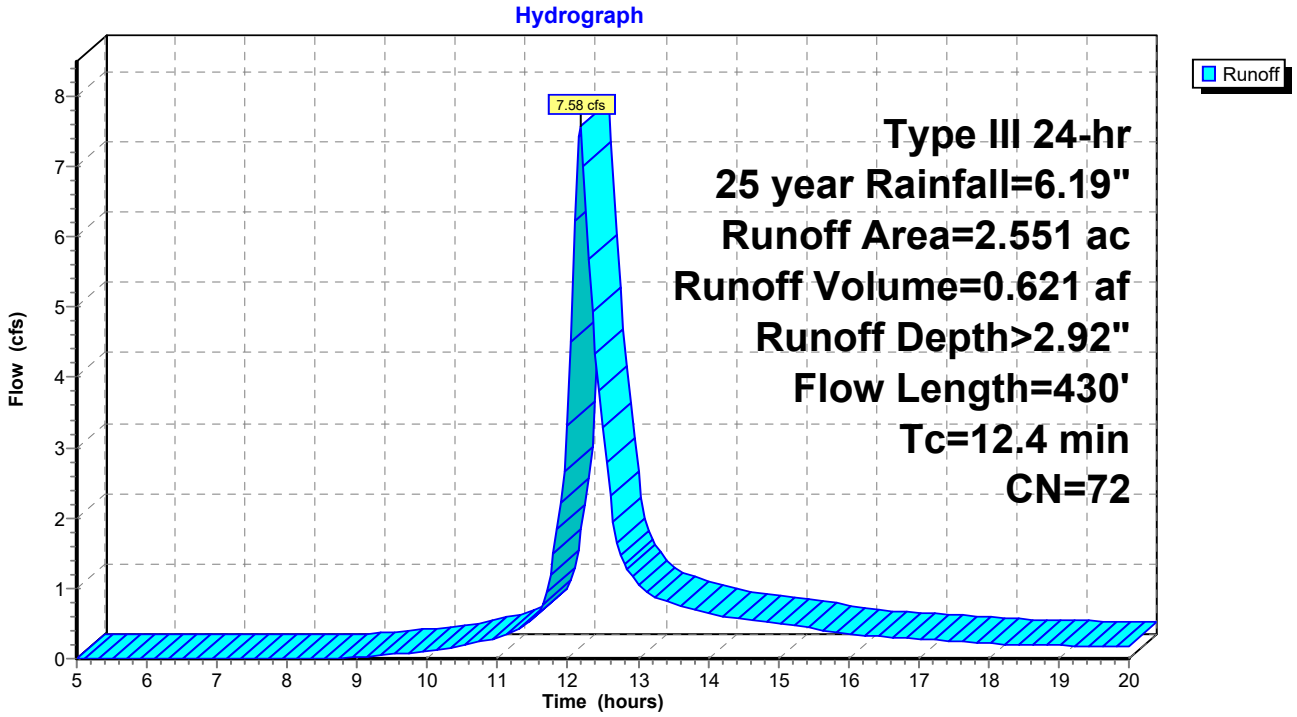
Runoff = 7.58 cfs @ 12.17 hrs, Volume= 0.621 af, Depth> 2.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
1.748	74	>75% Grass cover, Good, HSG C
0.237	96	Gravel surface, HSG C
0.566	58	Meadow, non-grazed, HSG B
2.551	72	Weighted Average
2.551		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0200	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
4.5	380	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.4	430	Total			

Subcatchment 2: Subcat 2



Summary for Subcatchment 2A: Subcat 2A

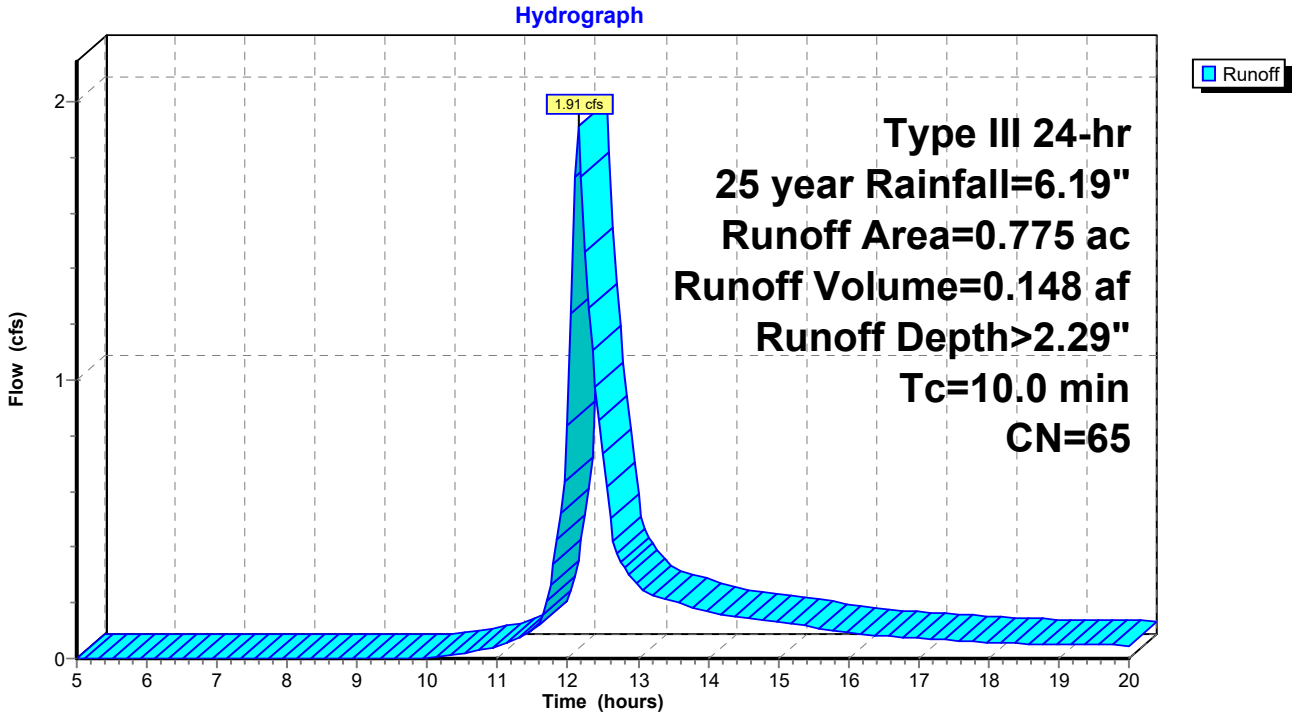
Runoff = 1.91 cfs @ 12.15 hrs, Volume= 0.148 af, Depth> 2.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.000	96	Gravel surface, HSG B
0.488	58	Meadow, non-grazed, HSG B
0.287	78	Meadow, non-grazed, HSG D
0.775	65	Weighted Average
0.775		100.00% Pervious Area

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

Subcatchment 2A: Subcat 2A



Summary for Subcatchment 3: Subcat 3

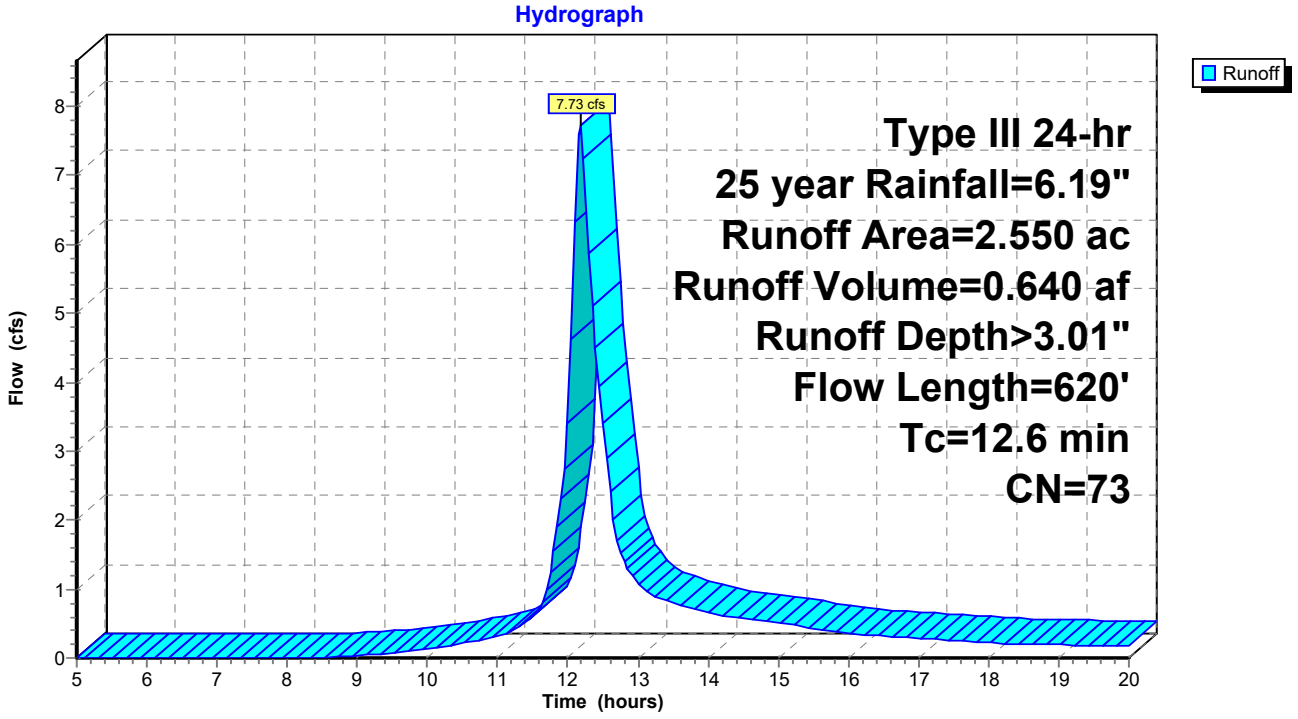
Runoff = 7.73 cfs @ 12.18 hrs, Volume= 0.640 af, Depth> 3.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
2.135	74	>75% Grass cover, Good, HSG C
0.110	96	Gravel surface, HSG C
0.271	58	Meadow, non-grazed, HSG B
0.034	78	Meadow, non-grazed, HSG D
2.550	73	Weighted Average
2.550		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
6.0	500	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	70	0.0700	1.85		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.6	620	Total			

Subcatchment 3: Subcat 3



Summary for Subcatchment 3A: Subcat 3A

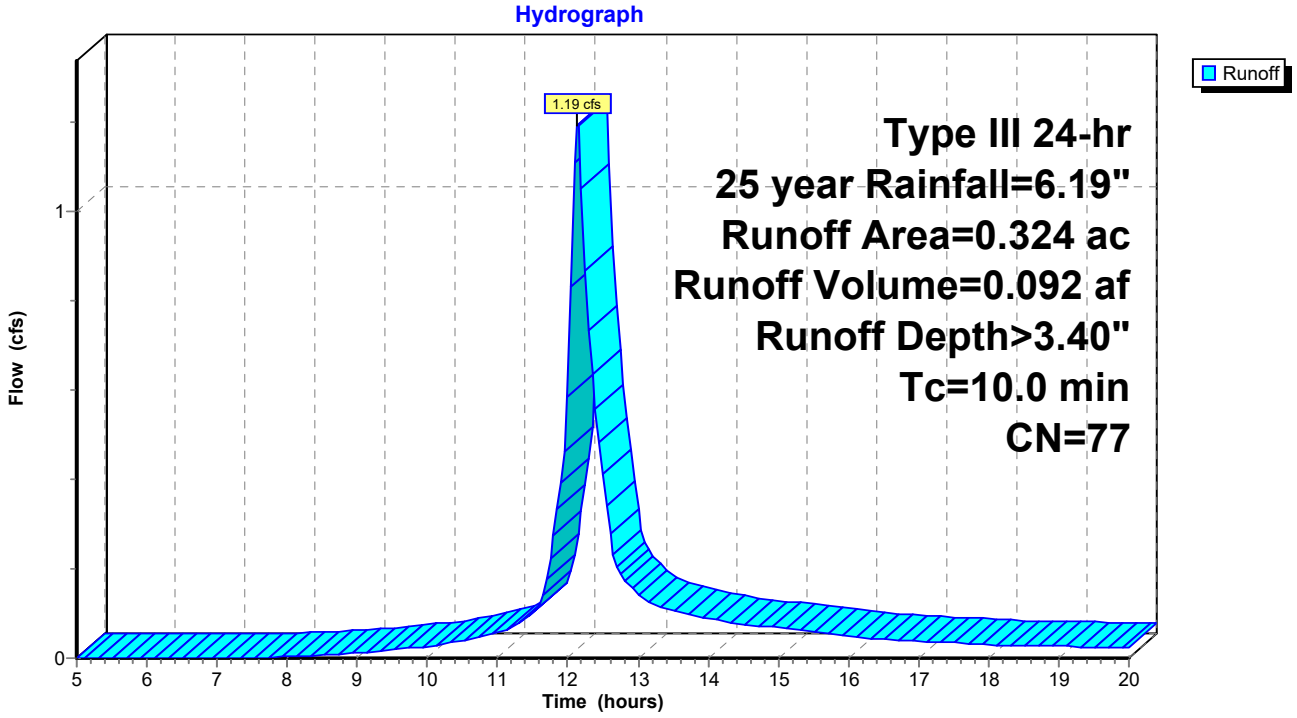
Runoff = 1.19 cfs @ 12.14 hrs, Volume= 0.092 af, Depth> 3.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.009	58	Meadow, non-grazed, HSG B
0.315	78	Meadow, non-grazed, HSG D
0.324	77	Weighted Average
0.324		100.00% Pervious Area

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

Subcatchment 3A: Subcat 3A



Summary for Subcatchment 4: Subcat 4

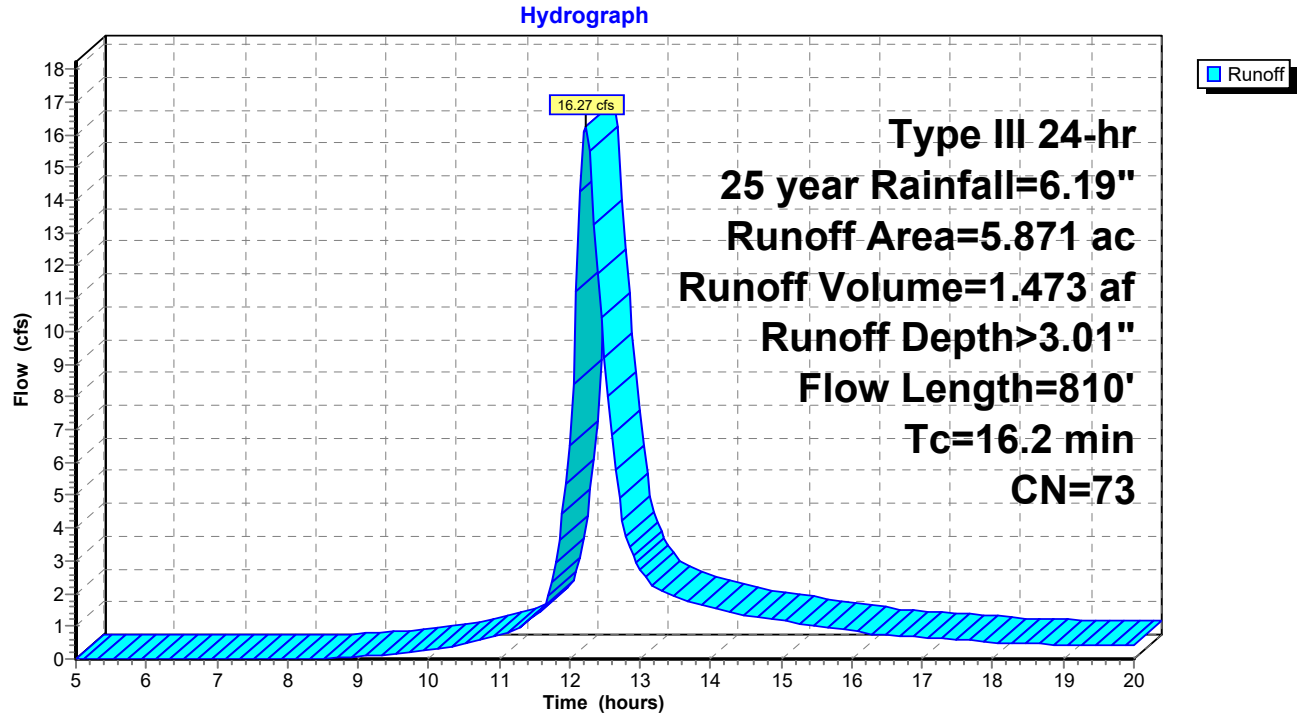
Runoff = 16.27 cfs @ 12.23 hrs, Volume= 1.473 af, Depth> 3.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
3.281	74	>75% Grass cover, Good, HSG C
0.192	80	>75% Grass cover, Good, HSG D
0.197	96	Gravel surface, HSG C
0.095	96	Gravel surface, HSG D
1.100	58	Meadow, non-grazed, HSG B
1.006	78	Meadow, non-grazed, HSG D
5.871	73	Weighted Average
5.871		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	50	0.0150	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
4.3	360	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.0	400	0.1000	2.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
16.2	810	Total			

Subcatchment 4: Subcat 4



Summary for Subcatchment 5: Subcat 5

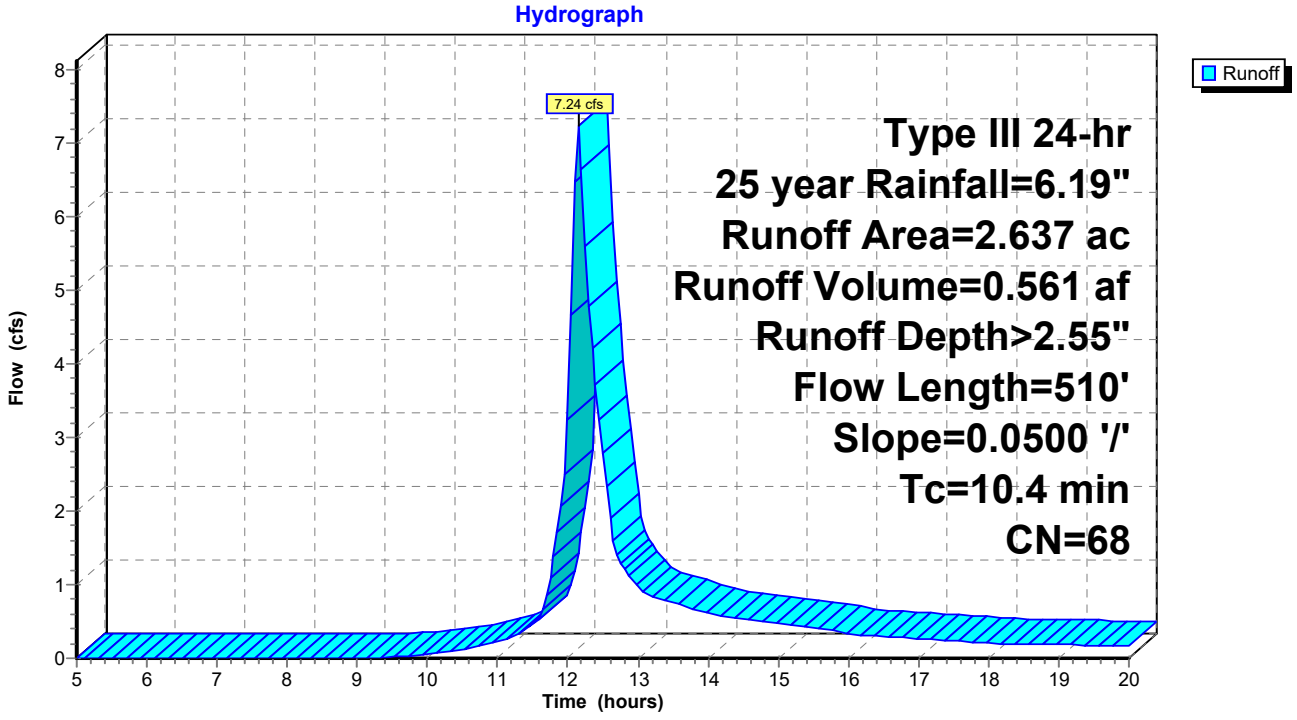
Runoff = 7.24 cfs @ 12.15 hrs, Volume= 0.561 af, Depth> 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
1.616	74	>75% Grass cover, Good, HSG C
1.021	58	Meadow, non-grazed, HSG B
2.637	68	Weighted Average
2.637		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	50	0.0500	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
4.9	460	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.4	510	Total			

Subcatchment 5: Subcat 5



Summary for Subcatchment 6: Subcat 6

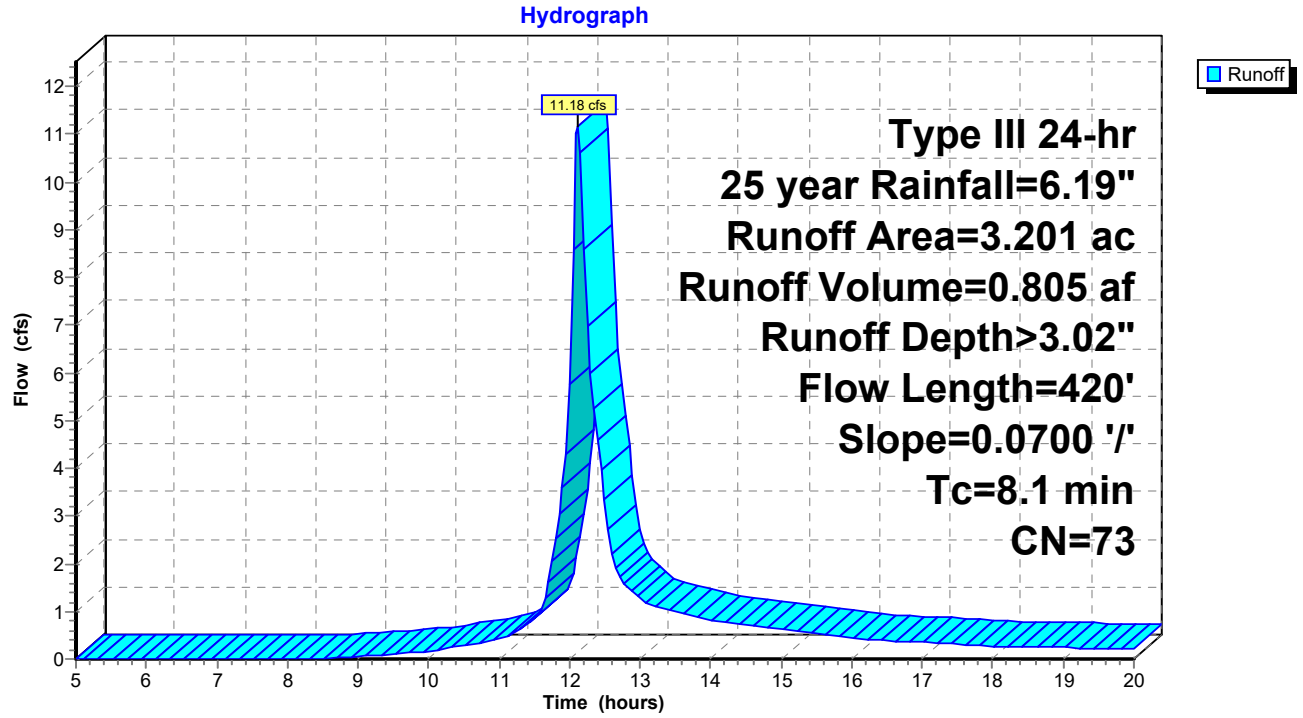
Runoff = 11.18 cfs @ 12.12 hrs, Volume= 0.805 af, Depth> 3.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
1.401	74	>75% Grass cover, Good, HSG C
0.111	80	>75% Grass cover, Good, HSG D
0.211	96	Gravel surface, HSG C
0.001	96	Gravel surface, HSG D
0.637	58	Meadow, non-grazed, HSG B
0.489	78	Meadow, non-grazed, HSG D
0.032	60	Woods, Fair, HSG B
0.319	79	Woods, Fair, HSG D
3.201	73	Weighted Average
3.201		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	50	0.0700	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
3.3	370	0.0700	1.85		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.1	420	Total			

Subcatchment 6: Subcat 6



Summary for Subcatchment 6A: Subcat 6A

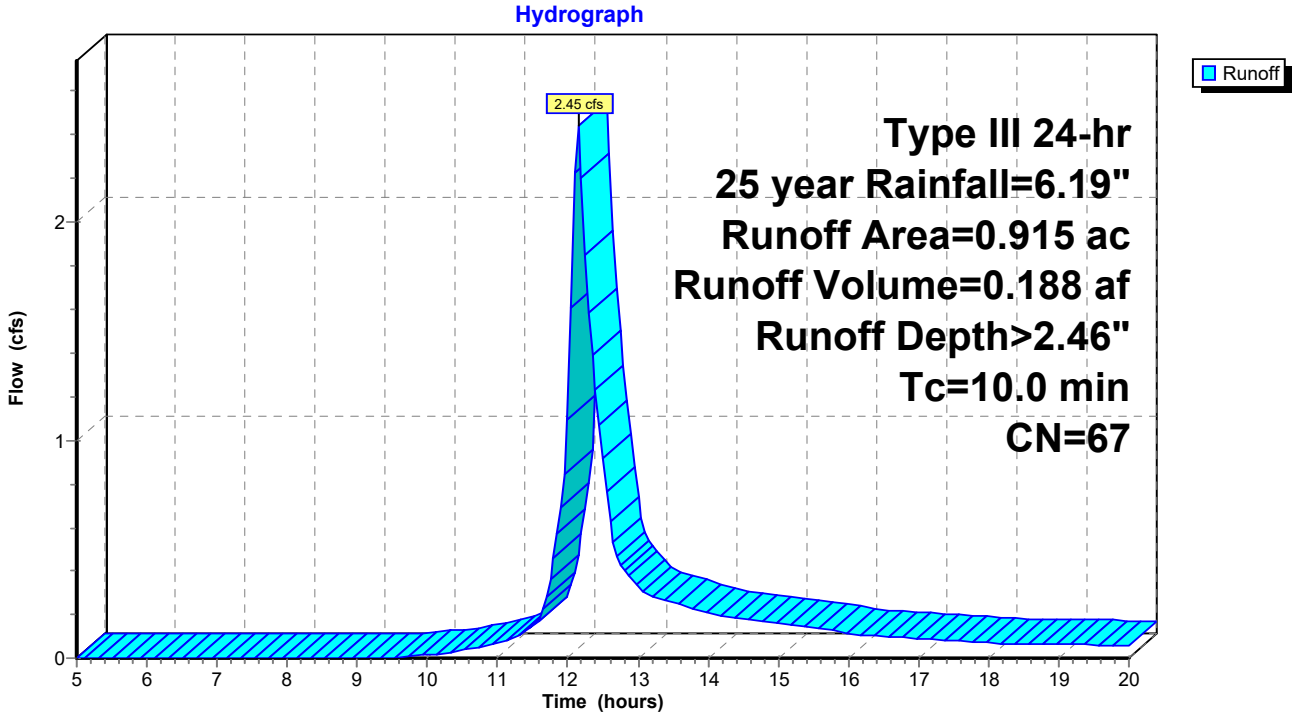
Runoff = 2.45 cfs @ 12.15 hrs, Volume= 0.188 af, Depth> 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.517	58	Meadow, non-grazed, HSG B
0.398	78	Meadow, non-grazed, HSG D
0.915	67	Weighted Average
0.915		100.00% Pervious Area

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

Subcatchment 6A: Subcat 6A



Summary for Subcatchment 6B: Subcat 6B

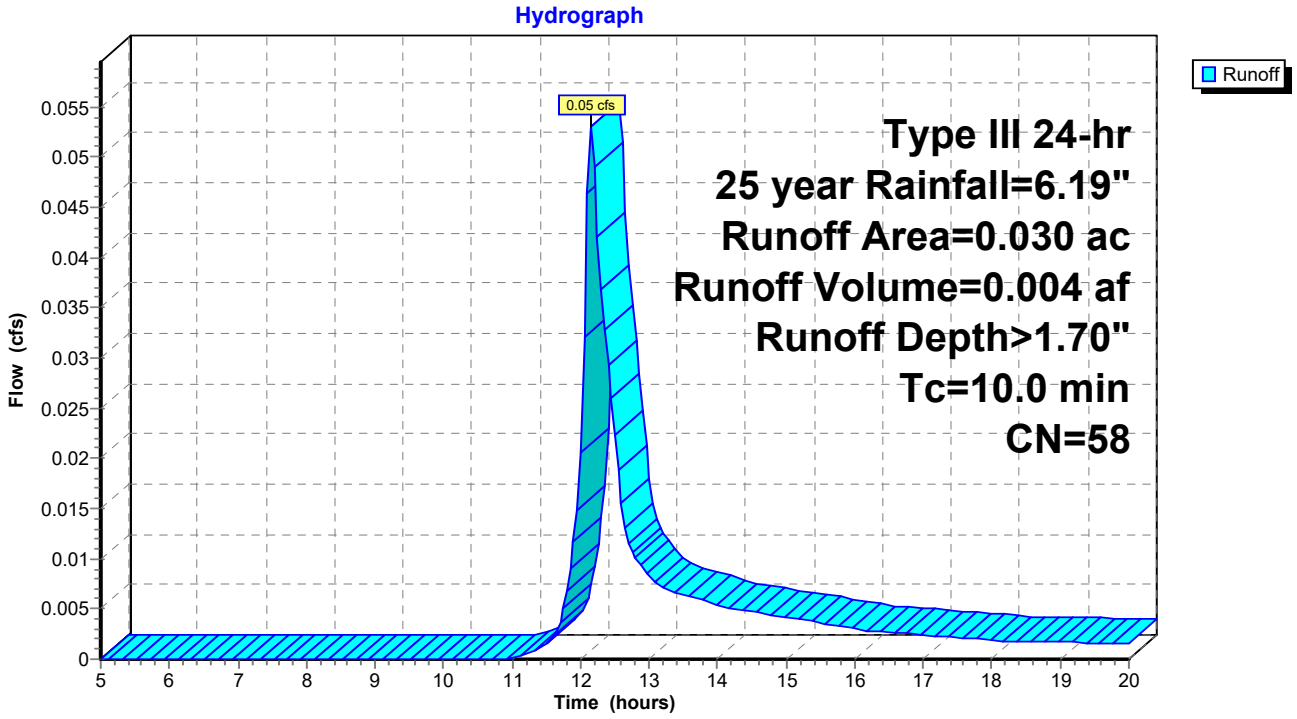
Runoff = 0.05 cfs @ 12.16 hrs, Volume= 0.004 af, Depth> 1.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.030	58	Meadow, non-grazed, HSG B
0.030		100.00% Pervious Area

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

Subcatchment 6B: Subcat 6B



Summary for Subcatchment 6C: Subcat 6C

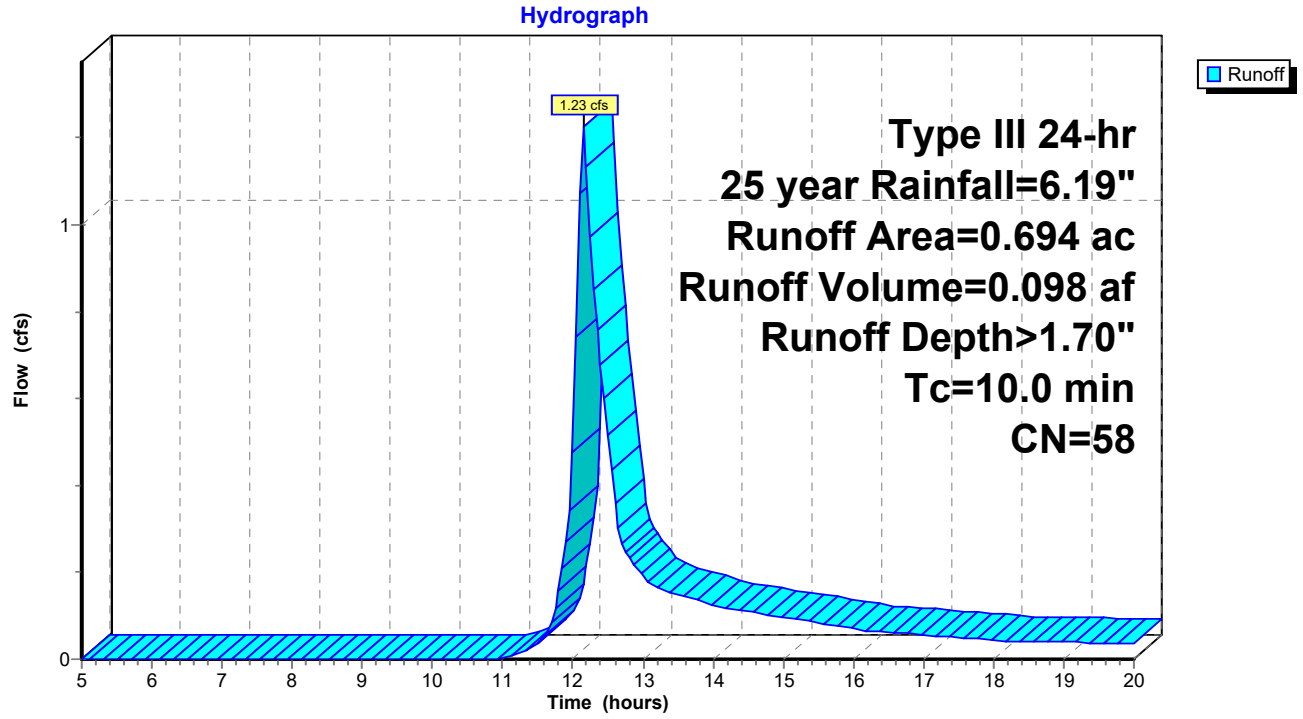
Runoff = 1.23 cfs @ 12.16 hrs, Volume= 0.098 af, Depth> 1.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.694	58	Meadow, non-grazed, HSG B
0.694		100.00% Pervious Area

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

Subcatchment 6C: Subcat 6C



Summary for Subcatchment 7: Subcat 7

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

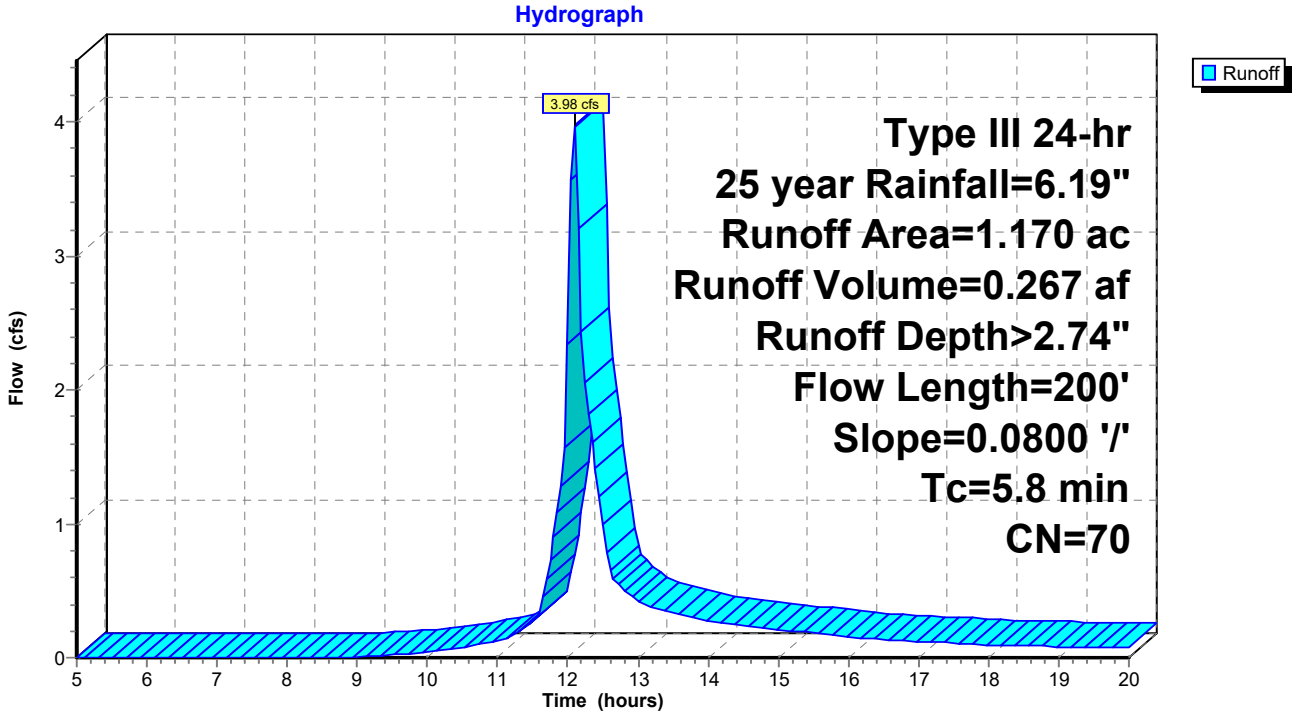
Runoff = 3.98 cfs @ 12.09 hrs, Volume= 0.267 af, Depth> 2.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.634	74	>75% Grass cover, Good, HSG C
0.117	96	Gravel surface, HSG C
0.419	58	Meadow, non-grazed, HSG B
1.170	70	Weighted Average
1.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.3	150	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.8	200	Total			

Subcatchment 7: Subcat 7



Summary for Subcatchment 7A: Subcat 7A

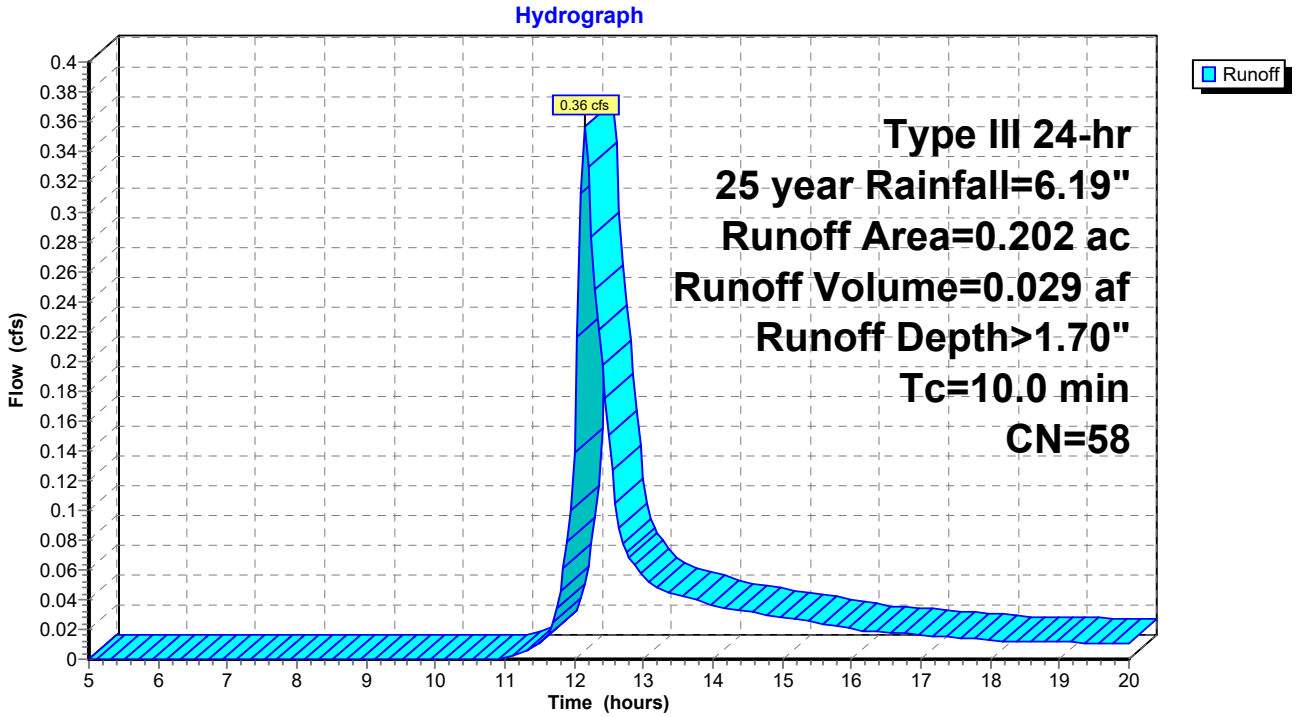
Runoff = 0.36 cfs @ 12.16 hrs, Volume= 0.029 af, Depth> 1.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.202	58	Meadow, non-grazed, HSG B
0.202		100.00% Pervious Area

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

Subcatchment 7A: Subcat 7A



Summary for Subcatchment 8: Subcat 8

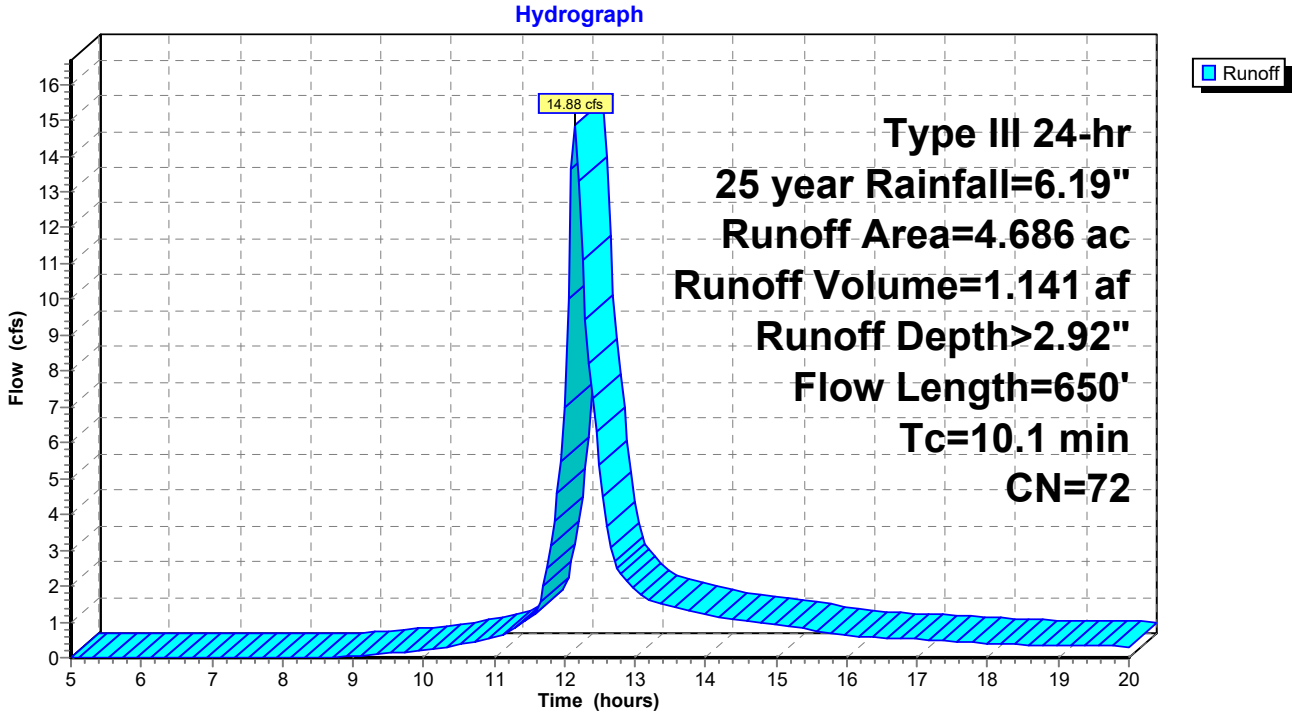
Runoff = 14.88 cfs @ 12.15 hrs, Volume= 1.141 af, Depth> 2.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
3.284	74	>75% Grass cover, Good, HSG C
0.293	96	Gravel surface, HSG C
1.109	58	Meadow, non-grazed, HSG B
4.686	72	Weighted Average
4.686		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	50	0.1100	0.21		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.9	270	0.1100	2.32		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.2	330	0.0350	1.31		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.1	650	Total			

Subcatchment 8: Subcat 8



Summary for Subcatchment 8A: Subcat 8A

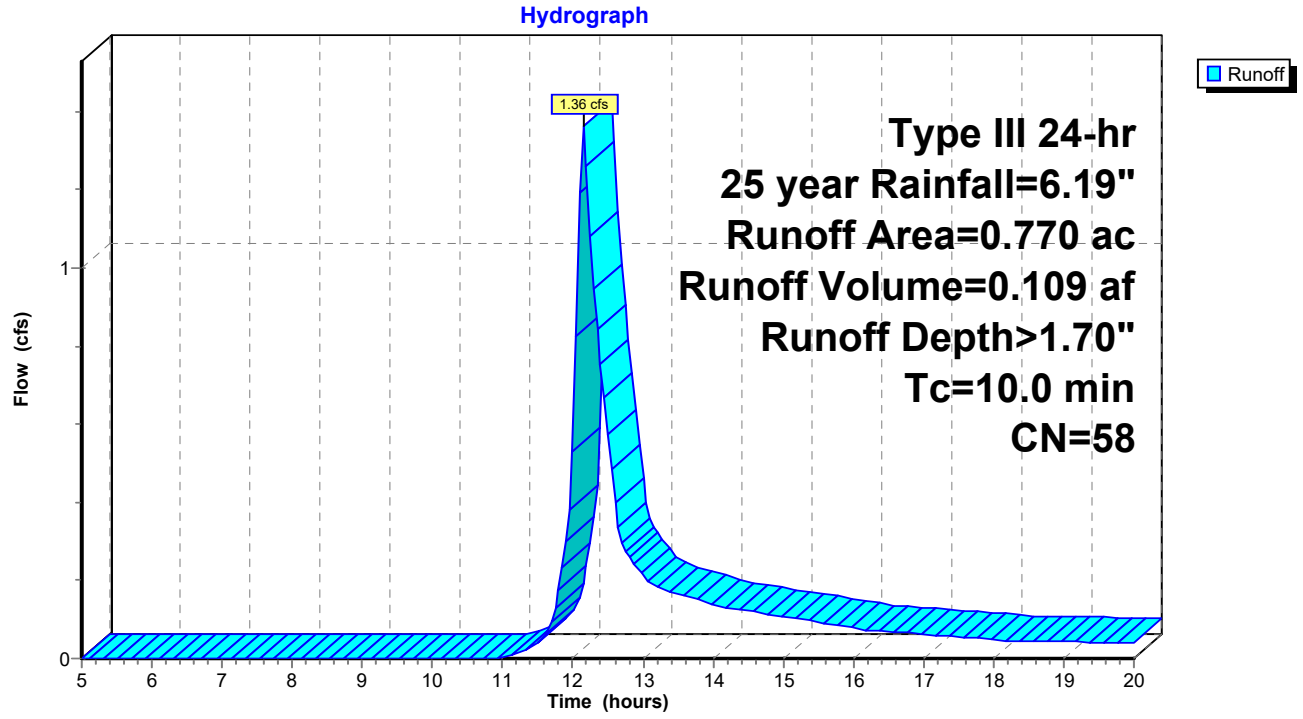
Runoff = 1.36 cfs @ 12.16 hrs, Volume= 0.109 af, Depth> 1.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.000	61	>75% Grass cover, Good, HSG B
0.003	96	Gravel surface, HSG B
0.767	58	Meadow, non-grazed, HSG B
0.770	58	Weighted Average
0.770		100.00% Pervious Area

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

Subcatchment 8A: Subcat 8A



Summary for Subcatchment 9: Subcat 9

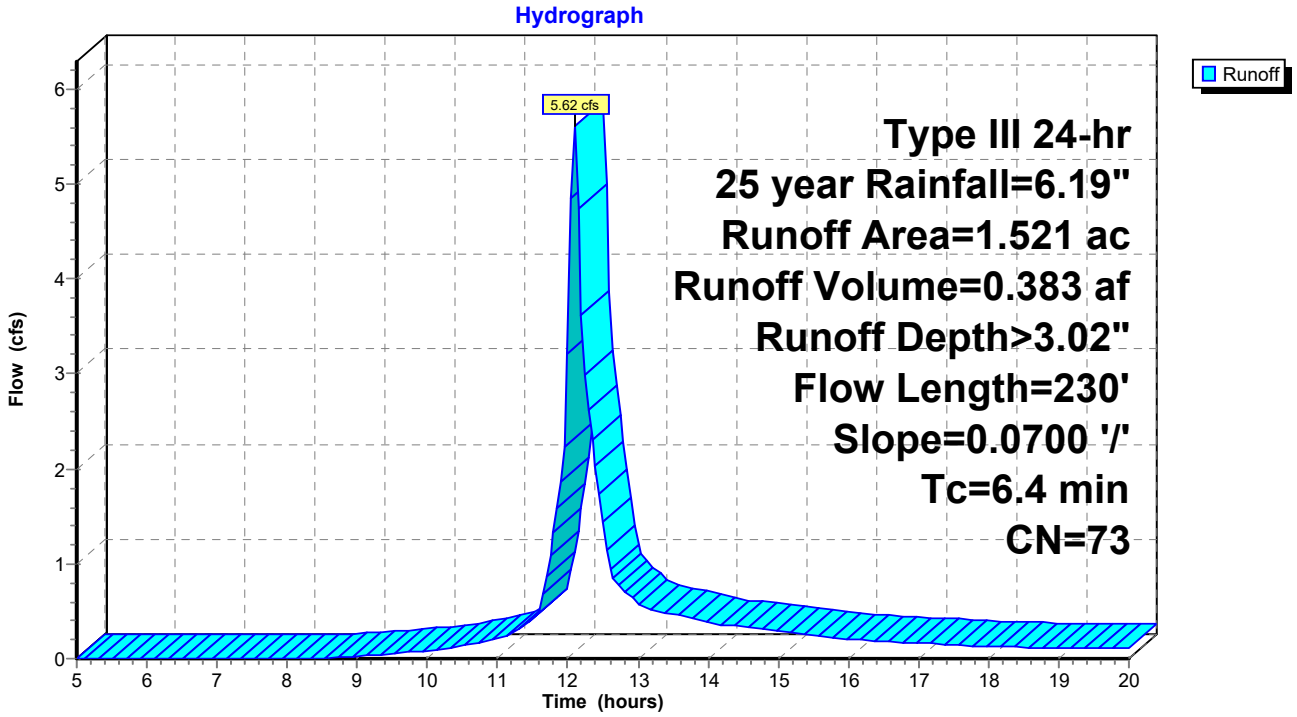
Runoff = 5.62 cfs @ 12.10 hrs, Volume= 0.383 af, Depth> 3.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.918	74	>75% Grass cover, Good, HSG C
0.199	96	Gravel surface, HSG C
0.404	58	Meadow, non-grazed, HSG B
1.521	73	Weighted Average
1.521		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	50	0.0700	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.6	180	0.0700	1.85		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.4	230	Total			

Subcatchment 9: Subcat 9



Summary for Subcatchment 9A: Subcat 9A

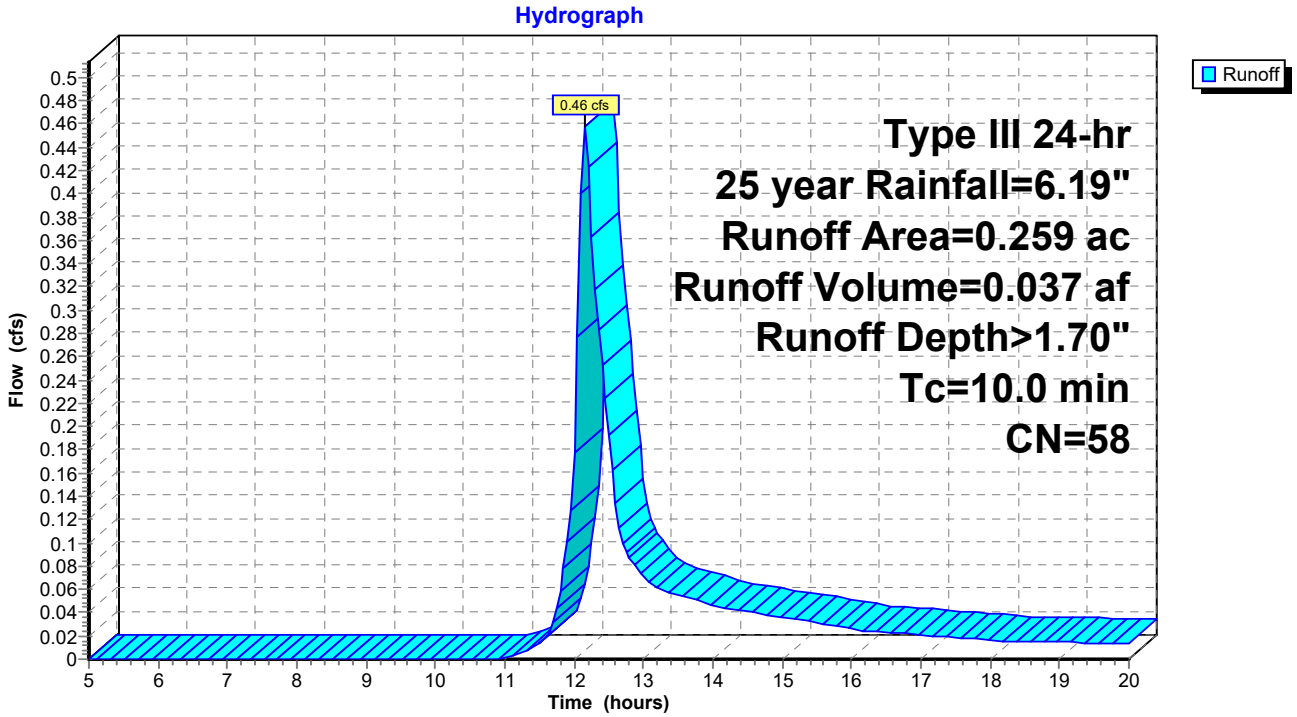
Runoff = 0.46 cfs @ 12.16 hrs, Volume= 0.037 af, Depth> 1.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.259	58	Meadow, non-grazed, HSG B
0.259		100.00% Pervious Area

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

Subcatchment 9A: Subcat 9A



Summary for Subcatchment 10: Subcat 10

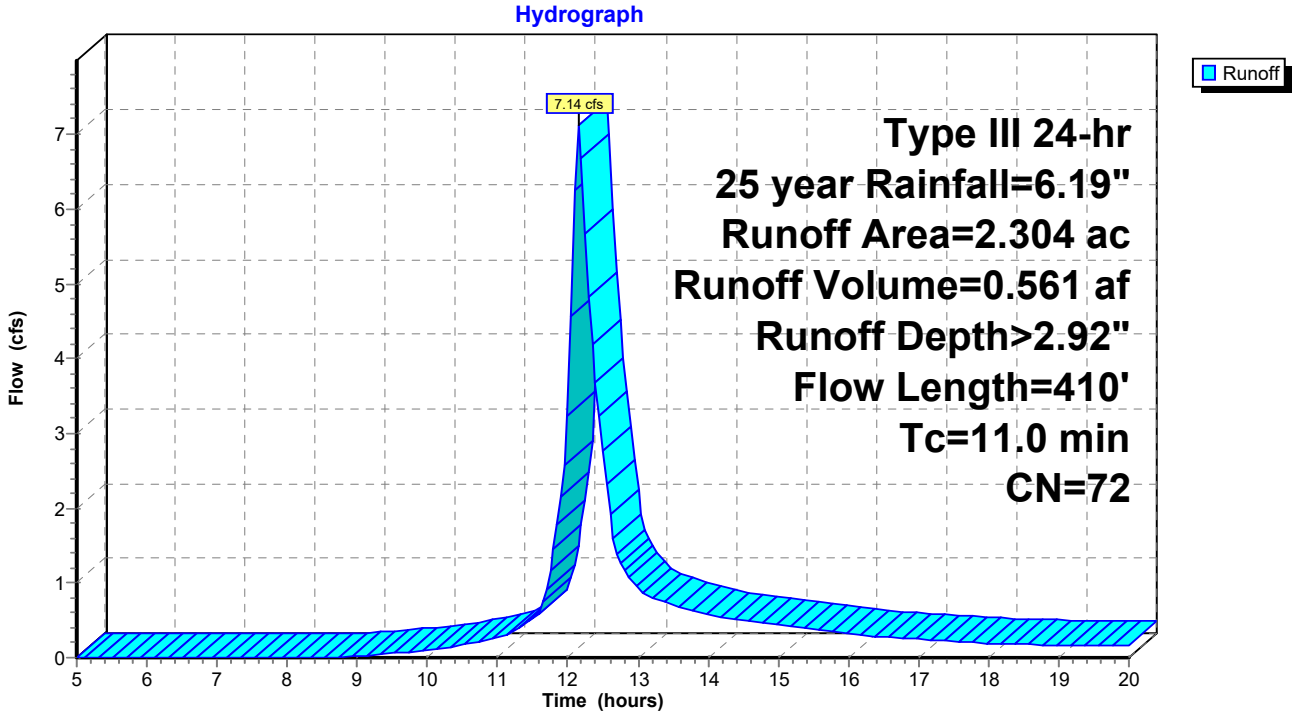
Runoff = 7.14 cfs @ 12.16 hrs, Volume= 0.561 af, Depth> 2.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
1.640	74	>75% Grass cover, Good, HSG C
0.157	96	Gravel surface, HSG C
0.507	58	Meadow, non-grazed, HSG B
2.304	72	Weighted Average
2.304		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0200	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
2.0	270	0.1000	2.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.1	90	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.0	410	Total			

Subcatchment 10: Subcat 10



Summary for Subcatchment 10A: Subcat 10A

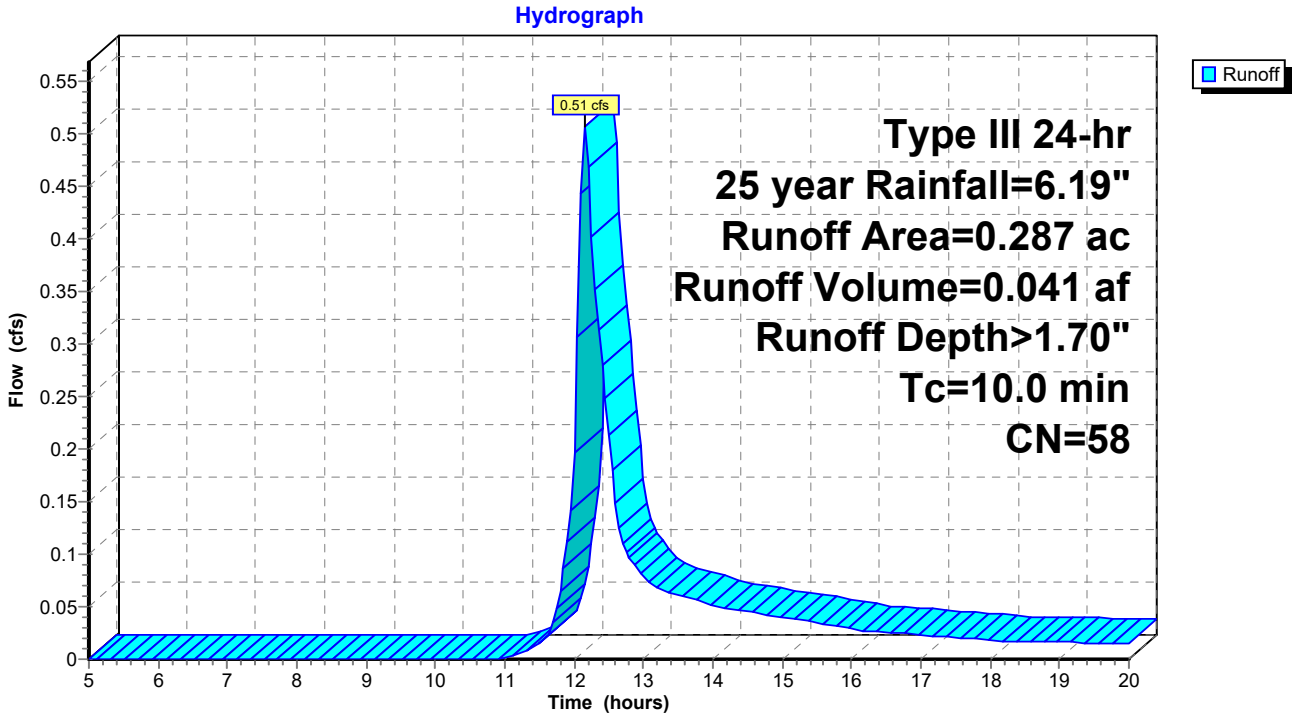
Runoff = 0.51 cfs @ 12.16 hrs, Volume= 0.041 af, Depth> 1.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.287	58	Meadow, non-grazed, HSG B
0.287		100.00% Pervious Area

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

Subcatchment 10A: Subcat 10A



Summary for Subcatchment 11: Subcat 11

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

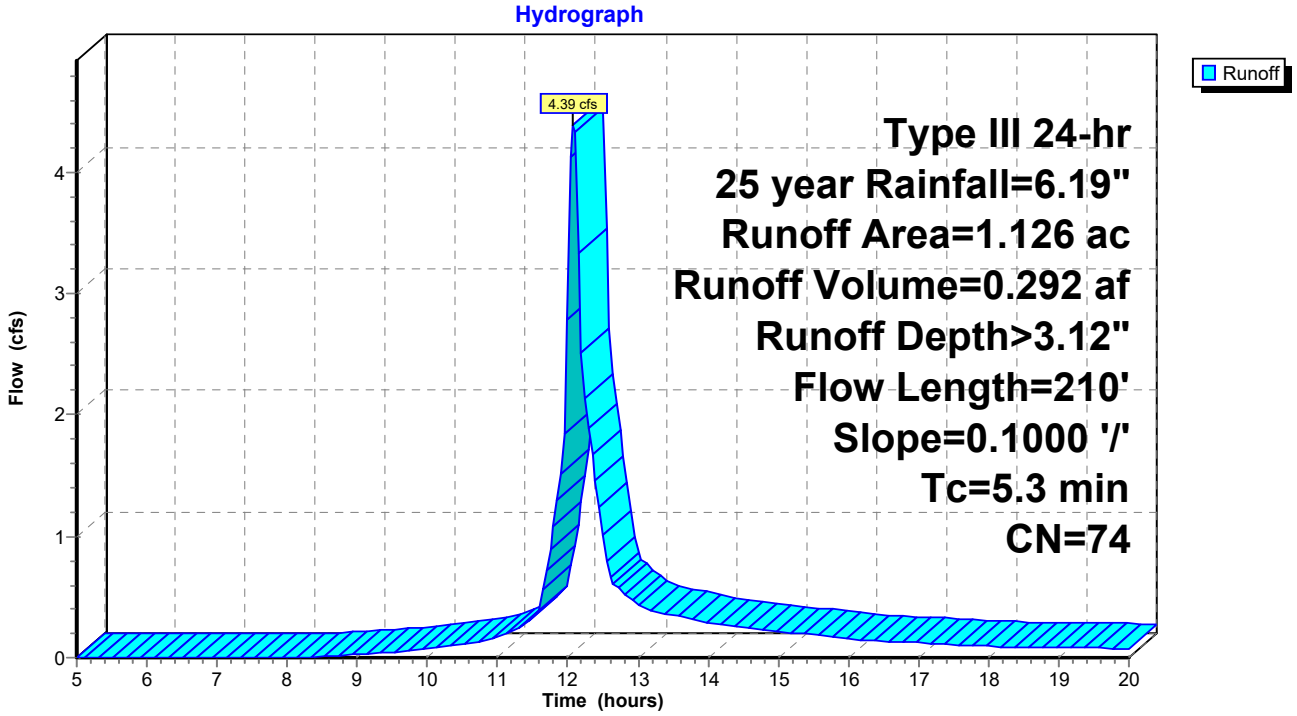
Runoff = 4.39 cfs @ 12.08 hrs, Volume= 0.292 af, Depth> 3.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.813	74	>75% Grass cover, Good, HSG C
0.144	96	Gravel surface, HSG C
0.169	58	Meadow, non-grazed, HSG B
1.126	74	Weighted Average
1.126		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.1000	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.2	160	0.1000	2.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.3	210	Total			

Subcatchment 11: Subcat 11



Summary for Subcatchment 11A: Subcat 11A

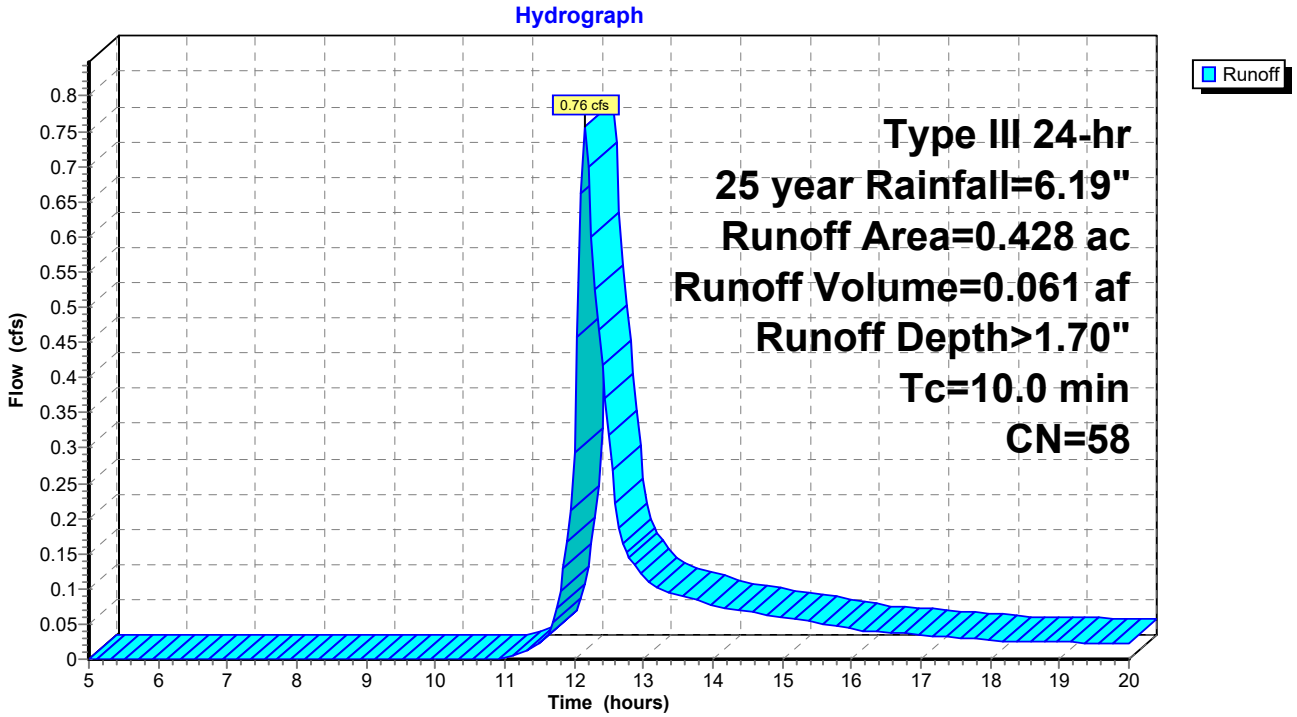
Runoff = 0.76 cfs @ 12.16 hrs, Volume= 0.061 af, Depth> 1.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.428	58	Meadow, non-grazed, HSG B
0.428		100.00% Pervious Area

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

Subcatchment 11A: Subcat 11A



Summary for Subcatchment 12: Subcat 12

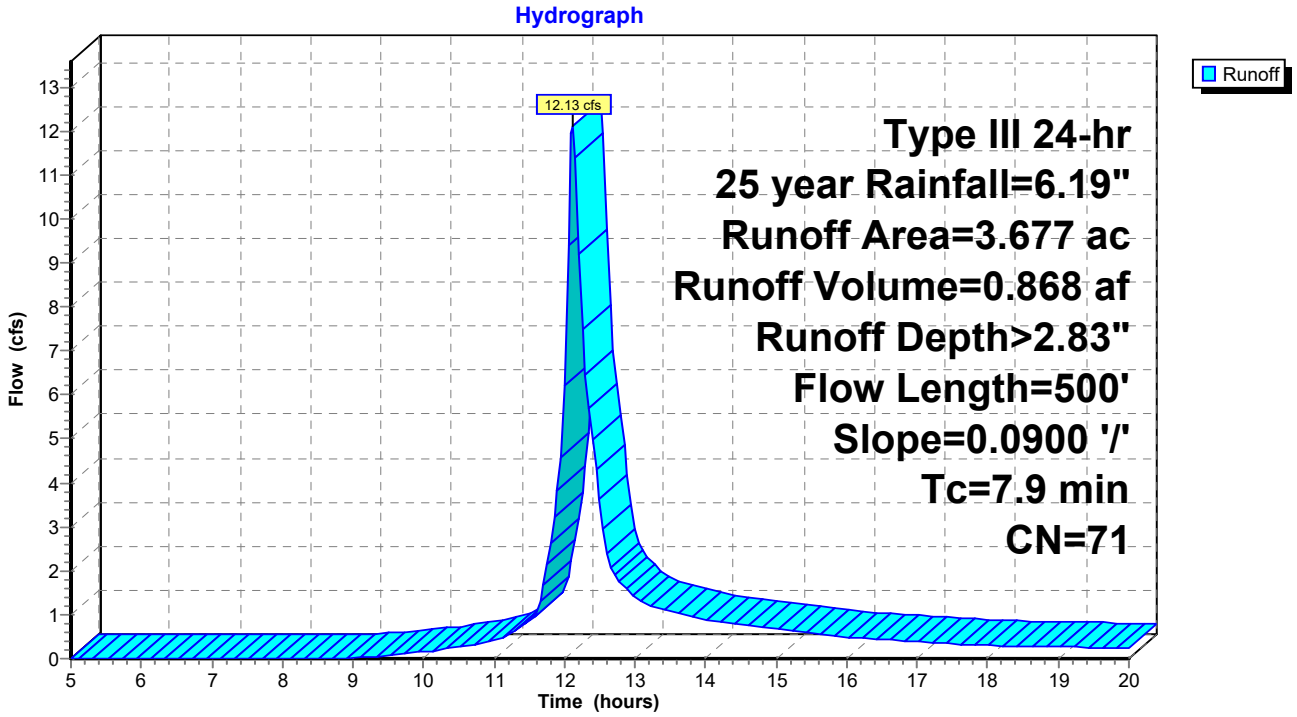
Runoff = 12.13 cfs @ 12.12 hrs, Volume= 0.868 af, Depth> 2.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
2.738	74	>75% Grass cover, Good, HSG C
0.100	96	Gravel surface, HSG C
0.839	58	Meadow, non-grazed, HSG B
3.677	71	Weighted Average
3.677		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0900	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
3.6	450	0.0900	2.10		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.9	500	Total			

Subcatchment 12: Subcat 12



Summary for Subcatchment 13.1: Subcat 13.1

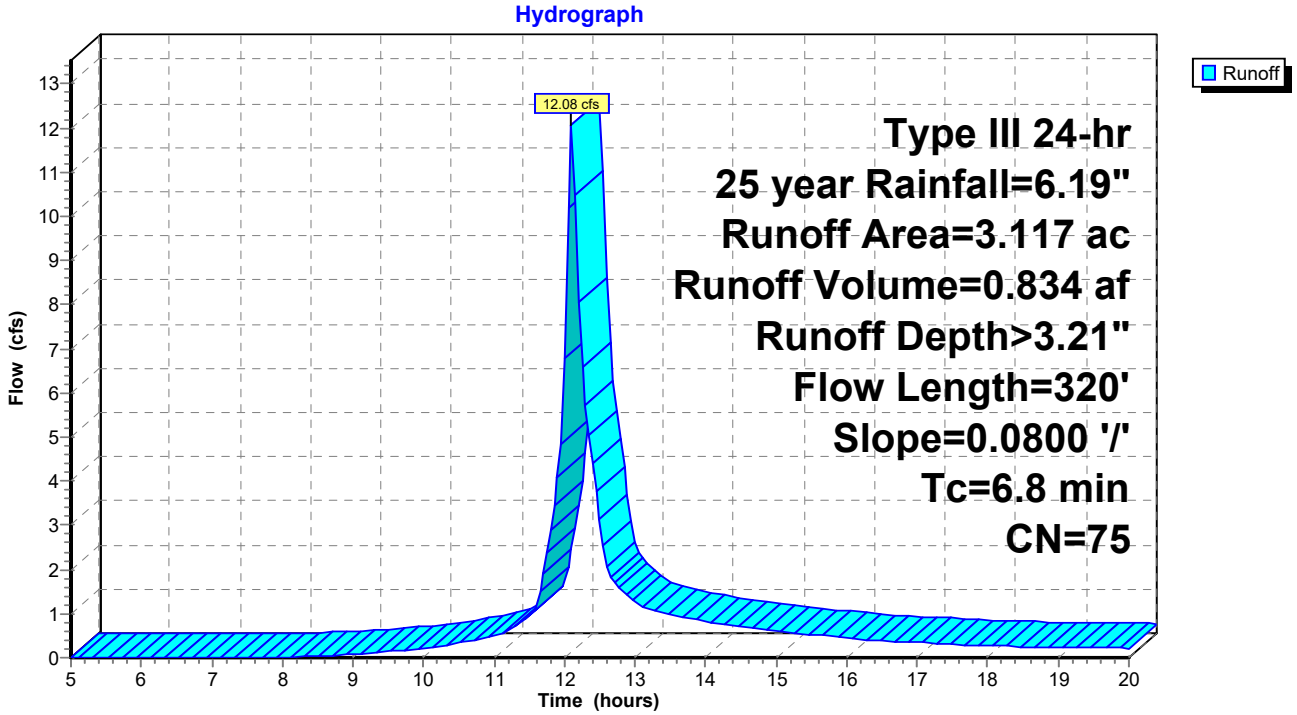
Runoff = 12.08 cfs @ 12.10 hrs, Volume= 0.834 af, Depth> 3.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
2.825	74	>75% Grass cover, Good, HSG C
0.010	80	>75% Grass cover, Good, HSG D
0.216	96	Gravel surface, HSG C
0.050	58	Meadow, non-grazed, HSG B
0.016	78	Meadow, non-grazed, HSG D
3.117	75	Weighted Average
3.117		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
2.3	270	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.8	320	Total			

Subcatchment 13.1: Subcat 13.1



Summary for Subcatchment 13.2: Subcat 13.2

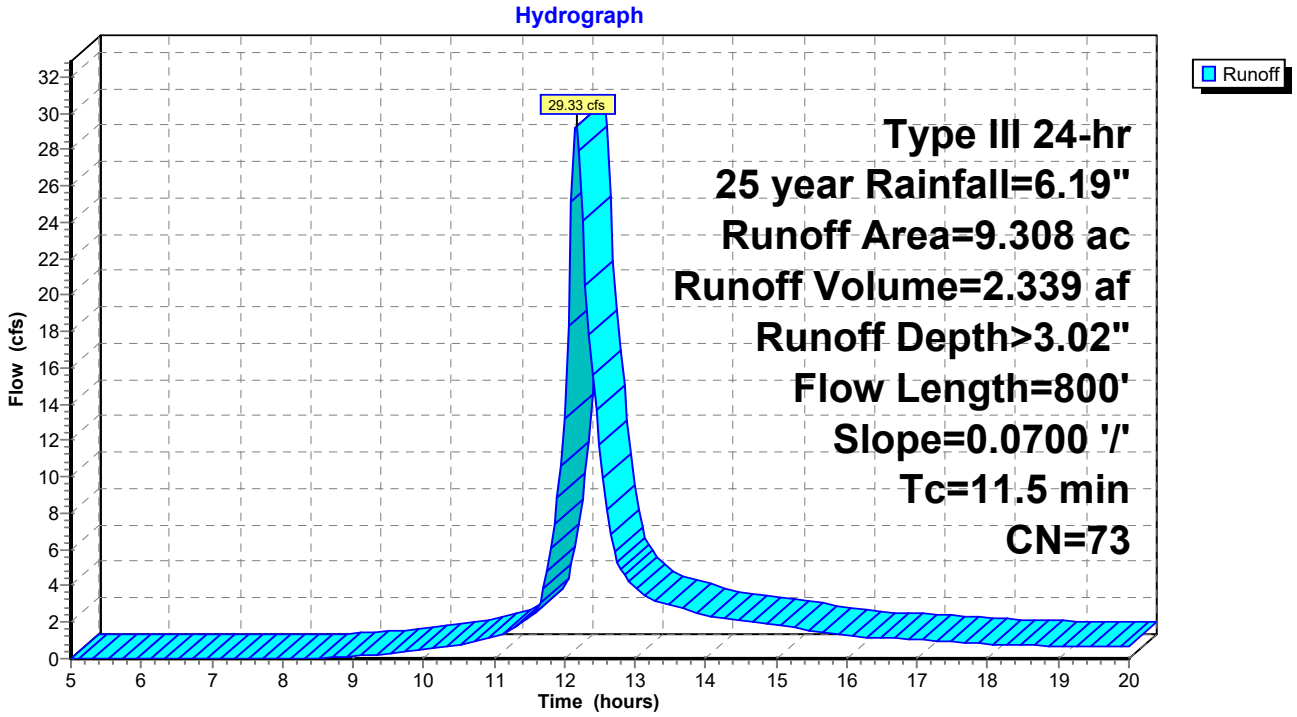
Runoff = 29.33 cfs @ 12.16 hrs, Volume= 2.339 af, Depth> 3.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
7.145	74	>75% Grass cover, Good, HSG C
0.662	96	Gravel surface, HSG C
1.501	58	Meadow, non-grazed, HSG B
9.308	73	Weighted Average
9.308		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	50	0.0700	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
6.7	750	0.0700	1.85		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.5	800	Total			

Subcatchment 13.2: Subcat 13.2



Summary for Subcatchment 14: Subcat 14

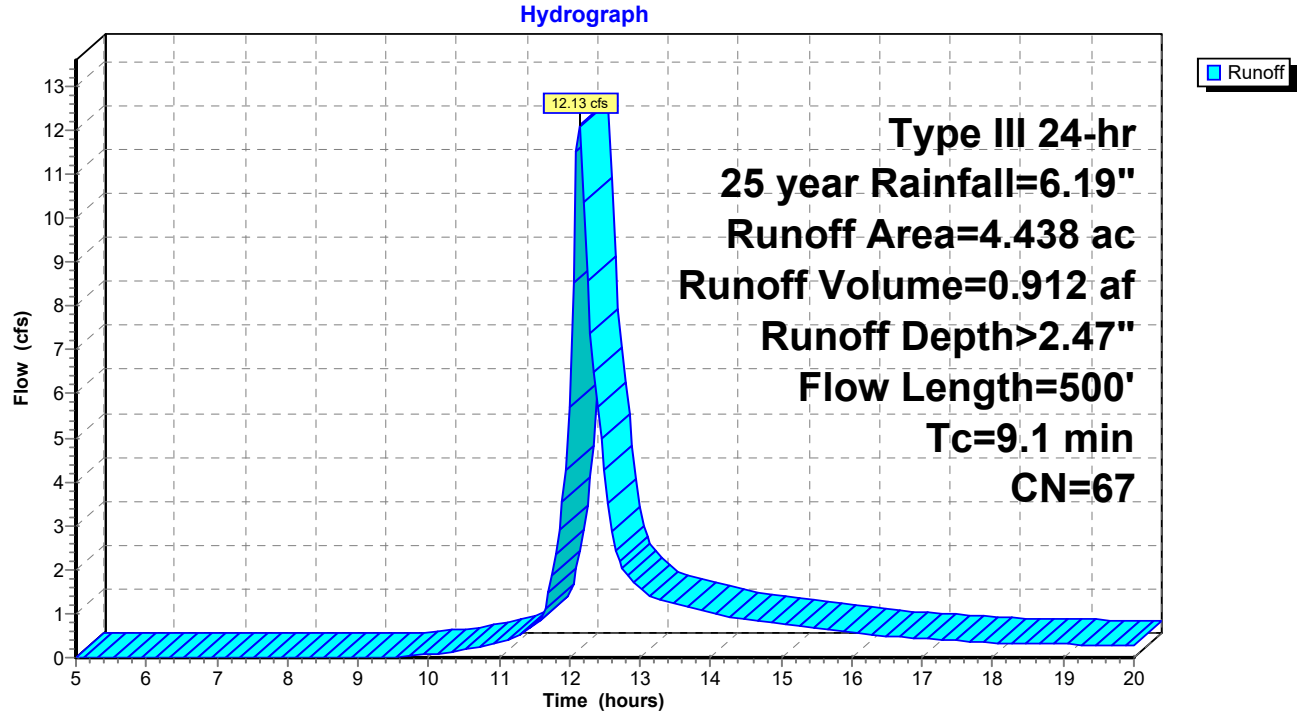
Runoff = 12.13 cfs @ 12.14 hrs, Volume= 0.912 af, Depth> 2.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
1.956	74	>75% Grass cover, Good, HSG C
0.193	96	Gravel surface, HSG C
2.289	58	Meadow, non-grazed, HSG B
4.438	67	Weighted Average
4.438		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.3	160	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.2	180	0.1300	2.52		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	110	0.2000	3.13		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.1	500	Total			

Subcatchment 14: Subcat 14



Summary for Subcatchment 16: Subcat 16

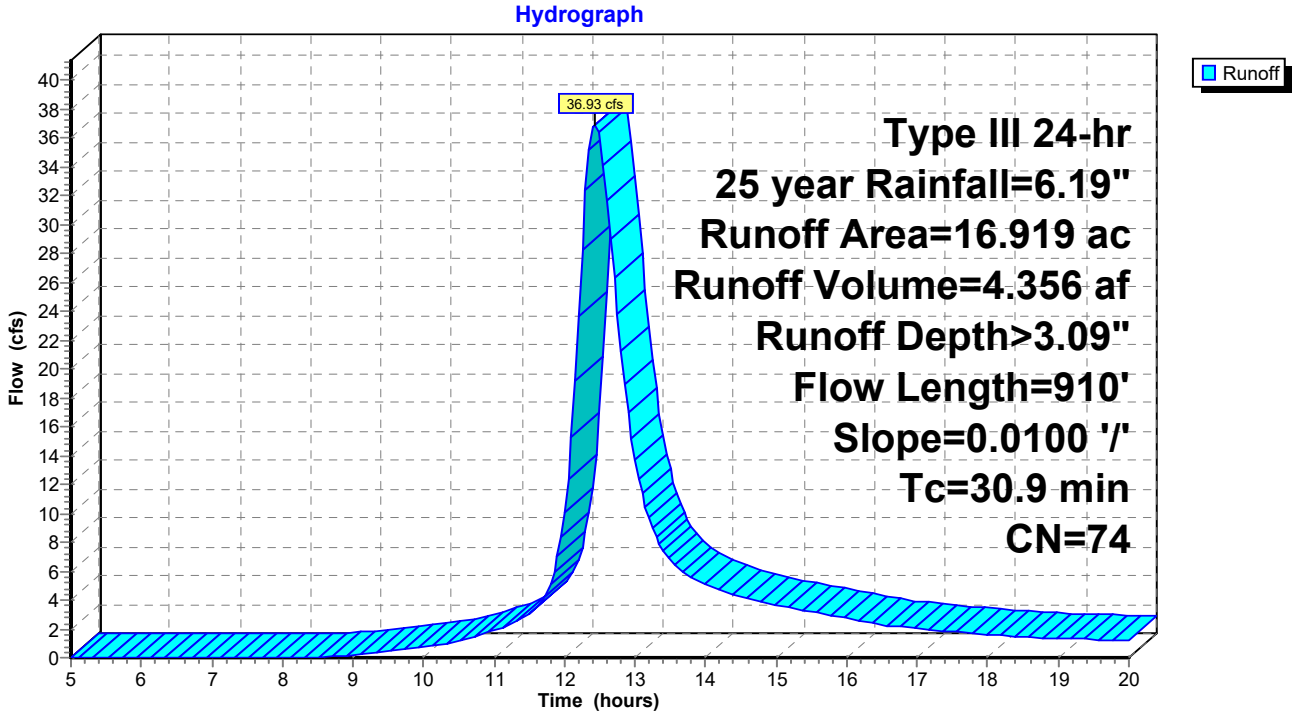
Runoff = 36.93 cfs @ 12.43 hrs, Volume= 4.356 af, Depth> 3.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
14.551	74	>75% Grass cover, Good, HSG C
1.069	96	Gravel surface, HSG C
1.299	58	Meadow, non-grazed, HSG B
16.919	74	Weighted Average
16.919		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	50	0.0100	0.08		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
11.9	500	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.6	360	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
30.9	910	Total			

Subcatchment 16: Subcat 16



Summary for Subcatchment 16A: Subcat 16A

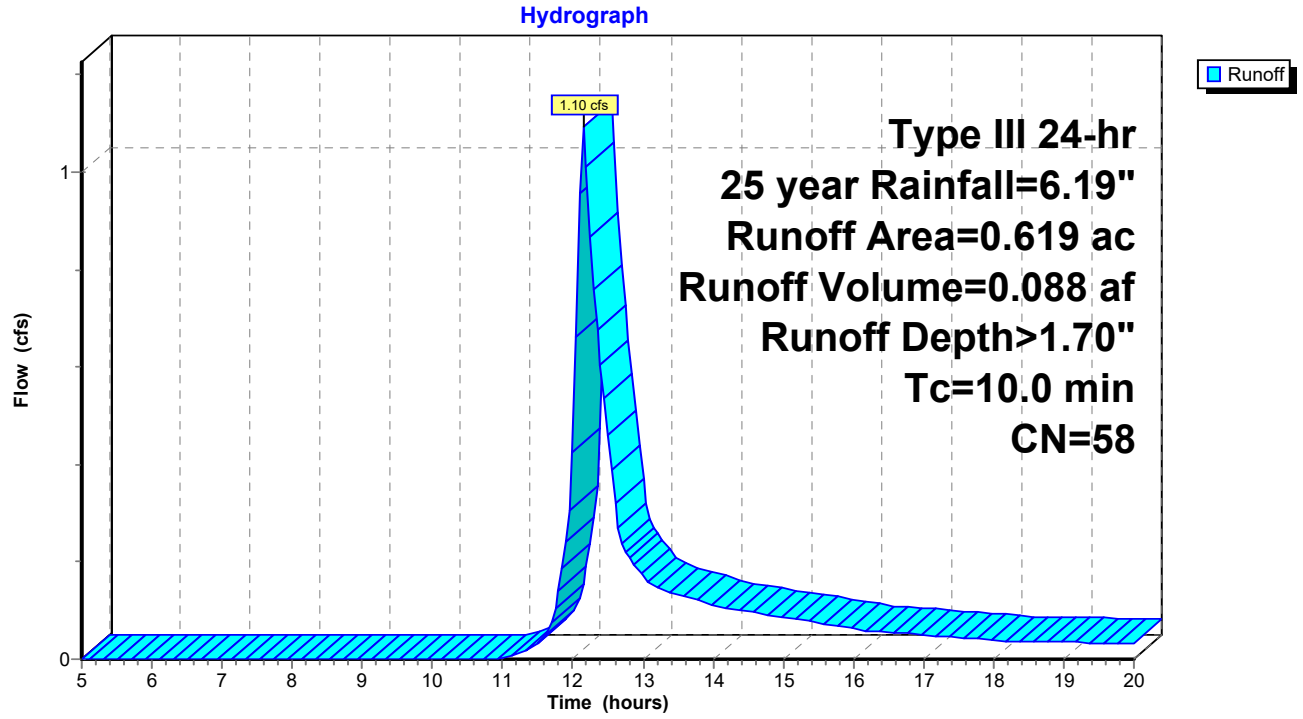
Runoff = 1.10 cfs @ 12.16 hrs, Volume= 0.088 af, Depth> 1.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.619	58	Meadow, non-grazed, HSG B
0.619		100.00% Pervious Area

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

Subcatchment 16A: Subcat 16A



Summary for Reach 13.1R: Reach 13.1

[91] Warning: Storage range exceeded by 0.19'
[55] Hint: Peak inflow is 474% of Manning's capacity
[79] Warning: Submerged Pond 13.1P Primary device # 1 by 0.29'

Inflow Area = 3.117 ac, 0.00% Impervious, Inflow Depth > 2.28" for 25 year event
Inflow = 4.52 cfs @ 12.39 hrs, Volume= 0.592 af
Outflow = 4.44 cfs @ 12.51 hrs, Volume= 0.589 af, Atten= 2%, Lag= 7.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.45 fps, Min. Travel Time= 3.4 min
Avg. Velocity = 1.68 fps, Avg. Travel Time= 4.9 min

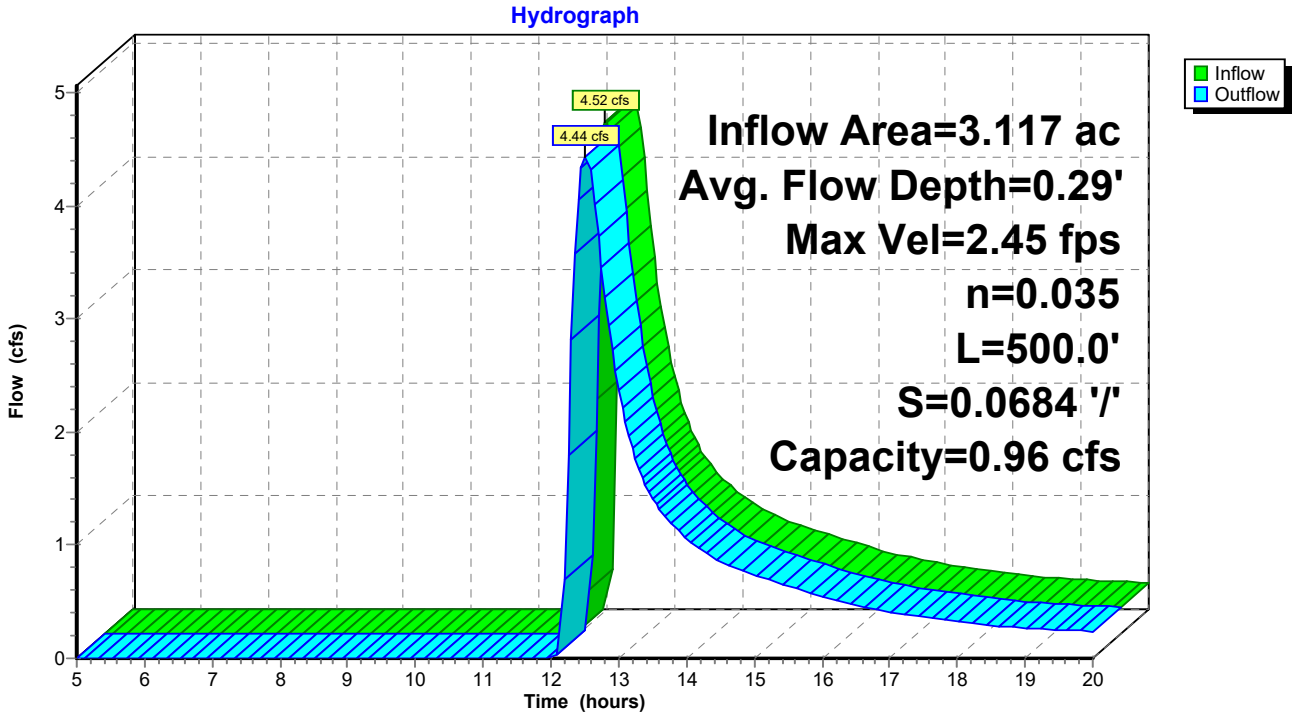
Peak Storage= 906 cf @ 12.45 hrs
Average Depth at Peak Storage= 0.29'
Bank-Full Depth= 0.10' Flow Area= 0.5 sf, Capacity= 0.96 cfs

3.00' x 0.10' deep channel, n= 0.035
Side Slope Z-value= 20.0 '/' Top Width= 7.00'
Length= 500.0' Slope= 0.0684 '/'
Inlet Invert= 224.20', Outlet Invert= 190.00'



‡

Reach 13.1R: Reach 13.1



Summary for Pond 1P: Pond 1

Inflow Area = 3.006 ac, 0.00% Impervious, Inflow Depth > 2.74" for 25 year event
Inflow = 9.55 cfs @ 12.12 hrs, Volume= 0.686 af
Outflow = 4.80 cfs @ 12.33 hrs, Volume= 0.549 af, Atten= 50%, Lag= 12.9 min
Primary = 4.80 cfs @ 12.33 hrs, Volume= 0.549 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 191.75' Surf.Area= 3,745 sf Storage= 5,323 cf
Peak Elev= 193.93' @ 12.33 hrs Surf.Area= 5,761 sf Storage= 15,624 cf (10,301 cf above start)

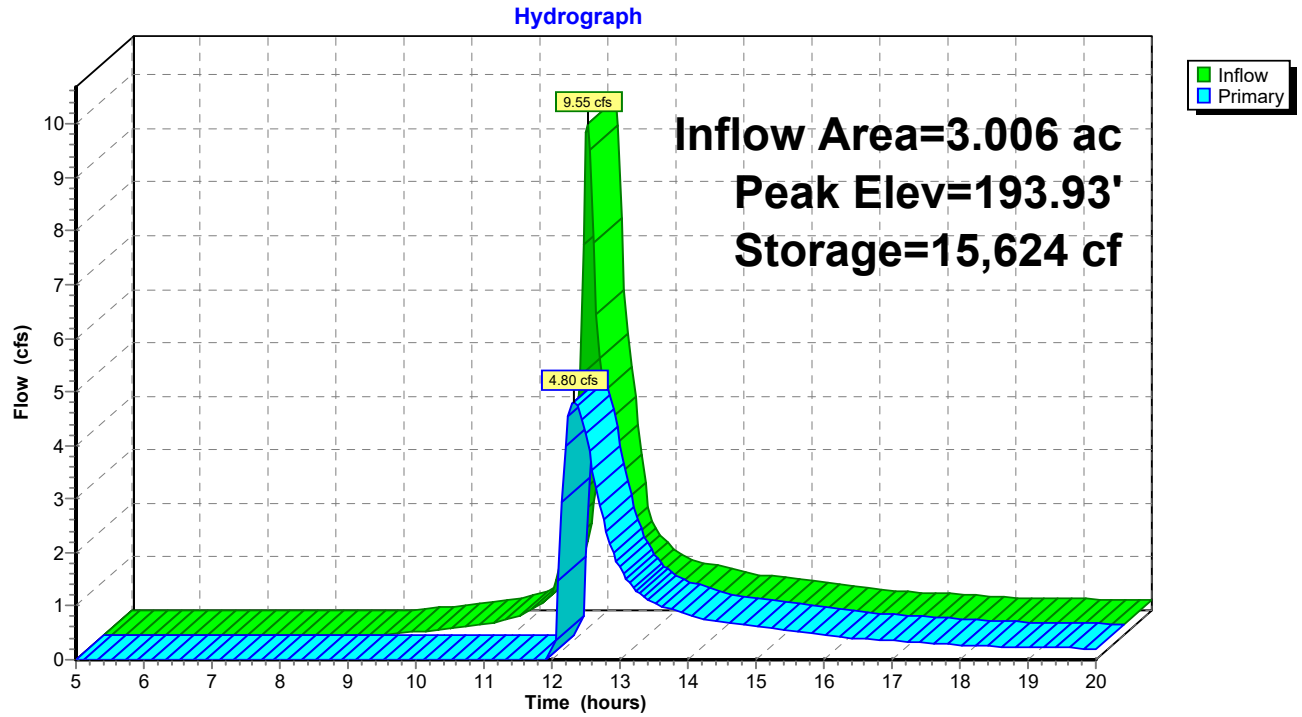
Plug-Flow detention time= 148.5 min calculated for 0.427 af (62% of inflow)
Center-of-Mass det. time= 42.0 min (842.5 - 800.5)

Volume	Invert	Avail.Storage	Storage Description
#1	190.00'	22,375 cf	**25.00'W x 95.00'L x 5.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	193.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=4.78 cfs @ 12.33 hrs HW=193.93' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 4.78 cfs @ 2.58 fps)

Pond 1P: Pond 1



Summary for Pond 2P: Pond 2

Inflow Area = 2.551 ac, 0.00% Impervious, Inflow Depth > 2.92" for 25 year event
Inflow = 7.58 cfs @ 12.17 hrs, Volume= 0.621 af
Outflow = 2.75 cfs @ 12.56 hrs, Volume= 0.422 af, Atten= 64%, Lag= 23.2 min
Discarded = 0.37 cfs @ 12.56 hrs, Volume= 0.248 af
Primary = 2.38 cfs @ 12.56 hrs, Volume= 0.174 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 231.38' @ 12.56 hrs Surf.Area= 4,720 sf Storage= 11,717 cf

Plug-Flow detention time= 142.9 min calculated for 0.420 af (68% of inflow)
Center-of-Mass det. time= 74.3 min (874.7 - 800.3)

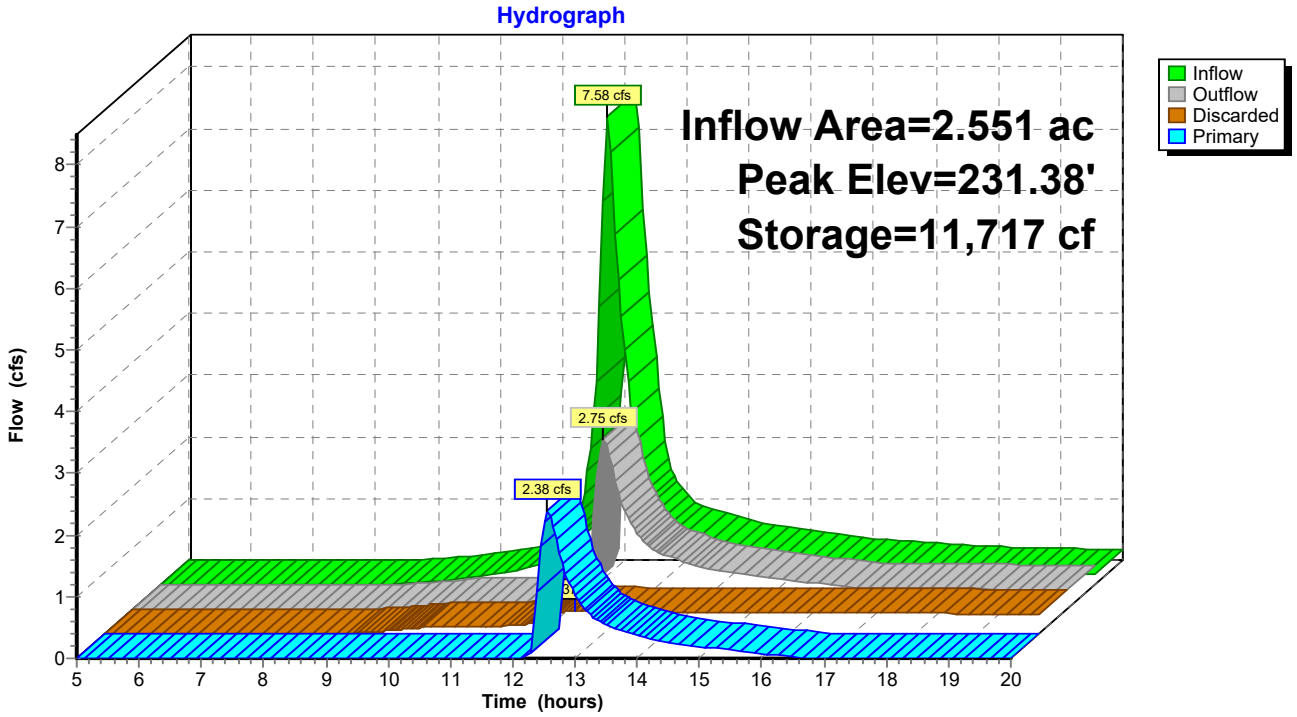
Volume	Invert	Avail.Storage	Storage Description
#1	227.50'	17,625 cf	**15.00'W x 100.00'L x 5.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	231.00'	**4.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	227.50'	**3.000 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 200.00'

Discarded OutFlow Max=0.37 cfs @ 12.56 hrs HW=231.38' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.37 cfs)

Primary OutFlow Max=2.35 cfs @ 12.56 hrs HW=231.38' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 2.35 cfs @ 1.55 fps)

Pond 2P: Pond 2



Summary for Pond 3P: Pond 3

Inflow Area = 2.550 ac, 0.00% Impervious, Inflow Depth > 3.01" for 25 year event
Inflow = 7.73 cfs @ 12.18 hrs, Volume= 0.640 af
Outflow = 3.40 cfs @ 12.50 hrs, Volume= 0.492 af, Atten= 56%, Lag= 19.5 min
Primary = 3.40 cfs @ 12.50 hrs, Volume= 0.492 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 227.67' @ 12.50 hrs Surf.Area= 5,383 sf Storage= 11,360 cf

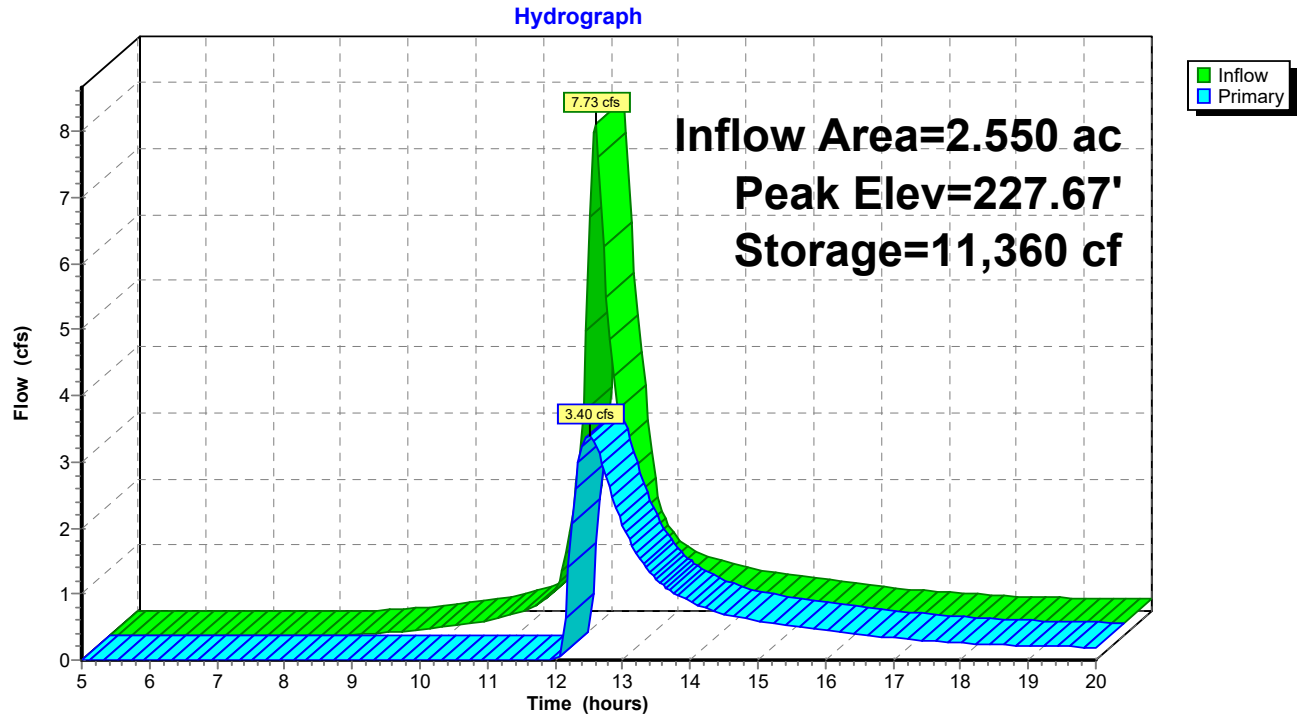
Plug-Flow detention time= 112.2 min calculated for 0.492 af (77% of inflow)
Center-of-Mass det. time= 54.5 min (853.1 - 798.6)

Volume	Invert	Avail.Storage	Storage Description
#1	225.00'	16,125 cf	**40.00'W x 80.00'L x 3.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	226.50'	**1.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=3.39 cfs @ 12.50 hrs HW=227.67' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 3.39 cfs @ 2.89 fps)

Pond 3P: Pond 3



Summary for Pond 4P: Pond 4

Inflow Area = 5.871 ac, 0.00% Impervious, Inflow Depth > 3.01" for 25 year event
Inflow = 16.27 cfs @ 12.23 hrs, Volume= 1.473 af
Outflow = 5.72 cfs @ 12.66 hrs, Volume= 0.857 af, Atten= 65%, Lag= 26.0 min
Primary = 5.72 cfs @ 12.66 hrs, Volume= 0.857 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 186.00' Surf.Area= 11,484 sf Storage= 20,436 cf
Peak Elev= 188.43' @ 12.66 hrs Surf.Area= 14,884 sf Storage= 52,343 cf (31,907 cf above start)

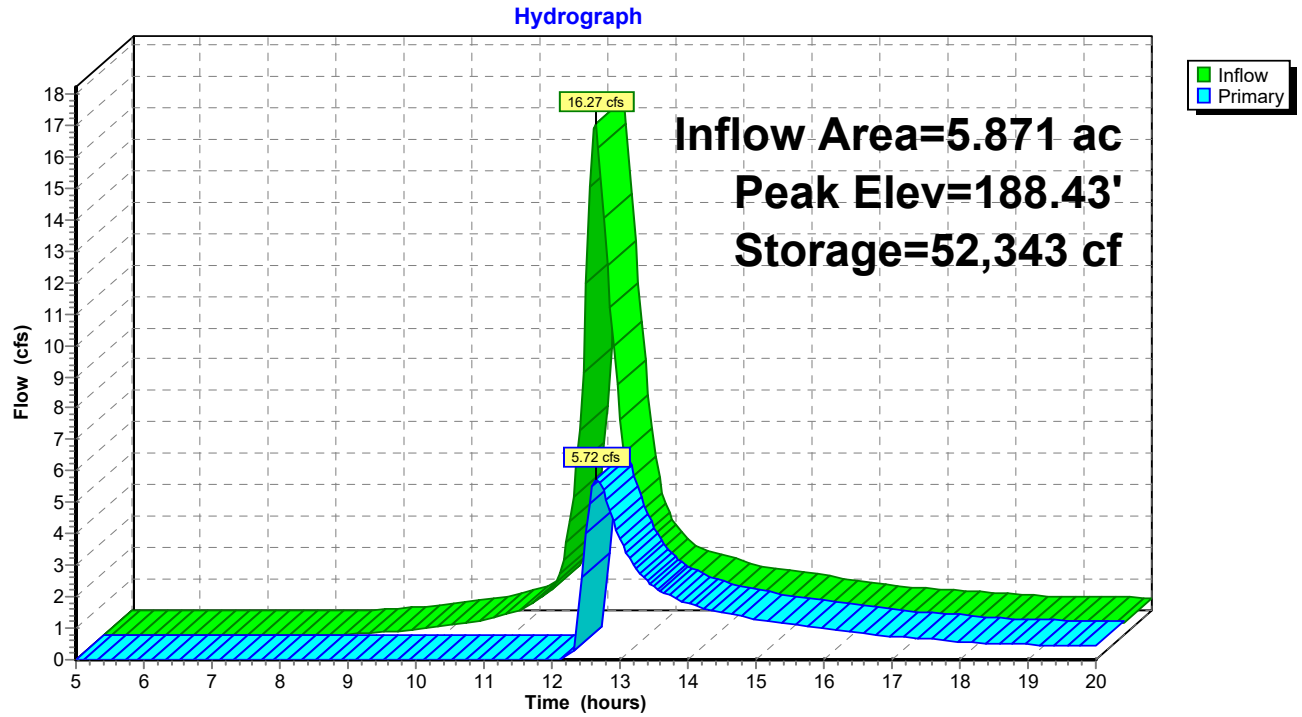
Plug-Flow detention time= 287.4 min calculated for 0.388 af (26% of inflow)
Center-of-Mass det. time= 77.0 min (878.4 - 801.4)

Volume	Invert	Avail.Storage	Storage Description
#1	184.00'	77,652 cf	**75.00'W x 120.00'L x 6.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	188.00'	**8.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=5.69 cfs @ 12.66 hrs HW=188.43' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 5.69 cfs @ 1.67 fps)

Pond 4P: Pond 4



Summary for Pond 5P: Pond 5

Inflow Area = 2.637 ac, 0.00% Impervious, Inflow Depth > 2.55" for 25 year event
Inflow = 7.24 cfs @ 12.15 hrs, Volume= 0.561 af
Outflow = 2.75 cfs @ 12.51 hrs, Volume= 0.380 af, Atten= 62%, Lag= 21.2 min
Primary = 2.75 cfs @ 12.51 hrs, Volume= 0.380 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 218.64' @ 12.51 hrs Surf.Area= 4,993 sf Storage= 10,437 cf

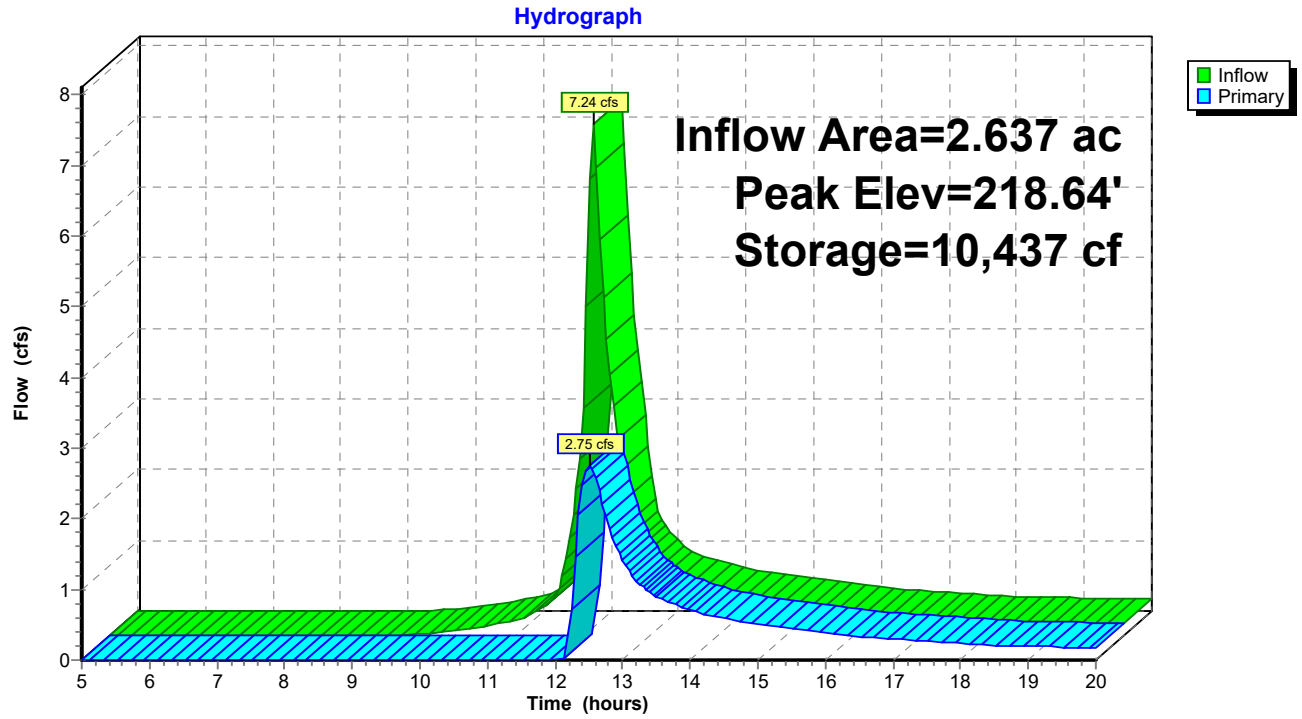
Plug-Flow detention time= 130.9 min calculated for 0.380 af (68% of inflow)
Center-of-Mass det. time= 60.2 min (866.2 - 806.0)

Volume	Invert	Avail.Storage	Storage Description
#1	216.00'	18,048 cf	**60.00'W x 50.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	218.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=2.74 cfs @ 12.51 hrs HW=218.64' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 2.74 cfs @ 2.15 fps)

Pond 5P: Pond 5



Summary for Pond 6P: Pond 6

Inflow Area = 3.201 ac, 0.00% Impervious, Inflow Depth > 3.02" for 25 year event
Inflow = 11.18 cfs @ 12.12 hrs, Volume= 0.805 af
Outflow = 5.36 cfs @ 12.35 hrs, Volume= 0.580 af, Atten= 52%, Lag= 13.8 min
Primary = 5.36 cfs @ 12.35 hrs, Volume= 0.580 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 207.00' Surf.Area= 3,844 sf Storage= 6,296 cf
Peak Elev= 209.76' @ 12.35 hrs Surf.Area= 6,174 sf Storage= 20,009 cf (13,713 cf above start)

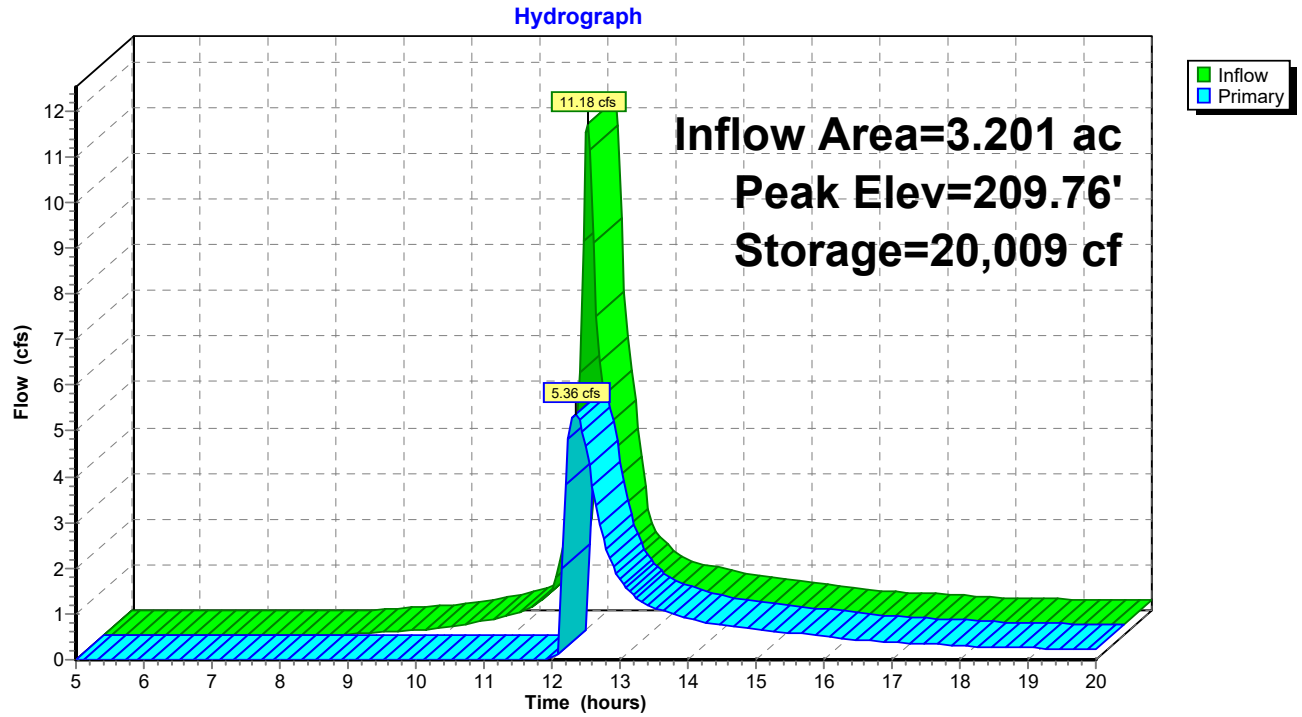
Plug-Flow detention time= 167.3 min calculated for 0.435 af (54% of inflow)
Center-of-Mass det. time= 51.3 min (846.3 - 795.1)

Volume	Invert	Avail.Storage	Storage Description
#1	205.00'	24,822 cf	**50.00'W x 50.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	209.00'	**3.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=5.36 cfs @ 12.35 hrs HW=209.76' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 5.36 cfs @ 2.34 fps)

Pond 6P: Pond 6



Summary for Pond 7P: Pond 7

Inflow Area = 1.170 ac, 0.00% Impervious, Inflow Depth > 2.74" for 25 year event
Inflow = 3.98 cfs @ 12.09 hrs, Volume= 0.267 af
Outflow = 0.99 cfs @ 12.51 hrs, Volume= 0.202 af, Atten= 75%, Lag= 24.8 min
Discarded = 0.24 cfs @ 12.51 hrs, Volume= 0.155 af
Primary = 0.75 cfs @ 12.51 hrs, Volume= 0.048 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 226.29' @ 12.51 hrs Surf.Area= 2,372 sf Storage= 4,998 cf

Plug-Flow detention time= 153.1 min calculated for 0.202 af (76% of inflow)
Center-of-Mass det. time= 92.4 min (891.2 - 798.8)

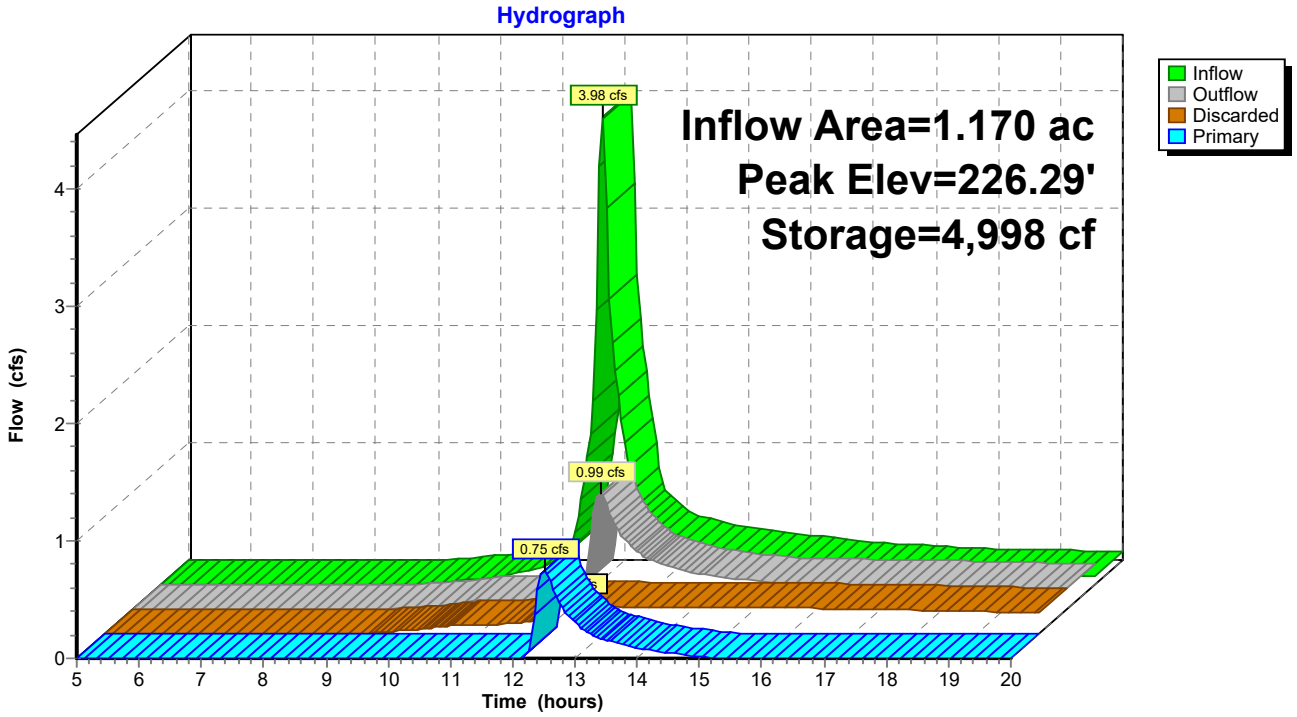
Volume	Invert	Avail.Storage	Storage Description
#1	223.00'	8,339 cf	**20.00'W x 40.00'L x 4.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	226.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	223.00'	**3.900 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 200.00'

Discarded OutFlow Max=0.24 cfs @ 12.51 hrs HW=226.29' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.24 cfs)

Primary OutFlow Max=0.75 cfs @ 12.51 hrs HW=226.29' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.75 cfs @ 1.31 fps)

Pond 7P: Pond 7



Summary for Pond 8P: Pond 8

Inflow Area = 4.686 ac, 0.00% Impervious, Inflow Depth > 2.92" for 25 year event
Inflow = 14.88 cfs @ 12.15 hrs, Volume= 1.141 af
Outflow = 6.77 cfs @ 12.42 hrs, Volume= 0.914 af, Atten= 54%, Lag= 16.7 min
Primary = 6.77 cfs @ 12.42 hrs, Volume= 0.914 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 189.93' @ 12.42 hrs Surf.Area= 7,942 sf Storage= 18,785 cf

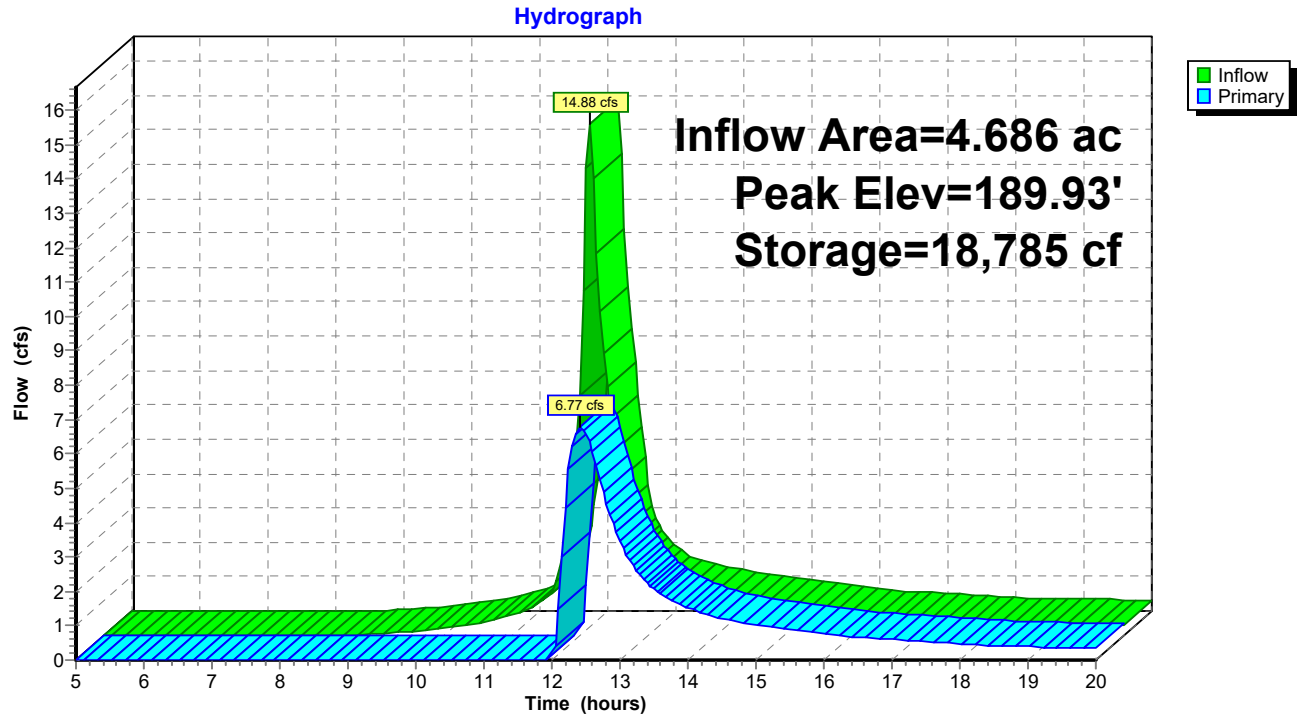
Plug-Flow detention time= 100.0 min calculated for 0.911 af (80% of inflow)
Center-of-Mass det. time= 48.0 min (846.5 - 798.5)

Volume	Invert	Avail.Storage	Storage Description
#1	187.00'	27,968 cf	**50.00'W x 100.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	188.50'	**1.5' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=6.75 cfs @ 12.42 hrs HW=189.92' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 6.75 cfs @ 3.16 fps)

Pond 8P: Pond 8



Summary for Pond 9P: Pond 9

Inflow Area = 1.521 ac, 0.00% Impervious, Inflow Depth > 3.02" for 25 year event
Inflow = 5.62 cfs @ 12.10 hrs, Volume= 0.383 af
Outflow = 1.35 cfs @ 12.52 hrs, Volume= 0.221 af, Atten= 76%, Lag= 25.2 min
Primary = 1.35 cfs @ 12.52 hrs, Volume= 0.221 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 188.00' Surf.Area= 2,664 sf Storage= 4,116 cf
Peak Elev= 190.41' @ 12.52 hrs Surf.Area= 4,450 sf Storage= 12,610 cf (8,494 cf above start)

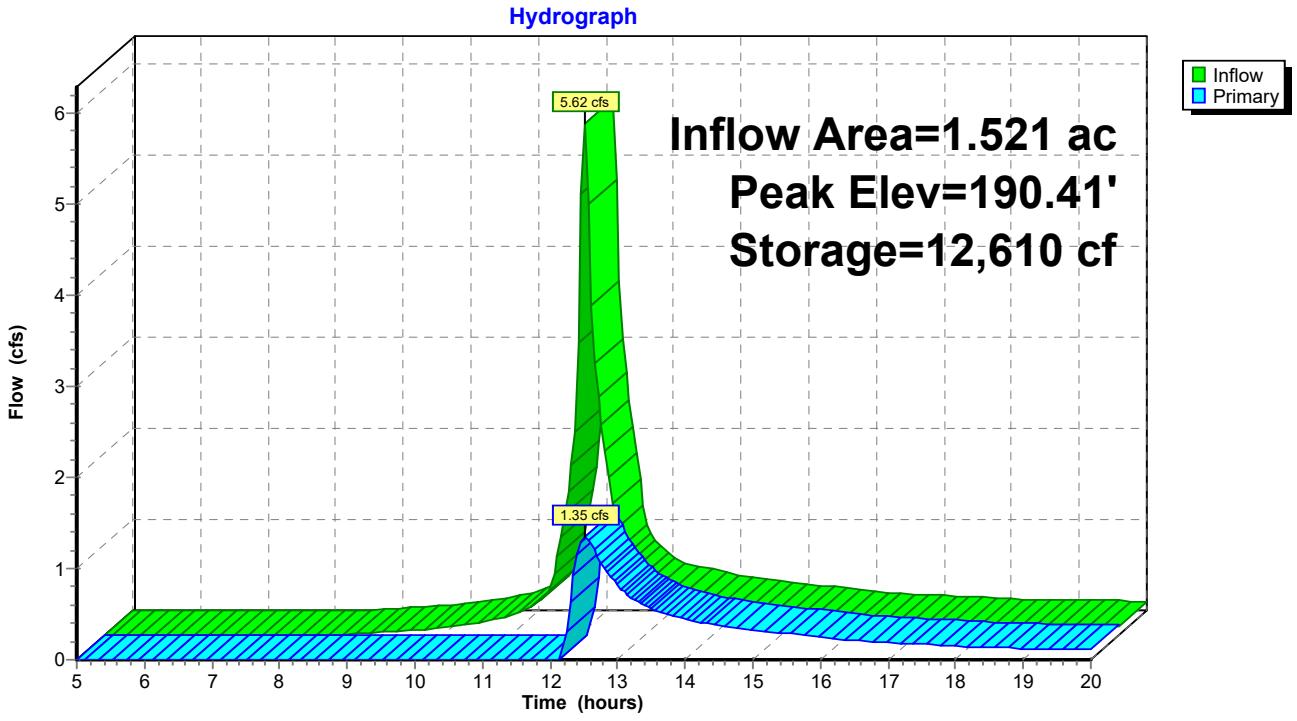
Plug-Flow detention time= 255.1 min calculated for 0.126 af (33% of inflow)
Center-of-Mass det. time= 81.1 min (874.8 - 793.7)

Volume	Invert	Avail.Storage	Storage Description
#1	186.00'	17,960 cf	**25.00'W x 60.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	190.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=1.34 cfs @ 12.52 hrs HW=190.41' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 1.34 cfs @ 1.63 fps)

Pond 9P: Pond 9



Summary for Pond 10P: Pond 10

Inflow Area = 2.304 ac, 0.00% Impervious, Inflow Depth > 2.92" for 25 year event
Inflow = 7.14 cfs @ 12.16 hrs, Volume= 0.561 af
Outflow = 2.34 cfs @ 12.55 hrs, Volume= 0.352 af, Atten= 67%, Lag= 23.7 min
Primary = 2.34 cfs @ 12.55 hrs, Volume= 0.352 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 169.08' @ 12.55 hrs Surf.Area= 5,594 sf Storage= 11,612 cf

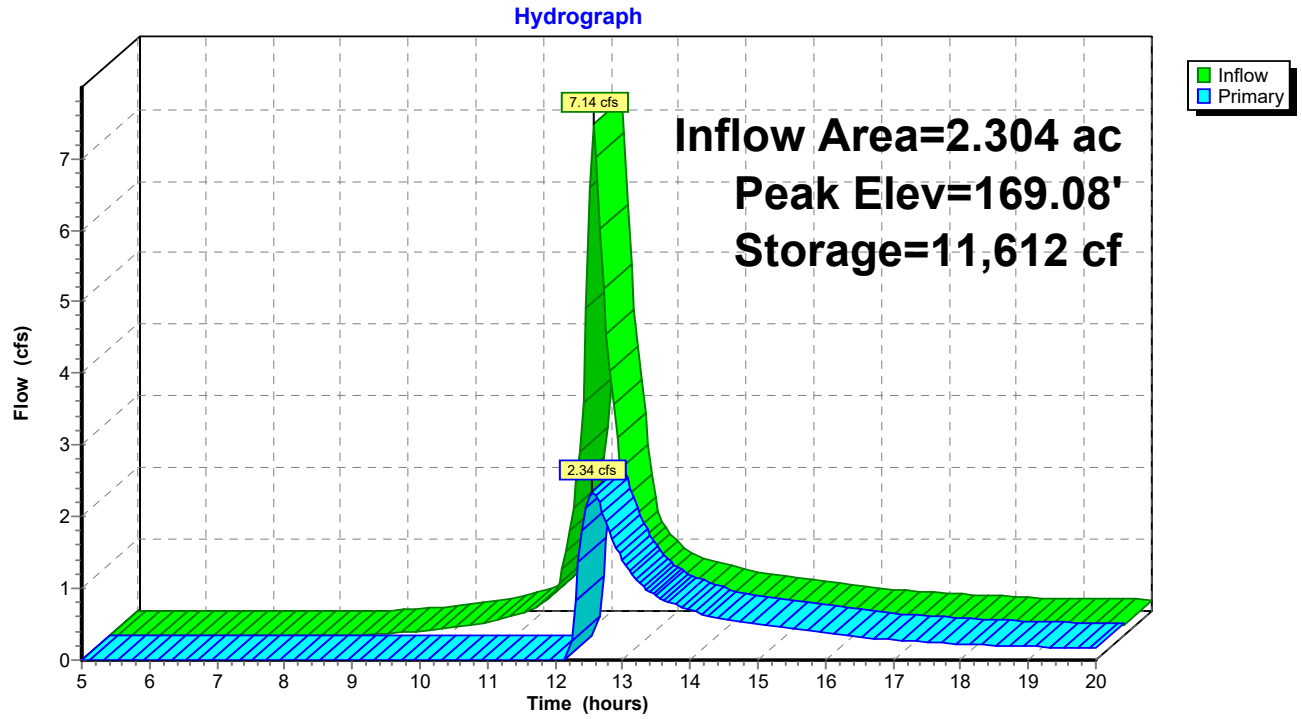
Plug-Flow detention time= 144.4 min calculated for 0.351 af (63% of inflow)
Center-of-Mass det. time= 71.3 min (870.6 - 799.2)

Volume	Invert	Avail.Storage	Storage Description
#1	166.50'	17,175 cf	**50.00'W x 70.00'L x 3.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	168.50'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=2.34 cfs @ 12.55 hrs HW=169.08' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 2.34 cfs @ 2.03 fps)

Pond 10P: Pond 10



Summary for Pond 11P: Pond 11

Inflow Area = 1.126 ac, 0.00% Impervious, Inflow Depth > 3.12" for 25 year event
Inflow = 4.39 cfs @ 12.08 hrs, Volume= 0.292 af
Outflow = 0.57 cfs @ 12.73 hrs, Volume= 0.139 af, Atten= 87%, Lag= 39.0 min
Primary = 0.57 cfs @ 12.73 hrs, Volume= 0.139 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 149.50' Surf.Area= 1,776 sf Storage= 2,043 cf
Peak Elev= 152.24' @ 12.73 hrs Surf.Area= 3,657 sf Storage= 9,362 cf (7,319 cf above start)

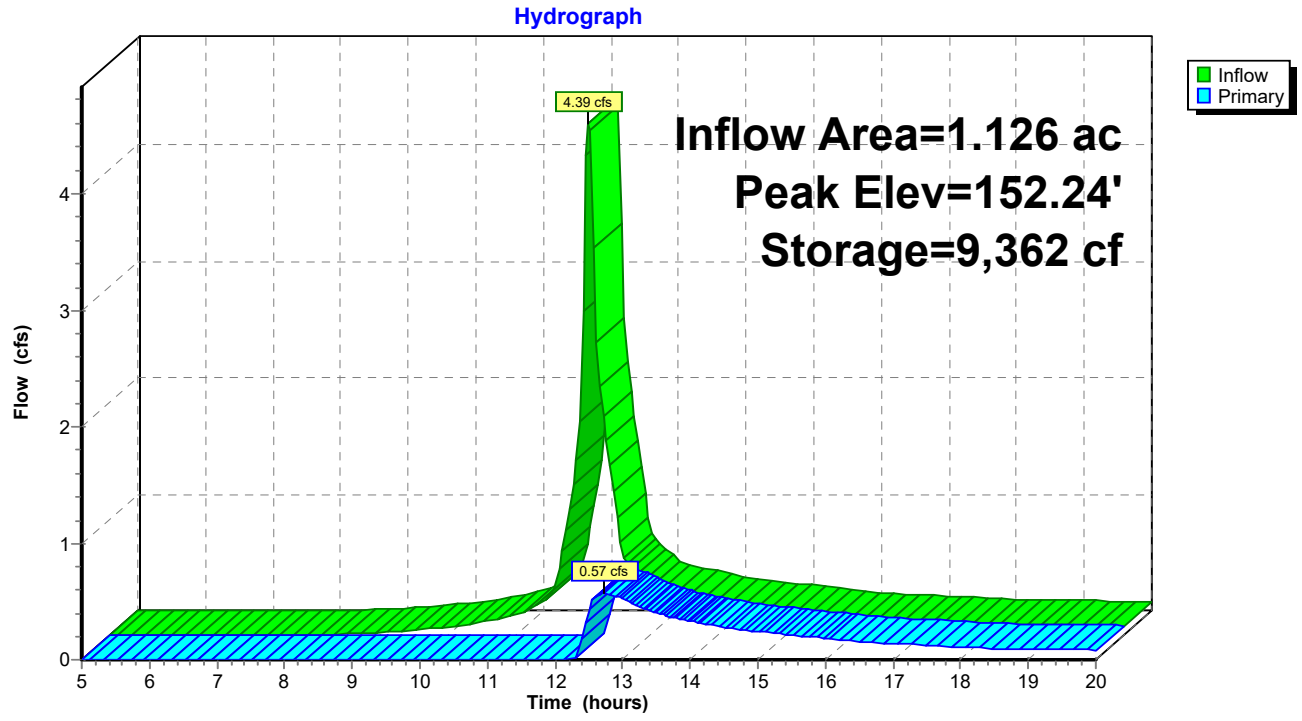
Plug-Flow detention time= 262.2 min calculated for 0.092 af (31% of inflow)
Center-of-Mass det. time= 105.3 min (896.3 - 791.0)

Volume	Invert	Avail.Storage	Storage Description
#1	148.00'	14,619 cf	**15.00'W x 65.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	152.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.57 cfs @ 12.73 hrs HW=152.24' (Free Discharge)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 0.57 cfs @ 1.18 fps)

Pond 11P: Pond 11



Summary for Pond 12P: Pond 12

Inflow Area = 3.677 ac, 0.00% Impervious, Inflow Depth > 2.83" for 25 year event
Inflow = 12.13 cfs @ 12.12 hrs, Volume= 0.868 af
Outflow = 5.33 cfs @ 12.38 hrs, Volume= 0.670 af, Atten= 56%, Lag= 15.7 min
Primary = 5.33 cfs @ 12.38 hrs, Volume= 0.670 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 157.00' Surf.Area= 4,384 sf Storage= 6,836 cf
Peak Elev= 159.50' @ 12.38 hrs Surf.Area= 7,143 sf Storage= 21,143 cf (14,307 cf above start)

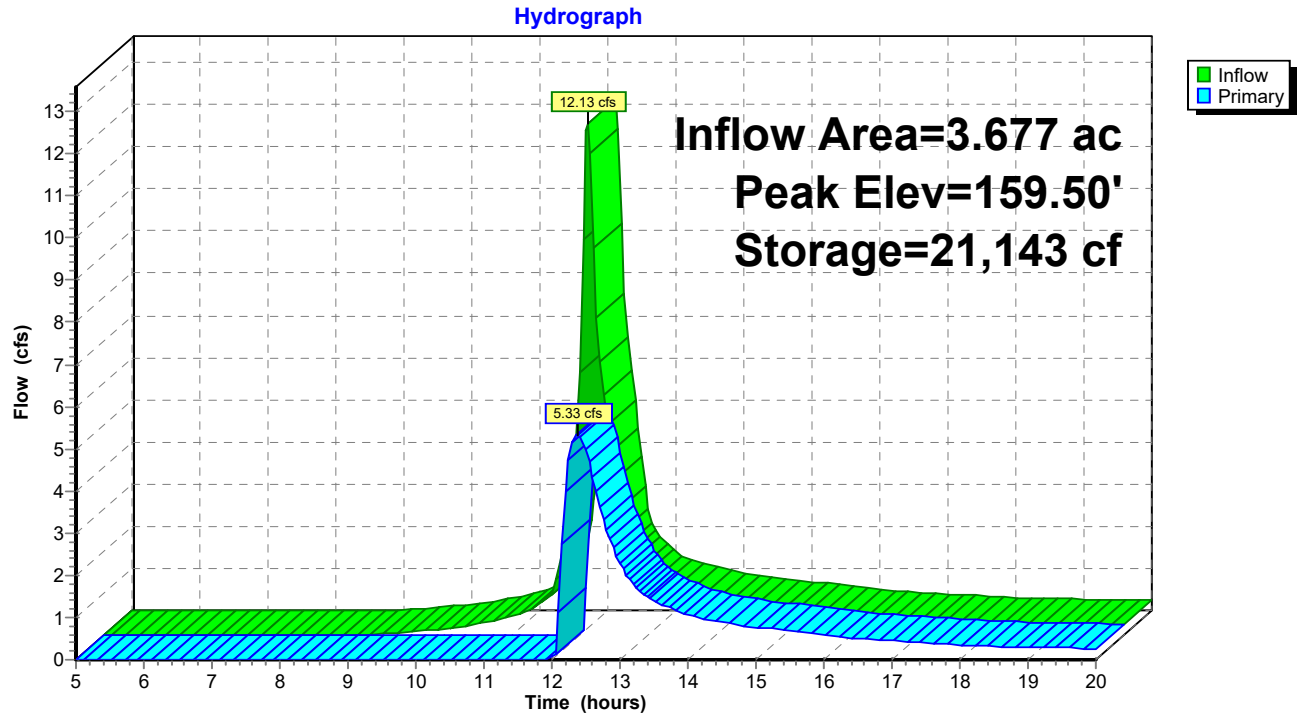
Plug-Flow detention time= 158.4 min calculated for 0.511 af (59% of inflow)
Center-of-Mass det. time= 48.3 min (846.9 - 798.6)

Volume	Invert	Avail.Storage	Storage Description
#1	155.00'	28,905 cf	**20.00'W x 125.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	158.50'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=5.31 cfs @ 12.38 hrs HW=159.50' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 5.31 cfs @ 2.67 fps)

Pond 12P: Pond 12



Summary for Pond 13.1P: Pond 13.1

Inflow Area = 3.117 ac, 0.00% Impervious, Inflow Depth > 3.21" for 25 year event
Inflow = 12.08 cfs @ 12.10 hrs, Volume= 0.834 af
Outflow = 4.52 cfs @ 12.39 hrs, Volume= 0.592 af, Atten= 63%, Lag= 17.5 min
Primary = 4.52 cfs @ 12.39 hrs, Volume= 0.592 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 224.57' @ 12.39 hrs Surf.Area= 17,240 sf Storage= 15,737 cf

Plug-Flow detention time= 125.5 min calculated for 0.592 af (71% of inflow)
Center-of-Mass det. time= 59.8 min (850.1 - 790.3)

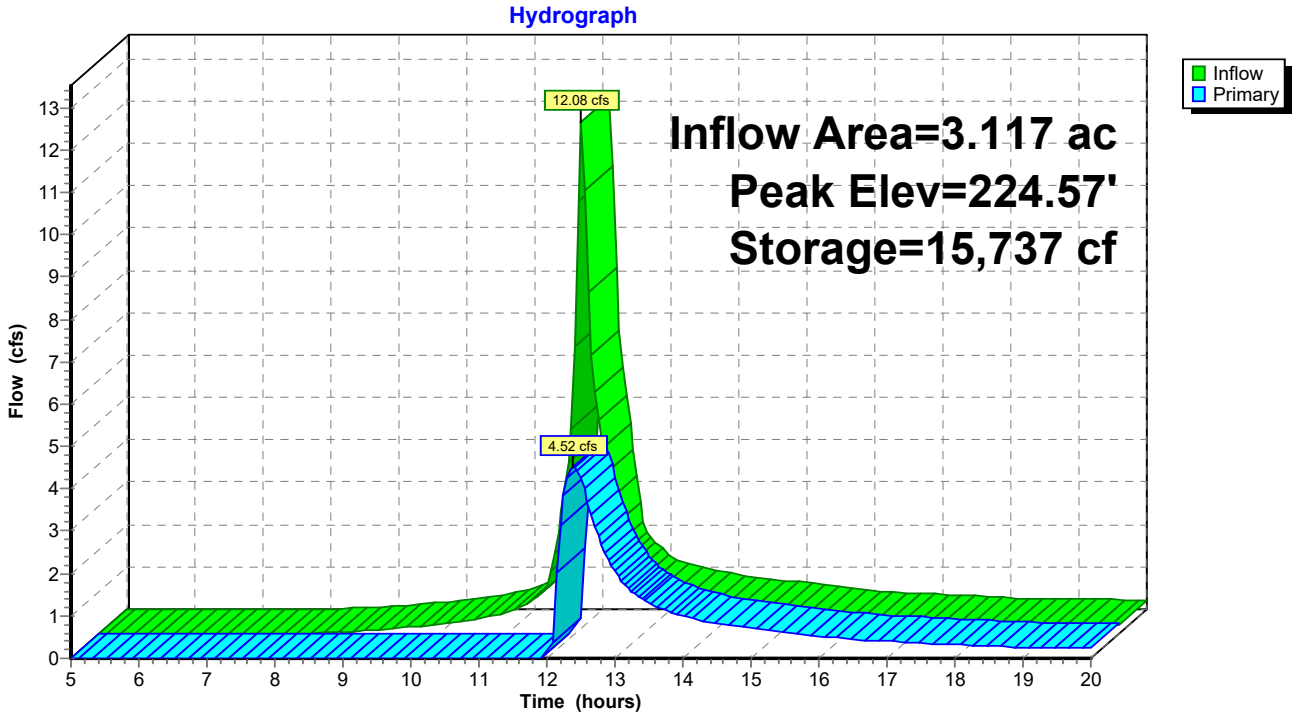
Volume	Invert	Avail.Storage	Storage Description
#1	223.00'	27,720 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
223.00	1,200	0	0
224.20	15,000	9,720	9,720
225.20	21,000	18,000	27,720

Device	Routing	Invert	Outlet Devices
#1	Primary	224.20'	**8.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=4.51 cfs @ 12.39 hrs HW=224.57' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 4.51 cfs @ 1.51 fps)

Pond 13.1P: Pond 13.1



Summary for Pond 13P: Pond 13

Inflow Area = 12.425 ac, 0.00% Impervious, Inflow Depth > 2.83" for 25 year event
Inflow = 29.56 cfs @ 12.17 hrs, Volume= 2.928 af
Outflow = 3.33 cfs @ 14.10 hrs, Volume= 1.535 af, Atten= 89%, Lag= 116.2 min
Discarded = 1.79 cfs @ 14.10 hrs, Volume= 1.277 af
Primary = 1.54 cfs @ 14.10 hrs, Volume= 0.257 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 188.19' @ 14.10 hrs Surf.Area= 20,510 sf Storage= 70,957 cf

Plug-Flow detention time= 196.9 min calculated for 1.535 af (52% of inflow)
Center-of-Mass det. time= 111.2 min (920.7 - 809.5)

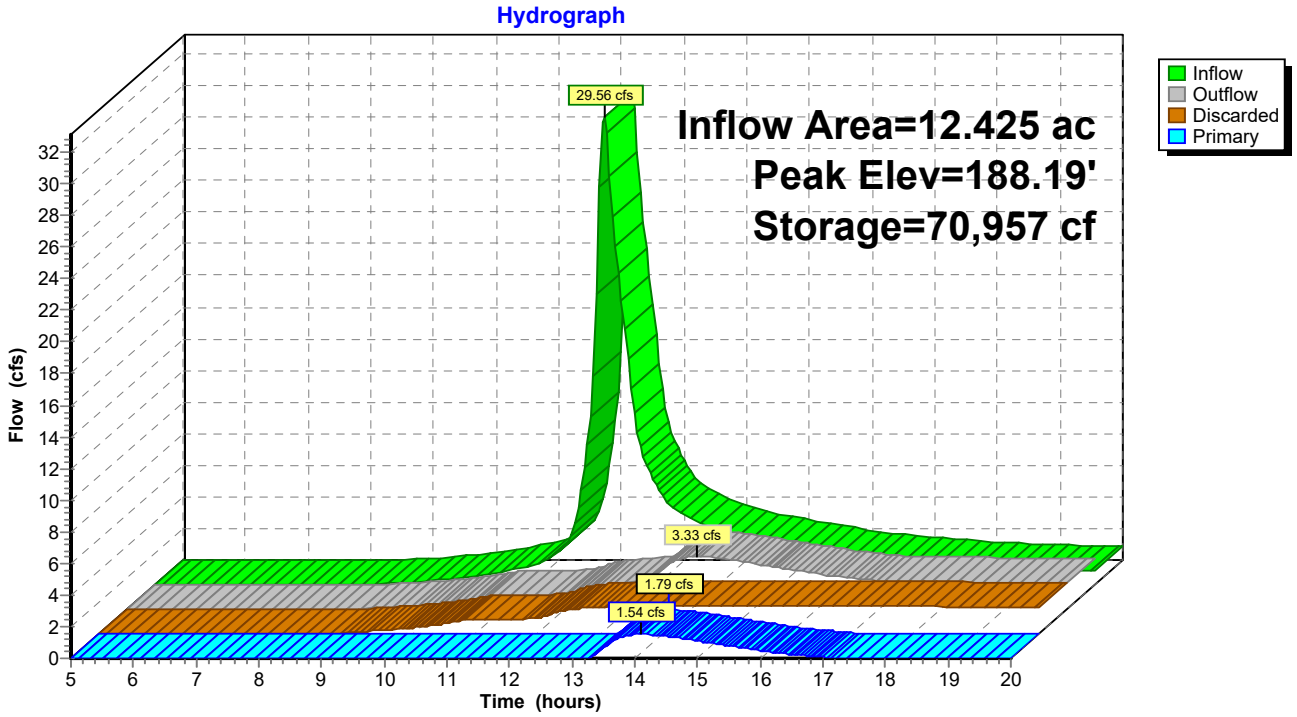
Volume	Invert	Avail.Storage	Storage Description
#1	184.00'	99,484 cf	**80.00'W x 170.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	188.00'	**8.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	184.00'	**2.700 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 175.00'

Discarded OutFlow Max=1.79 cfs @ 14.10 hrs HW=188.19' (Free Discharge)
↑—**2=Exfiltration** (Controls 1.79 cfs)

Primary OutFlow Max=1.53 cfs @ 14.10 hrs HW=188.19' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 1.53 cfs @ 1.03 fps)

Pond 13P: Pond 13



Summary for Pond 14P: Pond 14

Inflow Area = 4.438 ac, 0.00% Impervious, Inflow Depth > 2.47" for 25 year event
Inflow = 12.13 cfs @ 12.14 hrs, Volume= 0.912 af
Outflow = 5.53 cfs @ 12.42 hrs, Volume= 0.716 af, Atten= 54%, Lag= 16.8 min
Discarded = 0.55 cfs @ 12.42 hrs, Volume= 0.329 af
Primary = 4.99 cfs @ 12.42 hrs, Volume= 0.387 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 190.95' @ 12.42 hrs Surf.Area= 4,745 sf Storage= 13,658 cf

Plug-Flow detention time= 105.4 min calculated for 0.713 af (78% of inflow)
Center-of-Mass det. time= 49.9 min (856.7 - 806.8)

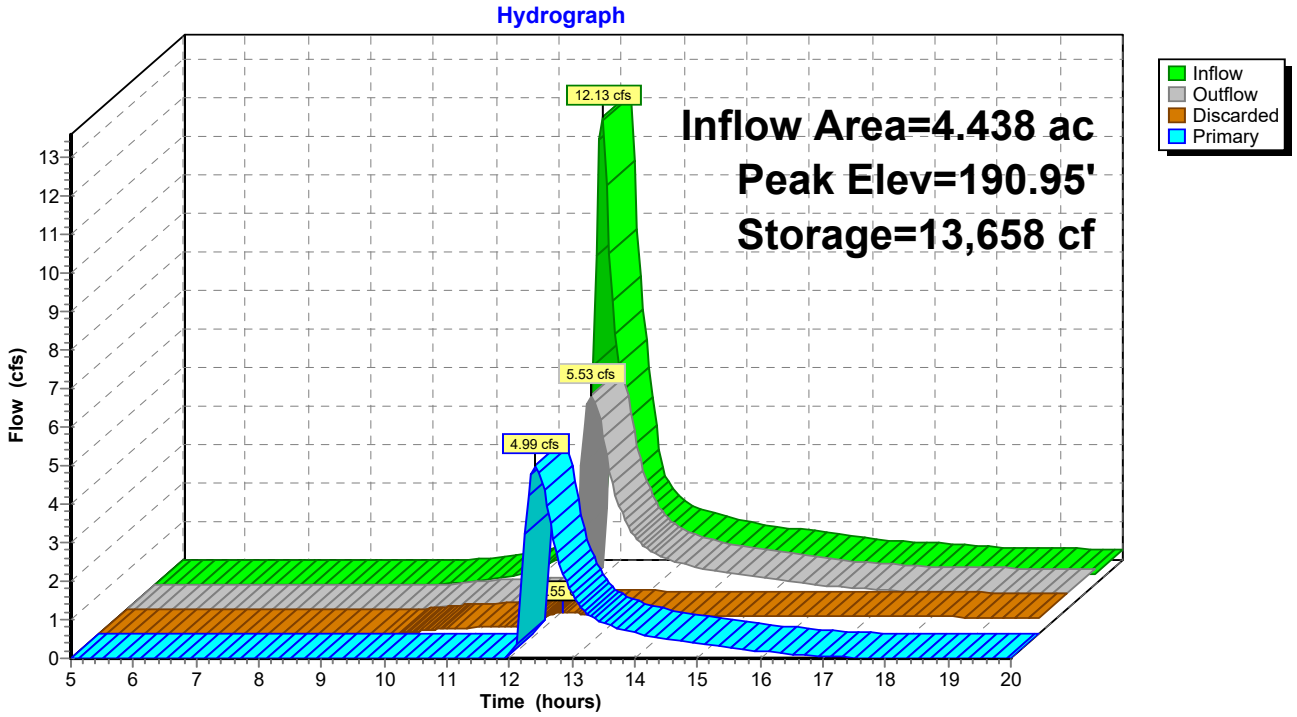
Volume	Invert	Avail.Storage	Storage Description
#1	186.50'	19,102 cf	**25.00'W x 65.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	190.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	186.50'	**3.900 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 175.00'

Discarded OutFlow Max=0.55 cfs @ 12.42 hrs HW=190.95' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.55 cfs)

Primary OutFlow Max=4.96 cfs @ 12.42 hrs HW=190.95' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 4.96 cfs @ 2.61 fps)

Pond 14P: Pond 14



Summary for Pond 16P: Pond 16

Inflow Area = 16.919 ac, 0.00% Impervious, Inflow Depth > 3.09" for 25 year event
Inflow = 36.93 cfs @ 12.43 hrs, Volume= 4.356 af
Outflow = 8.28 cfs @ 13.31 hrs, Volume= 1.969 af, Atten= 78%, Lag= 52.9 min
Primary = 8.28 cfs @ 13.31 hrs, Volume= 1.969 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 191.00' Surf.Area= 17,554 sf Storage= 31,256 cf
Peak Elev= 195.97' @ 13.31 hrs Surf.Area= 28,247 sf Storage= 144,272 cf (113,016 cf above start)

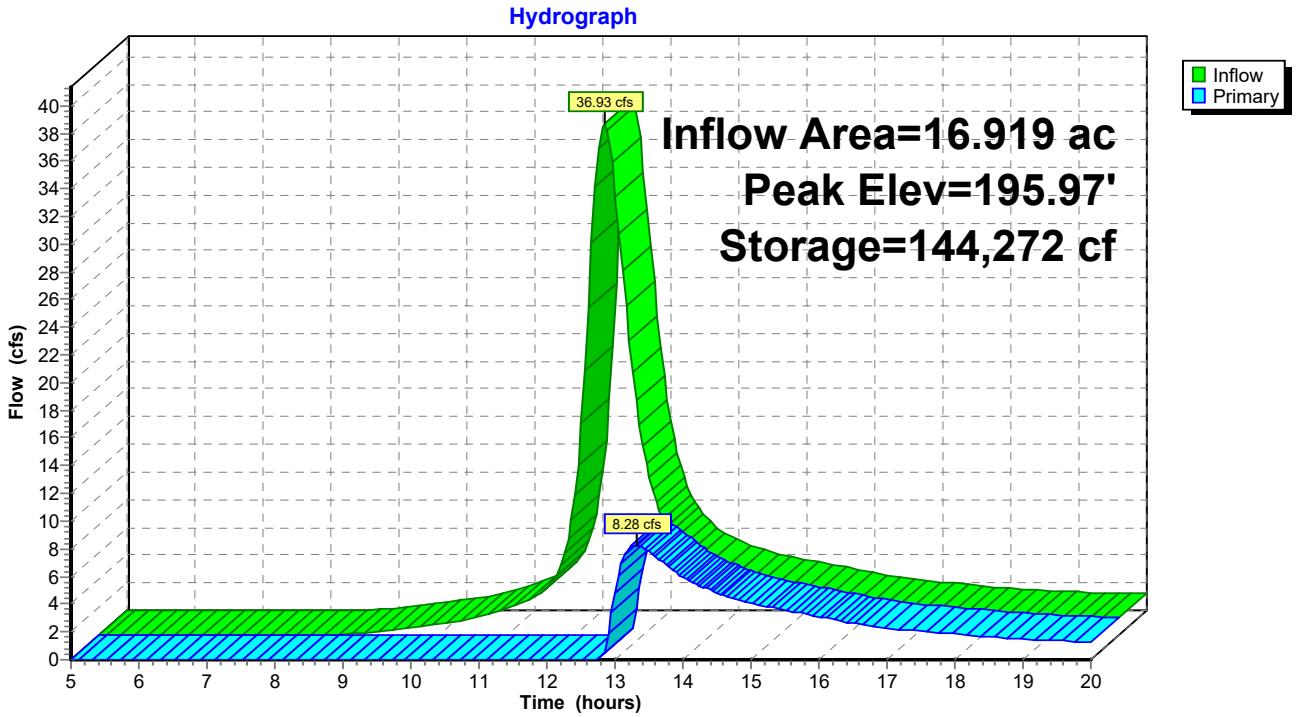
Plug-Flow detention time= 271.2 min calculated for 1.248 af (29% of inflow)
Center-of-Mass det. time= 109.8 min (921.0 - 811.1)

Volume	Invert	Avail.Storage	Storage Description
#1	189.00'	174,704 cf	**55.00'W x 250.00'L x 8.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	195.50'	**10.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=8.26 cfs @ 13.31 hrs HW=195.97' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 8.26 cfs @ 1.77 fps)

Pond 16P: Pond 16



50-Year Storm Event- Proposed

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=3.006 ac 0.00% Impervious Runoff Depth>3.34"
Flow Length=470' Slope=0.0800 '/' Tc=8.0 min CN=70 Runoff=11.65 cfs 0.836 af

Subcatchment2: Subcat 2 Runoff Area=2.551 ac 0.00% Impervious Runoff Depth>3.54"
Flow Length=430' Tc=12.4 min CN=72 Runoff=9.18 cfs 0.752 af

Subcatchment2A: Subcat 2A Runoff Area=0.775 ac 0.00% Impervious Runoff Depth>2.84"
Tc=10.0 min CN=65 Runoff=2.39 cfs 0.183 af

Subcatchment3: Subcat 3 Runoff Area=2.550 ac 0.00% Impervious Runoff Depth>3.64"
Flow Length=620' Tc=12.6 min CN=73 Runoff=9.32 cfs 0.773 af

Subcatchment3A: Subcat 3A Runoff Area=0.324 ac 0.00% Impervious Runoff Depth>4.06"
Tc=10.0 min CN=77 Runoff=1.42 cfs 0.110 af

Subcatchment4: Subcat 4 Runoff Area=5.871 ac 0.00% Impervious Runoff Depth>3.63"
Flow Length=810' Tc=16.2 min CN=73 Runoff=19.71 cfs 1.778 af

Subcatchment5: Subcat 5 Runoff Area=2.637 ac 0.00% Impervious Runoff Depth>3.14"
Flow Length=510' Slope=0.0500 '/' Tc=10.4 min CN=68 Runoff=8.91 cfs 0.689 af

Subcatchment6: Subcat 6 Runoff Area=3.201 ac 0.00% Impervious Runoff Depth>3.64"
Flow Length=420' Slope=0.0700 '/' Tc=8.1 min CN=73 Runoff=13.47 cfs 0.972 af

Subcatchment6A: Subcat 6A Runoff Area=0.915 ac 0.00% Impervious Runoff Depth>3.04"
Tc=10.0 min CN=67 Runoff=3.02 cfs 0.232 af

Subcatchment6B: Subcat 6B Runoff Area=0.030 ac 0.00% Impervious Runoff Depth>2.18"
Tc=10.0 min CN=58 Runoff=0.07 cfs 0.005 af

Subcatchment6C: Subcat 6C Runoff Area=0.694 ac 0.00% Impervious Runoff Depth>2.18"
Tc=10.0 min CN=58 Runoff=1.60 cfs 0.126 af

Subcatchment7: Subcat 7 Runoff Area=1.170 ac 0.00% Impervious Runoff Depth>3.34"
Flow Length=200' Slope=0.0800 '/' Tc=5.8 min CN=70 Runoff=4.85 cfs 0.326 af

Subcatchment7A: Subcat 7A Runoff Area=0.202 ac 0.00% Impervious Runoff Depth>2.18"
Tc=10.0 min CN=58 Runoff=0.47 cfs 0.037 af

Subcatchment8: Subcat 8 Runoff Area=4.686 ac 0.00% Impervious Runoff Depth>3.54"
Flow Length=650' Tc=10.1 min CN=72 Runoff=18.00 cfs 1.382 af

Subcatchment8A: Subcat 8A Runoff Area=0.770 ac 0.00% Impervious Runoff Depth>2.18"
Tc=10.0 min CN=58 Runoff=1.78 cfs 0.140 af

Subcatchment9: Subcat 9 Runoff Area=1.521 ac 0.00% Impervious Runoff Depth>3.65"
Flow Length=230' Slope=0.0700 '/' Tc=6.4 min CN=73 Runoff=6.77 cfs 0.462 af

Subcatchment9A: Subcat 9A Runoff Area=0.259 ac 0.00% Impervious Runoff Depth>2.18"
Tc=10.0 min CN=58 Runoff=0.60 cfs 0.047 af

Subcatchment10: Subcat 10 Runoff Area=2.304 ac 0.00% Impervious Runoff Depth>3.54"
Flow Length=410' Tc=11.0 min CN=72 Runoff=8.64 cfs 0.679 af

Subcatchment10A: Subcat 10A Runoff Area=0.287 ac 0.00% Impervious Runoff Depth>2.18"
Tc=10.0 min CN=58 Runoff=0.66 cfs 0.052 af

Subcatchment11: Subcat 11 Runoff Area=1.126 ac 0.00% Impervious Runoff Depth>3.75"
Flow Length=210' Slope=0.1000 '/' Tc=5.3 min CN=74 Runoff=5.27 cfs 0.352 af

Subcatchment11A: Subcat 11A Runoff Area=0.428 ac 0.00% Impervious Runoff Depth>2.18"
Tc=10.0 min CN=58 Runoff=0.99 cfs 0.078 af

Subcatchment12: Subcat 12 Runoff Area=3.677 ac 0.00% Impervious Runoff Depth>3.44"
Flow Length=500' Slope=0.0900 '/' Tc=7.9 min CN=71 Runoff=14.74 cfs 1.054 af

Subcatchment13.1: Subcat 13.1 Runoff Area=3.117 ac 0.00% Impervious Runoff Depth>3.85"
Flow Length=320' Slope=0.0800 '/' Tc=6.8 min CN=75 Runoff=14.44 cfs 1.001 af

Subcatchment13.2: Subcat 13.2 Runoff Area=9.308 ac 0.00% Impervious Runoff Depth>3.64"
Flow Length=800' Slope=0.0700 '/' Tc=11.5 min CN=73 Runoff=35.36 cfs 2.824 af

Subcatchment14: Subcat 14 Runoff Area=4.438 ac 0.00% Impervious Runoff Depth>3.04"
Flow Length=500' Tc=9.1 min CN=67 Runoff=15.00 cfs 1.124 af

Subcatchment16: Subcat 16 Runoff Area=16.919 ac 0.00% Impervious Runoff Depth>3.72"
Flow Length=910' Slope=0.0100 '/' Tc=30.9 min CN=74 Runoff=44.36 cfs 5.244 af

Subcatchment16A: Subcat 16A Runoff Area=0.619 ac 0.00% Impervious Runoff Depth>2.18"
Tc=10.0 min CN=58 Runoff=1.43 cfs 0.112 af

Reach 13.1R: Reach 13.1 Avg. Flow Depth=0.40' Max Vel=2.51 fps Inflow=6.64 cfs 0.757 af
n=0.035 L=500.0' S=0.0684 '/' Capacity=0.96 cfs Outflow=6.48 cfs 0.754 af

Pond 1P: Pond 1 Peak Elev=194.16' Storage=16,964 cf Inflow=11.65 cfs 0.836 af
Outflow=6.66 cfs 0.698 af

Pond 2P: Pond 2 Peak Elev=231.55' Storage=12,521 cf Inflow=9.18 cfs 0.752 af
Discarded=0.38 cfs 0.257 af Primary=4.30 cfs 0.286 af Outflow=4.69 cfs 0.543 af

Pond 3P: Pond 3 Peak Elev=227.95' Storage=12,896 cf Inflow=9.32 cfs 0.773 af
Outflow=4.64 cfs 0.623 af

Pond 4P: Pond 4 Peak Elev=188.59' Storage=54,851 cf Inflow=19.71 cfs 1.778 af
Outflow=9.81 cfs 1.160 af

Pond 5P: Pond 5 Peak Elev=218.86' Storage=11,564 cf Inflow=8.91 cfs 0.689 af
Outflow=4.28 cfs 0.506 af

Pond 6P: Pond 6 Peak Elev=209.99' Storage=21,405 cf Inflow=13.47 cfs 0.972 af
Outflow=7.84 cfs 0.745 af

Pond 7P: Pond 7 Peak Elev=226.45' Storage=5,397 cf Inflow=4.85 cfs 0.326 af
Discarded=0.25 cfs 0.162 af Primary=1.56 cfs 0.093 af Outflow=1.81 cfs 0.255 af

Pond 8P: Pond 8 Peak Elev=190.24' Storage=21,369 cf Inflow=18.00 cfs 1.382 af
Outflow=9.19 cfs 1.152 af

Pond 9P: Pond 9 Peak Elev=190.58' Storage=13,367 cf Inflow=6.77 cfs 0.462 af
Outflow=2.35 cfs 0.299 af

Pond 10P: Pond 10 Peak Elev=169.28' Storage=12,789 cf Inflow=8.64 cfs 0.679 af
Outflow=3.72 cfs 0.470 af

Pond 11P: Pond 11 Peak Elev=152.41' Storage=9,998 cf Inflow=5.27 cfs 0.352 af
Outflow=1.34 cfs 0.198 af

Pond 12P: Pond 12 Peak Elev=159.76' Storage=23,018 cf Inflow=14.74 cfs 1.054 af
Outflow=7.50 cfs 0.854 af

Pond 13.1P: Pond 13.1 Peak Elev=224.67' Storage=17,447 cf Inflow=14.44 cfs 1.001 af
Outflow=6.64 cfs 0.757 af

Pond 13P: Pond 13 Peak Elev=188.41' Storage=75,679 cf Inflow=36.98 cfs 3.578 af
Discarded=1.85 cfs 1.336 af Primary=5.45 cfs 0.801 af Outflow=7.30 cfs 2.137 af

Pond 14P: Pond 14 Peak Elev=191.27' Storage=15,209 cf Inflow=15.00 cfs 1.124 af
Discarded=0.58 cfs 0.343 af Primary=7.64 cfs 0.573 af Outflow=8.23 cfs 0.916 af

Pond 16P: Pond 16 Peak Elev=196.23' Storage=151,820 cf Inflow=44.36 cfs 5.244 af
Outflow=16.80 cfs 2.849 af

Total Runoff Area = 73.385 ac Runoff Volume = 21.372 af Average Runoff Depth = 3.49"
100.00% Pervious = 73.385 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1: Subcat 1

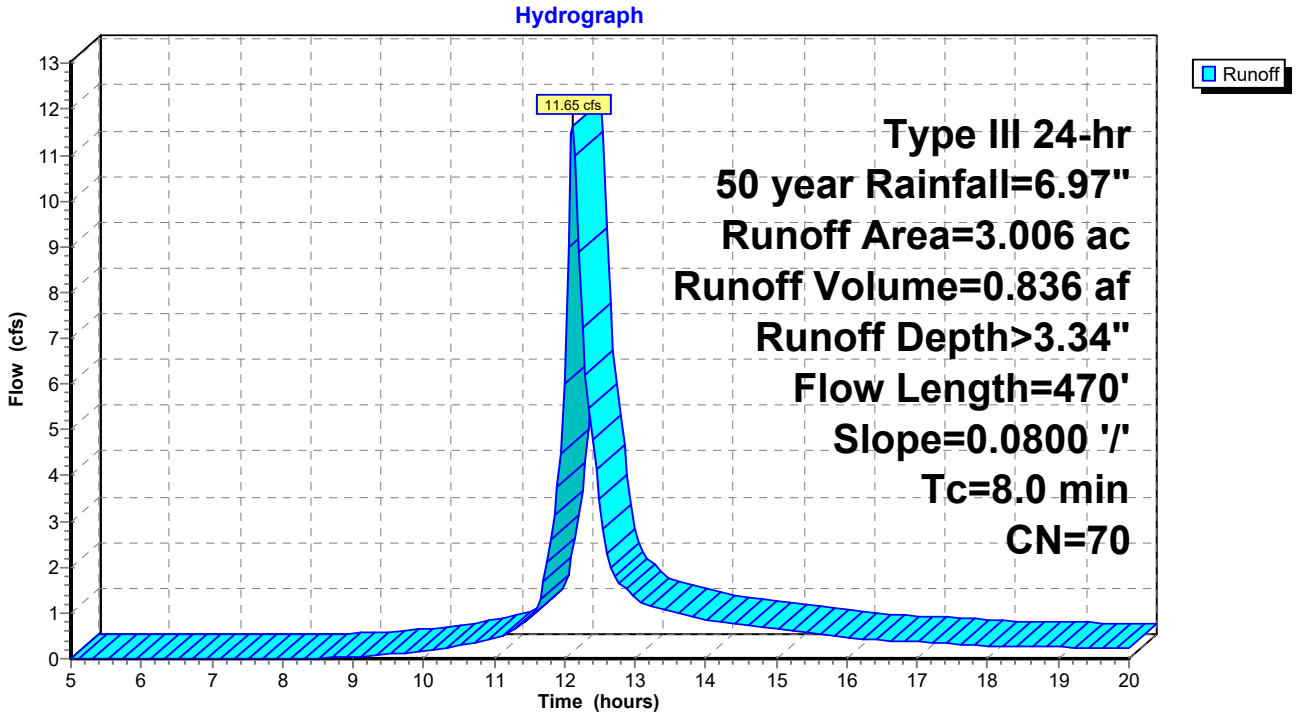
Runoff = 11.65 cfs @ 12.12 hrs, Volume= 0.836 af, Depth> 3.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
1.756	74	>75% Grass cover, Good, HSG C
0.217	96	Gravel surface, HSG C
1.033	58	Meadow, non-grazed, HSG B
3.006	70	Weighted Average
3.006		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
3.5	420	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.0	470	Total			

Subcatchment 1: Subcat 1



Summary for Subcatchment 2: Subcat 2

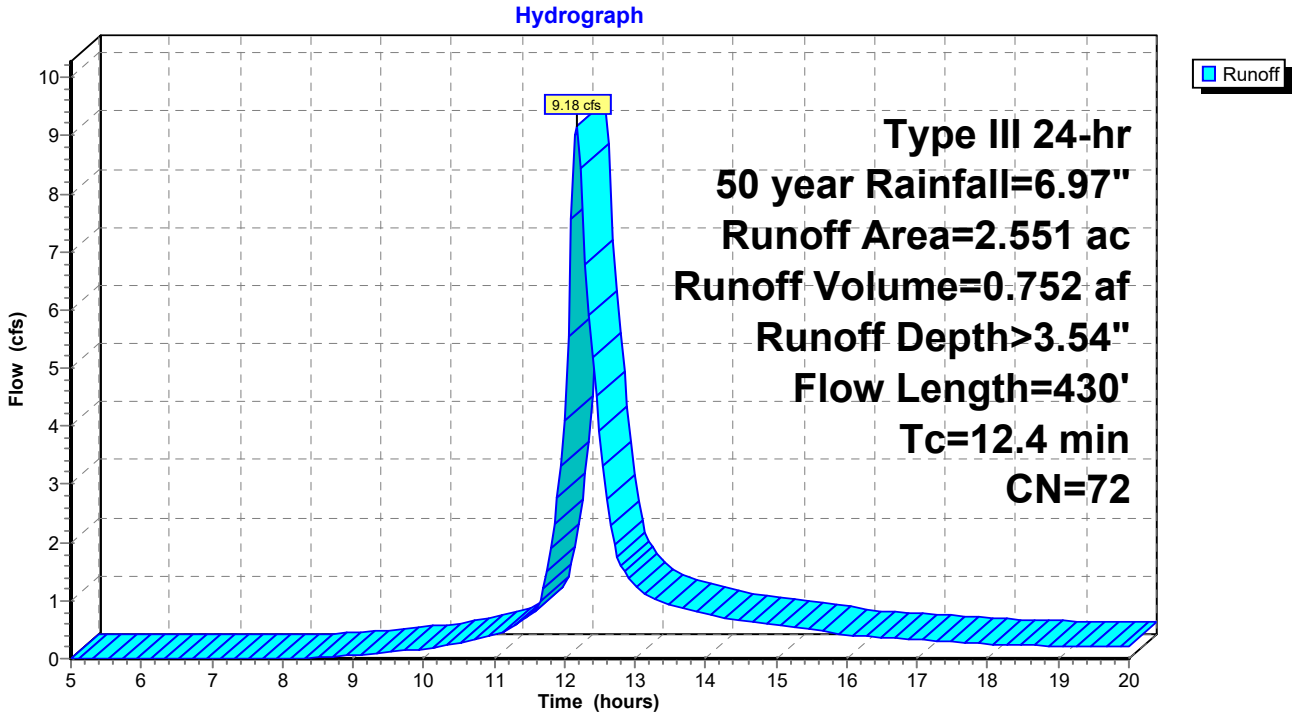
Runoff = 9.18 cfs @ 12.17 hrs, Volume= 0.752 af, Depth> 3.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
1.748	74	>75% Grass cover, Good, HSG C
0.237	96	Gravel surface, HSG C
0.566	58	Meadow, non-grazed, HSG B
2.551	72	Weighted Average
2.551		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0200	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
4.5	380	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.4	430	Total			

Subcatchment 2: Subcat 2



Summary for Subcatchment 2A: Subcat 2A

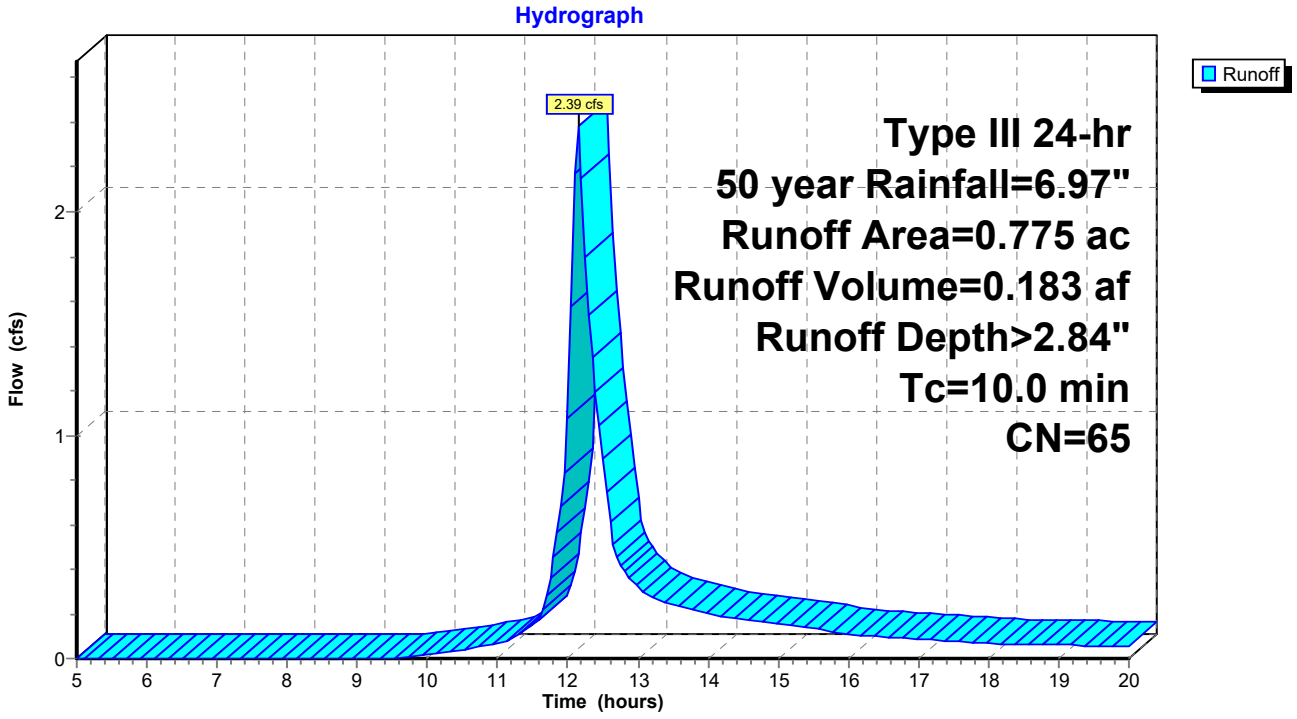
Runoff = 2.39 cfs @ 12.15 hrs, Volume= 0.183 af, Depth> 2.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.000	96	Gravel surface, HSG B
0.488	58	Meadow, non-grazed, HSG B
0.287	78	Meadow, non-grazed, HSG D
0.775	65	Weighted Average
0.775		100.00% Pervious Area

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

Subcatchment 2A: Subcat 2A



Summary for Subcatchment 3: Subcat 3

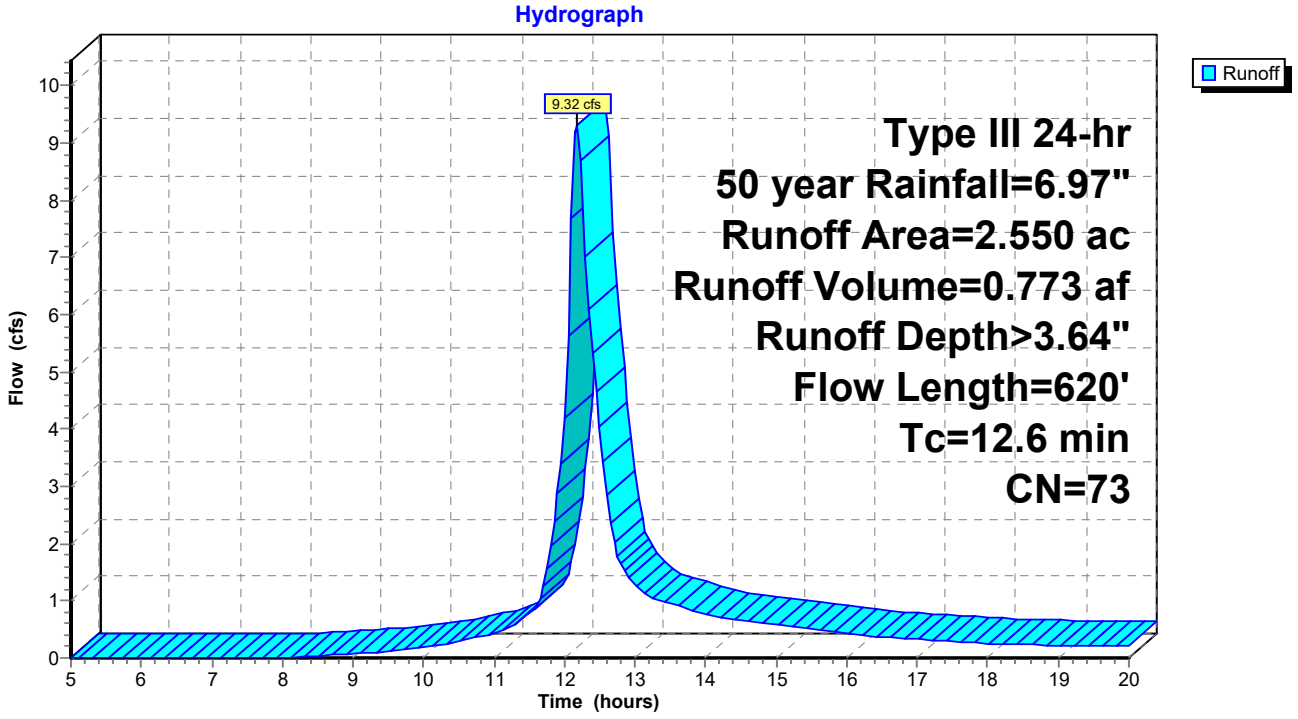
Runoff = 9.32 cfs @ 12.18 hrs, Volume= 0.773 af, Depth> 3.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
2.135	74	>75% Grass cover, Good, HSG C
0.110	96	Gravel surface, HSG C
0.271	58	Meadow, non-grazed, HSG B
0.034	78	Meadow, non-grazed, HSG D
2.550	73	Weighted Average
2.550		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
6.0	500	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	70	0.0700	1.85		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.6	620	Total			

Subcatchment 3: Subcat 3



Summary for Subcatchment 3A: Subcat 3A

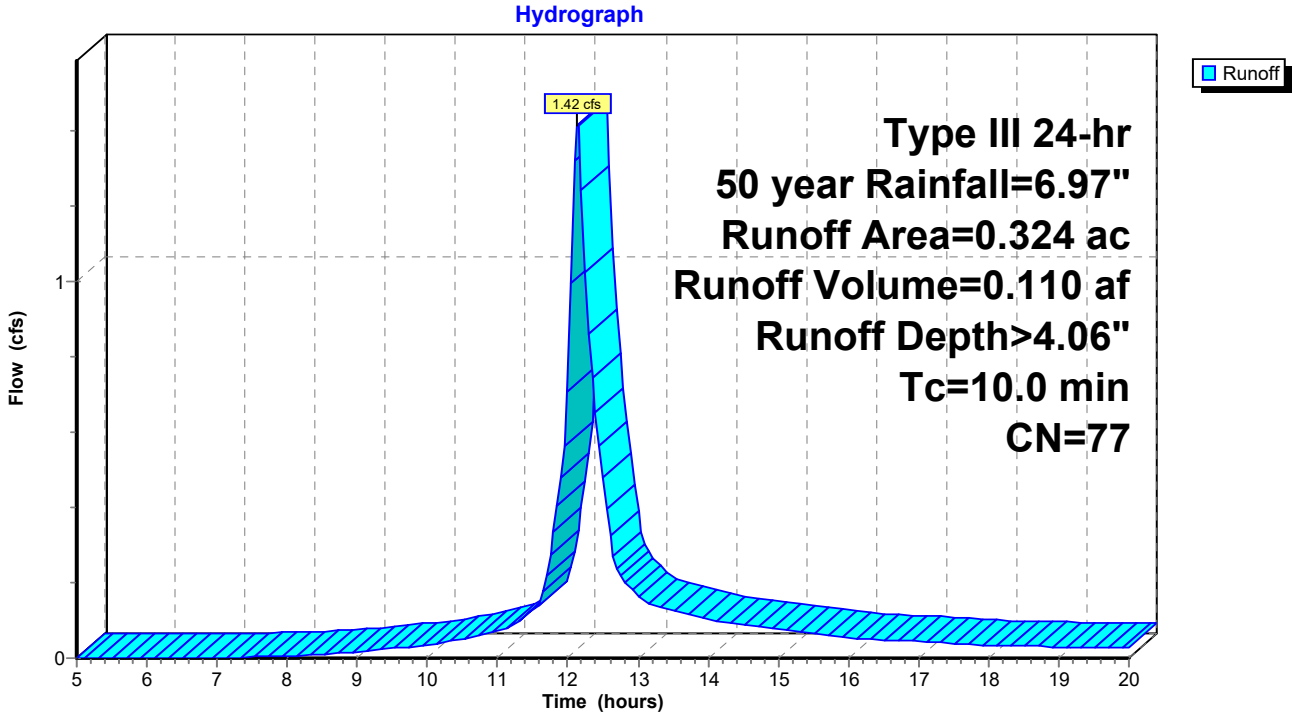
Runoff = 1.42 cfs @ 12.14 hrs, Volume= 0.110 af, Depth> 4.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.009	58	Meadow, non-grazed, HSG B
0.315	78	Meadow, non-grazed, HSG D
0.324	77	Weighted Average
0.324		100.00% Pervious Area

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

Subcatchment 3A: Subcat 3A



Summary for Subcatchment 4: Subcat 4

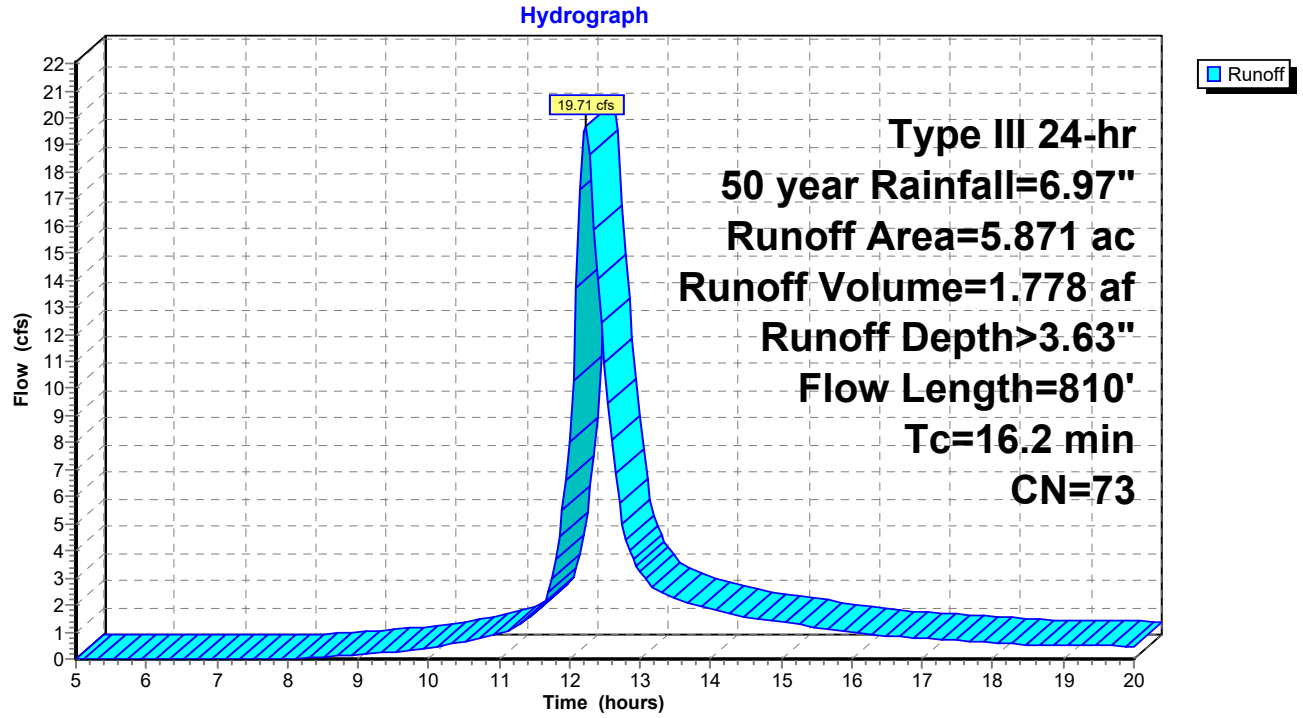
Runoff = 19.71 cfs @ 12.22 hrs, Volume= 1.778 af, Depth> 3.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
3.281	74	>75% Grass cover, Good, HSG C
0.192	80	>75% Grass cover, Good, HSG D
0.197	96	Gravel surface, HSG C
0.095	96	Gravel surface, HSG D
1.100	58	Meadow, non-grazed, HSG B
1.006	78	Meadow, non-grazed, HSG D
5.871	73	Weighted Average
5.871		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	50	0.0150	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
4.3	360	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.0	400	0.1000	2.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
16.2	810	Total			

Subcatchment 4: Subcat 4



Summary for Subcatchment 5: Subcat 5

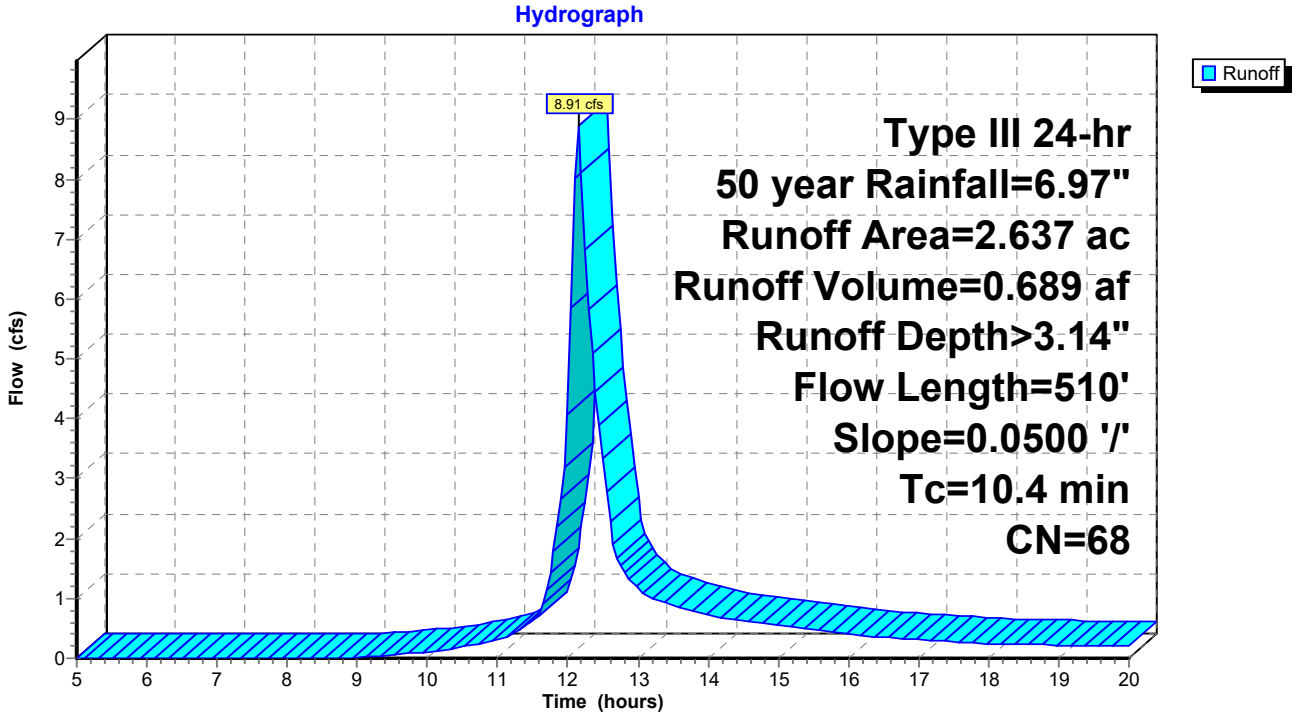
Runoff = 8.91 cfs @ 12.15 hrs, Volume= 0.689 af, Depth> 3.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
1.616	74	>75% Grass cover, Good, HSG C
1.021	58	Meadow, non-grazed, HSG B
2.637	68	Weighted Average
2.637		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	50	0.0500	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
4.9	460	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.4	510	Total			

Subcatchment 5: Subcat 5



Summary for Subcatchment 6: Subcat 6

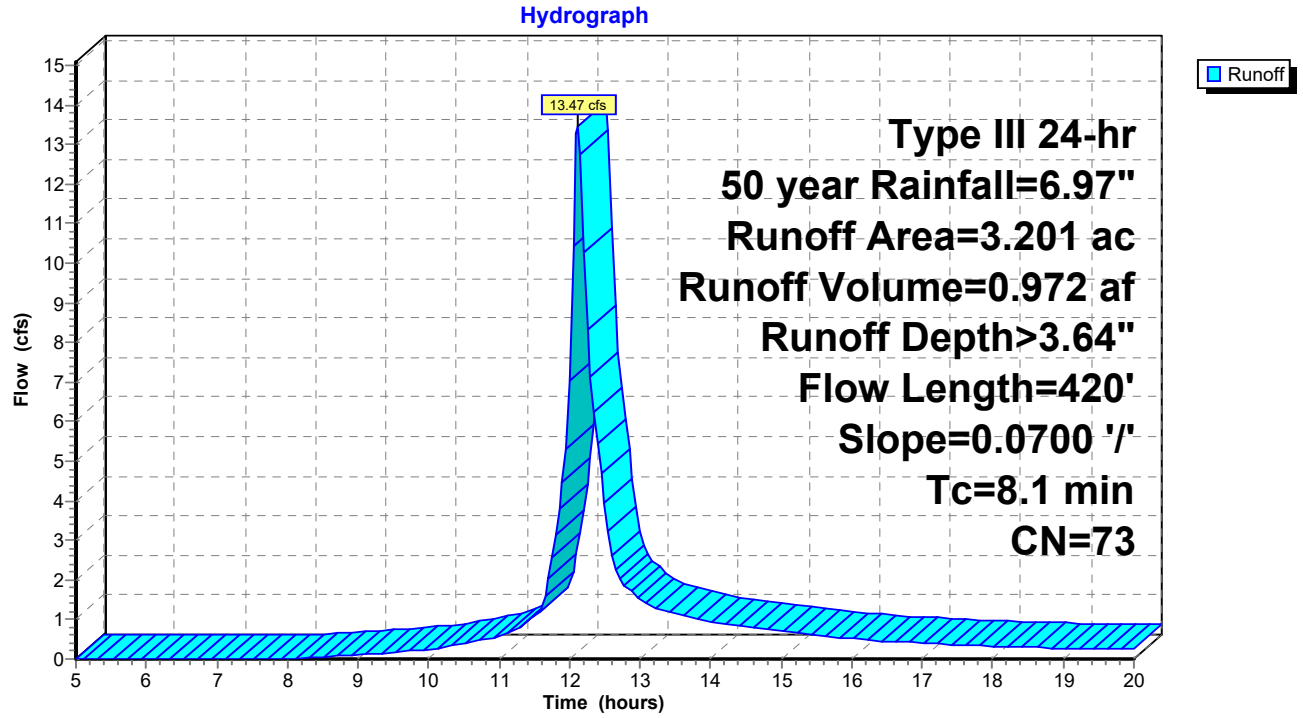
Runoff = 13.47 cfs @ 12.12 hrs, Volume= 0.972 af, Depth> 3.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
1.401	74	>75% Grass cover, Good, HSG C
0.111	80	>75% Grass cover, Good, HSG D
0.211	96	Gravel surface, HSG C
0.001	96	Gravel surface, HSG D
0.637	58	Meadow, non-grazed, HSG B
0.489	78	Meadow, non-grazed, HSG D
0.032	60	Woods, Fair, HSG B
0.319	79	Woods, Fair, HSG D
3.201	73	Weighted Average
3.201		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	50	0.0700	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
3.3	370	0.0700	1.85		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.1	420	Total			

Subcatchment 6: Subcat 6



Summary for Subcatchment 6A: Subcat 6A

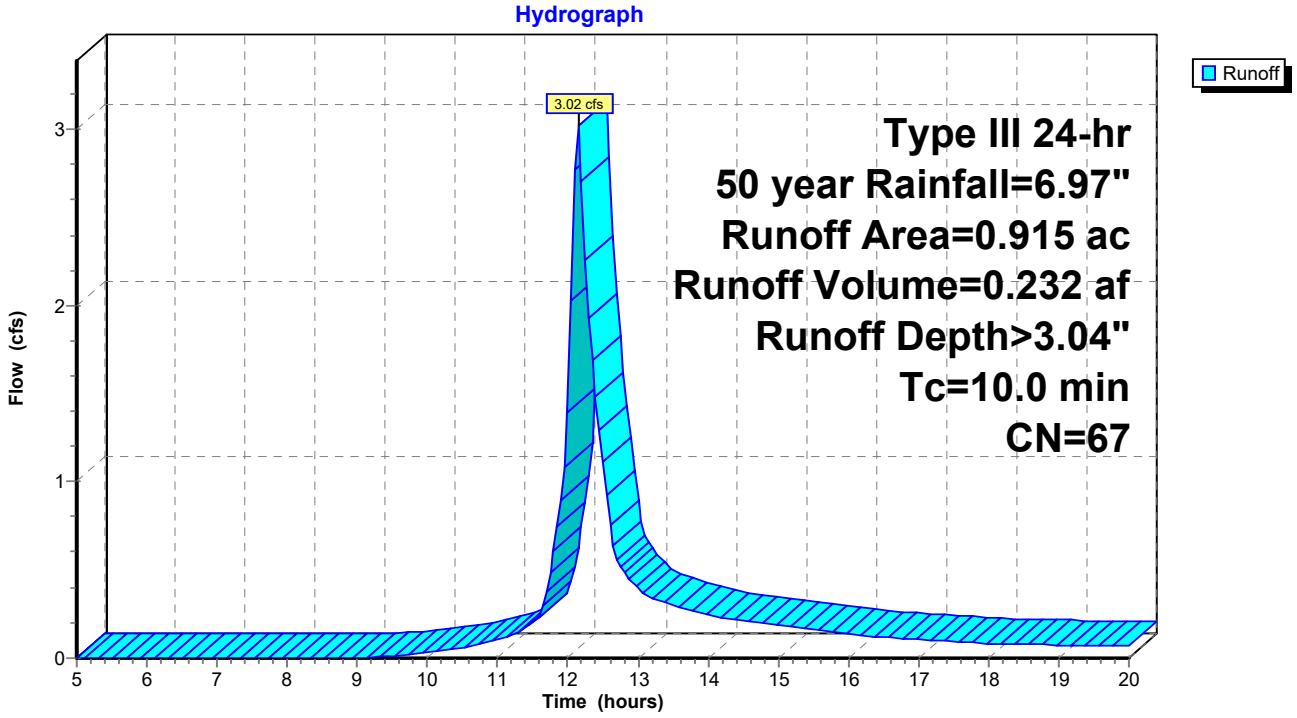
Runoff = 3.02 cfs @ 12.15 hrs, Volume= 0.232 af, Depth> 3.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.517	58	Meadow, non-grazed, HSG B
0.398	78	Meadow, non-grazed, HSG D
0.915	67	Weighted Average
0.915		100.00% Pervious Area

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

Subcatchment 6A: Subcat 6A



Summary for Subcatchment 6B: Subcat 6B

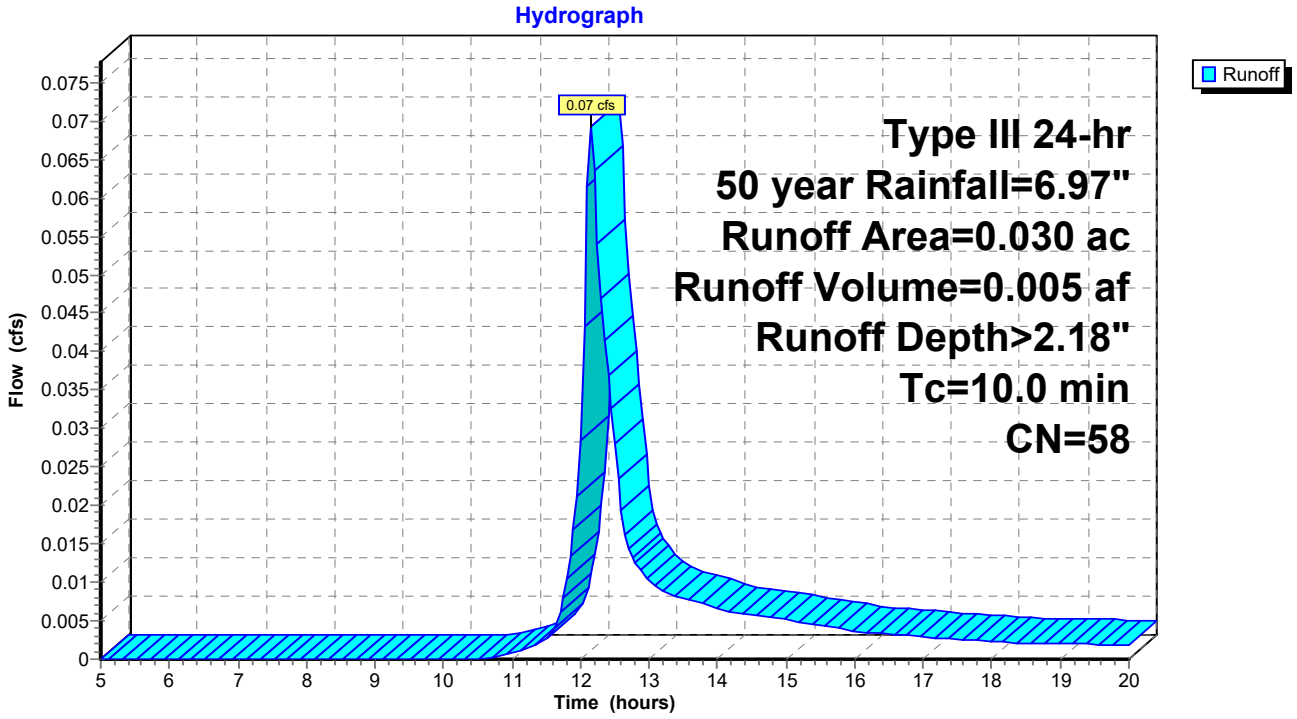
Runoff = 0.07 cfs @ 12.15 hrs, Volume= 0.005 af, Depth> 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.030	58	Meadow, non-grazed, HSG B
0.030		100.00% Pervious Area

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

Subcatchment 6B: Subcat 6B



Summary for Subcatchment 6C: Subcat 6C

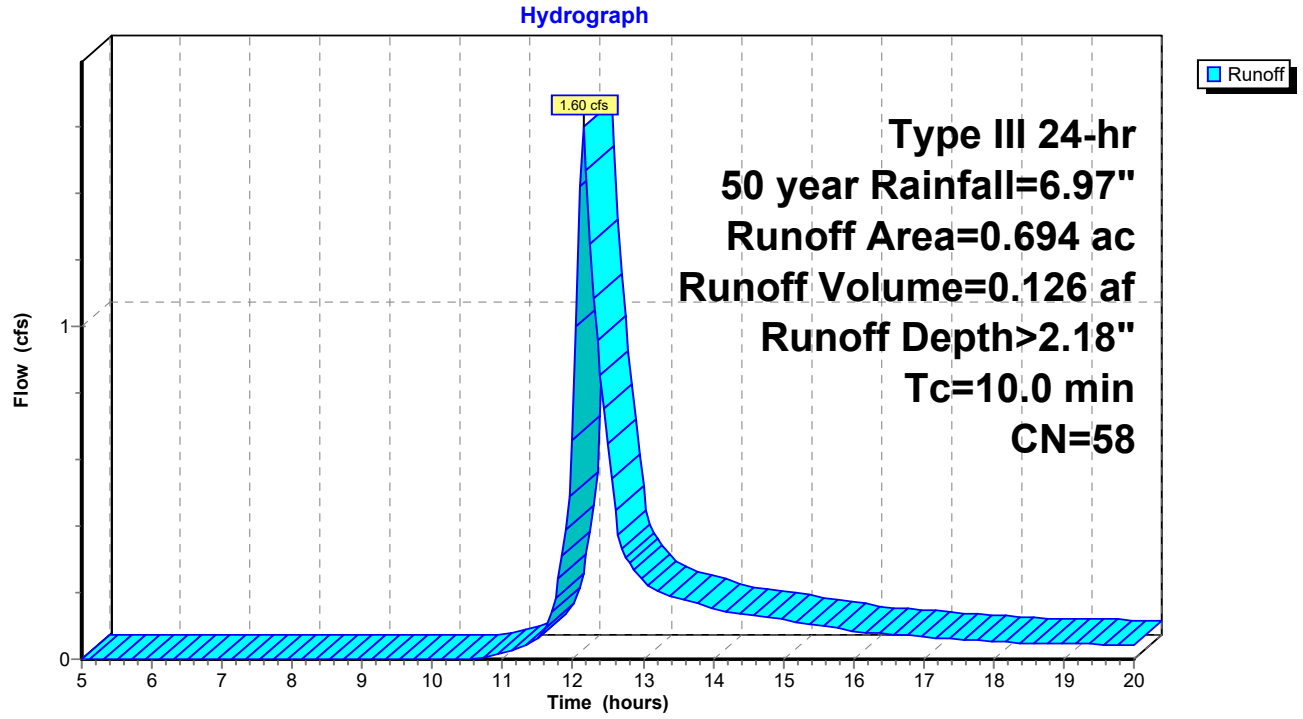
Runoff = 1.60 cfs @ 12.15 hrs, Volume= 0.126 af, Depth> 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.694	58	Meadow, non-grazed, HSG B
0.694		100.00% Pervious Area

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

Subcatchment 6C: Subcat 6C



Summary for Subcatchment 7: Subcat 7

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

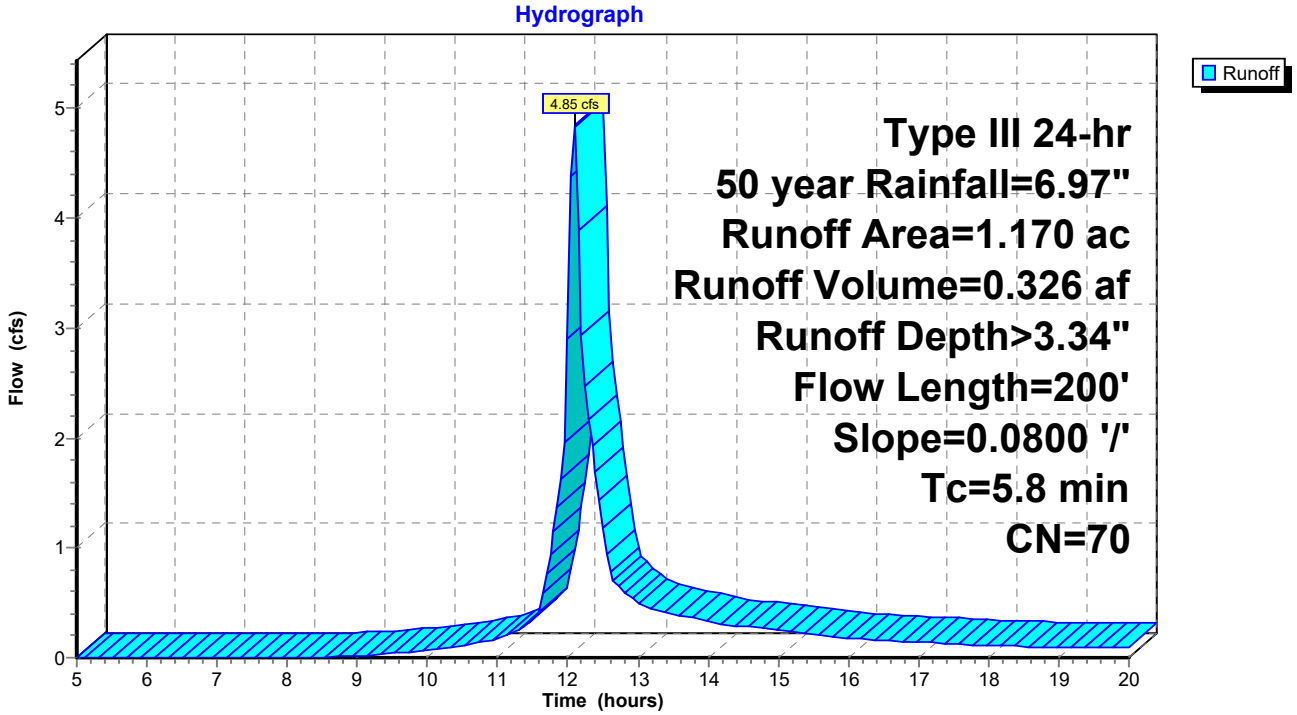
Runoff = 4.85 cfs @ 12.09 hrs, Volume= 0.326 af, Depth> 3.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.634	74	>75% Grass cover, Good, HSG C
0.117	96	Gravel surface, HSG C
0.419	58	Meadow, non-grazed, HSG B
1.170	70	Weighted Average
1.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.3	150	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.8	200	Total			

Subcatchment 7: Subcat 7



Summary for Subcatchment 7A: Subcat 7A

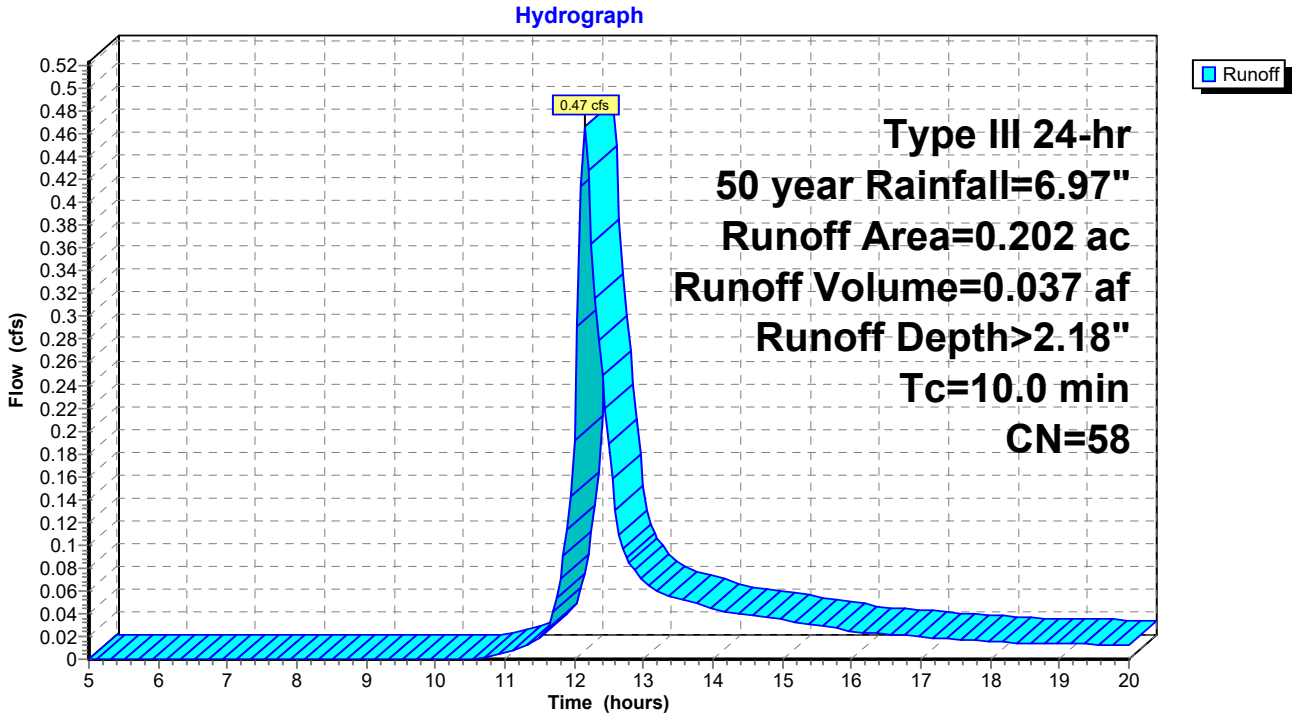
Runoff = 0.47 cfs @ 12.15 hrs, Volume= 0.037 af, Depth> 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.202	58	Meadow, non-grazed, HSG B
0.202		100.00% Pervious Area

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

Subcatchment 7A: Subcat 7A



Summary for Subcatchment 8: Subcat 8

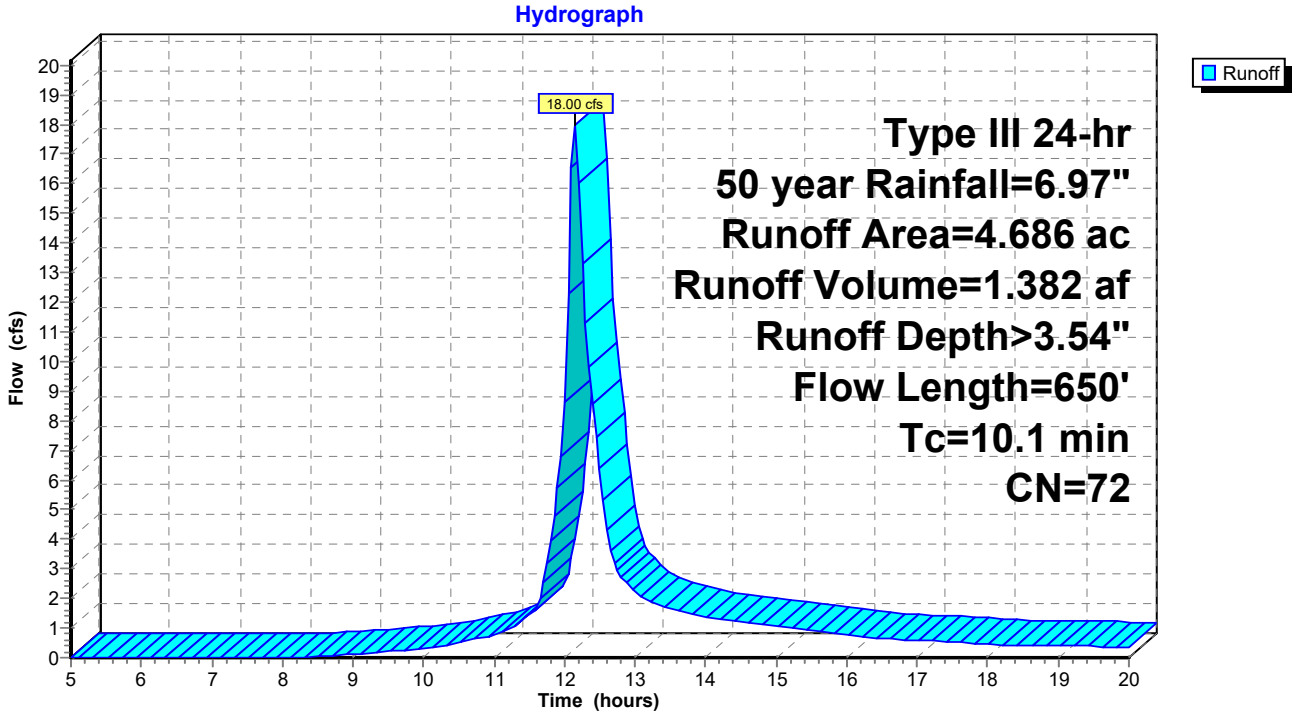
Runoff = 18.00 cfs @ 12.15 hrs, Volume= 1.382 af, Depth> 3.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
3.284	74	>75% Grass cover, Good, HSG C
0.293	96	Gravel surface, HSG C
1.109	58	Meadow, non-grazed, HSG B
4.686	72	Weighted Average
4.686		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	50	0.1100	0.21		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.9	270	0.1100	2.32		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.2	330	0.0350	1.31		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.1	650	Total			

Subcatchment 8: Subcat 8



Summary for Subcatchment 8A: Subcat 8A

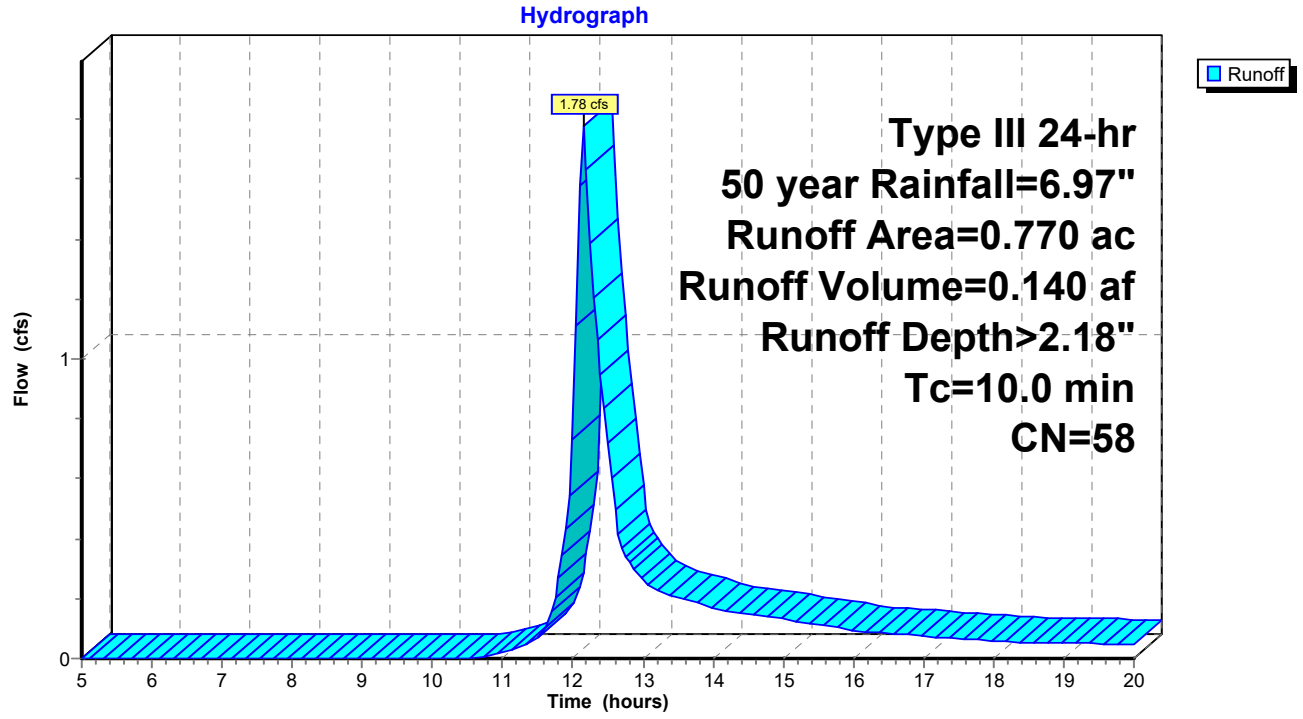
Runoff = 1.78 cfs @ 12.15 hrs, Volume= 0.140 af, Depth> 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.000	61	>75% Grass cover, Good, HSG B
0.003	96	Gravel surface, HSG B
0.767	58	Meadow, non-grazed, HSG B
0.770	58	Weighted Average
0.770		100.00% Pervious Area

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

Subcatchment 8A: Subcat 8A



Summary for Subcatchment 9: Subcat 9

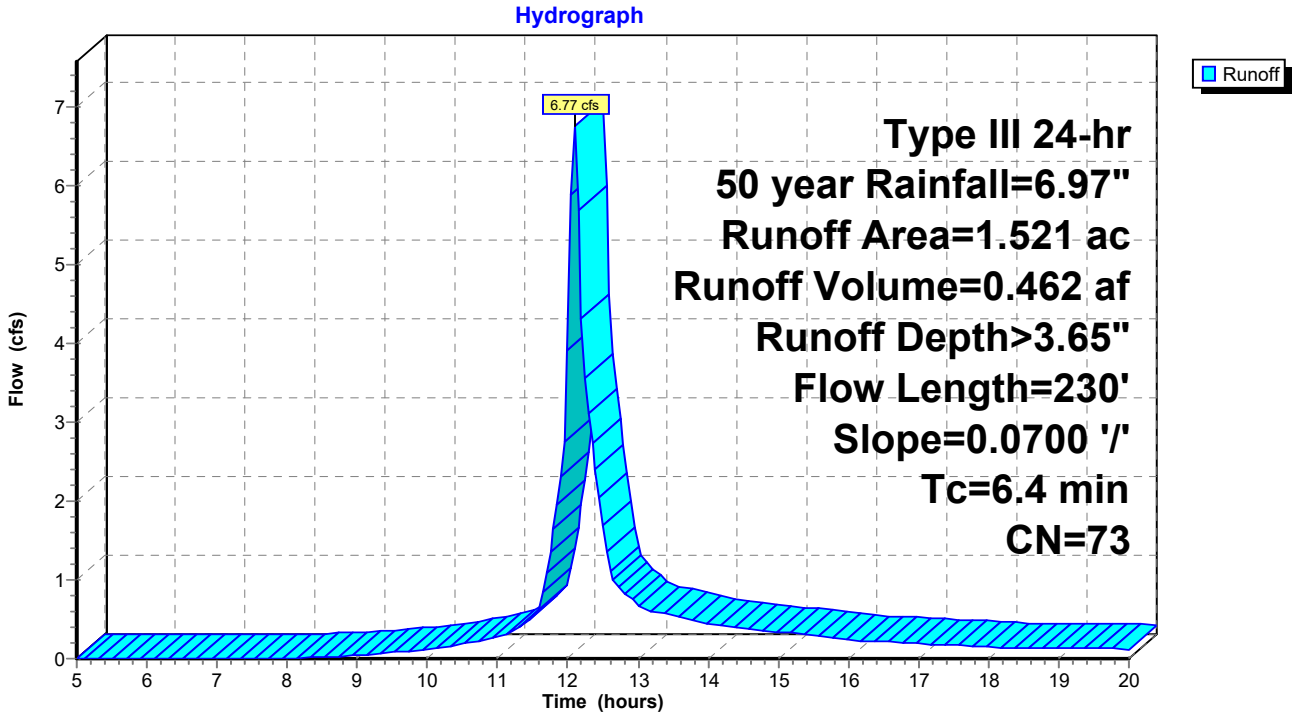
Runoff = 6.77 cfs @ 12.10 hrs, Volume= 0.462 af, Depth> 3.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.918	74	>75% Grass cover, Good, HSG C
0.199	96	Gravel surface, HSG C
0.404	58	Meadow, non-grazed, HSG B
1.521	73	Weighted Average
1.521		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	50	0.0700	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.6	180	0.0700	1.85		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.4	230	Total			

Subcatchment 9: Subcat 9



Summary for Subcatchment 9A: Subcat 9A

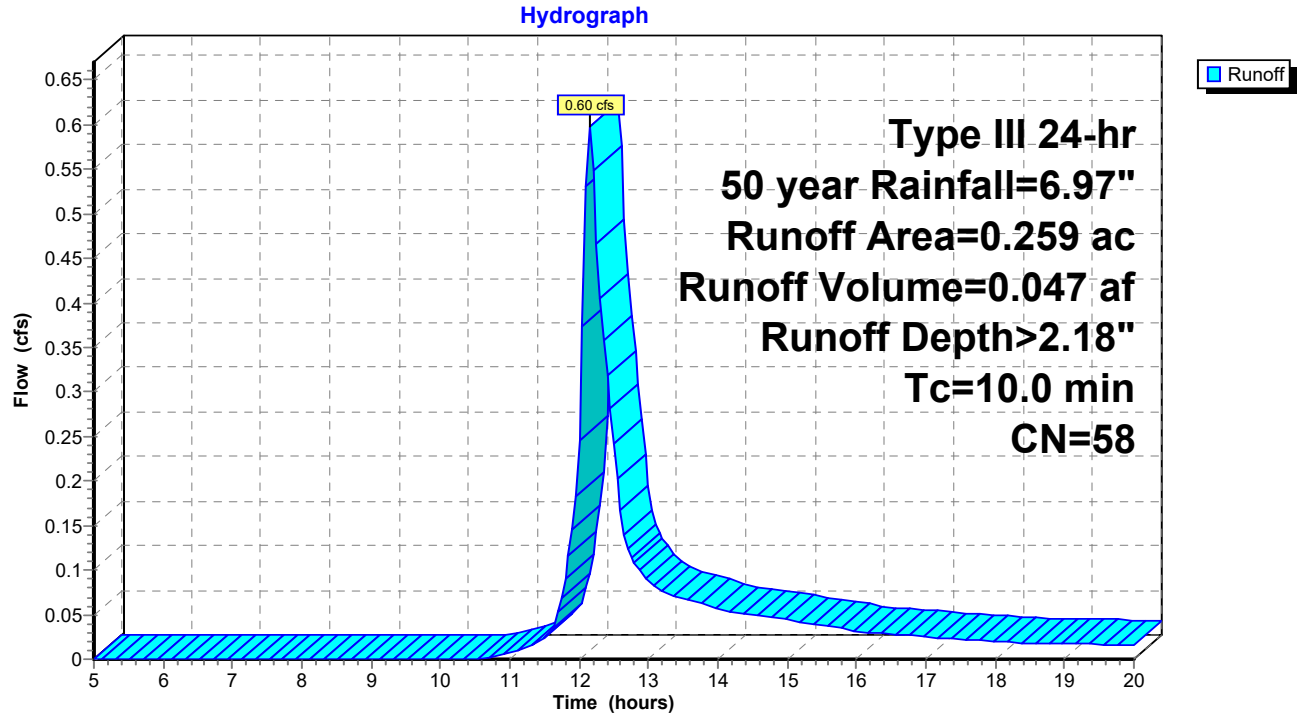
Runoff = 0.60 cfs @ 12.15 hrs, Volume= 0.047 af, Depth> 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.259	58	Meadow, non-grazed, HSG B
0.259		100.00% Pervious Area

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

Subcatchment 9A: Subcat 9A



Summary for Subcatchment 10: Subcat 10

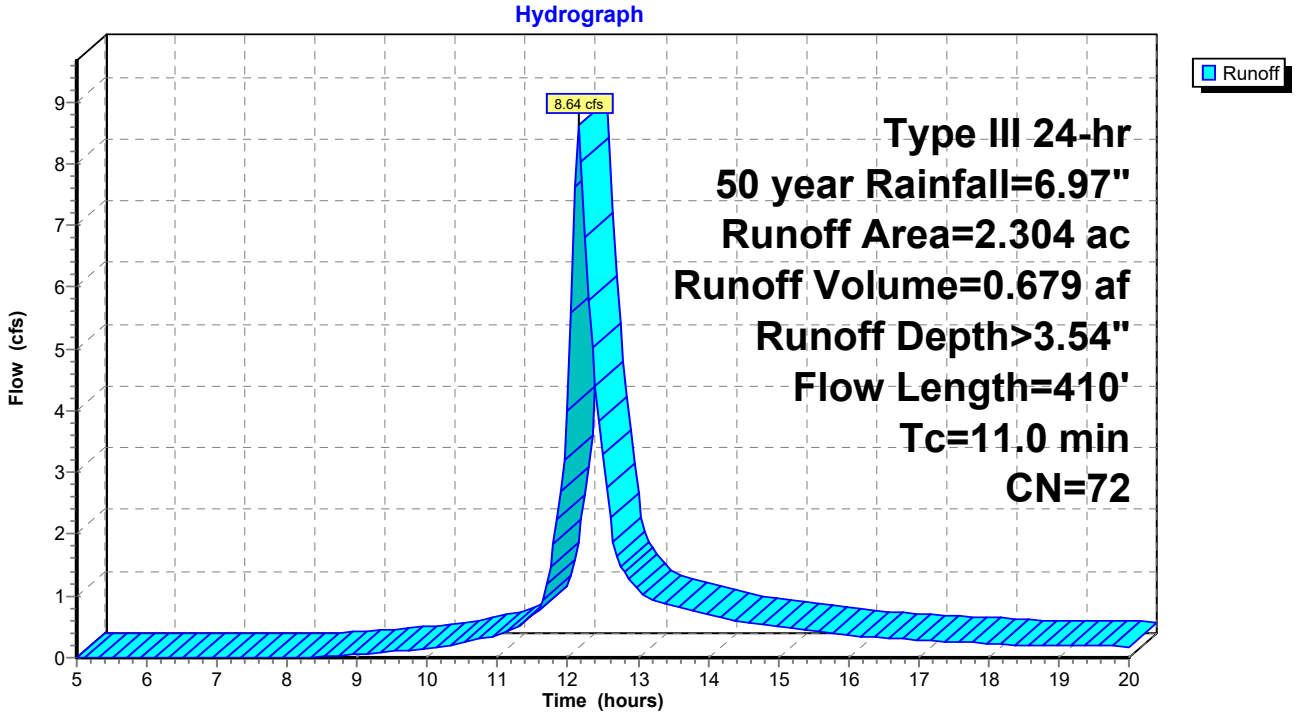
Runoff = 8.64 cfs @ 12.16 hrs, Volume= 0.679 af, Depth> 3.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
1.640	74	>75% Grass cover, Good, HSG C
0.157	96	Gravel surface, HSG C
0.507	58	Meadow, non-grazed, HSG B
2.304	72	Weighted Average
2.304		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0200	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
2.0	270	0.1000	2.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.1	90	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.0	410	Total			

Subcatchment 10: Subcat 10



Summary for Subcatchment 10A: Subcat 10A

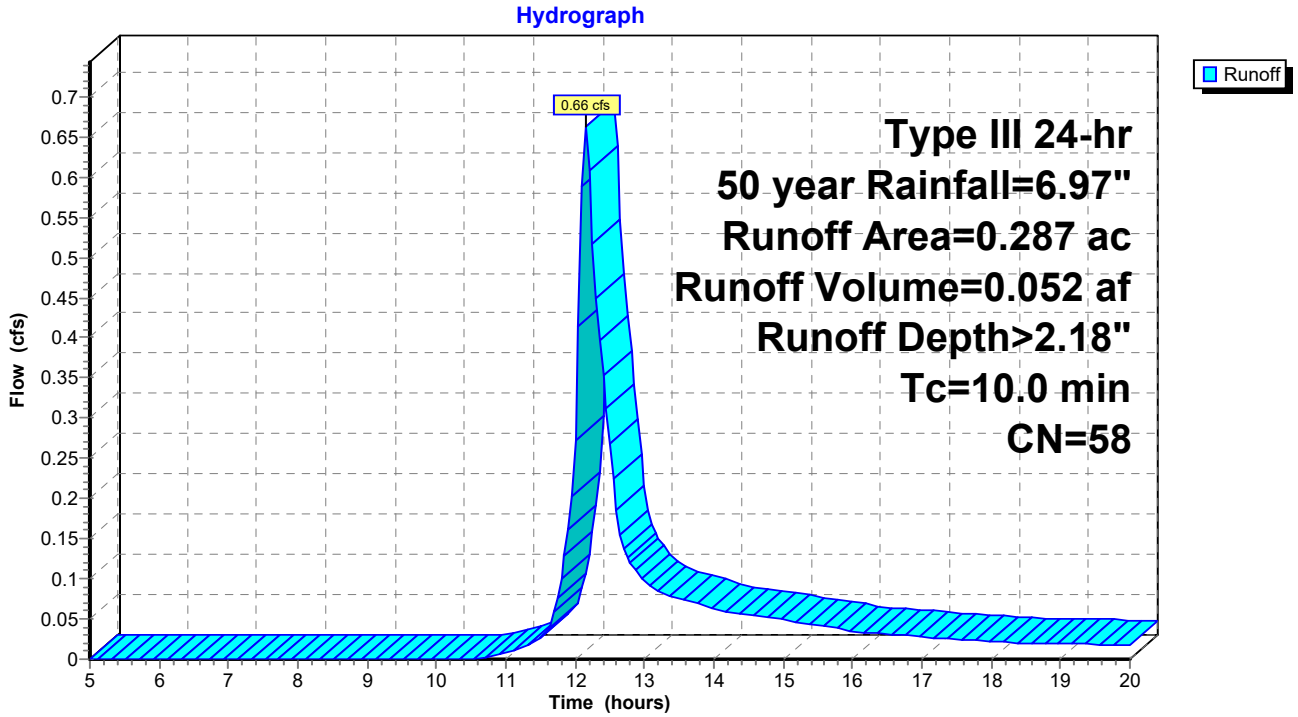
Runoff = 0.66 cfs @ 12.15 hrs, Volume= 0.052 af, Depth> 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.287	58	Meadow, non-grazed, HSG B
0.287		100.00% Pervious Area

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

Subcatchment 10A: Subcat 10A



Summary for Subcatchment 11: Subcat 11

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

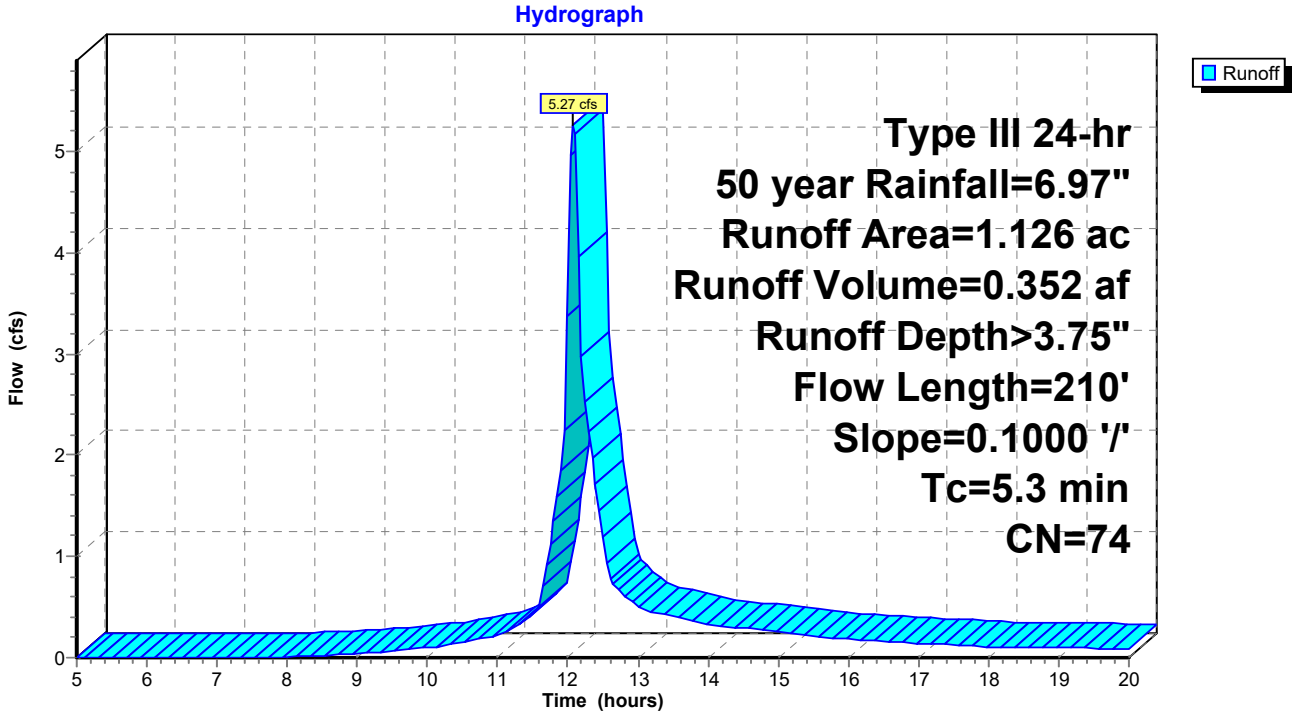
Runoff = 5.27 cfs @ 12.08 hrs, Volume= 0.352 af, Depth> 3.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.813	74	>75% Grass cover, Good, HSG C
0.144	96	Gravel surface, HSG C
0.169	58	Meadow, non-grazed, HSG B
1.126	74	Weighted Average
1.126		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.1000	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.2	160	0.1000	2.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.3	210	Total			

Subcatchment 11: Subcat 11



Summary for Subcatchment 11A: Subcat 11A

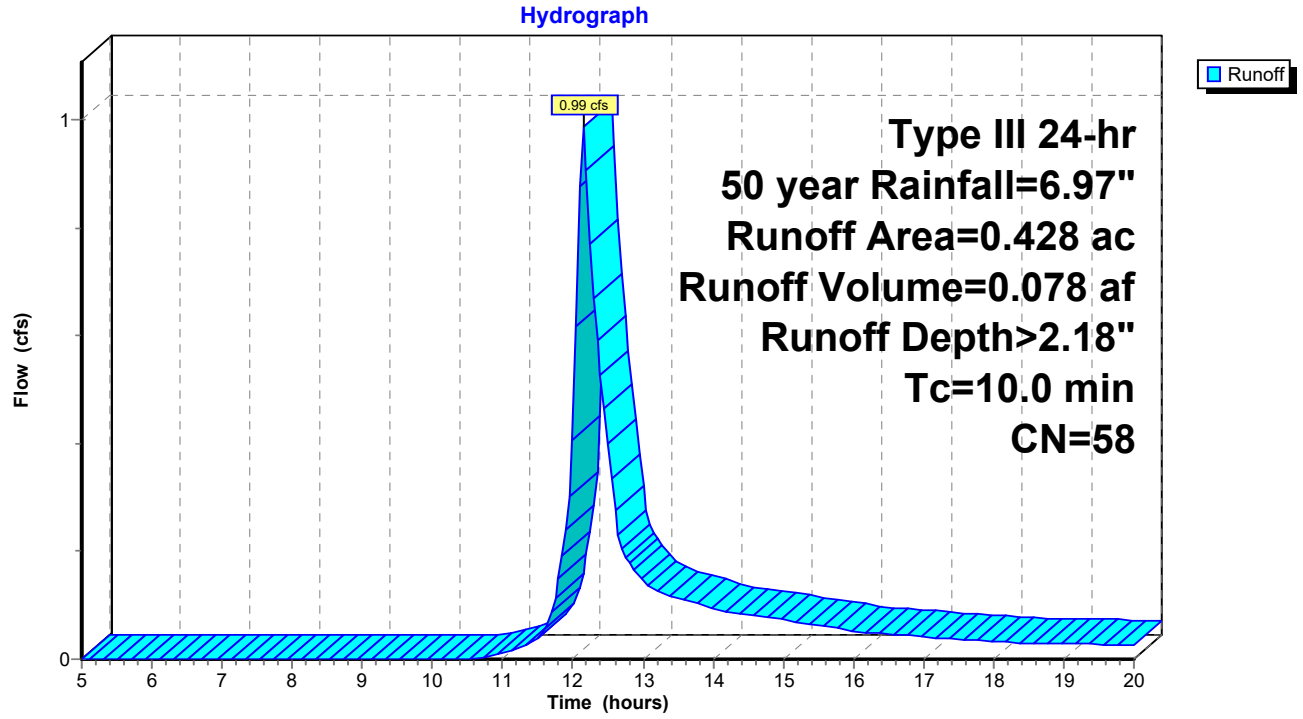
Runoff = 0.99 cfs @ 12.15 hrs, Volume= 0.078 af, Depth> 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.428	58	Meadow, non-grazed, HSG B
0.428		100.00% Pervious Area

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

Subcatchment 11A: Subcat 11A



Summary for Subcatchment 12: Subcat 12

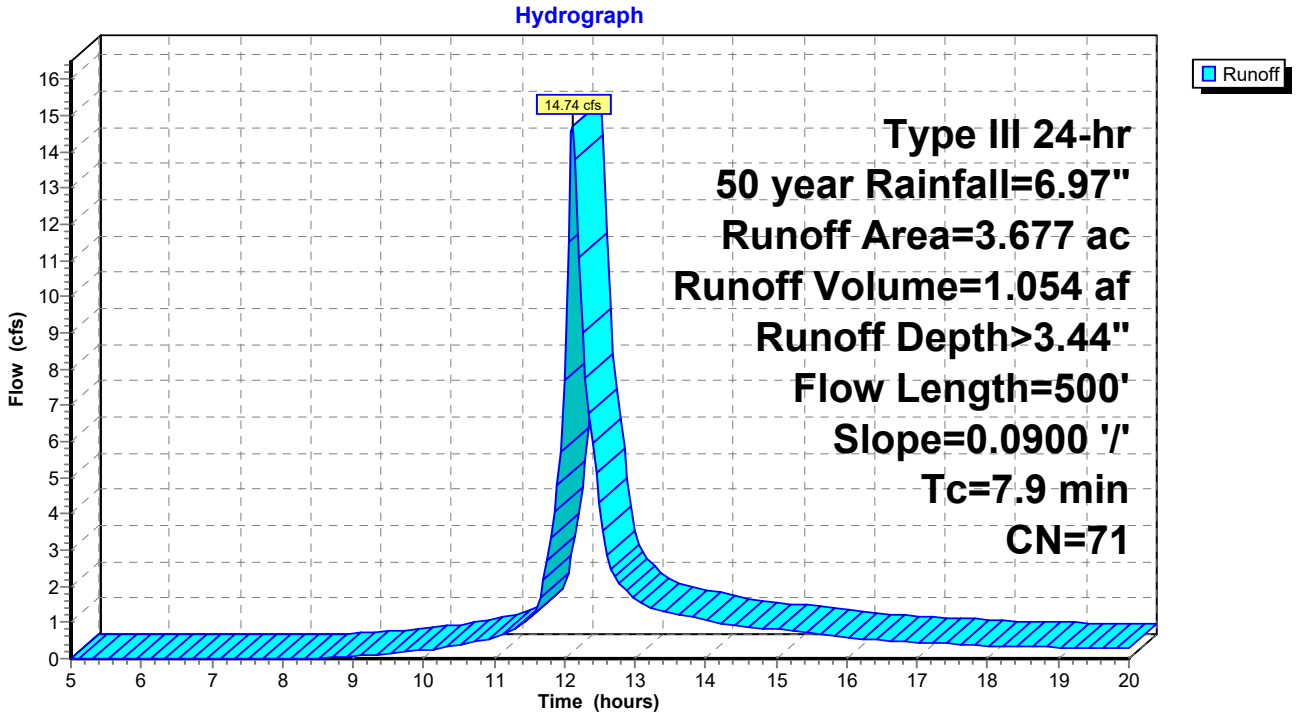
Runoff = 14.74 cfs @ 12.12 hrs, Volume= 1.054 af, Depth> 3.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
2.738	74	>75% Grass cover, Good, HSG C
0.100	96	Gravel surface, HSG C
0.839	58	Meadow, non-grazed, HSG B
3.677	71	Weighted Average
3.677		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0900	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
3.6	450	0.0900	2.10		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.9	500	Total			

Subcatchment 12: Subcat 12



Summary for Subcatchment 13.1: Subcat 13.1

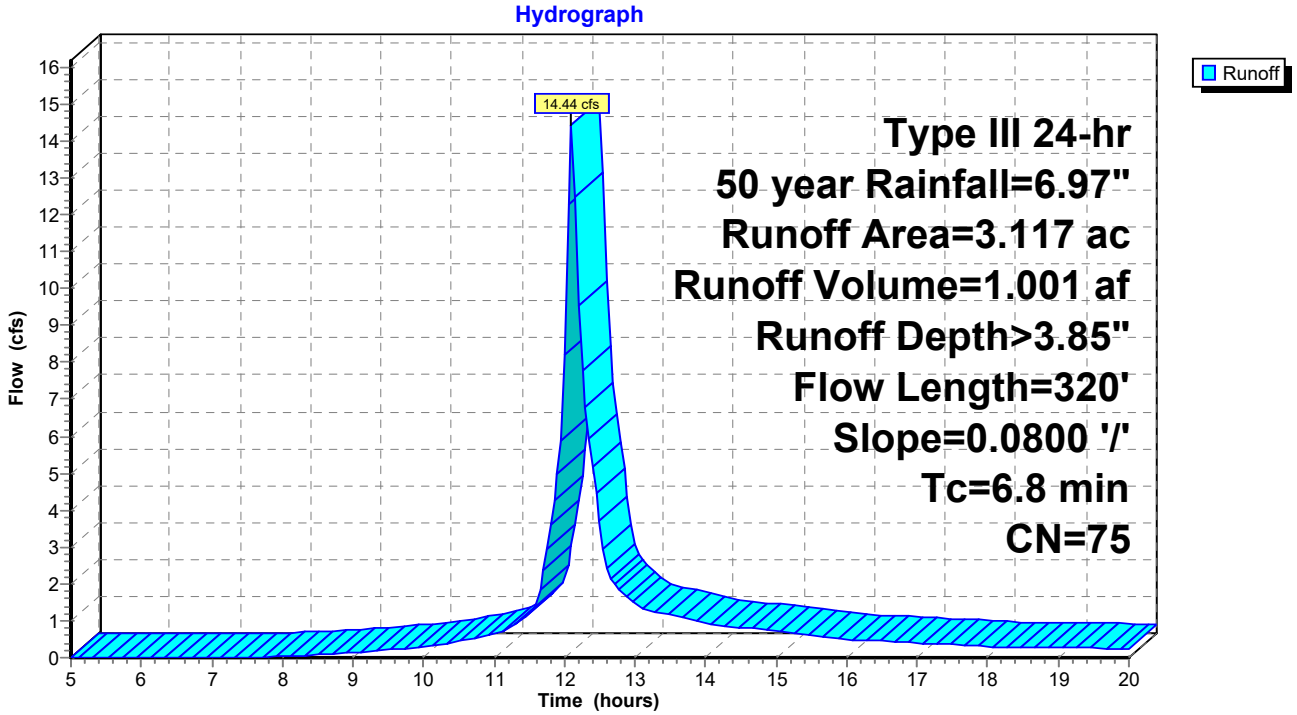
Runoff = 14.44 cfs @ 12.10 hrs, Volume= 1.001 af, Depth> 3.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
2.825	74	>75% Grass cover, Good, HSG C
0.010	80	>75% Grass cover, Good, HSG D
0.216	96	Gravel surface, HSG C
0.050	58	Meadow, non-grazed, HSG B
0.016	78	Meadow, non-grazed, HSG D
3.117	75	Weighted Average
3.117		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
2.3	270	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.8	320	Total			

Subcatchment 13.1: Subcat 13.1



Summary for Subcatchment 13.2: Subcat 13.2

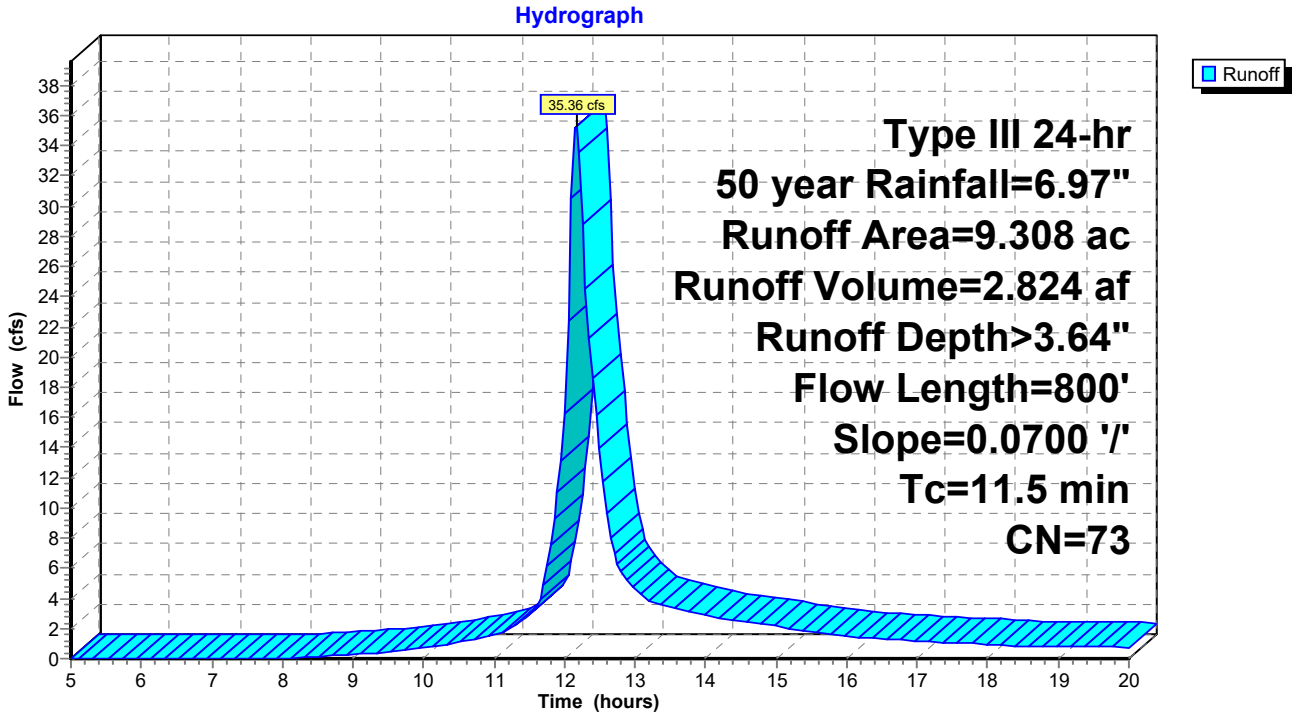
Runoff = 35.36 cfs @ 12.16 hrs, Volume= 2.824 af, Depth> 3.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
7.145	74	>75% Grass cover, Good, HSG C
0.662	96	Gravel surface, HSG C
1.501	58	Meadow, non-grazed, HSG B
9.308	73	Weighted Average
9.308		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	50	0.0700	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
6.7	750	0.0700	1.85		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.5	800	Total			

Subcatchment 13.2: Subcat 13.2



Summary for Subcatchment 14: Subcat 14

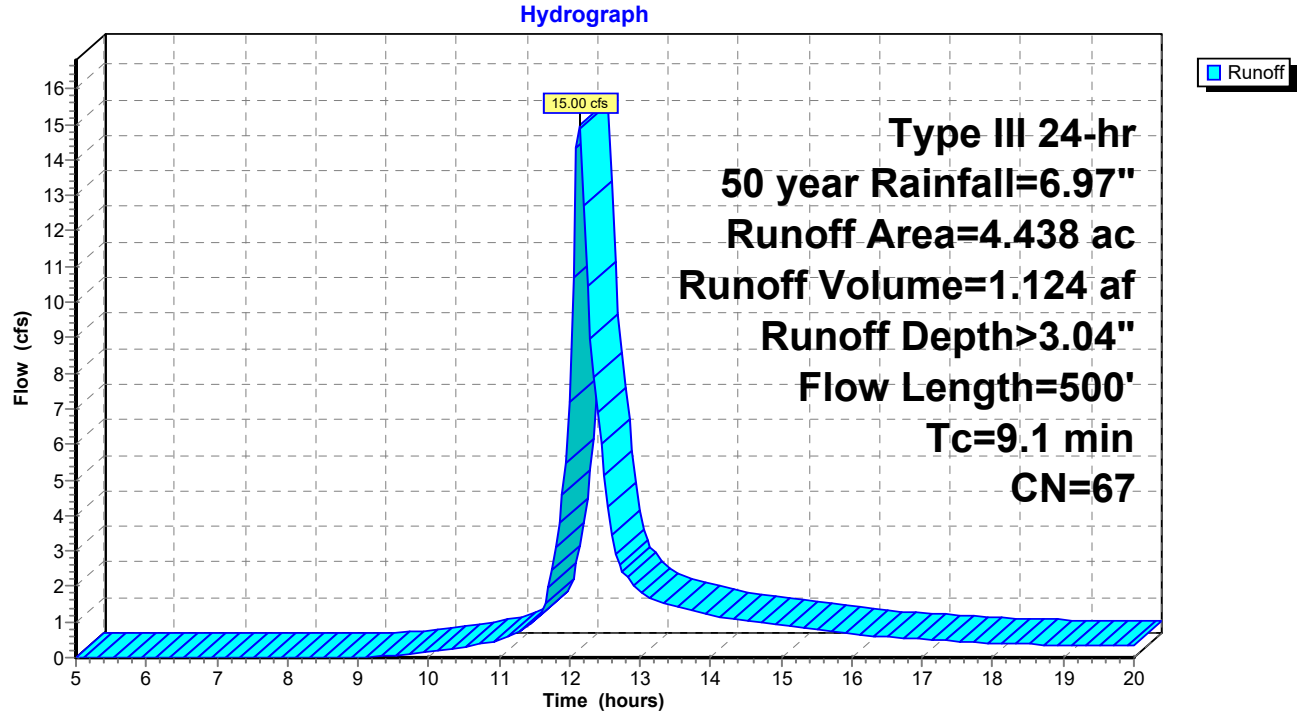
Runoff = 15.00 cfs @ 12.14 hrs, Volume= 1.124 af, Depth> 3.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
1.956	74	>75% Grass cover, Good, HSG C
0.193	96	Gravel surface, HSG C
2.289	58	Meadow, non-grazed, HSG B
4.438	67	Weighted Average
4.438		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.3	160	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.2	180	0.1300	2.52		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	110	0.2000	3.13		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.1	500	Total			

Subcatchment 14: Subcat 14



Summary for Subcatchment 16: Subcat 16

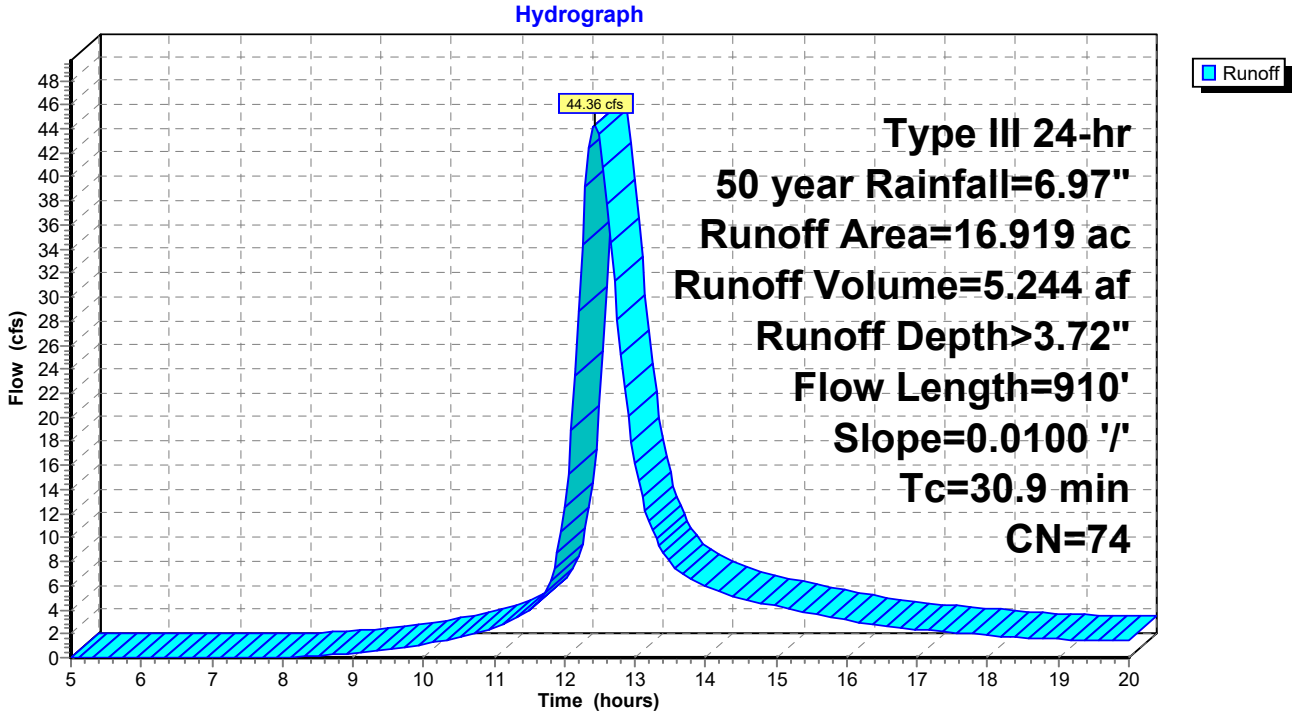
Runoff = 44.36 cfs @ 12.43 hrs, Volume= 5.244 af, Depth> 3.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
14.551	74	>75% Grass cover, Good, HSG C
1.069	96	Gravel surface, HSG C
1.299	58	Meadow, non-grazed, HSG B
16.919	74	Weighted Average
16.919		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	50	0.0100	0.08		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
11.9	500	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.6	360	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
30.9	910	Total			

Subcatchment 16: Subcat 16



Summary for Subcatchment 16A: Subcat 16A

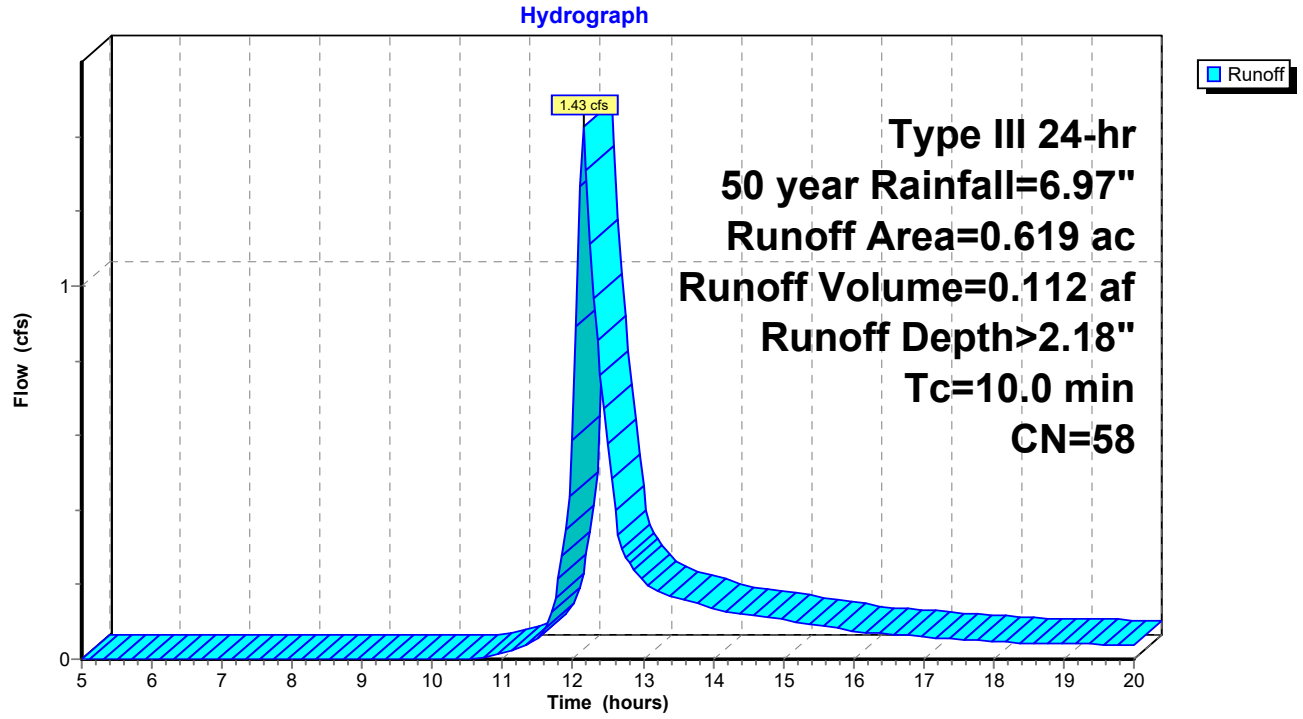
Runoff = 1.43 cfs @ 12.15 hrs, Volume= 0.112 af, Depth> 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.619	58	Meadow, non-grazed, HSG B
0.619		100.00% Pervious Area

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

Subcatchment 16A: Subcat 16A



Summary for Reach 13.1R: Reach 13.1

[91] Warning: Storage range exceeded by 0.30'
[55] Hint: Peak inflow is 696% of Manning's capacity
[79] Warning: Submerged Pond 13.1P Primary device # 1 by 0.40'

Inflow Area = 3.117 ac, 0.00% Impervious, Inflow Depth > 2.92" for 50 year event
Inflow = 6.64 cfs @ 12.31 hrs, Volume= 0.757 af
Outflow = 6.48 cfs @ 12.43 hrs, Volume= 0.754 af, Atten= 3%, Lag= 7.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.51 fps, Min. Travel Time= 3.3 min
Avg. Velocity = 1.75 fps, Avg. Travel Time= 4.8 min

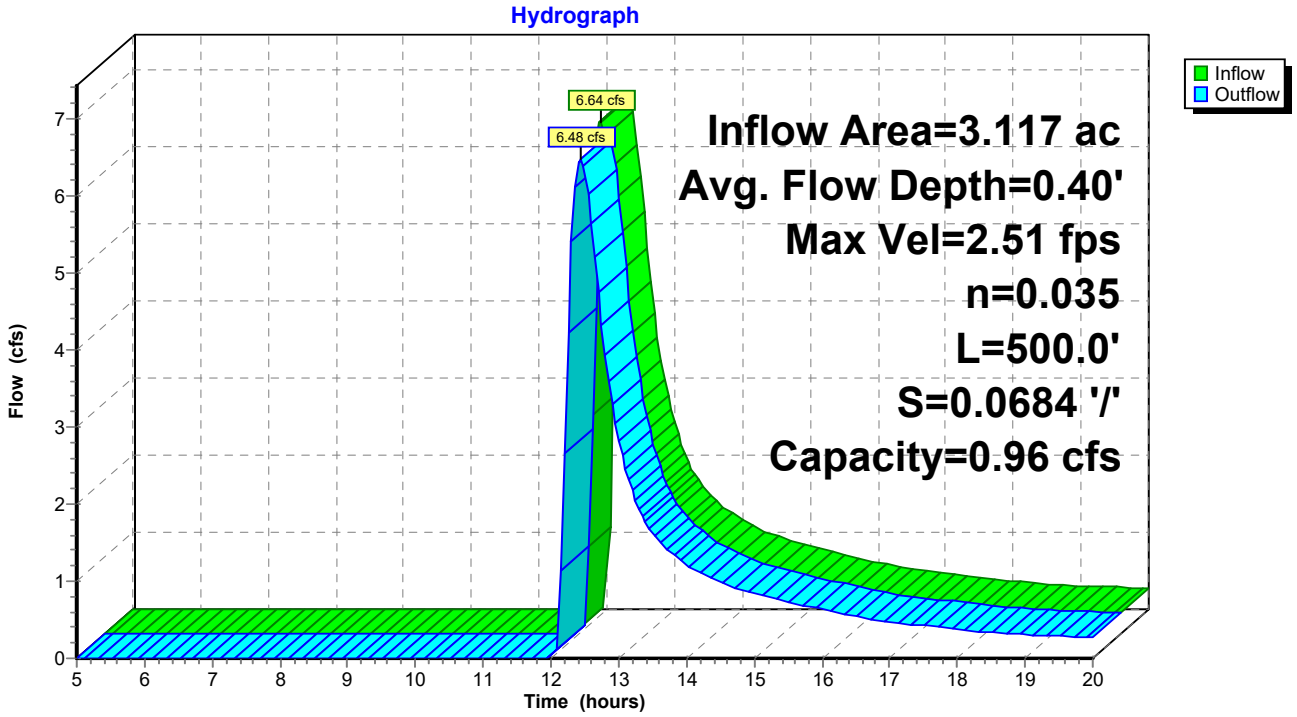
Peak Storage= 1,291 cf @ 12.38 hrs
Average Depth at Peak Storage= 0.40'
Bank-Full Depth= 0.10' Flow Area= 0.5 sf, Capacity= 0.96 cfs

3.00' x 0.10' deep channel, n= 0.035
Side Slope Z-value= 20.0 '/' Top Width= 7.00'
Length= 500.0' Slope= 0.0684 '/'
Inlet Invert= 224.20', Outlet Invert= 190.00'



‡

Reach 13.1R: Reach 13.1



Summary for Pond 1P: Pond 1

Inflow Area = 3.006 ac, 0.00% Impervious, Inflow Depth > 3.34" for 50 year event
Inflow = 11.65 cfs @ 12.12 hrs, Volume= 0.836 af
Outflow = 6.66 cfs @ 12.28 hrs, Volume= 0.698 af, Atten= 43%, Lag= 9.8 min
Primary = 6.66 cfs @ 12.28 hrs, Volume= 0.698 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 191.75' Surf.Area= 3,745 sf Storage= 5,323 cf
Peak Elev= 194.16' @ 12.28 hrs Surf.Area= 5,992 sf Storage= 16,964 cf (11,641 cf above start)

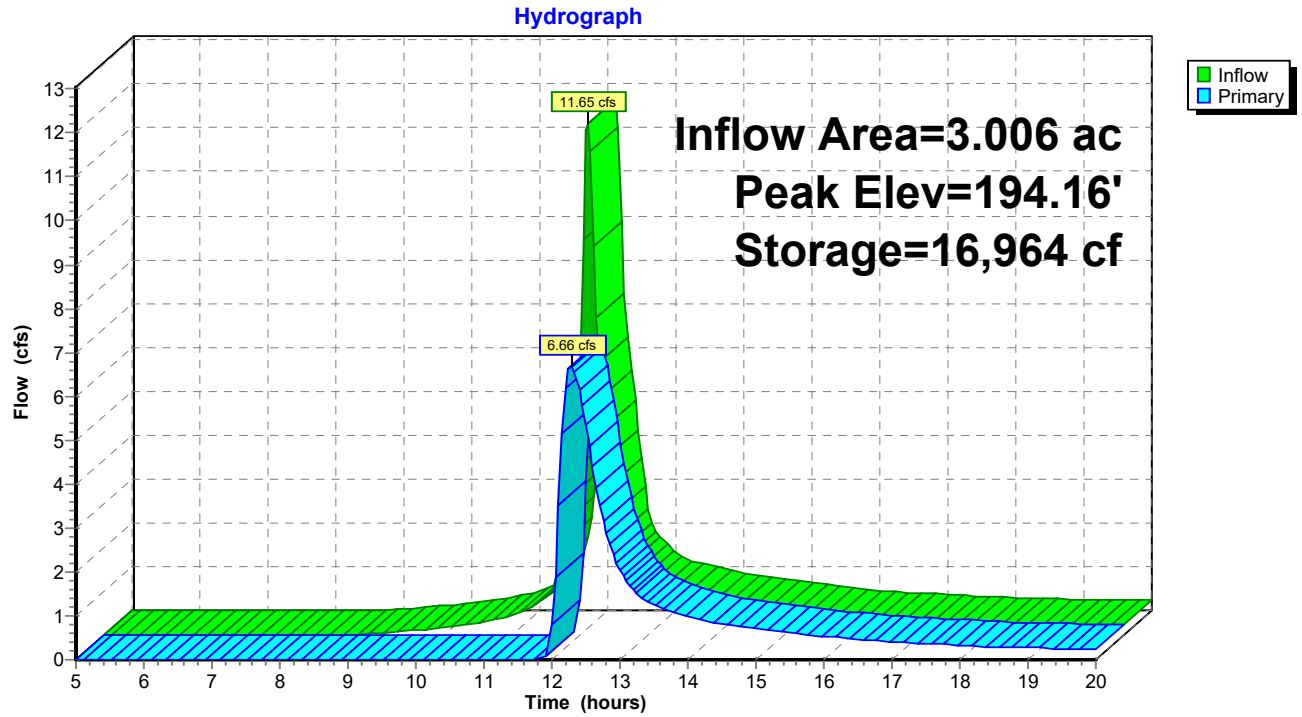
Plug-Flow detention time= 127.6 min calculated for 0.574 af (69% of inflow)
Center-of-Mass det. time= 37.5 min (833.6 - 796.1)

Volume	Invert	Avail.Storage	Storage Description
#1	190.00'	22,375 cf	**25.00'W x 95.00'L x 5.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	193.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=6.63 cfs @ 12.28 hrs HW=194.16' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 6.63 cfs @ 2.87 fps)

Pond 1P: Pond 1



Summary for Pond 2P: Pond 2

Inflow Area = 2.551 ac, 0.00% Impervious, Inflow Depth > 3.54" for 50 year event
Inflow = 9.18 cfs @ 12.17 hrs, Volume= 0.752 af
Outflow = 4.69 cfs @ 12.44 hrs, Volume= 0.543 af, Atten= 49%, Lag= 16.2 min
Discarded = 0.38 cfs @ 12.44 hrs, Volume= 0.257 af
Primary = 4.30 cfs @ 12.44 hrs, Volume= 0.286 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 231.55' @ 12.44 hrs Surf.Area= 4,883 sf Storage= 12,521 cf

Plug-Flow detention time= 119.9 min calculated for 0.542 af (72% of inflow)
Center-of-Mass det. time= 56.8 min (852.7 - 796.0)

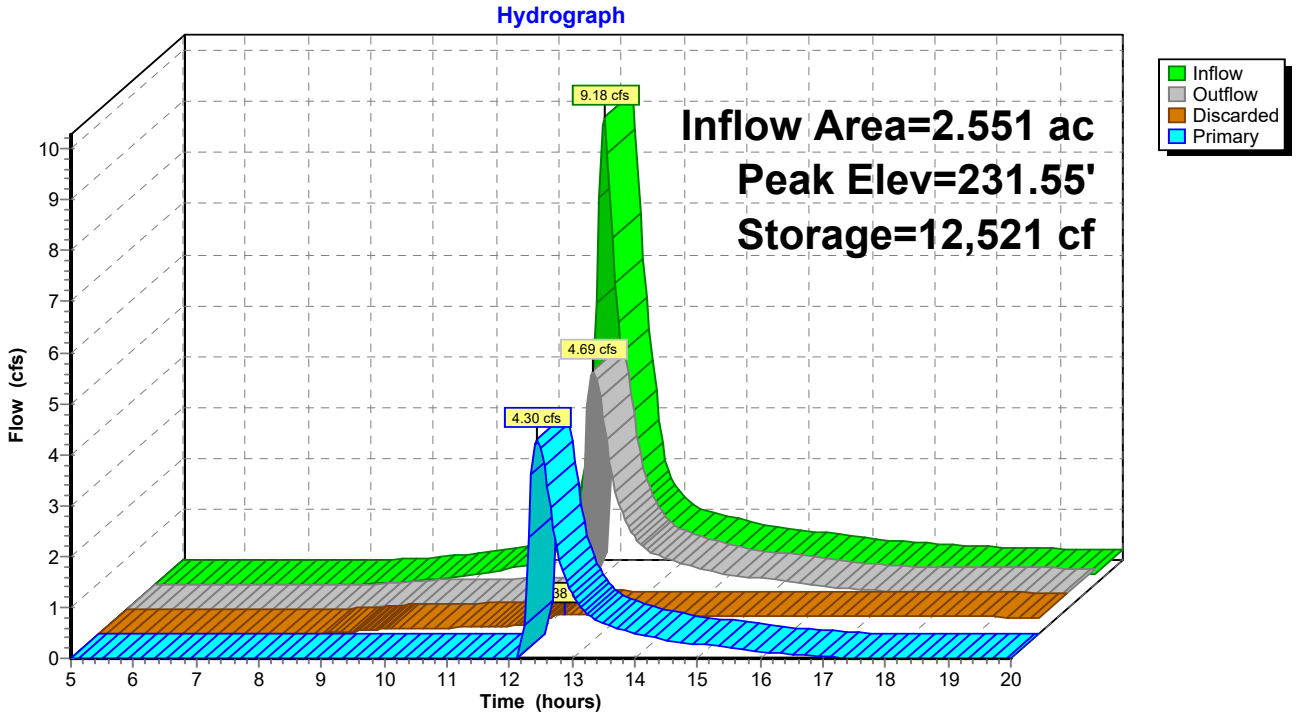
Volume	Invert	Avail.Storage	Storage Description
#1	227.50'	17,625 cf	**15.00'W x 100.00'L x 5.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	231.00'	**4.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	227.50'	**3.000 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 200.00'

Discarded OutFlow Max=0.38 cfs @ 12.44 hrs HW=231.55' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.38 cfs)

Primary OutFlow Max=4.29 cfs @ 12.44 hrs HW=231.55' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 4.29 cfs @ 1.96 fps)

Pond 2P: Pond 2



Summary for Pond 3P: Pond 3

Inflow Area = 2.550 ac, 0.00% Impervious, Inflow Depth > 3.64" for 50 year event
Inflow = 9.32 cfs @ 12.18 hrs, Volume= 0.773 af
Outflow = 4.64 cfs @ 12.45 hrs, Volume= 0.623 af, Atten= 50%, Lag= 16.7 min
Primary = 4.64 cfs @ 12.45 hrs, Volume= 0.623 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 227.95' @ 12.45 hrs Surf.Area= 5,640 sf Storage= 12,896 cf

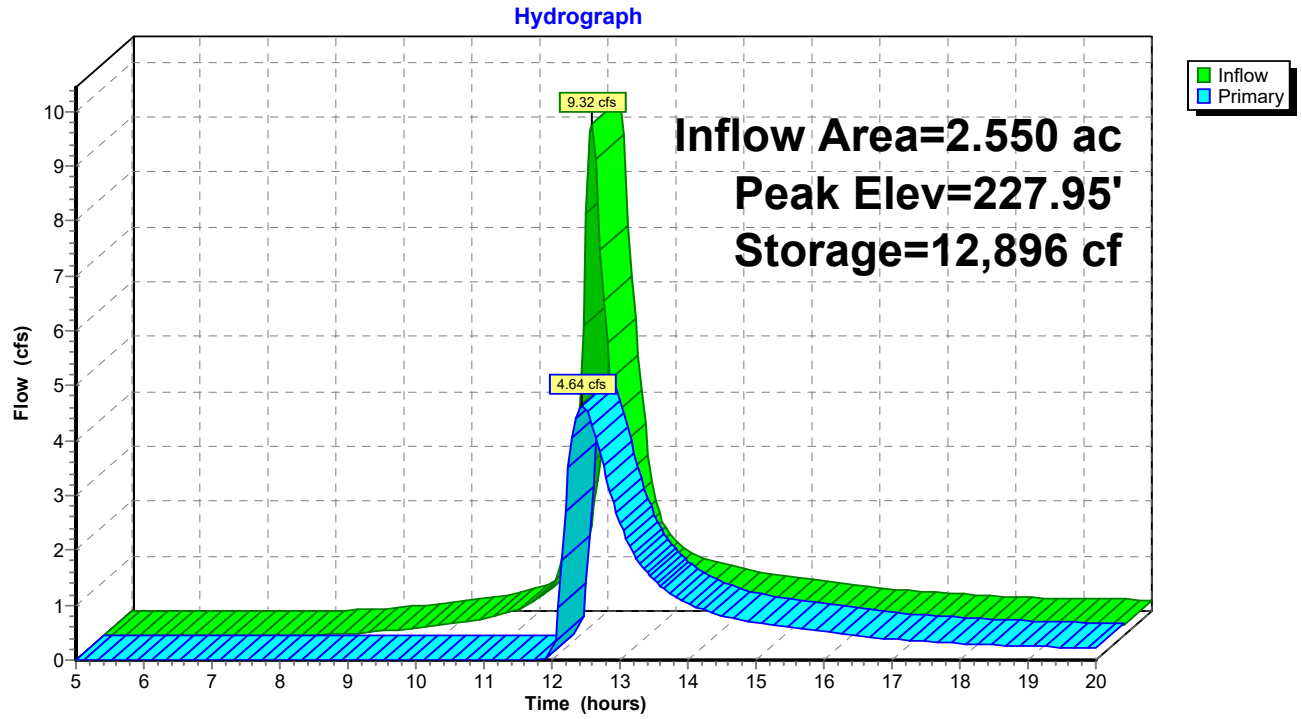
Plug-Flow detention time= 101.0 min calculated for 0.623 af (81% of inflow)
Center-of-Mass det. time= 49.5 min (843.9 - 794.3)

Volume	Invert	Avail.Storage	Storage Description
#1	225.00'	16,125 cf	**40.00'W x 80.00'L x 3.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	226.50'	**1.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=4.64 cfs @ 12.45 hrs HW=227.95' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 4.64 cfs @ 3.20 fps)

Pond 3P: Pond 3



Summary for Pond 4P: Pond 4

Inflow Area = 5.871 ac, 0.00% Impervious, Inflow Depth > 3.63" for 50 year event
Inflow = 19.71 cfs @ 12.22 hrs, Volume= 1.778 af
Outflow = 9.81 cfs @ 12.54 hrs, Volume= 1.160 af, Atten= 50%, Lag= 19.1 min
Primary = 9.81 cfs @ 12.54 hrs, Volume= 1.160 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 186.00' Surf.Area= 11,484 sf Storage= 20,436 cf
Peak Elev= 188.59' @ 12.54 hrs Surf.Area= 15,134 sf Storage= 54,851 cf (34,415 cf above start)

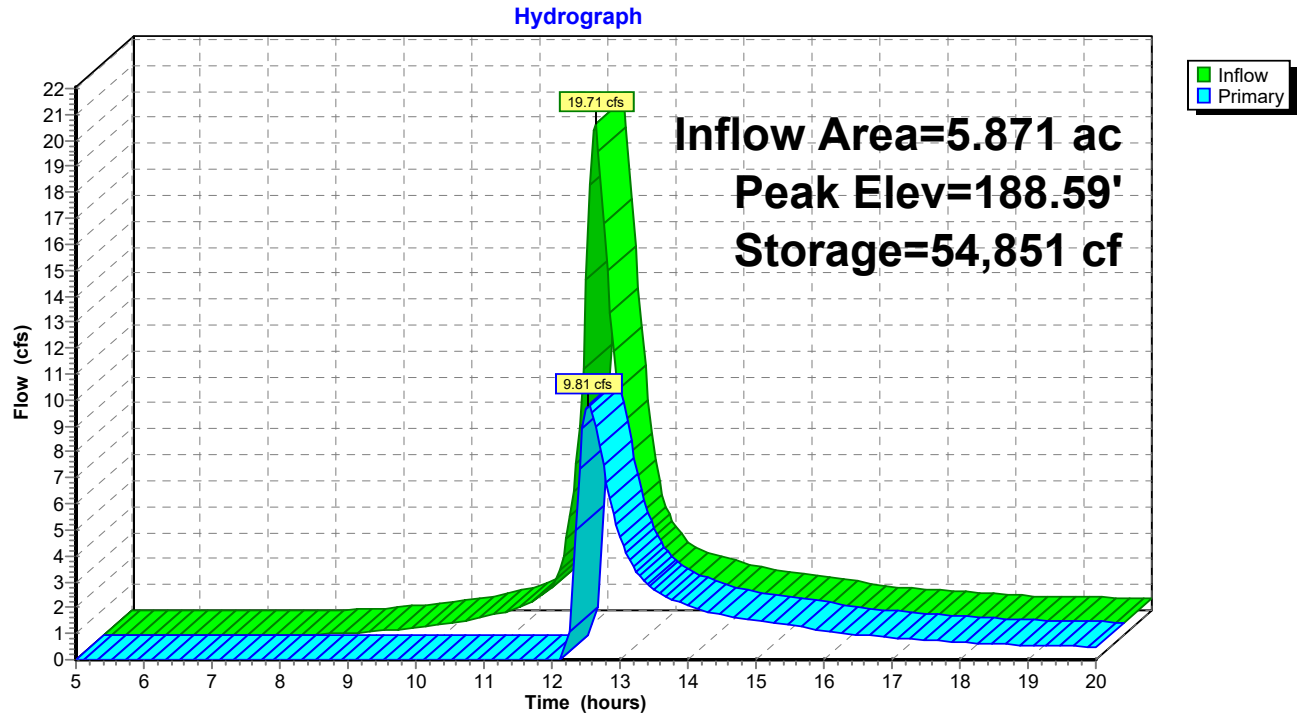
Plug-Flow detention time= 221.1 min calculated for 0.691 af (39% of inflow)
Center-of-Mass det. time= 63.1 min (860.3 - 797.2)

Volume	Invert	Avail.Storage	Storage Description
#1	184.00'	77,652 cf	**75.00'W x 120.00'L x 6.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	188.00'	**8.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=9.80 cfs @ 12.54 hrs HW=188.59' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 9.80 cfs @ 2.07 fps)

Pond 4P: Pond 4



Summary for Pond 5P: Pond 5

Inflow Area = 2.637 ac, 0.00% Impervious, Inflow Depth > 3.14" for 50 year event
Inflow = 8.91 cfs @ 12.15 hrs, Volume= 0.689 af
Outflow = 4.28 cfs @ 12.42 hrs, Volume= 0.506 af, Atten= 52%, Lag= 16.1 min
Primary = 4.28 cfs @ 12.42 hrs, Volume= 0.506 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 218.86' @ 12.42 hrs Surf.Area= 5,183 sf Storage= 11,564 cf

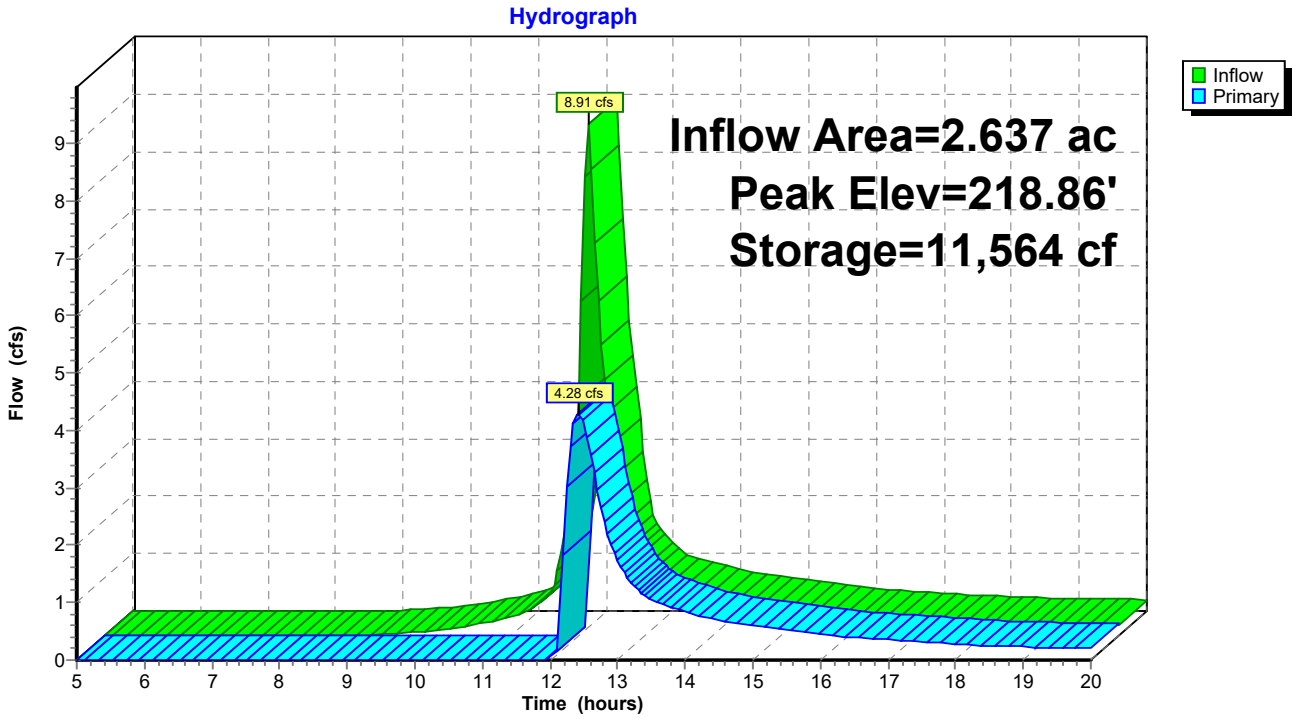
Plug-Flow detention time= 113.0 min calculated for 0.506 af (73% of inflow)
Center-of-Mass det. time= 50.0 min (851.4 - 801.4)

Volume	Invert	Avail.Storage	Storage Description
#1	216.00'	18,048 cf	**60.00'W x 50.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	218.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=4.26 cfs @ 12.42 hrs HW=218.86' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 4.26 cfs @ 2.48 fps)

Pond 5P: Pond 5



Summary for Pond 6P: Pond 6

Inflow Area = 3.201 ac, 0.00% Impervious, Inflow Depth > 3.64" for 50 year event
Inflow = 13.47 cfs @ 12.12 hrs, Volume= 0.972 af
Outflow = 7.84 cfs @ 12.27 hrs, Volume= 0.745 af, Atten= 42%, Lag= 9.4 min
Primary = 7.84 cfs @ 12.27 hrs, Volume= 0.745 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 207.00' Surf.Area= 3,844 sf Storage= 6,296 cf
Peak Elev= 209.99' @ 12.27 hrs Surf.Area= 6,386 sf Storage= 21,405 cf (15,109 cf above start)

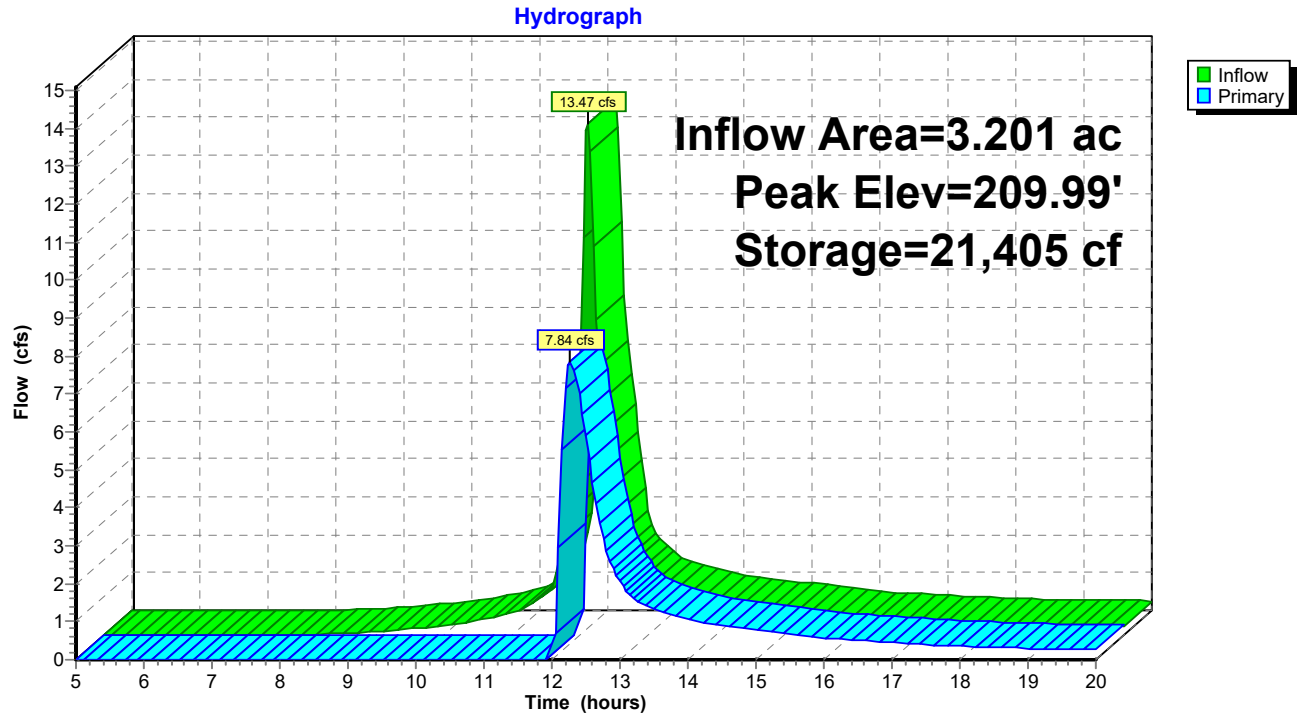
Plug-Flow detention time= 143.9 min calculated for 0.601 af (62% of inflow)
Center-of-Mass det. time= 44.6 min (835.4 - 790.8)

Volume	Invert	Avail.Storage	Storage Description
#1	205.00'	24,822 cf	**50.00'W x 50.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	209.00'	**3.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=7.76 cfs @ 12.27 hrs HW=209.98' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 7.76 cfs @ 2.64 fps)

Pond 6P: Pond 6



Summary for Pond 7P: Pond 7

Inflow Area = 1.170 ac, 0.00% Impervious, Inflow Depth > 3.34" for 50 year event
Inflow = 4.85 cfs @ 12.09 hrs, Volume= 0.326 af
Outflow = 1.81 cfs @ 12.38 hrs, Volume= 0.255 af, Atten= 63%, Lag= 17.0 min
Discarded = 0.25 cfs @ 12.38 hrs, Volume= 0.162 af
Primary = 1.56 cfs @ 12.38 hrs, Volume= 0.093 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 226.45' @ 12.38 hrs Surf.Area= 2,471 sf Storage= 5,397 cf

Plug-Flow detention time= 128.4 min calculated for 0.255 af (78% of inflow)
Center-of-Mass det. time= 71.9 min (866.2 - 794.3)

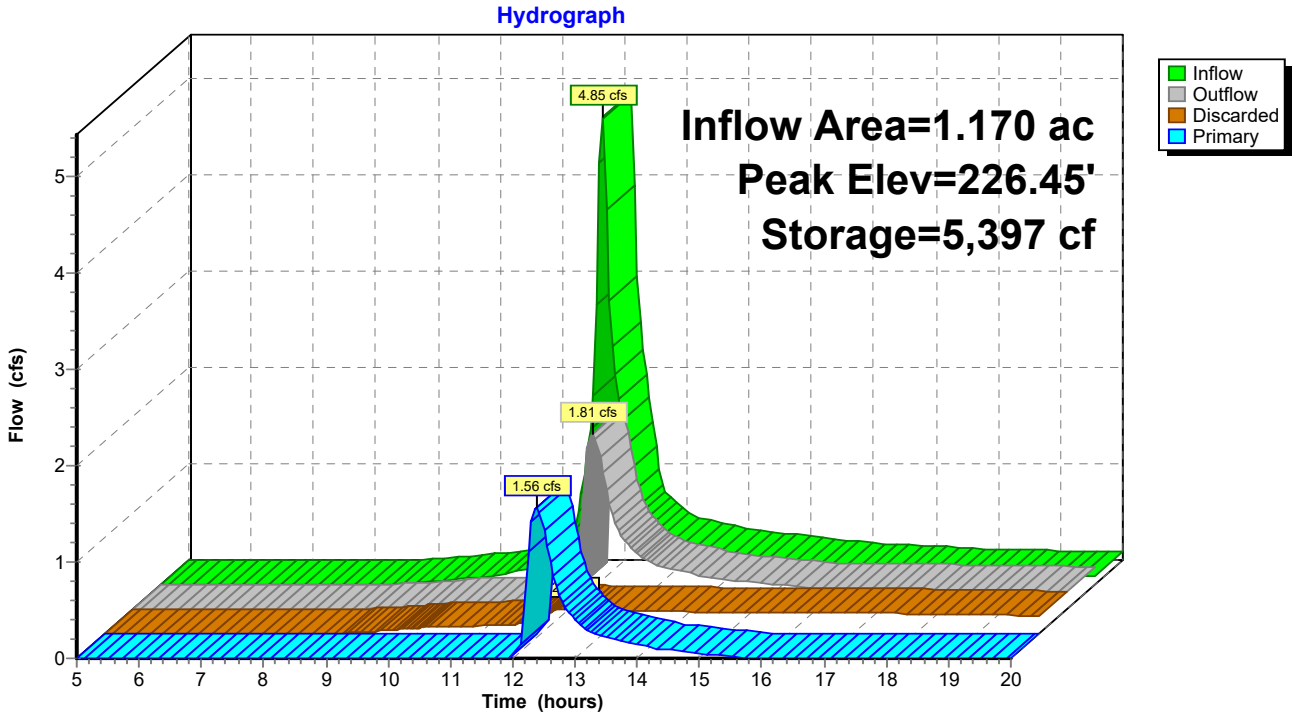
Volume	Invert	Avail.Storage	Storage Description
#1	223.00'	8,339 cf	**20.00'W x 40.00'L x 4.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	226.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	223.00'	**3.900 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 200.00'

Discarded OutFlow Max=0.25 cfs @ 12.38 hrs HW=226.45' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.25 cfs)

Primary OutFlow Max=1.55 cfs @ 12.38 hrs HW=226.45' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 1.55 cfs @ 1.73 fps)

Pond 7P: Pond 7



Summary for Pond 8P: Pond 8

Inflow Area = 4.686 ac, 0.00% Impervious, Inflow Depth > 3.54" for 50 year event
Inflow = 18.00 cfs @ 12.15 hrs, Volume= 1.382 af
Outflow = 9.19 cfs @ 12.38 hrs, Volume= 1.152 af, Atten= 49%, Lag= 13.8 min
Primary = 9.19 cfs @ 12.38 hrs, Volume= 1.152 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 190.24' @ 12.38 hrs Surf.Area= 8,299 sf Storage= 21,369 cf

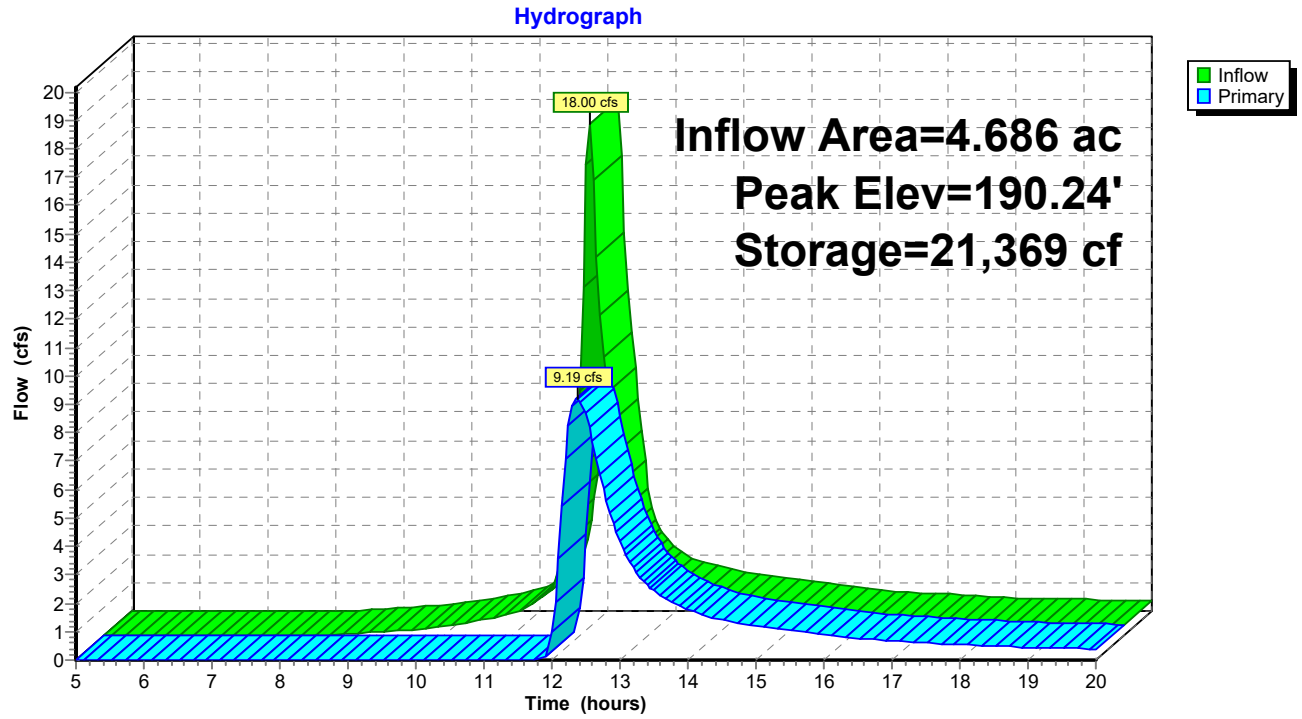
Plug-Flow detention time= 90.5 min calculated for 1.152 af (83% of inflow)
Center-of-Mass det. time= 43.9 min (838.0 - 794.2)

Volume	Invert	Avail.Storage	Storage Description
#1	187.00'	27,968 cf	**50.00'W x 100.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	188.50'	**1.5' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=9.17 cfs @ 12.38 hrs HW=190.24' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 9.17 cfs @ 3.51 fps)

Pond 8P: Pond 8



Summary for Pond 9P: Pond 9

Inflow Area = 1.521 ac, 0.00% Impervious, Inflow Depth > 3.65" for 50 year event
Inflow = 6.77 cfs @ 12.10 hrs, Volume= 0.462 af
Outflow = 2.35 cfs @ 12.41 hrs, Volume= 0.299 af, Atten= 65%, Lag= 18.7 min
Primary = 2.35 cfs @ 12.41 hrs, Volume= 0.299 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 188.00' Surf.Area= 2,664 sf Storage= 4,116 cf
Peak Elev= 190.58' @ 12.41 hrs Surf.Area= 4,590 sf Storage= 13,367 cf (9,251 cf above start)

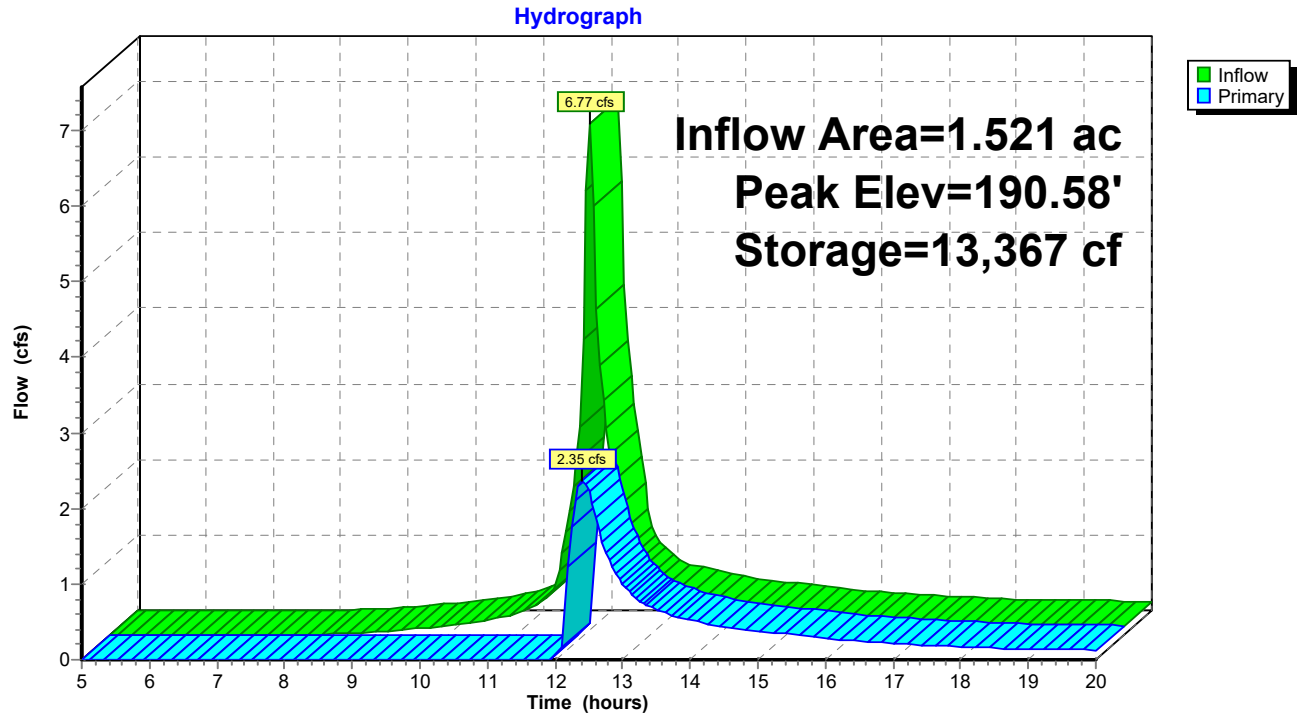
Plug-Flow detention time= 203.1 min calculated for 0.205 af (44% of inflow)
Center-of-Mass det. time= 66.4 min (855.9 - 789.4)

Volume	Invert	Avail.Storage	Storage Description
#1	186.00'	17,960 cf	**25.00'W x 60.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	190.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=2.35 cfs @ 12.41 hrs HW=190.58' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 2.35 cfs @ 2.03 fps)

Pond 9P: Pond 9



Summary for Pond 10P: Pond 10

Inflow Area = 2.304 ac, 0.00% Impervious, Inflow Depth > 3.54" for 50 year event
Inflow = 8.64 cfs @ 12.16 hrs, Volume= 0.679 af
Outflow = 3.72 cfs @ 12.46 hrs, Volume= 0.470 af, Atten= 57%, Lag= 18.4 min
Primary = 3.72 cfs @ 12.46 hrs, Volume= 0.470 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 169.28' @ 12.46 hrs Surf.Area= 5,783 sf Storage= 12,789 cf

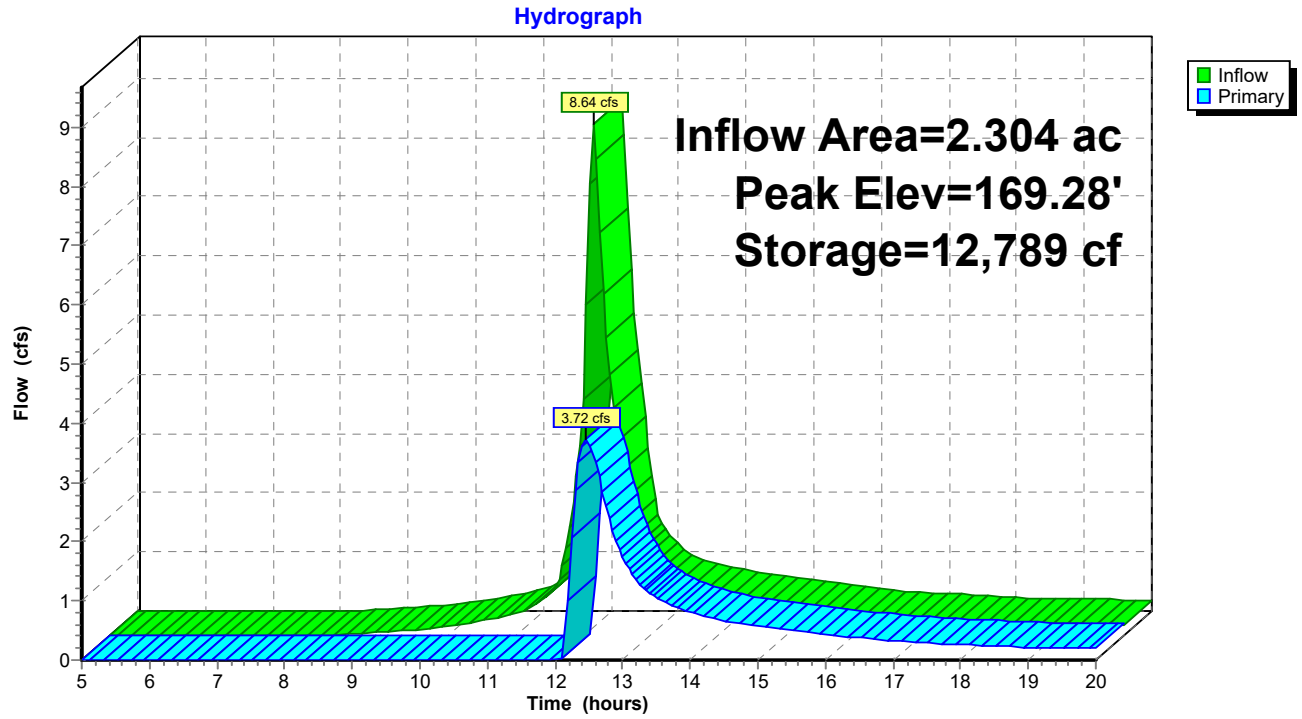
Plug-Flow detention time= 127.2 min calculated for 0.470 af (69% of inflow)
Center-of-Mass det. time= 59.8 min (854.6 - 794.9)

Volume	Invert	Avail.Storage	Storage Description
#1	166.50'	17,175 cf	**50.00'W x 70.00'L x 3.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	168.50'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=3.70 cfs @ 12.46 hrs HW=169.28' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 3.70 cfs @ 2.37 fps)

Pond 10P: Pond 10



Summary for Pond 11P: Pond 11

Inflow Area = 1.126 ac, 0.00% Impervious, Inflow Depth > 3.75" for 50 year event
Inflow = 5.27 cfs @ 12.08 hrs, Volume= 0.352 af
Outflow = 1.34 cfs @ 12.47 hrs, Volume= 0.198 af, Atten= 75%, Lag= 23.5 min
Primary = 1.34 cfs @ 12.47 hrs, Volume= 0.198 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 149.50' Surf.Area= 1,776 sf Storage= 2,043 cf
Peak Elev= 152.41' @ 12.47 hrs Surf.Area= 3,792 sf Storage= 9,998 cf (7,955 cf above start)

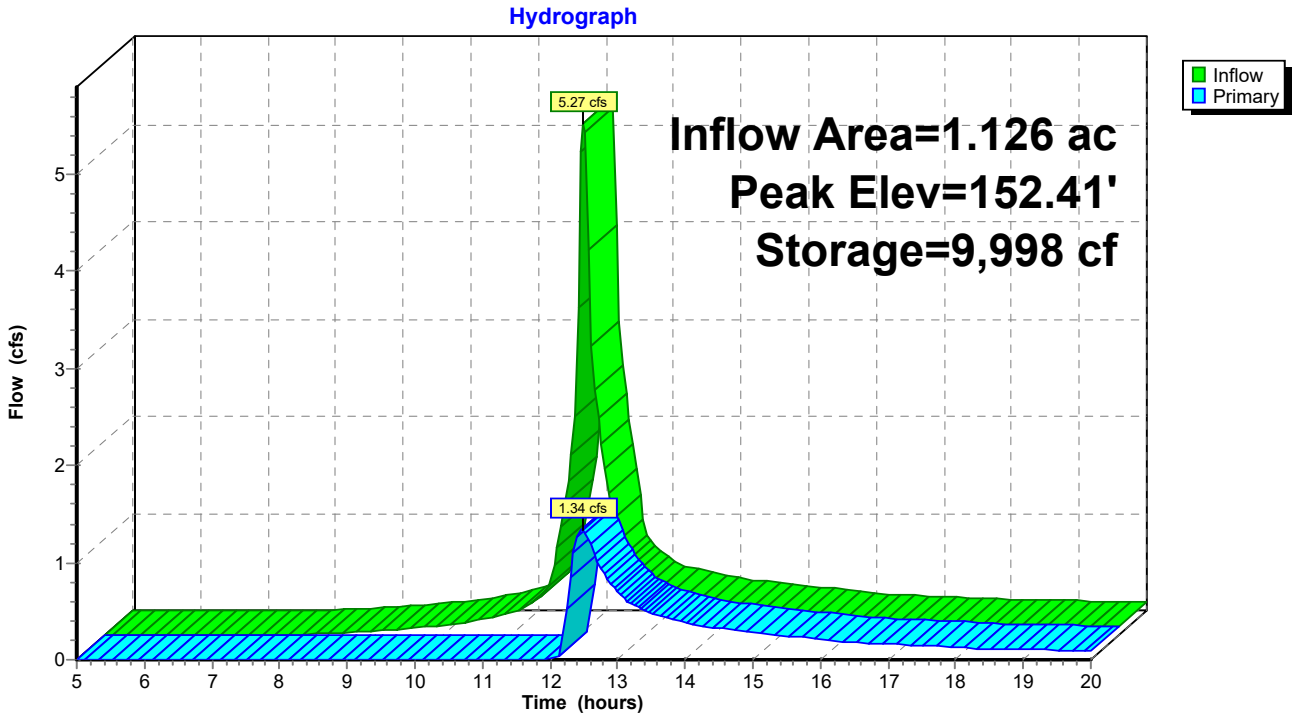
Plug-Flow detention time= 206.4 min calculated for 0.150 af (43% of inflow)
Center-of-Mass det. time= 82.4 min (869.1 - 786.7)

Volume	Invert	Avail.Storage	Storage Description
#1	148.00'	14,619 cf	**15.00'W x 65.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	152.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=1.33 cfs @ 12.47 hrs HW=152.41' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 1.33 cfs @ 1.63 fps)

Pond 11P: Pond 11



Summary for Pond 12P: Pond 12

Inflow Area = 3.677 ac, 0.00% Impervious, Inflow Depth > 3.44" for 50 year event
Inflow = 14.74 cfs @ 12.12 hrs, Volume= 1.054 af
Outflow = 7.50 cfs @ 12.32 hrs, Volume= 0.854 af, Atten= 49%, Lag= 12.1 min
Primary = 7.50 cfs @ 12.32 hrs, Volume= 0.854 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 157.00' Surf.Area= 4,384 sf Storage= 6,836 cf
Peak Elev= 159.76' @ 12.32 hrs Surf.Area= 7,452 sf Storage= 23,018 cf (16,182 cf above start)

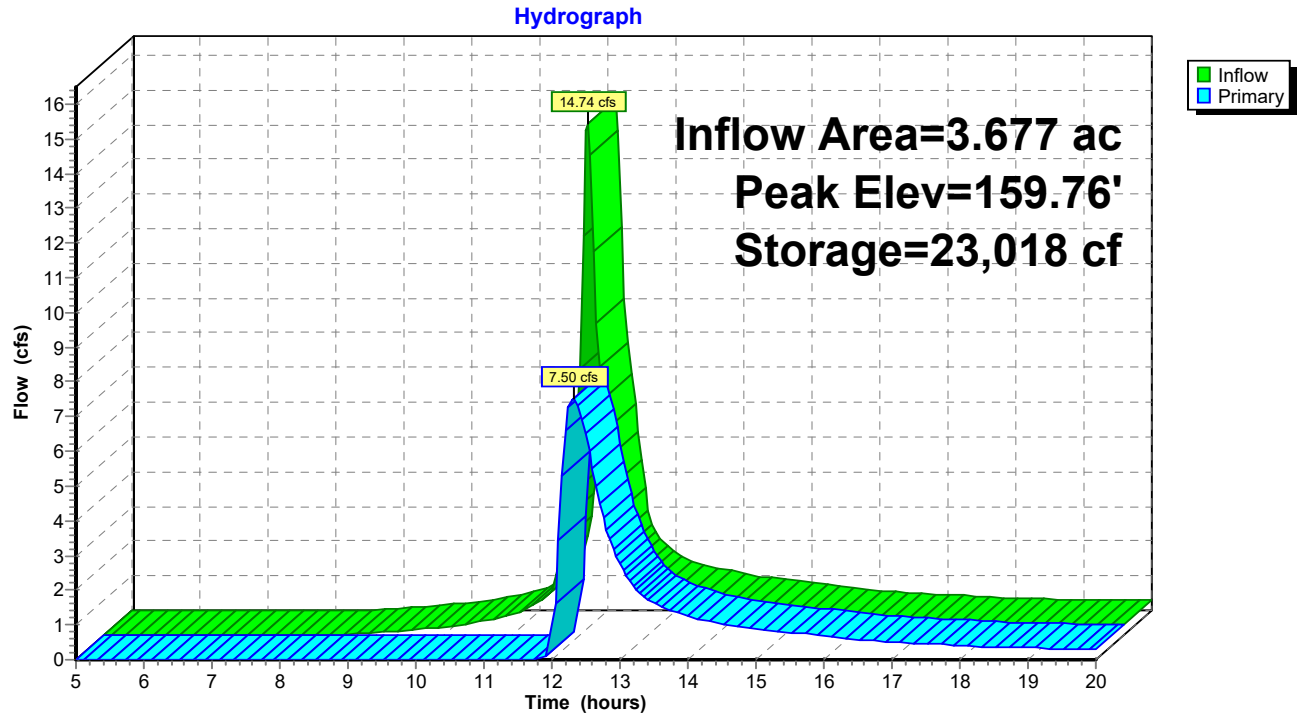
Plug-Flow detention time= 138.1 min calculated for 0.697 af (66% of inflow)
Center-of-Mass det. time= 43.1 min (837.3 - 794.2)

Volume	Invert	Avail.Storage	Storage Description
#1	155.00'	28,905 cf	**20.00'W x 125.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	158.50'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=7.47 cfs @ 12.32 hrs HW=159.75' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 7.47 cfs @ 2.98 fps)

Pond 12P: Pond 12



Summary for Pond 13.1P: Pond 13.1

Inflow Area = 3.117 ac, 0.00% Impervious, Inflow Depth > 3.85" for 50 year event
Inflow = 14.44 cfs @ 12.10 hrs, Volume= 1.001 af
Outflow = 6.64 cfs @ 12.31 hrs, Volume= 0.757 af, Atten= 54%, Lag= 12.6 min
Primary = 6.64 cfs @ 12.31 hrs, Volume= 0.757 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 224.67' @ 12.31 hrs Surf.Area= 17,825 sf Storage= 17,447 cf

Plug-Flow detention time= 111.6 min calculated for 0.755 af (75% of inflow)
Center-of-Mass det. time= 53.0 min (839.1 - 786.1)

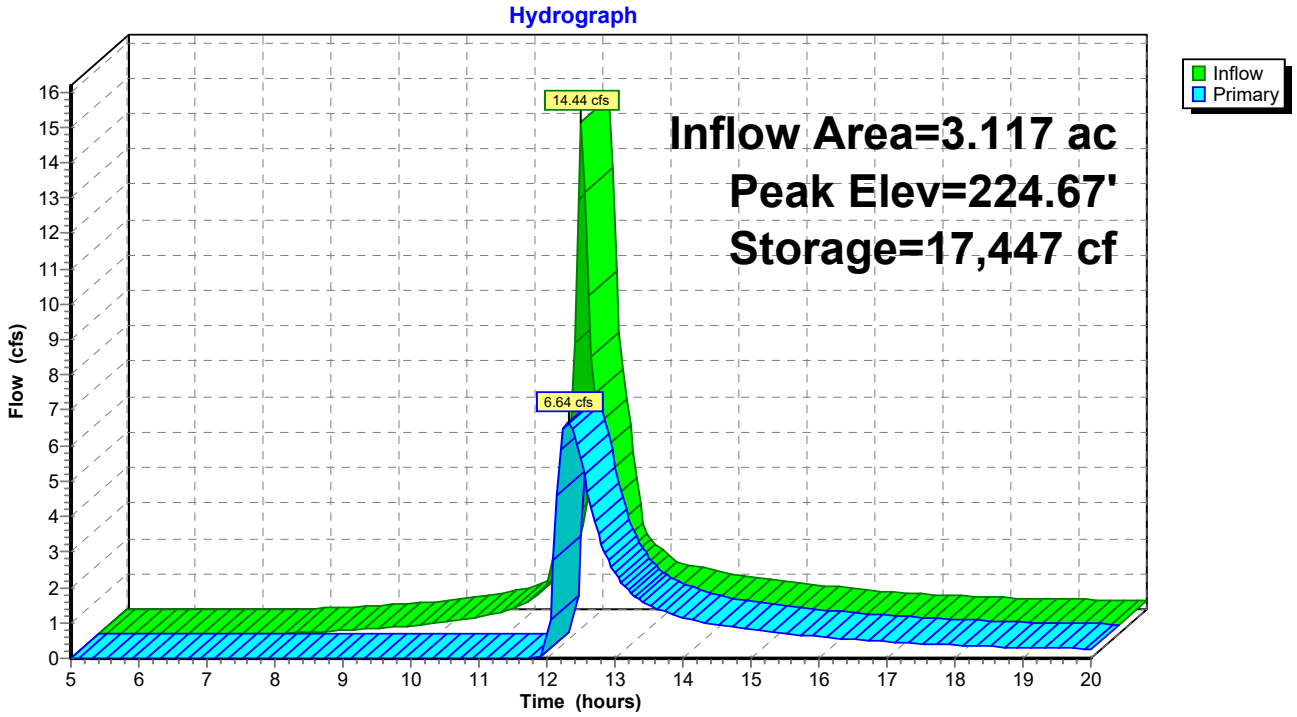
Volume	Invert	Avail.Storage	Storage Description
#1	223.00'	27,720 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
223.00	1,200	0	0
224.20	15,000	9,720	9,720
225.20	21,000	18,000	27,720

Device	Routing	Invert	Outlet Devices
#1	Primary	224.20'	**8.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=6.62 cfs @ 12.31 hrs HW=224.67' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 6.62 cfs @ 1.76 fps)

Pond 13.1P: Pond 13.1



Summary for Pond 13P: Pond 13

Inflow Area = 12.425 ac, 0.00% Impervious, Inflow Depth > 3.46" for 50 year event
Inflow = 36.98 cfs @ 12.17 hrs, Volume= 3.578 af
Outflow = 7.30 cfs @ 13.02 hrs, Volume= 2.137 af, Atten= 80%, Lag= 50.8 min
Discarded = 1.85 cfs @ 13.02 hrs, Volume= 1.336 af
Primary = 5.45 cfs @ 13.02 hrs, Volume= 0.801 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 188.41' @ 13.02 hrs Surf.Area= 20,923 sf Storage= 75,679 cf

Plug-Flow detention time= 163.2 min calculated for 2.137 af (60% of inflow)
Center-of-Mass det. time= 84.9 min (889.2 - 804.3)

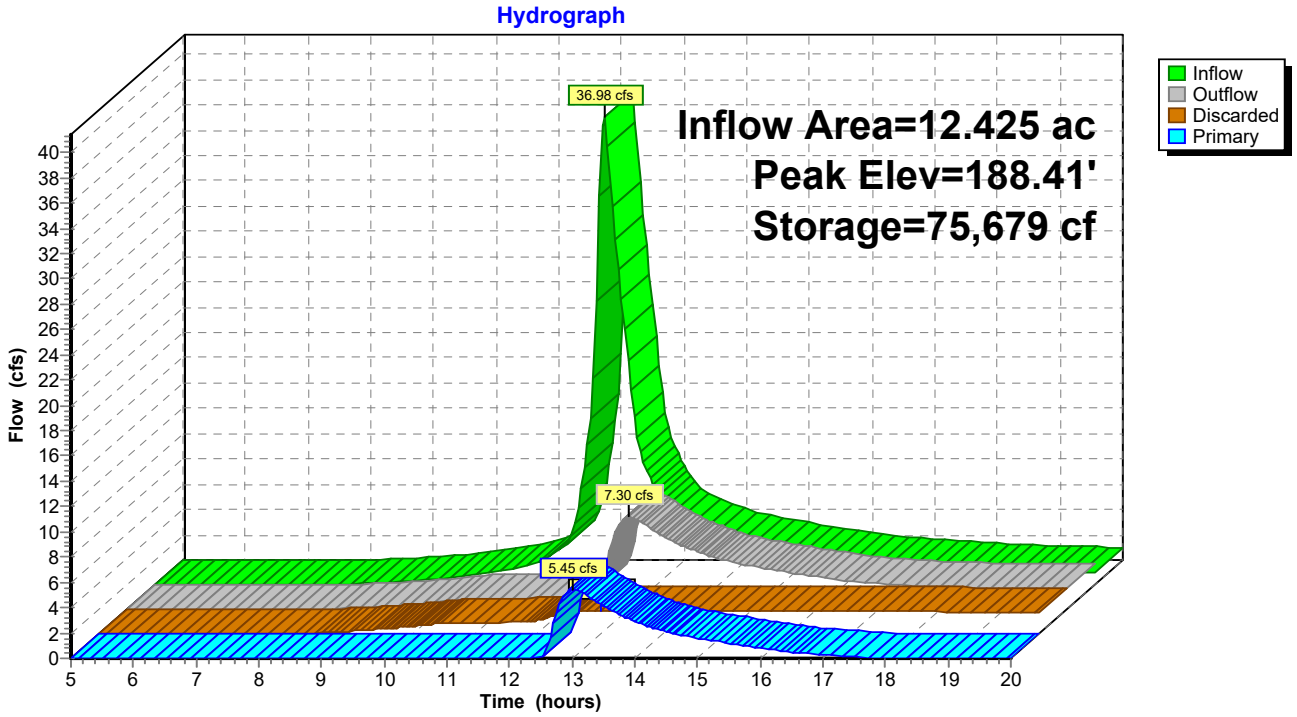
Volume	Invert	Avail.Storage	Storage Description
#1	184.00'	99,484 cf	**80.00'W x 170.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	188.00'	**8.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	184.00'	**2.700 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 175.00'

Discarded OutFlow Max=1.85 cfs @ 13.02 hrs HW=188.41' (Free Discharge)
↑—**2=Exfiltration** (Controls 1.85 cfs)

Primary OutFlow Max=5.43 cfs @ 13.02 hrs HW=188.41' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 5.43 cfs @ 1.64 fps)

Pond 13P: Pond 13



Summary for Pond 14P: Pond 14

Inflow Area = 4.438 ac, 0.00% Impervious, Inflow Depth > 3.04" for 50 year event
Inflow = 15.00 cfs @ 12.14 hrs, Volume= 1.124 af
Outflow = 8.23 cfs @ 12.34 hrs, Volume= 0.916 af, Atten= 45%, Lag= 12.1 min
Discarded = 0.58 cfs @ 12.34 hrs, Volume= 0.343 af
Primary = 7.64 cfs @ 12.34 hrs, Volume= 0.573 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 191.27' @ 12.34 hrs Surf.Area= 5,022 sf Storage= 15,209 cf

Plug-Flow detention time= 89.5 min calculated for 0.916 af (82% of inflow)
Center-of-Mass det. time= 38.9 min (841.1 - 802.2)

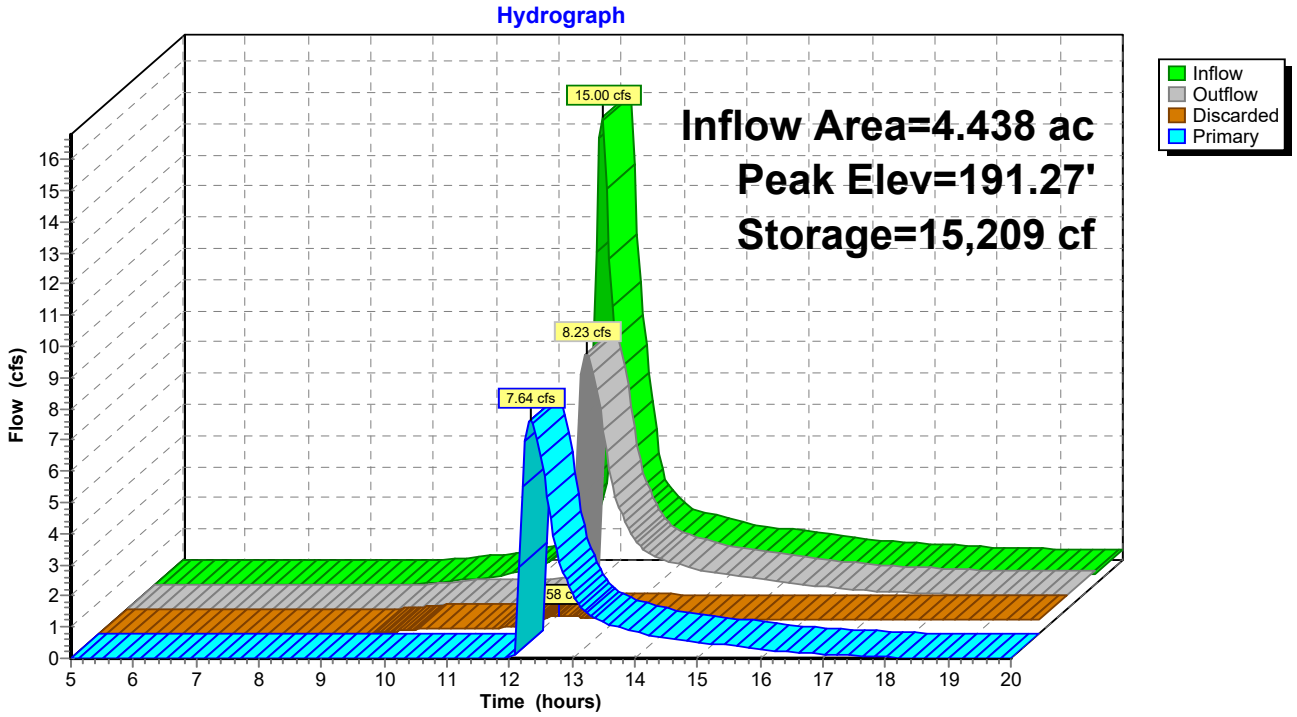
Volume	Invert	Avail.Storage	Storage Description
#1	186.50'	19,102 cf	**25.00'W x 65.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	190.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	186.50'	**3.900 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 175.00'

Discarded OutFlow Max=0.58 cfs @ 12.34 hrs HW=191.27' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.58 cfs)

Primary OutFlow Max=7.61 cfs @ 12.34 hrs HW=191.27' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 7.61 cfs @ 3.00 fps)

Pond 14P: Pond 14



Summary for Pond 16P: Pond 16

Inflow Area = 16.919 ac, 0.00% Impervious, Inflow Depth > 3.72" for 50 year event
Inflow = 44.36 cfs @ 12.43 hrs, Volume= 5.244 af
Outflow = 16.80 cfs @ 12.98 hrs, Volume= 2.849 af, Atten= 62%, Lag= 33.3 min
Primary = 16.80 cfs @ 12.98 hrs, Volume= 2.849 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 191.00' Surf.Area= 17,554 sf Storage= 31,256 cf
Peak Elev= 196.23' @ 12.98 hrs Surf.Area= 28,866 sf Storage= 151,820 cf (120,564 cf above start)

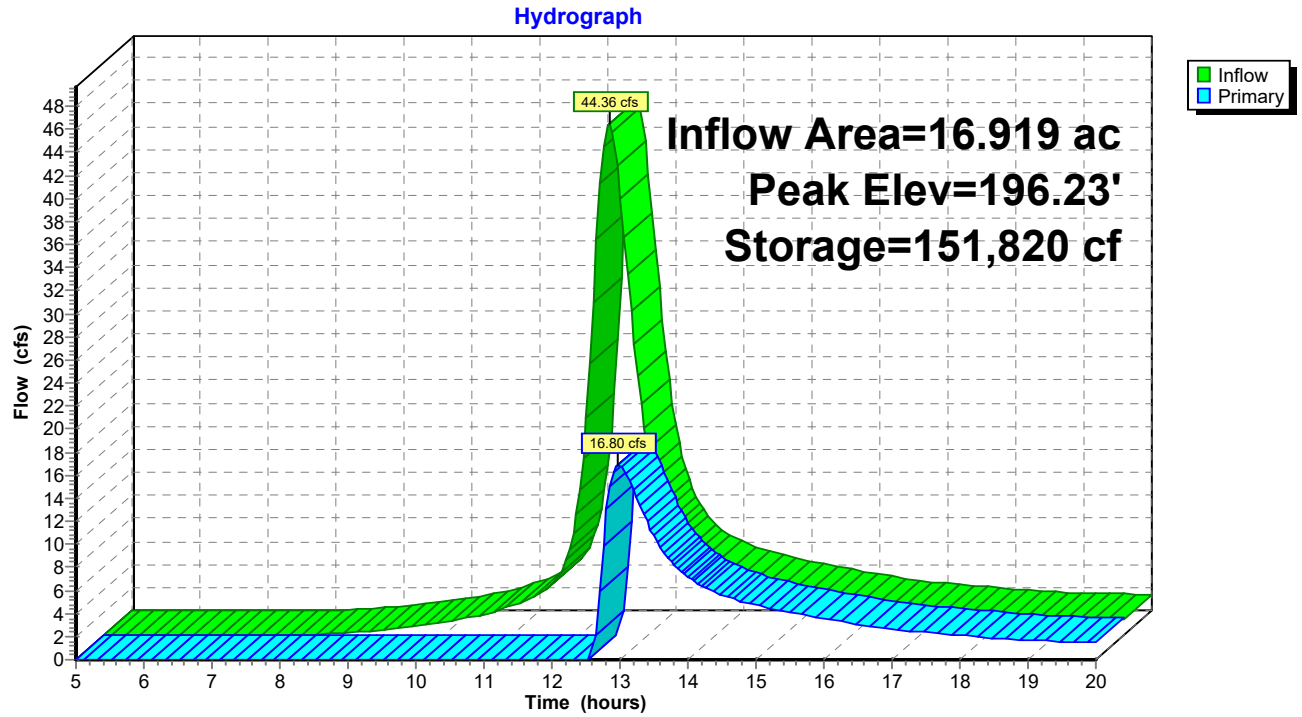
Plug-Flow detention time= 212.3 min calculated for 2.125 af (41% of inflow)
Center-of-Mass det. time= 86.0 min (893.0 - 807.0)

Volume	Invert	Avail.Storage	Storage Description
#1	189.00'	174,704 cf	**55.00'W x 250.00'L x 8.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	195.50'	**10.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=16.75 cfs @ 12.98 hrs HW=196.23' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 16.75 cfs @ 2.29 fps)

Pond 16P: Pond 16



100-Year Storm Event – Proposed

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=3.006 ac 0.00% Impervious Runoff Depth>4.01"
Flow Length=470' Slope=0.0800 '/' Tc=8.0 min CN=70 Runoff=13.97 cfs 1.004 af

Subcatchment2: Subcat 2 Runoff Area=2.551 ac 0.00% Impervious Runoff Depth>4.22"
Flow Length=430' Tc=12.4 min CN=72 Runoff=10.93 cfs 0.897 af

Subcatchment2A: Subcat 2A Runoff Area=0.775 ac 0.00% Impervious Runoff Depth>3.46"
Tc=10.0 min CN=65 Runoff=2.92 cfs 0.224 af

Subcatchment3: Subcat 3 Runoff Area=2.550 ac 0.00% Impervious Runoff Depth>4.33"
Flow Length=620' Tc=12.6 min CN=73 Runoff=11.13 cfs 0.920 af

Subcatchment3A: Subcat 3A Runoff Area=0.324 ac 0.00% Impervious Runoff Depth>4.78"
Tc=10.0 min CN=77 Runoff=1.66 cfs 0.129 af

Subcatchment4: Subcat 4 Runoff Area=5.871 ac 0.00% Impervious Runoff Depth>4.33"
Flow Length=810' Tc=16.2 min CN=73 Runoff=23.39 cfs 2.117 af

Subcatchment5: Subcat 5 Runoff Area=2.637 ac 0.00% Impervious Runoff Depth>3.79"
Flow Length=510' Slope=0.0500 '/' Tc=10.4 min CN=68 Runoff=10.76 cfs 0.832 af

Subcatchment6: Subcat 6 Runoff Area=3.201 ac 0.00% Impervious Runoff Depth>4.34"
Flow Length=420' Slope=0.0700 '/' Tc=8.1 min CN=73 Runoff=15.98 cfs 1.157 af

Subcatchment6A: Subcat 6A Runoff Area=0.915 ac 0.00% Impervious Runoff Depth>3.68"
Tc=10.0 min CN=67 Runoff=3.67 cfs 0.280 af

Subcatchment6B: Subcat 6B Runoff Area=0.030 ac 0.00% Impervious Runoff Depth>2.73"
Tc=10.0 min CN=58 Runoff=0.09 cfs 0.007 af

Subcatchment6C: Subcat 6C Runoff Area=0.694 ac 0.00% Impervious Runoff Depth>2.73"
Tc=10.0 min CN=58 Runoff=2.03 cfs 0.158 af

Subcatchment7: Subcat 7 Runoff Area=1.170 ac 0.00% Impervious Runoff Depth>4.01"
Flow Length=200' Slope=0.0800 '/' Tc=5.8 min CN=70 Runoff=5.81 cfs 0.391 af

Subcatchment7A: Subcat 7A Runoff Area=0.202 ac 0.00% Impervious Runoff Depth>2.73"
Tc=10.0 min CN=58 Runoff=0.59 cfs 0.046 af

Subcatchment8: Subcat 8 Runoff Area=4.686 ac 0.00% Impervious Runoff Depth>4.22"
Flow Length=650' Tc=10.1 min CN=72 Runoff=21.42 cfs 1.650 af

Subcatchment8A: Subcat 8A Runoff Area=0.770 ac 0.00% Impervious Runoff Depth>2.73"
Tc=10.0 min CN=58 Runoff=2.26 cfs 0.175 af

Subcatchment9: Subcat 9 Runoff Area=1.521 ac 0.00% Impervious Runoff Depth>4.34"
Flow Length=230' Slope=0.0700 '/' Tc=6.4 min CN=73 Runoff=8.02 cfs 0.550 af

Subcatchment9A: Subcat 9A Runoff Area=0.259 ac 0.00% Impervious Runoff Depth>2.73"
Tc=10.0 min CN=58 Runoff=0.76 cfs 0.059 af

Subcatchment10: Subcat 10 Runoff Area=2.304 ac 0.00% Impervious Runoff Depth>4.22"
Flow Length=410' Tc=11.0 min CN=72 Runoff=10.28 cfs 0.811 af

Subcatchment10A: Subcat 10A Runoff Area=0.287 ac 0.00% Impervious Runoff Depth>2.73"
Tc=10.0 min CN=58 Runoff=0.84 cfs 0.065 af

Subcatchment11: Subcat 11 Runoff Area=1.126 ac 0.00% Impervious Runoff Depth>4.45"
Flow Length=210' Slope=0.1000 '/' Tc=5.3 min CN=74 Runoff=6.23 cfs 0.418 af

Subcatchment11A: Subcat 11A Runoff Area=0.428 ac 0.00% Impervious Runoff Depth>2.73"
Tc=10.0 min CN=58 Runoff=1.25 cfs 0.097 af

Subcatchment12: Subcat 12 Runoff Area=3.677 ac 0.00% Impervious Runoff Depth>4.12"
Flow Length=500' Slope=0.0900 '/' Tc=7.9 min CN=71 Runoff=17.60 cfs 1.262 af

Subcatchment13.1: Subcat 13.1 Runoff Area=3.117 ac 0.00% Impervious Runoff Depth>4.56"
Flow Length=320' Slope=0.0800 '/' Tc=6.8 min CN=75 Runoff=17.02 cfs 1.185 af

Subcatchment13.2: Subcat 13.2 Runoff Area=9.308 ac 0.00% Impervious Runoff Depth>4.33"
Flow Length=800' Slope=0.0700 '/' Tc=11.5 min CN=73 Runoff=41.96 cfs 3.361 af

Subcatchment14: Subcat 14 Runoff Area=4.438 ac 0.00% Impervious Runoff Depth>3.68"
Flow Length=500' Tc=9.1 min CN=67 Runoff=18.18 cfs 1.361 af

Subcatchment16: Subcat 16 Runoff Area=16.919 ac 0.00% Impervious Runoff Depth>4.42"
Flow Length=910' Slope=0.0100 '/' Tc=30.9 min CN=74 Runoff=52.49 cfs 6.227 af

Subcatchment16A: Subcat 16A Runoff Area=0.619 ac 0.00% Impervious Runoff Depth>2.73"
Tc=10.0 min CN=58 Runoff=1.81 cfs 0.141 af

Reach 13.1R: Reach 13.1 Avg. Flow Depth=0.53' Max Vel=2.55 fps Inflow=9.16 cfs 0.940 af
n=0.035 L=500.0' S=0.0684 '/' Capacity=0.96 cfs Outflow=8.84 cfs 0.936 af

Pond 1P: Pond 1 Peak Elev=194.38' Storage=18,345 cf Inflow=13.97 cfs 1.004 af
Outflow=8.64 cfs 0.864 af

Pond 2P: Pond 2 Peak Elev=231.72' Storage=13,352 cf Inflow=10.93 cfs 0.897 af
Discarded=0.40 cfs 0.266 af Primary=6.50 cfs 0.415 af Outflow=6.90 cfs 0.681 af

Pond 3P: Pond 3 Peak Elev=228.23' Storage=14,478 cf Inflow=11.13 cfs 0.920 af
Outflow=6.04 cfs 0.768 af

Pond 4P: Pond 4 Peak Elev=188.76' Storage=57,384 cf Inflow=23.39 cfs 2.117 af
Outflow=14.21 cfs 1.496 af

Pond 5P: Pond 5 Peak Elev=219.09' Storage=12,784 cf Inflow=10.76 cfs 0.832 af
Outflow=6.09 cfs 0.648 af

Pond 6P: Pond 6 Peak Elev=210.20' Storage=22,788 cf Inflow=15.98 cfs 1.157 af
Outflow=10.50 cfs 0.929 af

Pond 7P: Pond 7 Peak Elev=226.61' Storage=5,802 cf Inflow=5.81 cfs 0.391 af
Discarded=0.26 cfs 0.169 af Primary=2.57 cfs 0.146 af Outflow=2.84 cfs 0.314 af

Pond 8P: Pond 8 Peak Elev=190.56' Storage=24,022 cf Inflow=21.42 cfs 1.650 af
Outflow=11.88 cfs 1.416 af

Pond 9P: Pond 9 Peak Elev=190.75' Storage=14,188 cf Inflow=8.02 cfs 0.550 af
Outflow=3.52 cfs 0.386 af

Pond 10P: Pond 10 Peak Elev=169.50' Storage=14,040 cf Inflow=10.28 cfs 0.811 af
Outflow=5.31 cfs 0.600 af

Pond 11P: Pond 11 Peak Elev=152.56' Storage=10,577 cf Inflow=6.23 cfs 0.418 af
Outflow=2.24 cfs 0.263 af

Pond 12P: Pond 12 Peak Elev=160.01' Storage=24,964 cf Inflow=17.60 cfs 1.262 af
Outflow=9.87 cfs 1.059 af

Pond 13.1P: Pond 13.1 Peak Elev=224.77' Storage=19,219 cf Inflow=17.02 cfs 1.185 af
Outflow=9.16 cfs 0.940 af

Pond 13P: Pond 13 Peak Elev=188.71' Storage=81,861 cf Inflow=45.84 cfs 4.297 af
Discarded=1.92 cfs 1.387 af Primary=12.75 cfs 1.428 af Outflow=14.67 cfs 2.815 af

Pond 14P: Pond 14 Peak Elev=191.61' Storage=16,929 cf Inflow=18.18 cfs 1.361 af
Discarded=0.62 cfs 0.358 af Primary=10.82 cfs 0.787 af Outflow=11.44 cfs 1.145 af

Pond 16P: Pond 16 Peak Elev=196.51' Storage=160,095 cf Inflow=52.49 cfs 6.227 af
Outflow=27.30 cfs 3.823 af

Total Runoff Area = 73.385 ac Runoff Volume = 25.524 af Average Runoff Depth = 4.17"
100.00% Pervious = 73.385 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1: Subcat 1

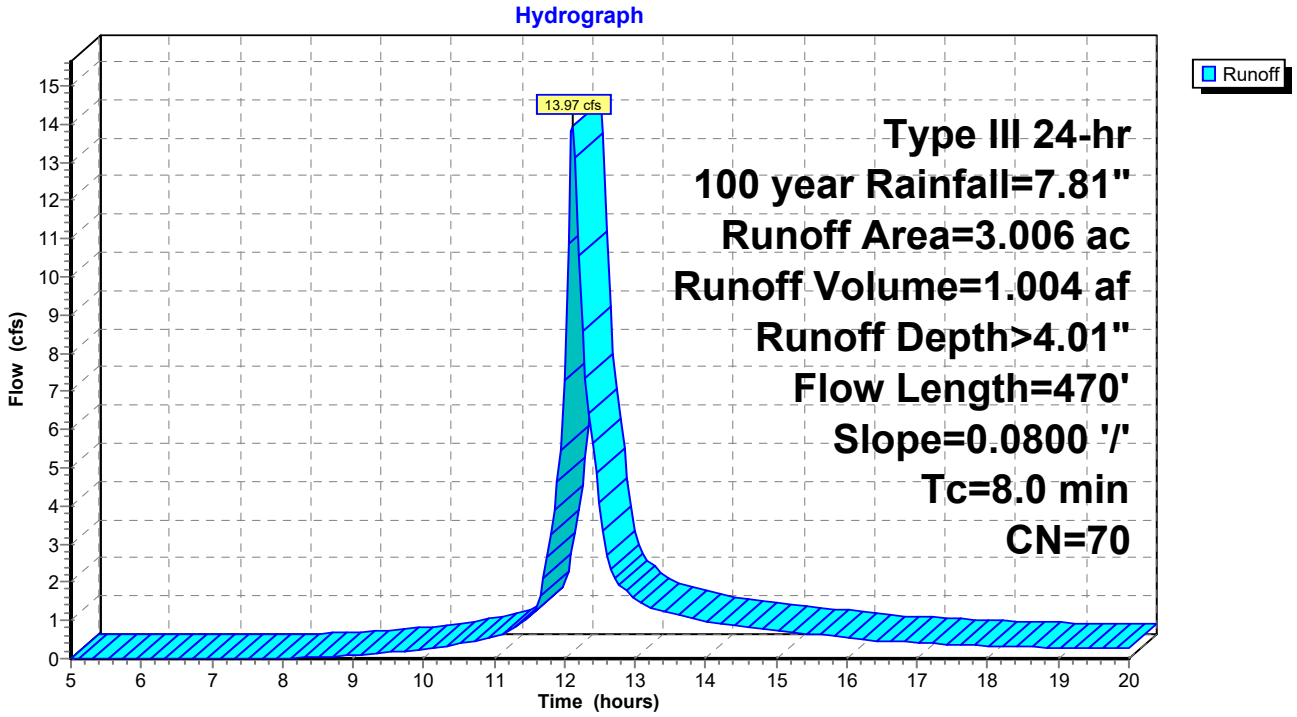
Runoff = 13.97 cfs @ 12.12 hrs, Volume= 1.004 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
1.756	74	>75% Grass cover, Good, HSG C
0.217	96	Gravel surface, HSG C
1.033	58	Meadow, non-grazed, HSG B
3.006	70	Weighted Average
3.006		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
3.5	420	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.0	470	Total			

Subcatchment 1: Subcat 1



Summary for Subcatchment 2: Subcat 2

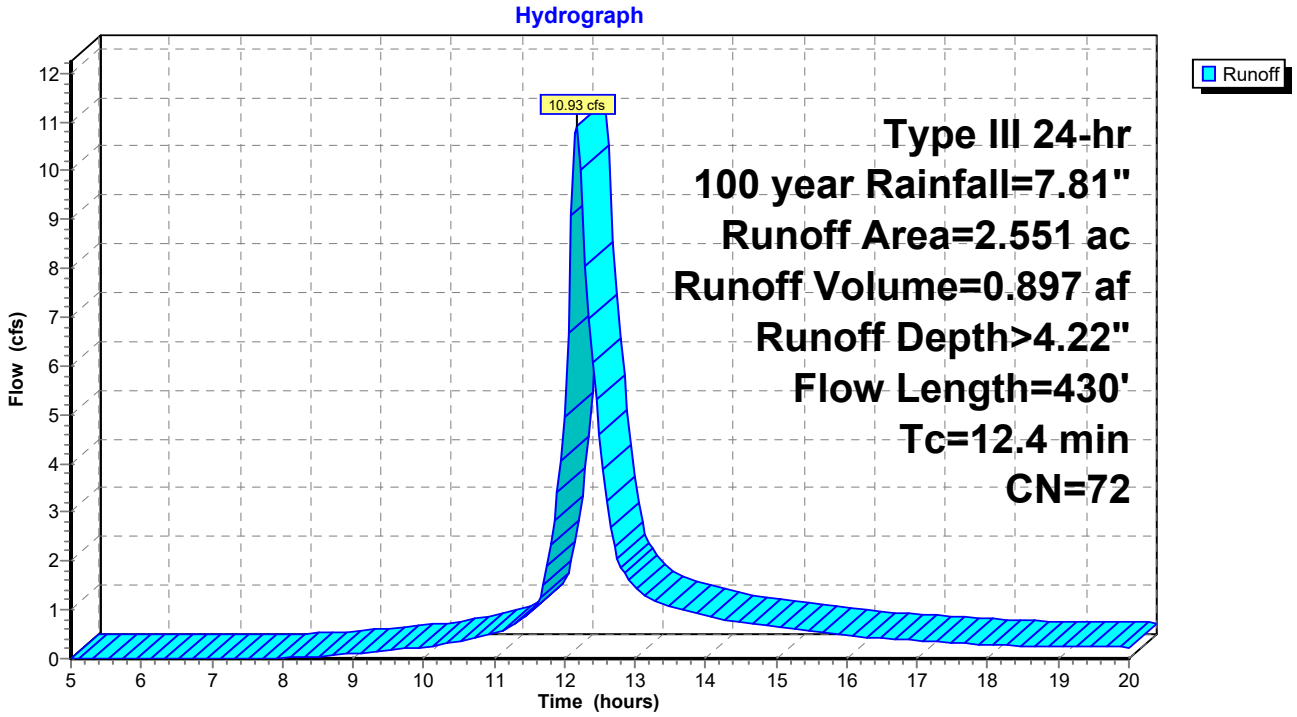
Runoff = 10.93 cfs @ 12.17 hrs, Volume= 0.897 af, Depth> 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
1.748	74	>75% Grass cover, Good, HSG C
0.237	96	Gravel surface, HSG C
0.566	58	Meadow, non-grazed, HSG B
2.551	72	Weighted Average
2.551		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0200	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
4.5	380	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.4	430	Total			

Subcatchment 2: Subcat 2



Summary for Subcatchment 2A: Subcat 2A

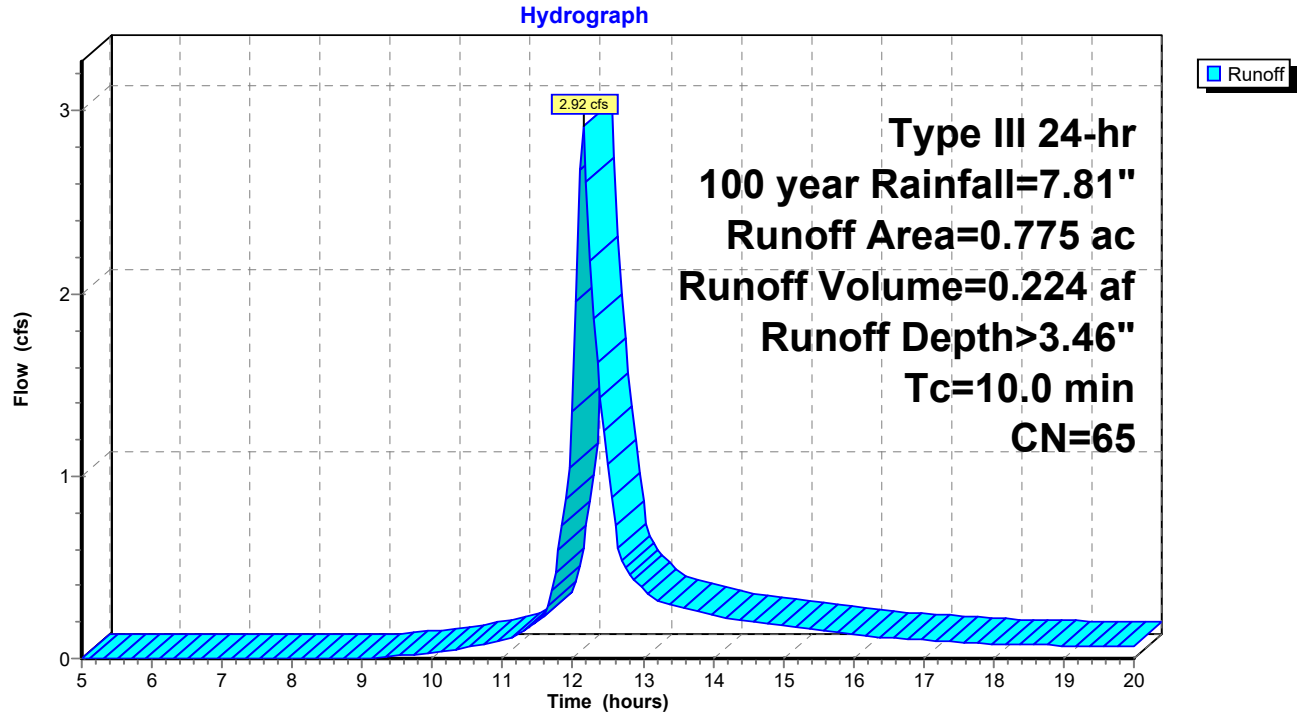
Runoff = 2.92 cfs @ 12.15 hrs, Volume= 0.224 af, Depth> 3.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.000	96	Gravel surface, HSG B
0.488	58	Meadow, non-grazed, HSG B
0.287	78	Meadow, non-grazed, HSG D
0.775	65	Weighted Average
0.775		100.00% Pervious Area

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

Subcatchment 2A: Subcat 2A



Summary for Subcatchment 3: Subcat 3

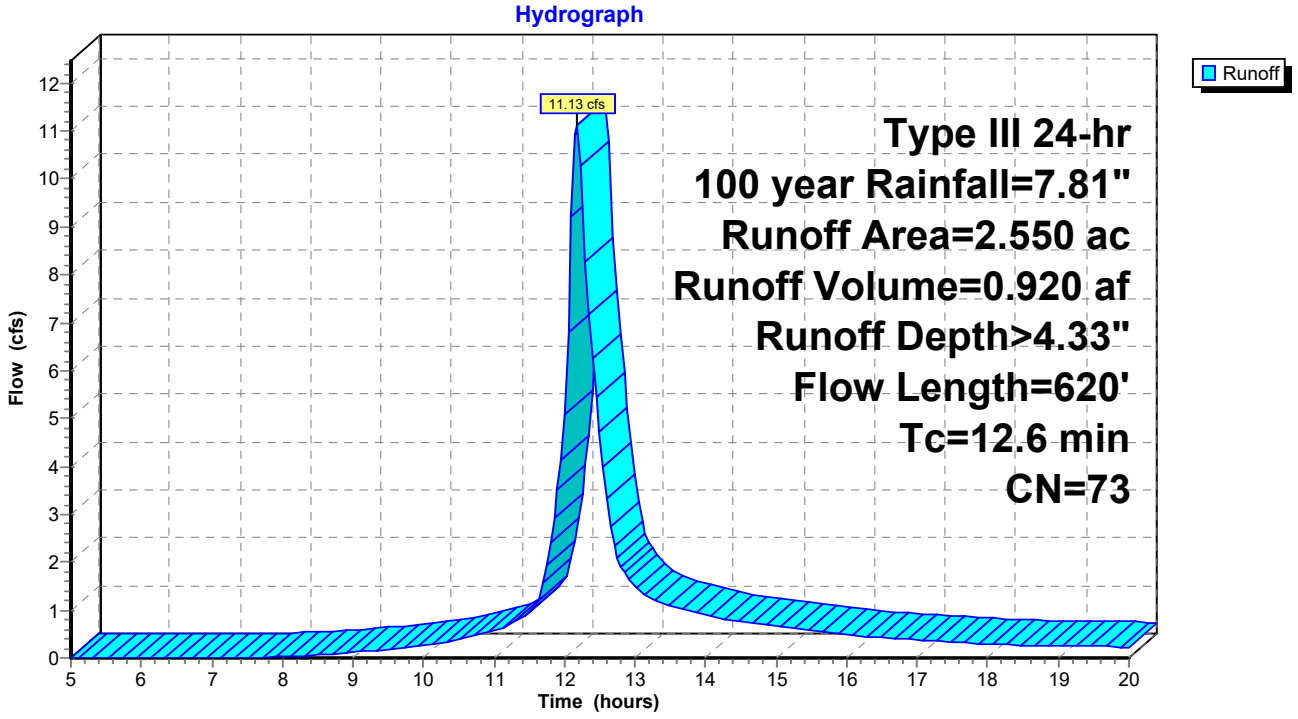
Runoff = 11.13 cfs @ 12.17 hrs, Volume= 0.920 af, Depth> 4.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
2.135	74	>75% Grass cover, Good, HSG C
0.110	96	Gravel surface, HSG C
0.271	58	Meadow, non-grazed, HSG B
0.034	78	Meadow, non-grazed, HSG D
2.550	73	Weighted Average
2.550		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
6.0	500	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	70	0.0700	1.85		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.6	620	Total			

Subcatchment 3: Subcat 3



Summary for Subcatchment 3A: Subcat 3A

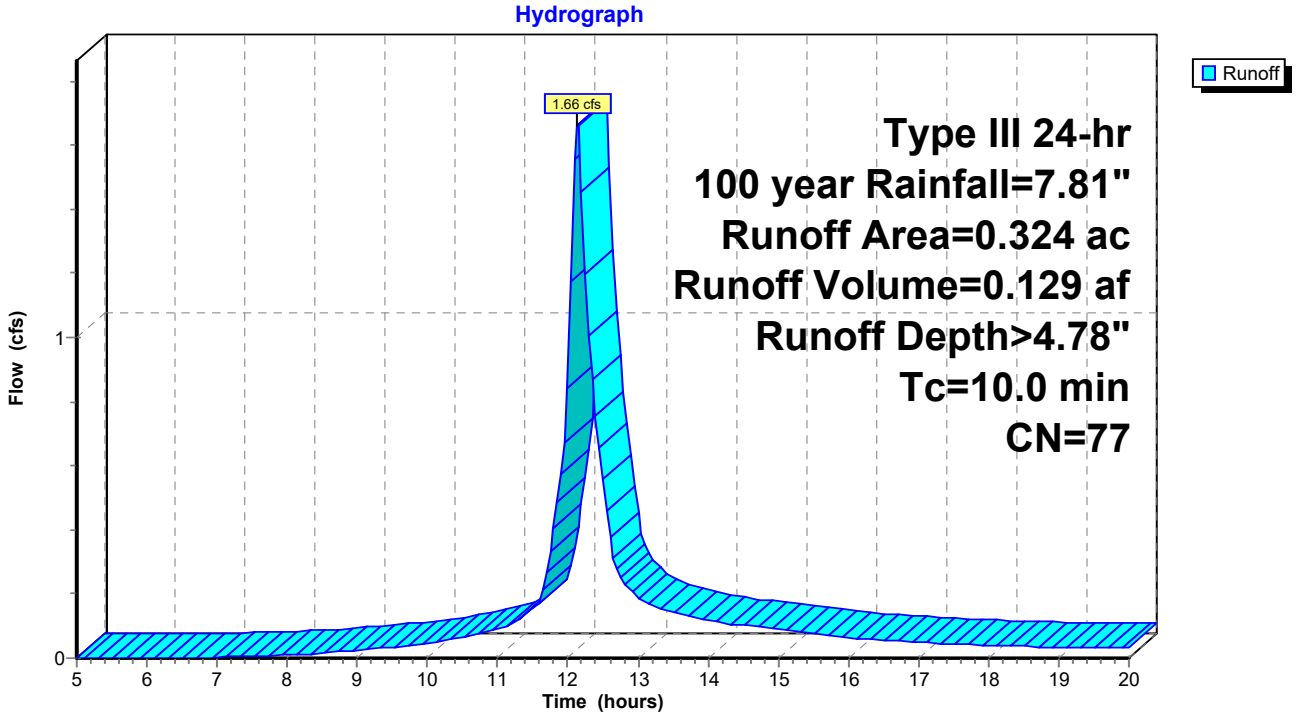
Runoff = 1.66 cfs @ 12.14 hrs, Volume= 0.129 af, Depth> 4.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.009	58	Meadow, non-grazed, HSG B
0.315	78	Meadow, non-grazed, HSG D
0.324	77	Weighted Average
0.324		100.00% Pervious Area

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

Subcatchment 3A: Subcat 3A



Summary for Subcatchment 4: Subcat 4

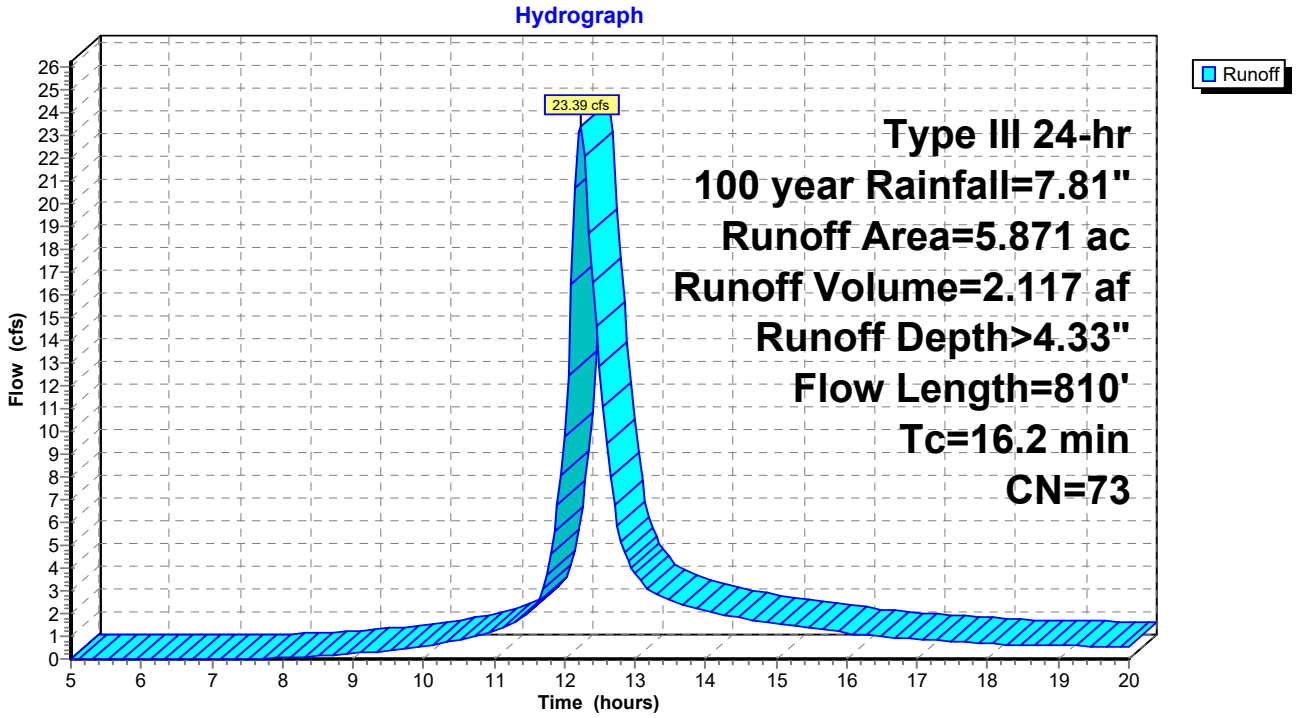
Runoff = 23.39 cfs @ 12.22 hrs, Volume= 2.117 af, Depth> 4.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
3.281	74	>75% Grass cover, Good, HSG C
0.192	80	>75% Grass cover, Good, HSG D
0.197	96	Gravel surface, HSG C
0.095	96	Gravel surface, HSG D
1.100	58	Meadow, non-grazed, HSG B
1.006	78	Meadow, non-grazed, HSG D
5.871	73	Weighted Average
5.871		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	50	0.0150	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
4.3	360	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.0	400	0.1000	2.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
16.2	810	Total			

Subcatchment 4: Subcat 4



Summary for Subcatchment 5: Subcat 5

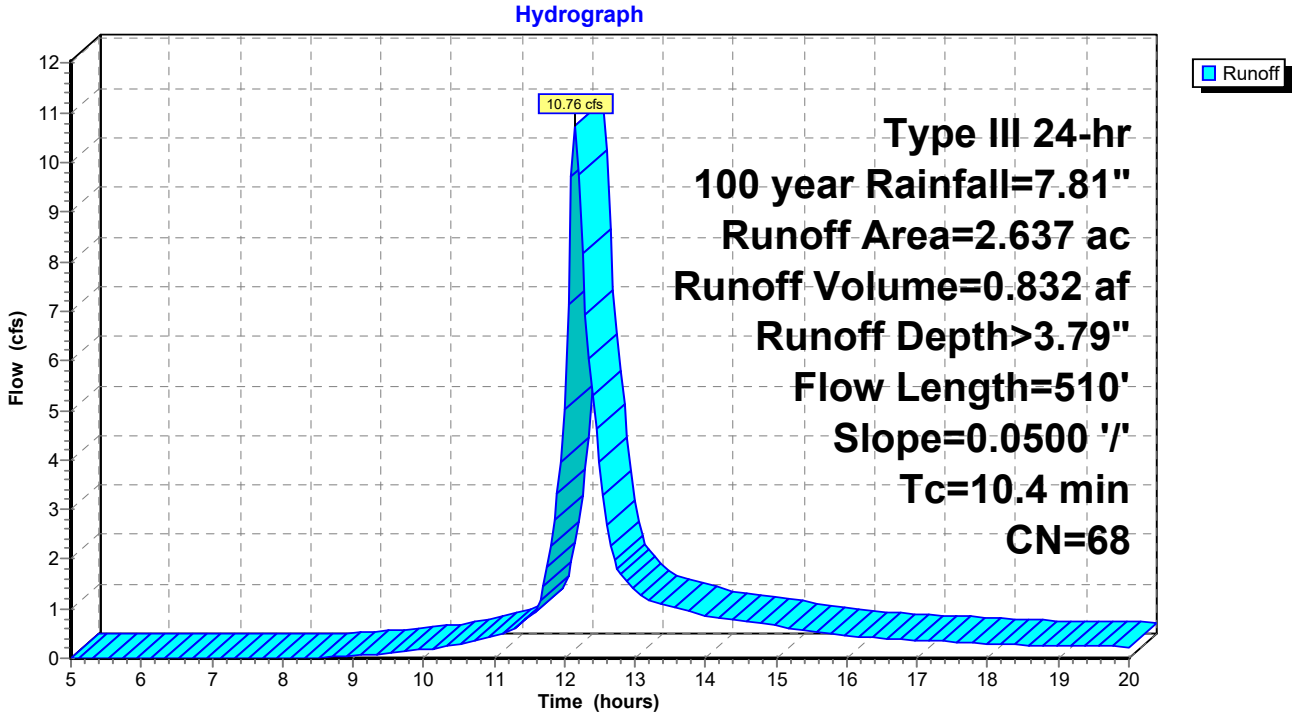
Runoff = 10.76 cfs @ 12.15 hrs, Volume= 0.832 af, Depth> 3.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
1.616	74	>75% Grass cover, Good, HSG C
1.021	58	Meadow, non-grazed, HSG B
2.637	68	Weighted Average
2.637		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	50	0.0500	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
4.9	460	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.4	510	Total			

Subcatchment 5: Subcat 5



Summary for Subcatchment 6: Subcat 6

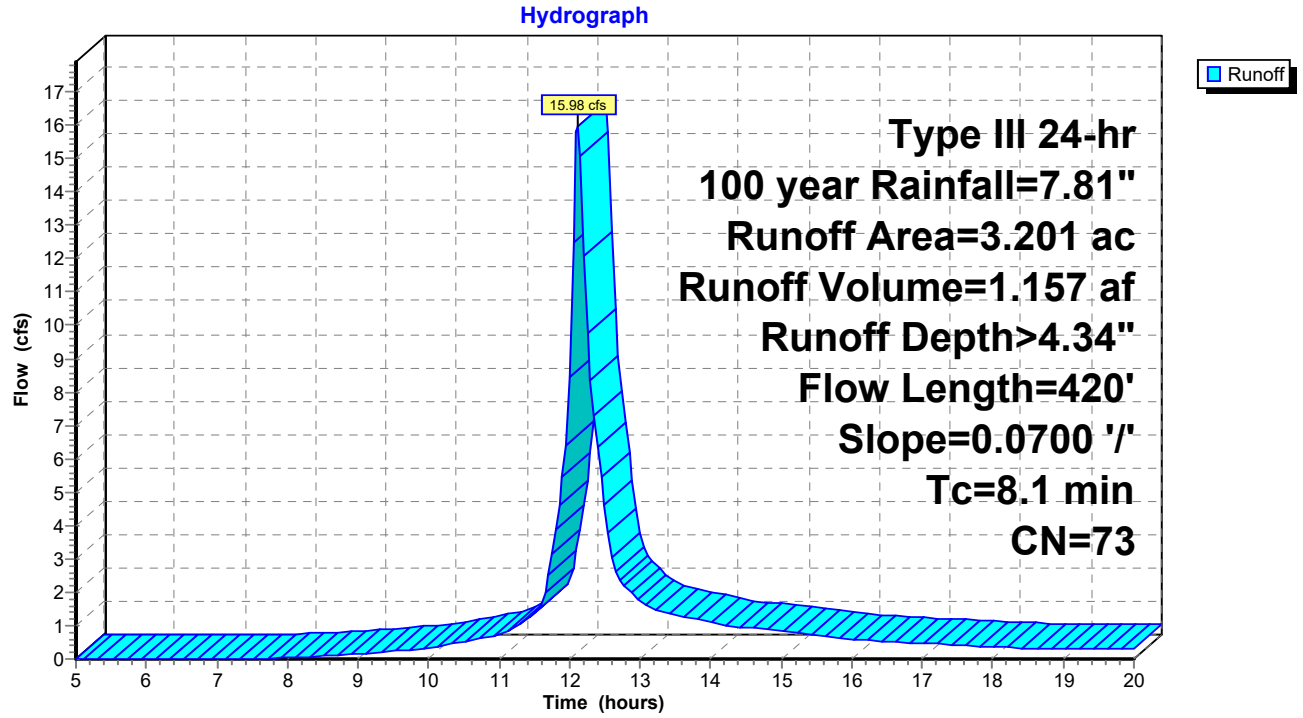
Runoff = 15.98 cfs @ 12.12 hrs, Volume= 1.157 af, Depth> 4.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
1.401	74	>75% Grass cover, Good, HSG C
0.111	80	>75% Grass cover, Good, HSG D
0.211	96	Gravel surface, HSG C
0.001	96	Gravel surface, HSG D
0.637	58	Meadow, non-grazed, HSG B
0.489	78	Meadow, non-grazed, HSG D
0.032	60	Woods, Fair, HSG B
0.319	79	Woods, Fair, HSG D
3.201	73	Weighted Average
3.201		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	50	0.0700	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
3.3	370	0.0700	1.85		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.1	420	Total			

Subcatchment 6: Subcat 6



Summary for Subcatchment 6A: Subcat 6A

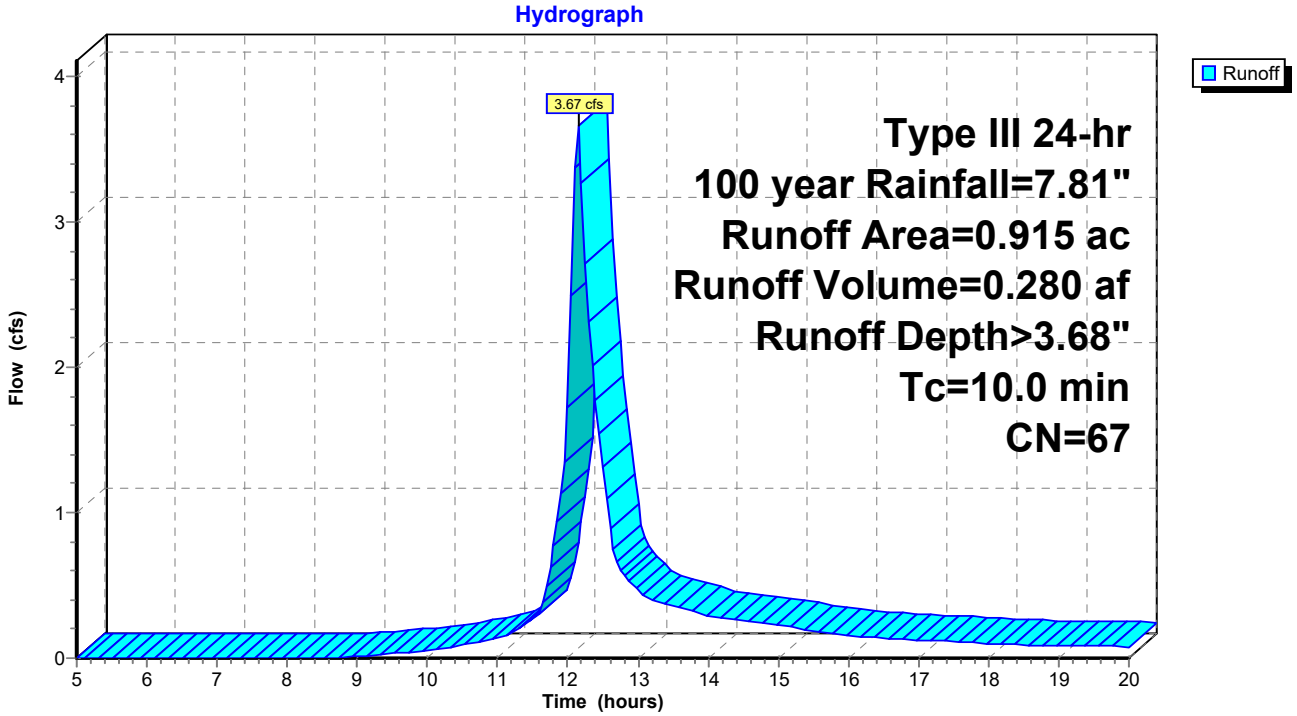
Runoff = 3.67 cfs @ 12.15 hrs, Volume= 0.280 af, Depth> 3.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.517	58	Meadow, non-grazed, HSG B
0.398	78	Meadow, non-grazed, HSG D
0.915	67	Weighted Average
0.915		100.00% Pervious Area

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

Subcatchment 6A: Subcat 6A



Summary for Subcatchment 6B: Subcat 6B

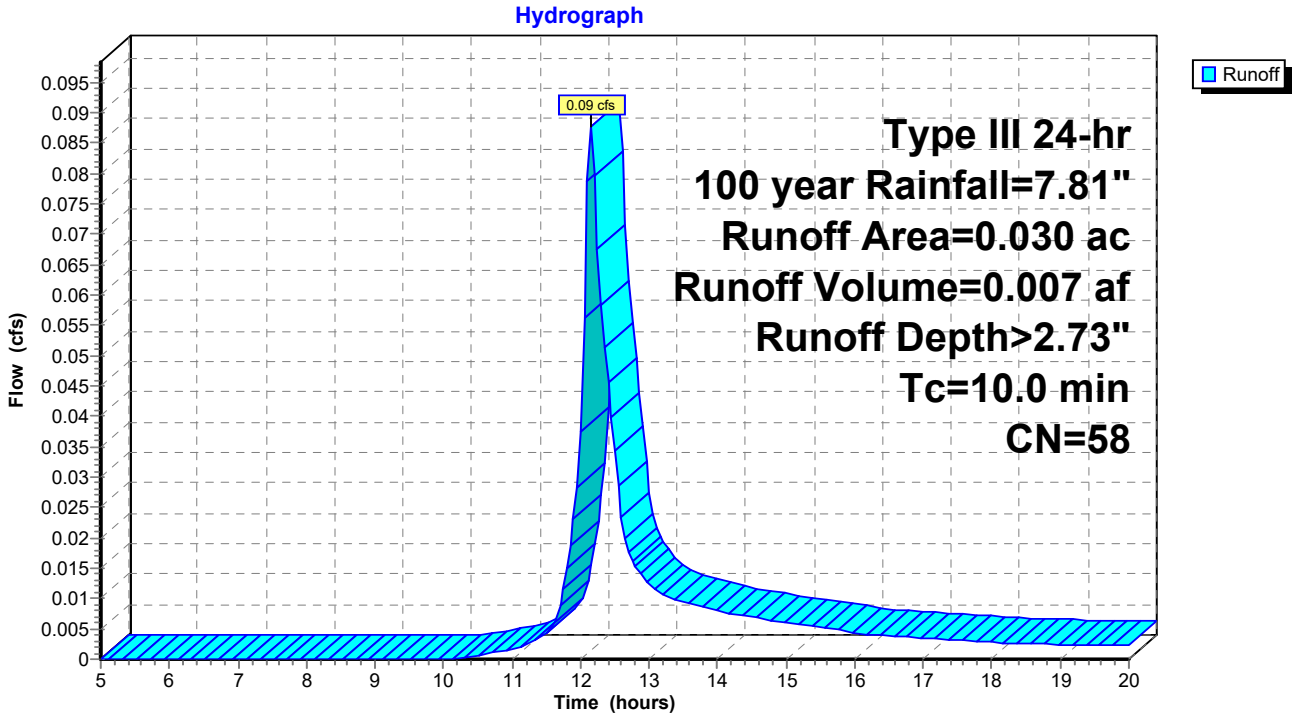
Runoff = 0.09 cfs @ 12.15 hrs, Volume= 0.007 af, Depth> 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.030	58	Meadow, non-grazed, HSG B
0.030		100.00% Pervious Area

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

Subcatchment 6B: Subcat 6B



Summary for Subcatchment 6C: Subcat 6C

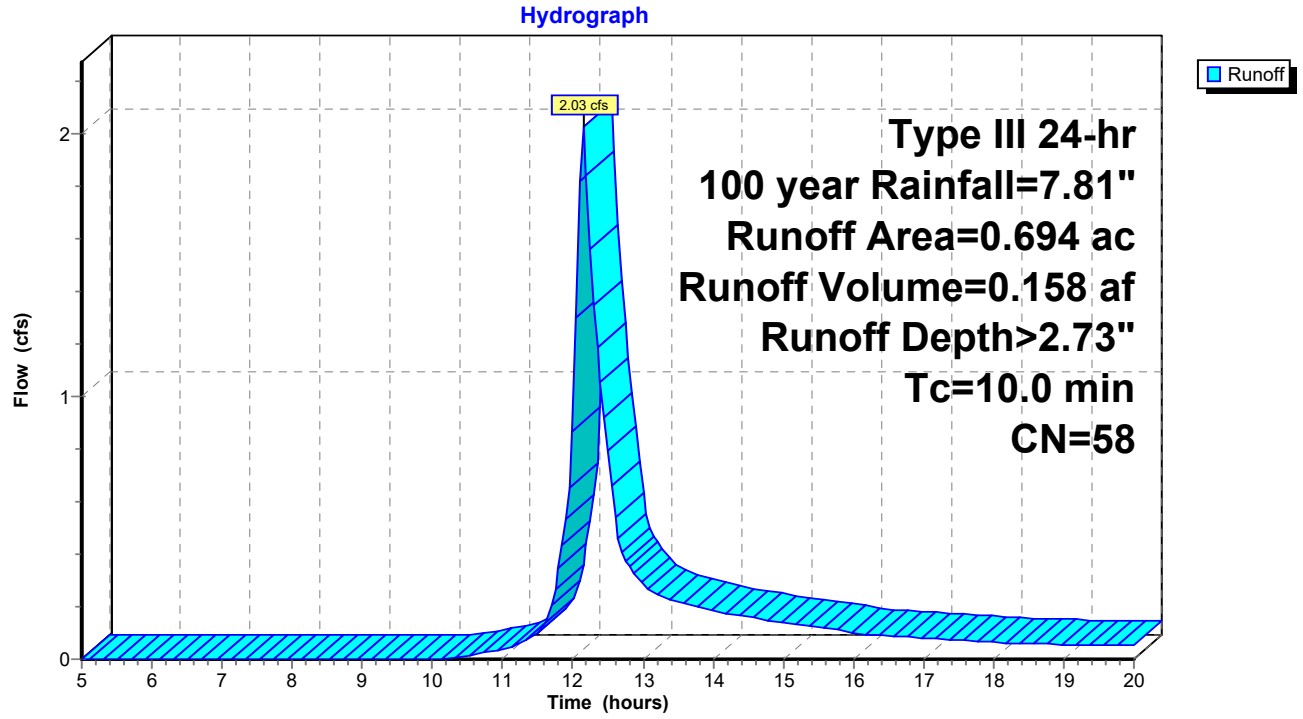
Runoff = 2.03 cfs @ 12.15 hrs, Volume= 0.158 af, Depth> 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.694	58	Meadow, non-grazed, HSG B
0.694		100.00% Pervious Area

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

Subcatchment 6C: Subcat 6C



Summary for Subcatchment 7: Subcat 7

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

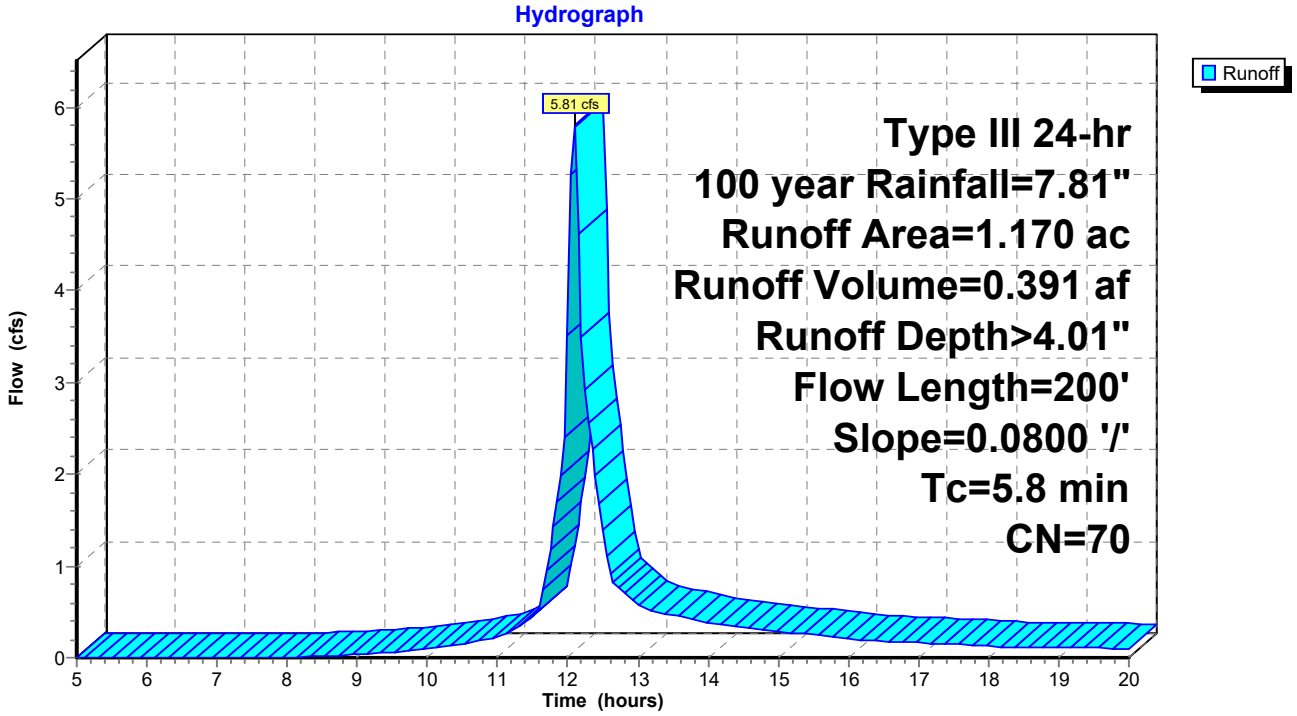
Runoff = 5.81 cfs @ 12.09 hrs, Volume= 0.391 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.634	74	>75% Grass cover, Good, HSG C
0.117	96	Gravel surface, HSG C
0.419	58	Meadow, non-grazed, HSG B
1.170	70	Weighted Average
1.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.3	150	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.8	200	Total			

Subcatchment 7: Subcat 7



Summary for Subcatchment 7A: Subcat 7A

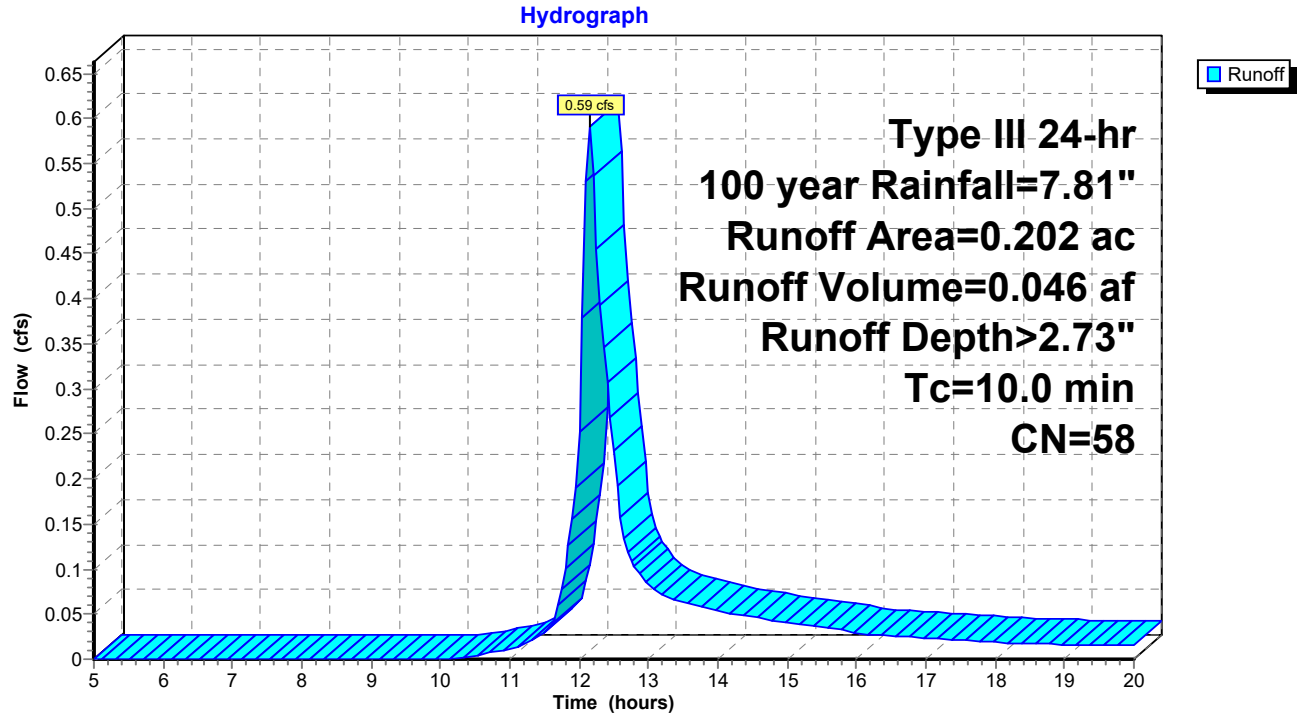
Runoff = 0.59 cfs @ 12.15 hrs, Volume= 0.046 af, Depth> 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.202	58	Meadow, non-grazed, HSG B
0.202		100.00% Pervious Area

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

Subcatchment 7A: Subcat 7A



Summary for Subcatchment 8: Subcat 8

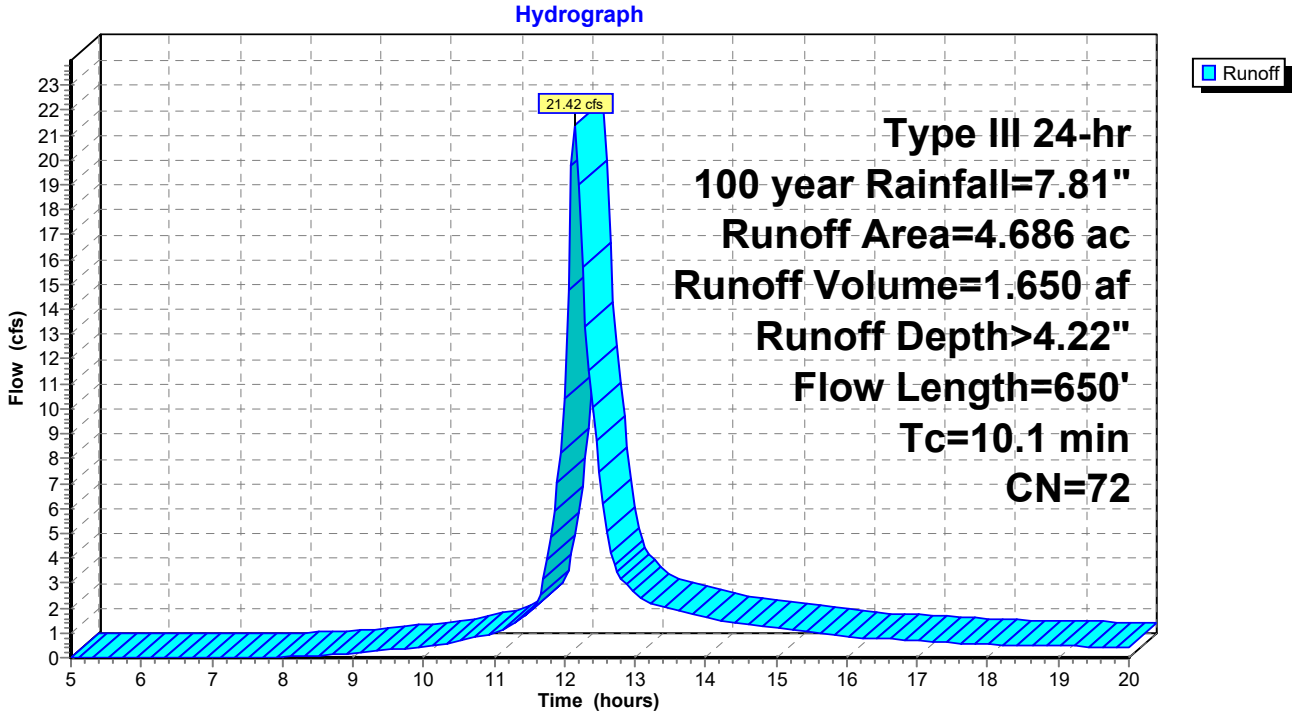
Runoff = 21.42 cfs @ 12.15 hrs, Volume= 1.650 af, Depth> 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
3.284	74	>75% Grass cover, Good, HSG C
0.293	96	Gravel surface, HSG C
1.109	58	Meadow, non-grazed, HSG B
4.686	72	Weighted Average
4.686		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	50	0.1100	0.21		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.9	270	0.1100	2.32		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.2	330	0.0350	1.31		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.1	650	Total			

Subcatchment 8: Subcat 8



Summary for Subcatchment 8A: Subcat 8A

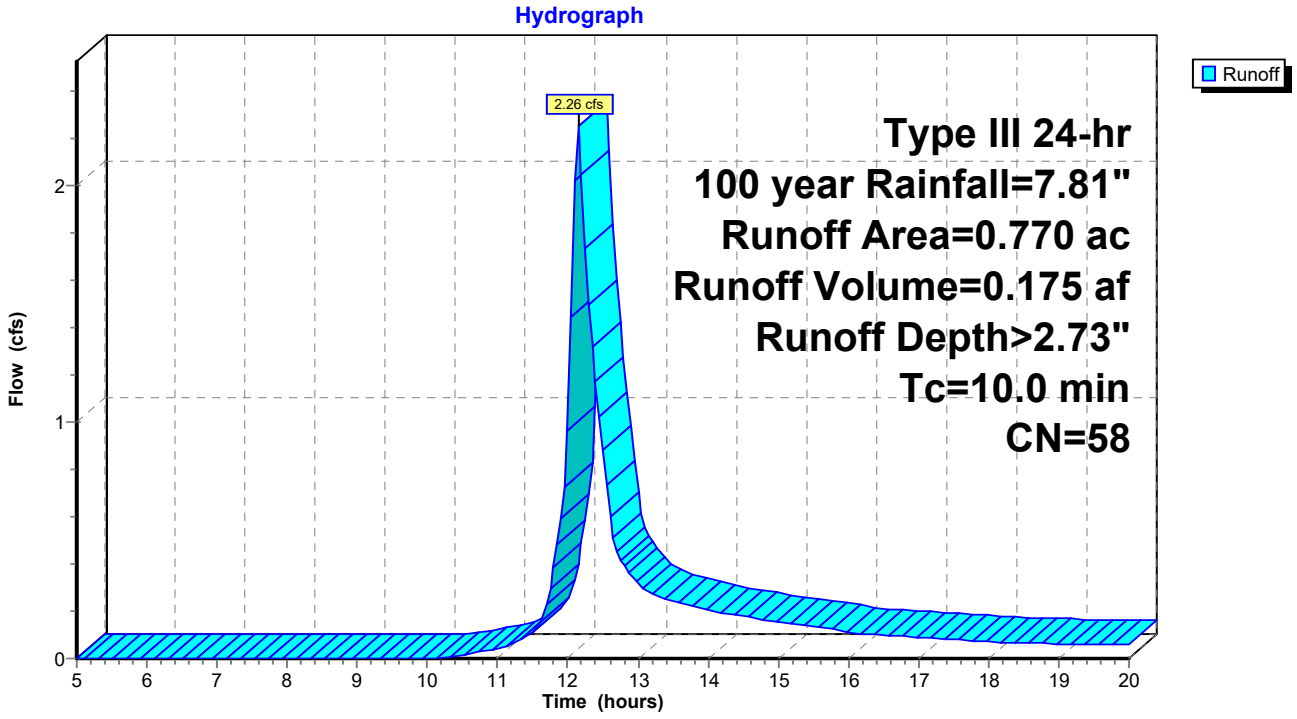
Runoff = 2.26 cfs @ 12.15 hrs, Volume= 0.175 af, Depth> 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.000	61	>75% Grass cover, Good, HSG B
0.003	96	Gravel surface, HSG B
0.767	58	Meadow, non-grazed, HSG B
0.770	58	Weighted Average
0.770		100.00% Pervious Area

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

Subcatchment 8A: Subcat 8A



Summary for Subcatchment 9: Subcat 9

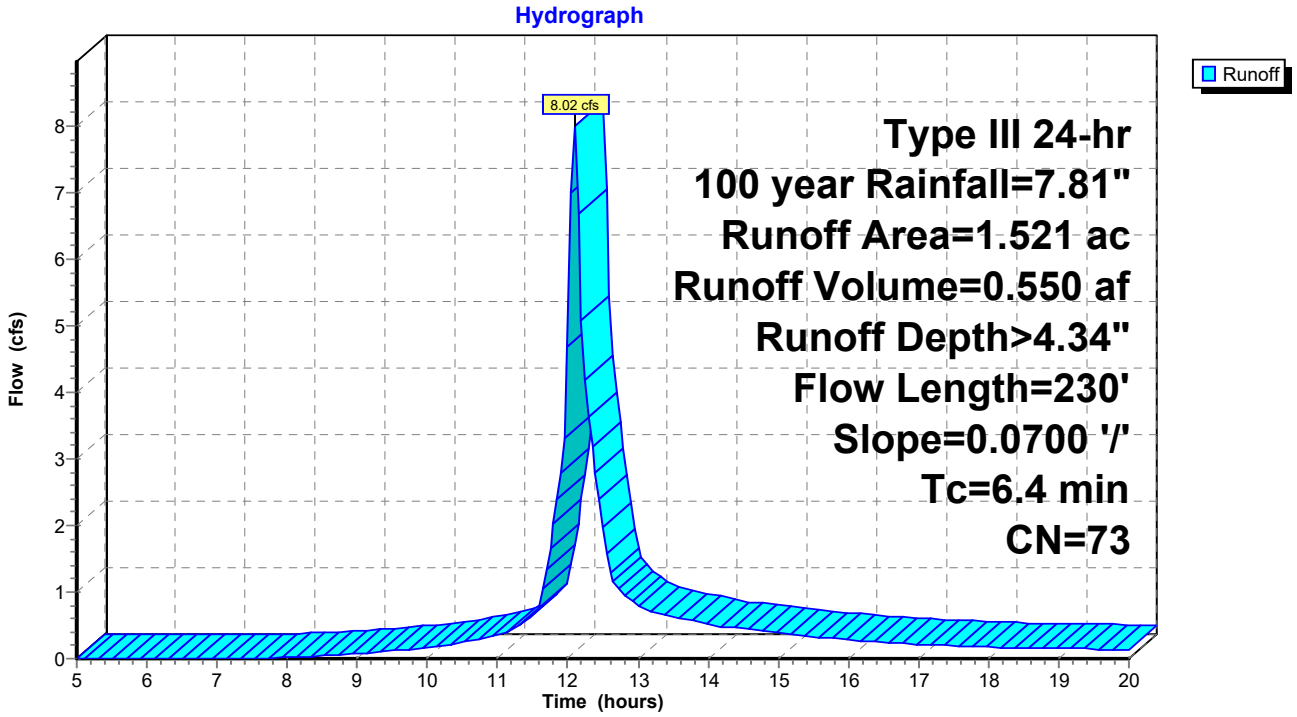
Runoff = 8.02 cfs @ 12.10 hrs, Volume= 0.550 af, Depth> 4.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.918	74	>75% Grass cover, Good, HSG C
0.199	96	Gravel surface, HSG C
0.404	58	Meadow, non-grazed, HSG B
1.521	73	Weighted Average
1.521		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	50	0.0700	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.6	180	0.0700	1.85		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.4	230	Total			

Subcatchment 9: Subcat 9



Summary for Subcatchment 9A: Subcat 9A

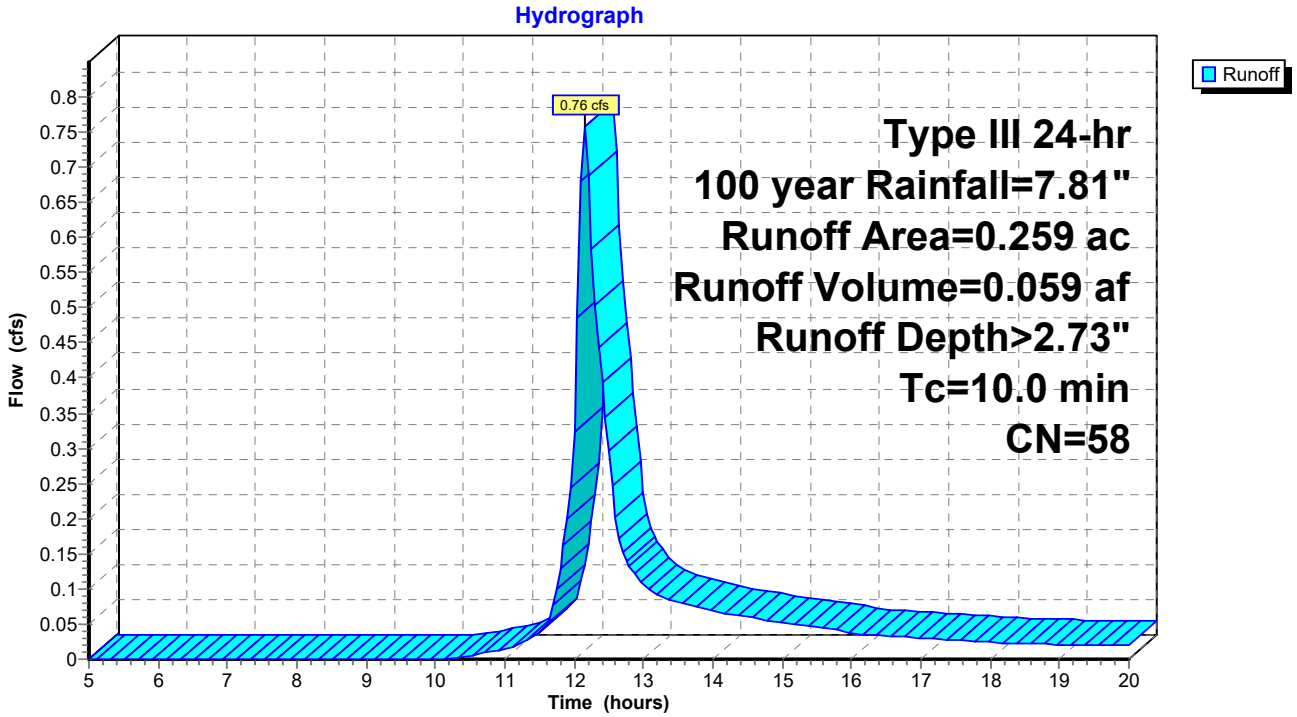
Runoff = 0.76 cfs @ 12.15 hrs, Volume= 0.059 af, Depth> 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.259	58	Meadow, non-grazed, HSG B
0.259		100.00% Pervious Area

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

Subcatchment 9A: Subcat 9A



Summary for Subcatchment 10: Subcat 10

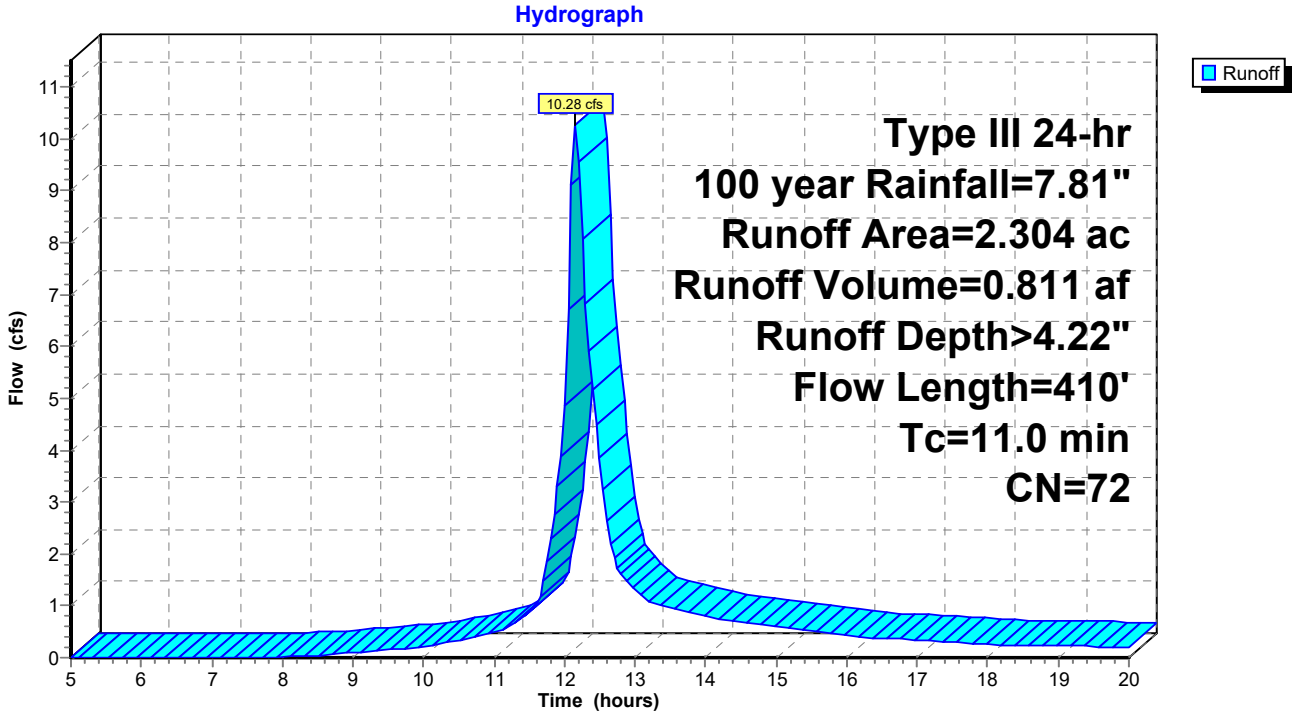
Runoff = 10.28 cfs @ 12.16 hrs, Volume= 0.811 af, Depth> 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
1.640	74	>75% Grass cover, Good, HSG C
0.157	96	Gravel surface, HSG C
0.507	58	Meadow, non-grazed, HSG B
2.304	72	Weighted Average
2.304		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0200	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
2.0	270	0.1000	2.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.1	90	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.0	410	Total			

Subcatchment 10: Subcat 10



Summary for Subcatchment 10A: Subcat 10A

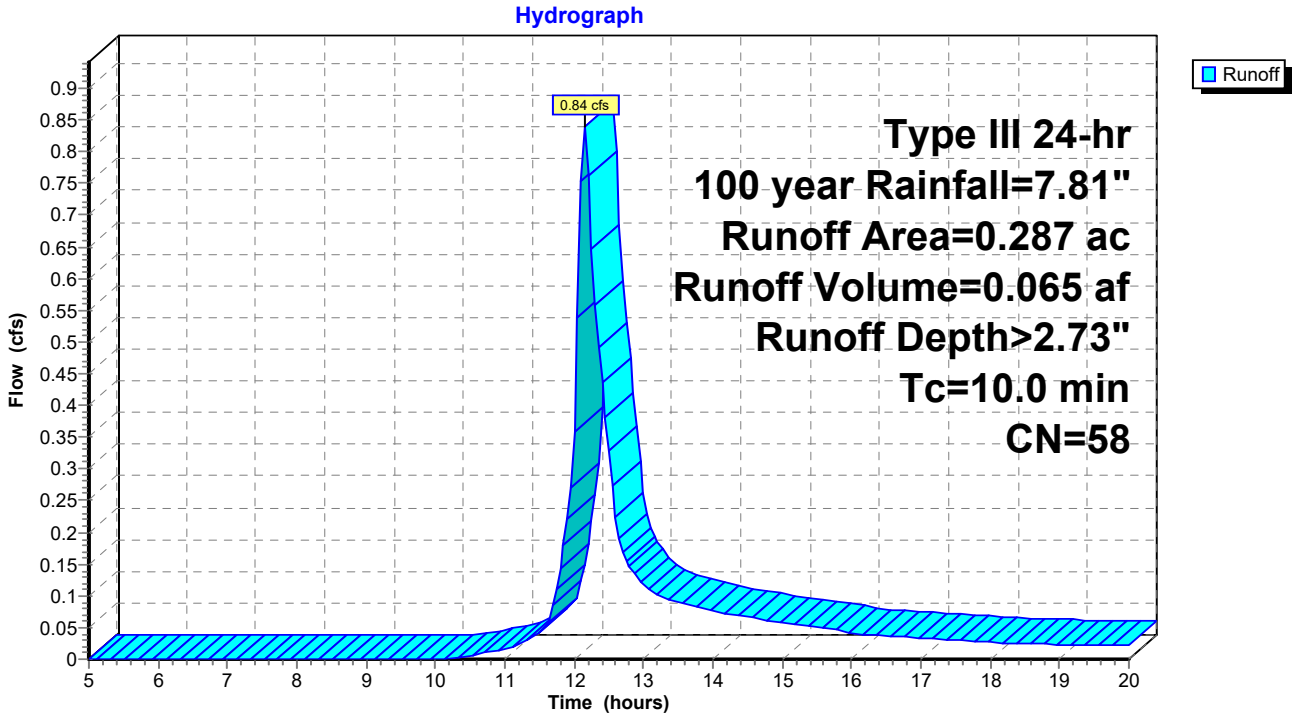
Runoff = 0.84 cfs @ 12.15 hrs, Volume= 0.065 af, Depth> 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.287	58	Meadow, non-grazed, HSG B
0.287		100.00% Pervious Area

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

Subcatchment 10A: Subcat 10A



Summary for Subcatchment 11: Subcat 11

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

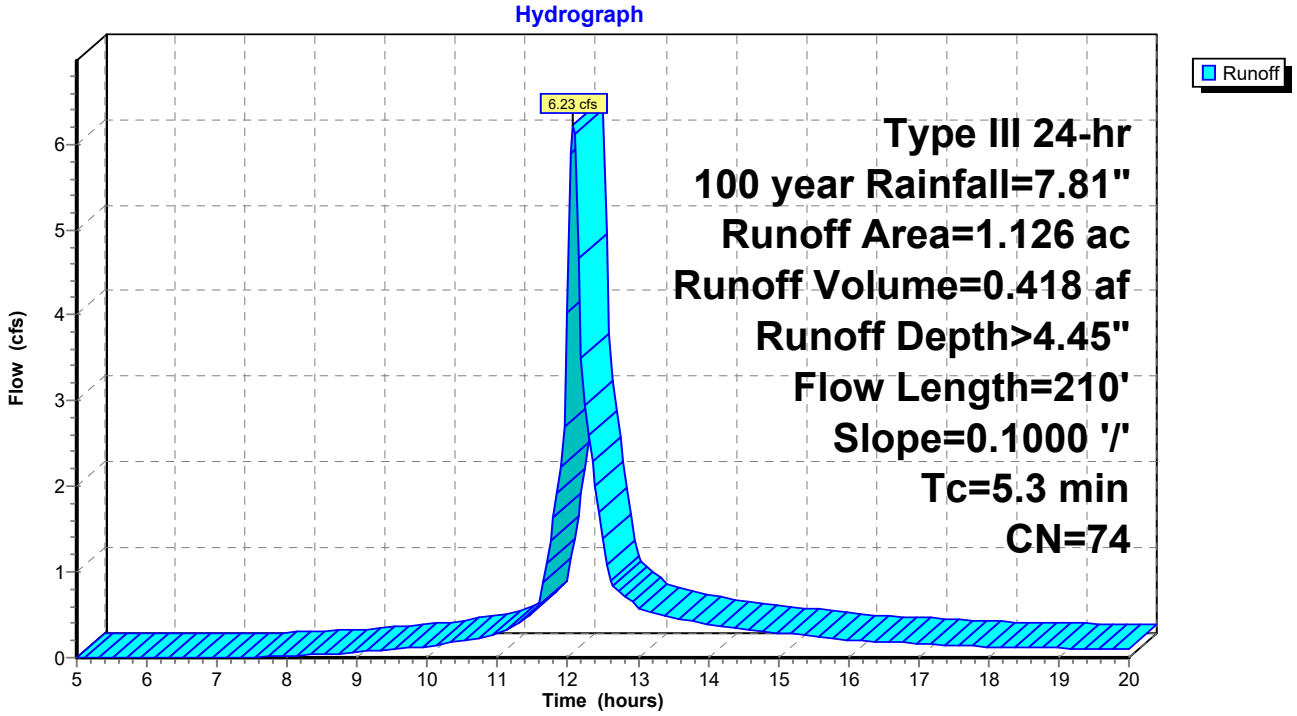
Runoff = 6.23 cfs @ 12.08 hrs, Volume= 0.418 af, Depth> 4.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.813	74	>75% Grass cover, Good, HSG C
0.144	96	Gravel surface, HSG C
0.169	58	Meadow, non-grazed, HSG B
1.126	74	Weighted Average
1.126		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.1000	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.2	160	0.1000	2.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.3	210	Total			

Subcatchment 11: Subcat 11



Summary for Subcatchment 11A: Subcat 11A

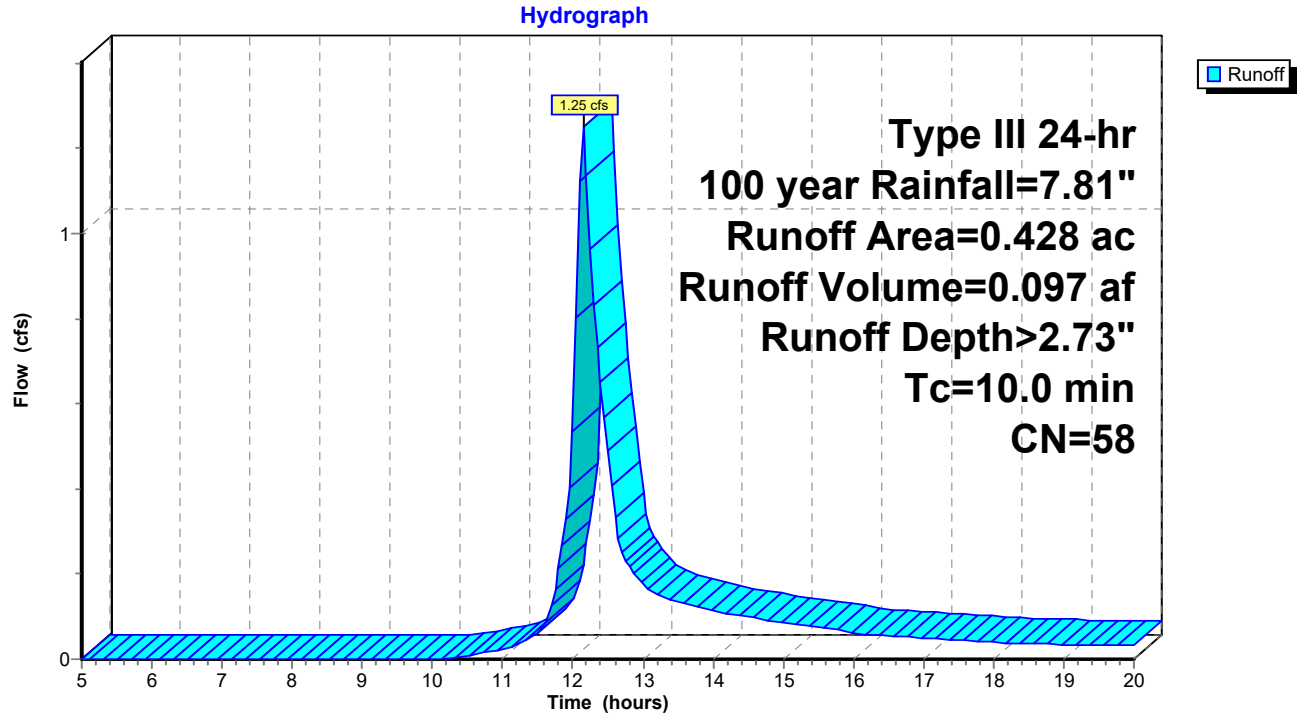
Runoff = 1.25 cfs @ 12.15 hrs, Volume= 0.097 af, Depth> 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.428	58	Meadow, non-grazed, HSG B
0.428		100.00% Pervious Area

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

Subcatchment 11A: Subcat 11A



Summary for Subcatchment 12: Subcat 12

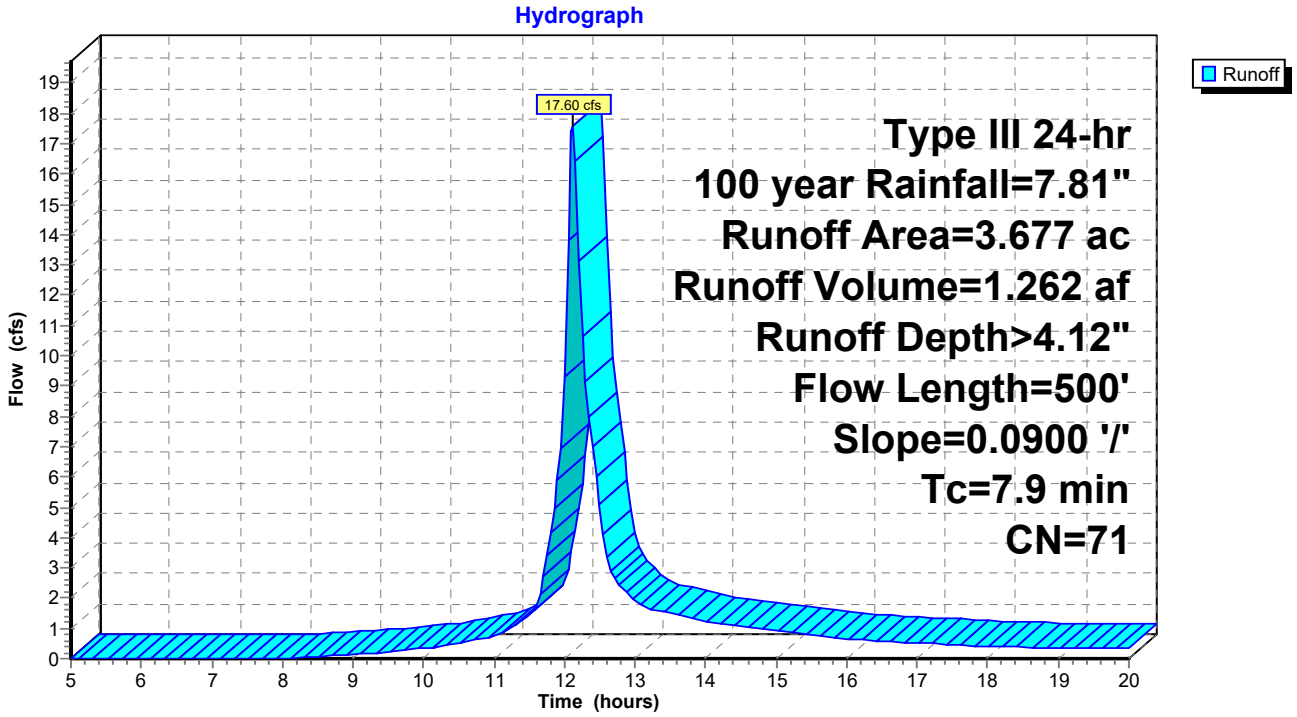
Runoff = 17.60 cfs @ 12.11 hrs, Volume= 1.262 af, Depth> 4.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
2.738	74	>75% Grass cover, Good, HSG C
0.100	96	Gravel surface, HSG C
0.839	58	Meadow, non-grazed, HSG B
3.677	71	Weighted Average
3.677		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0900	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
3.6	450	0.0900	2.10		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.9	500	Total			

Subcatchment 12: Subcat 12



Summary for Subcatchment 13.1: Subcat 13.1

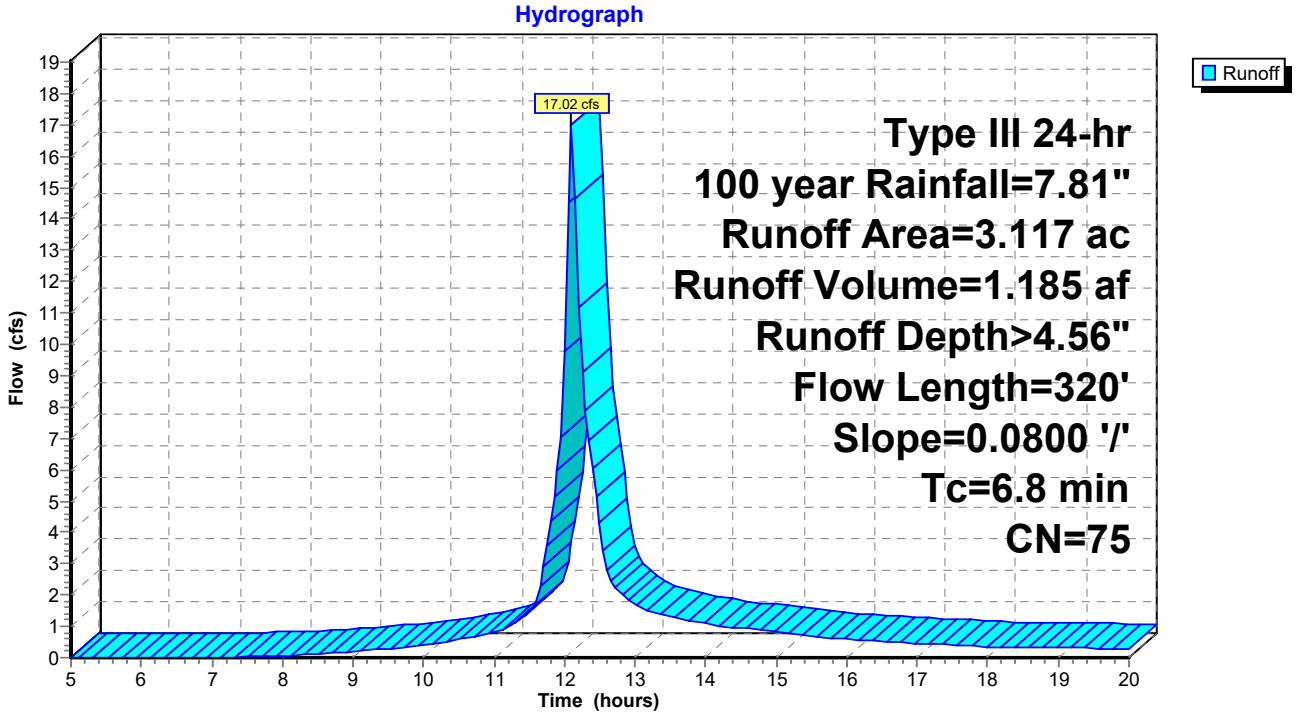
Runoff = 17.02 cfs @ 12.10 hrs, Volume= 1.185 af, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
2.825	74	>75% Grass cover, Good, HSG C
0.010	80	>75% Grass cover, Good, HSG D
0.216	96	Gravel surface, HSG C
0.050	58	Meadow, non-grazed, HSG B
0.016	78	Meadow, non-grazed, HSG D
3.117	75	Weighted Average
3.117		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
2.3	270	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.8	320	Total			

Subcatchment 13.1: Subcat 13.1



Summary for Subcatchment 13.2: Subcat 13.2

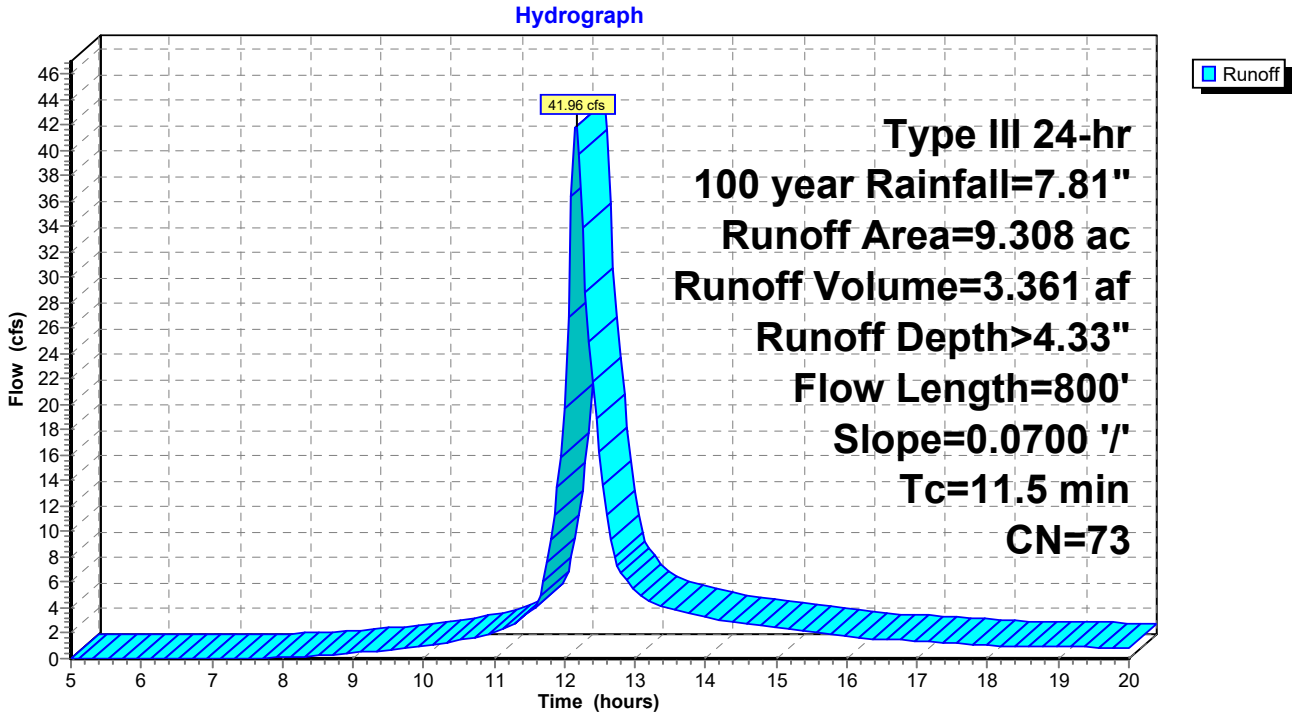
Runoff = 41.96 cfs @ 12.16 hrs, Volume= 3.361 af, Depth> 4.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
7.145	74	>75% Grass cover, Good, HSG C
0.662	96	Gravel surface, HSG C
1.501	58	Meadow, non-grazed, HSG B
9.308	73	Weighted Average
9.308		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	50	0.0700	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
6.7	750	0.0700	1.85		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.5	800	Total			

Subcatchment 13.2: Subcat 13.2



Summary for Subcatchment 14: Subcat 14

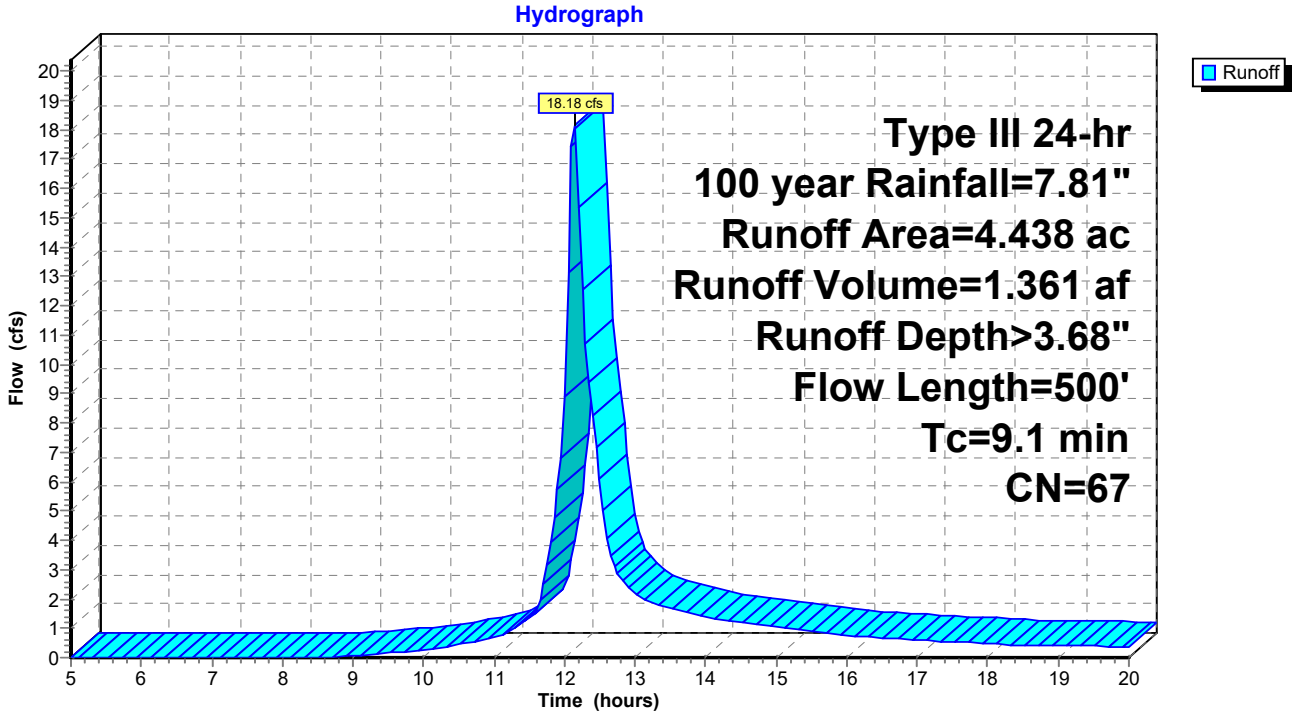
Runoff = 18.18 cfs @ 12.13 hrs, Volume= 1.361 af, Depth> 3.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
1.956	74	>75% Grass cover, Good, HSG C
0.193	96	Gravel surface, HSG C
2.289	58	Meadow, non-grazed, HSG B
4.438	67	Weighted Average
4.438		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.3	160	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.2	180	0.1300	2.52		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	110	0.2000	3.13		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.1	500	Total			

Subcatchment 14: Subcat 14



Summary for Subcatchment 16: Subcat 16

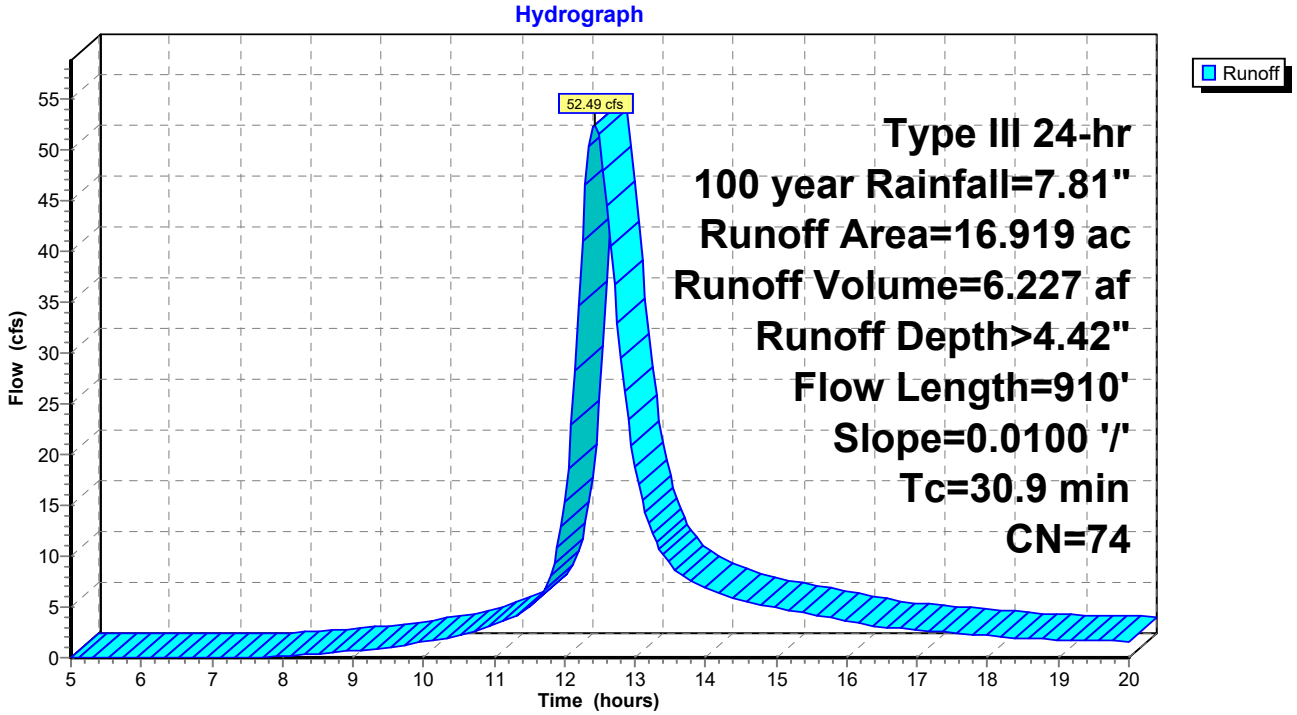
Runoff = 52.49 cfs @ 12.43 hrs, Volume= 6.227 af, Depth> 4.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
14.551	74	>75% Grass cover, Good, HSG C
1.069	96	Gravel surface, HSG C
1.299	58	Meadow, non-grazed, HSG B
16.919	74	Weighted Average
16.919		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	50	0.0100	0.08		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
11.9	500	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.6	360	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
30.9	910	Total			

Subcatchment 16: Subcat 16



Summary for Subcatchment 16A: Subcat 16A

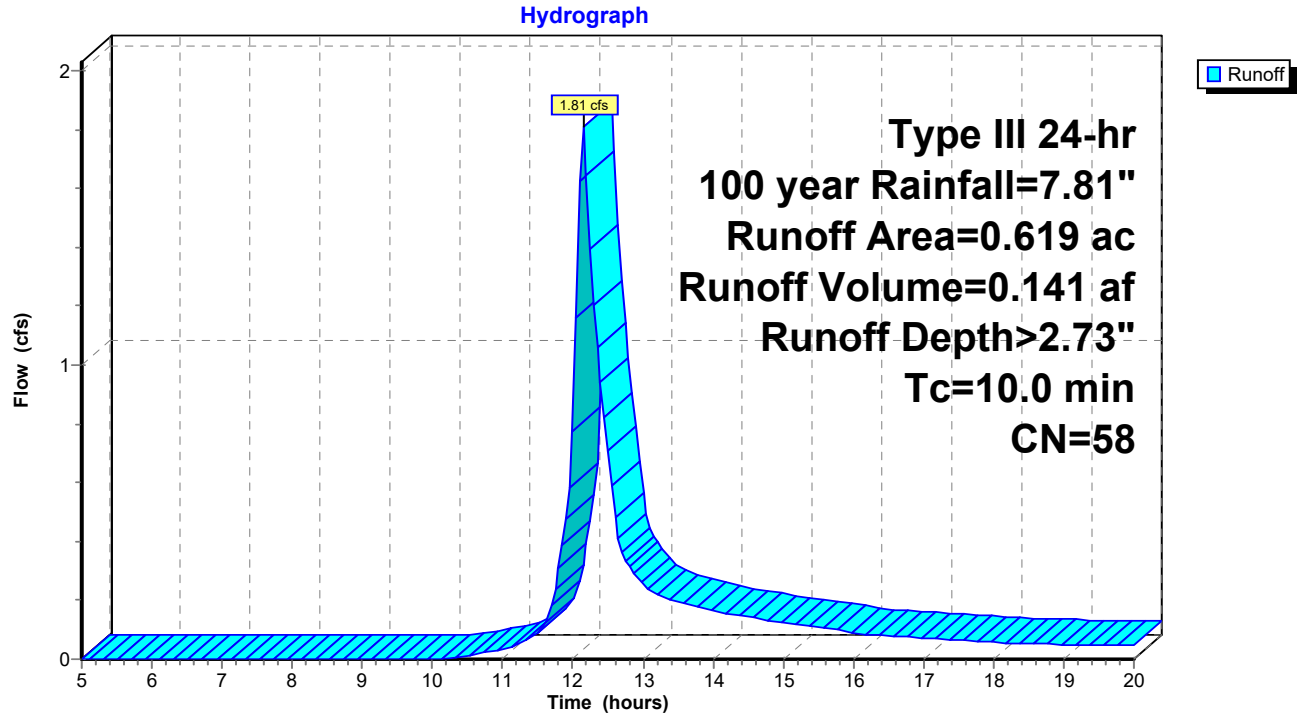
Runoff = 1.81 cfs @ 12.15 hrs, Volume= 0.141 af, Depth> 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.619	58	Meadow, non-grazed, HSG B
0.619		100.00% Pervious Area

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

Subcatchment 16A: Subcat 16A



Summary for Reach 13.1R: Reach 13.1

[91] Warning: Storage range exceeded by 0.43'
[55] Hint: Peak inflow is 958% of Manning's capacity
[79] Warning: Submerged Pond 13.1P Primary device # 1 by 0.52'

Inflow Area = 3.117 ac, 0.00% Impervious, Inflow Depth > 3.62" for 100 year event
Inflow = 9.16 cfs @ 12.26 hrs, Volume= 0.940 af
Outflow = 8.84 cfs @ 12.38 hrs, Volume= 0.936 af, Atten= 3%, Lag= 7.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.55 fps, Min. Travel Time= 3.3 min
Avg. Velocity = 1.81 fps, Avg. Travel Time= 4.6 min

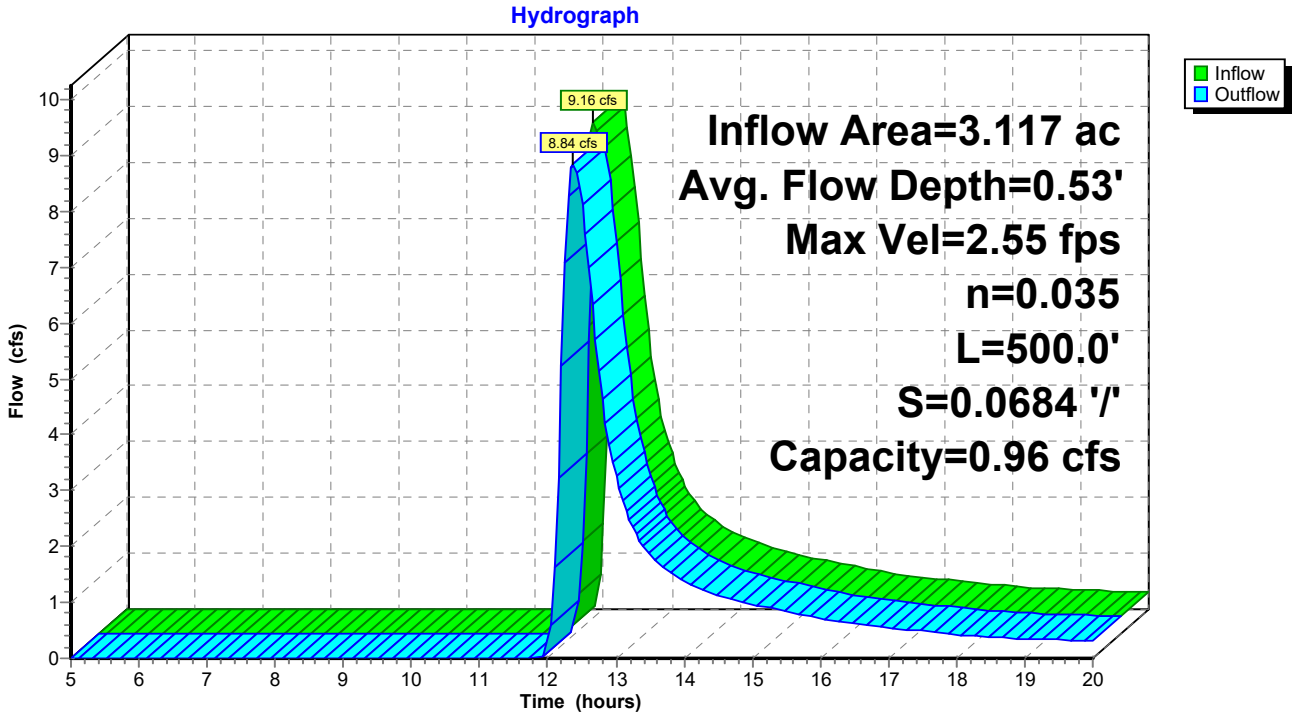
Peak Storage= 1,741 cf @ 12.32 hrs
Average Depth at Peak Storage= 0.53'
Bank-Full Depth= 0.10' Flow Area= 0.5 sf, Capacity= 0.96 cfs

3.00' x 0.10' deep channel, n= 0.035
Side Slope Z-value= 20.0 '/' Top Width= 7.00'
Length= 500.0' Slope= 0.0684 '/'
Inlet Invert= 224.20', Outlet Invert= 190.00'



‡

Reach 13.1R: Reach 13.1



Summary for Pond 1P: Pond 1

Inflow Area = 3.006 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100 year event
Inflow = 13.97 cfs @ 12.12 hrs, Volume= 1.004 af
Outflow = 8.64 cfs @ 12.26 hrs, Volume= 0.864 af, Atten= 38%, Lag= 8.5 min
Primary = 8.64 cfs @ 12.26 hrs, Volume= 0.864 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 191.75' Surf.Area= 3,745 sf Storage= 5,323 cf
Peak Elev= 194.38' @ 12.26 hrs Surf.Area= 6,224 sf Storage= 18,345 cf (13,022 cf above start)

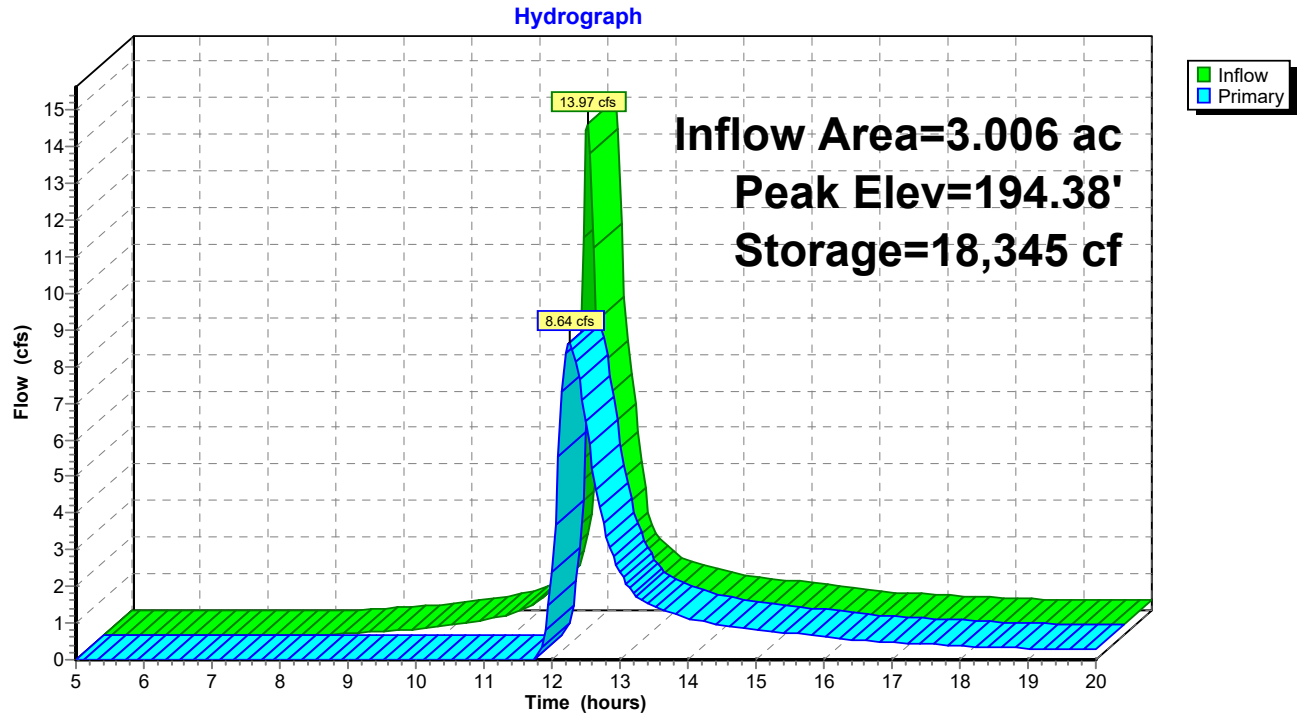
Plug-Flow detention time= 113.8 min calculated for 0.741 af (74% of inflow)
Center-of-Mass det. time= 34.6 min (826.5 - 791.9)

Volume	Invert	Avail.Storage	Storage Description
#1	190.00'	22,375 cf	**25.00'W x 95.00'L x 5.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	193.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=8.61 cfs @ 12.26 hrs HW=194.38' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 8.61 cfs @ 3.12 fps)

Pond 1P: Pond 1



Summary for Pond 2P: Pond 2

Inflow Area = 2.551 ac, 0.00% Impervious, Inflow Depth > 4.22" for 100 year event
Inflow = 10.93 cfs @ 12.17 hrs, Volume= 0.897 af
Outflow = 6.90 cfs @ 12.36 hrs, Volume= 0.681 af, Atten= 37%, Lag= 11.4 min
Discarded = 0.40 cfs @ 12.36 hrs, Volume= 0.266 af
Primary = 6.50 cfs @ 12.36 hrs, Volume= 0.415 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 231.72' @ 12.36 hrs Surf.Area= 5,048 sf Storage= 13,352 cf

Plug-Flow detention time= 104.3 min calculated for 0.681 af (76% of inflow)
Center-of-Mass det. time= 45.3 min (837.2 - 791.9)

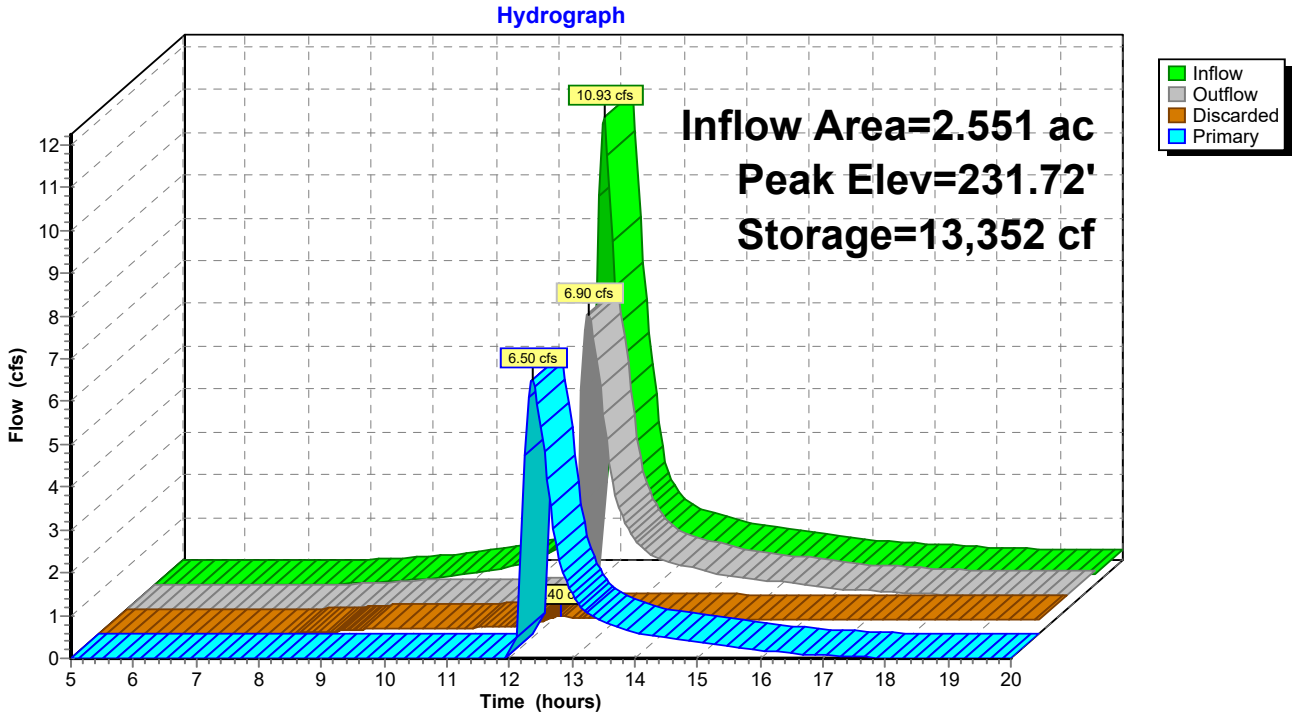
Volume	Invert	Avail.Storage	Storage Description
#1	227.50'	17,625 cf	**15.00'W x 100.00'L x 5.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	231.00'	**4.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	227.50'	**3.000 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 200.00'

Discarded OutFlow Max=0.40 cfs @ 12.36 hrs HW=231.71' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.40 cfs)

Primary OutFlow Max=6.45 cfs @ 12.36 hrs HW=231.71' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 6.45 cfs @ 2.26 fps)

Pond 2P: Pond 2



Summary for Pond 3P: Pond 3

Inflow Area = 2.550 ac, 0.00% Impervious, Inflow Depth > 4.33" for 100 year event
Inflow = 11.13 cfs @ 12.17 hrs, Volume= 0.920 af
Outflow = 6.04 cfs @ 12.42 hrs, Volume= 0.768 af, Atten= 46%, Lag= 14.5 min
Primary = 6.04 cfs @ 12.42 hrs, Volume= 0.768 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 228.23' @ 12.42 hrs Surf.Area= 5,898 sf Storage= 14,478 cf

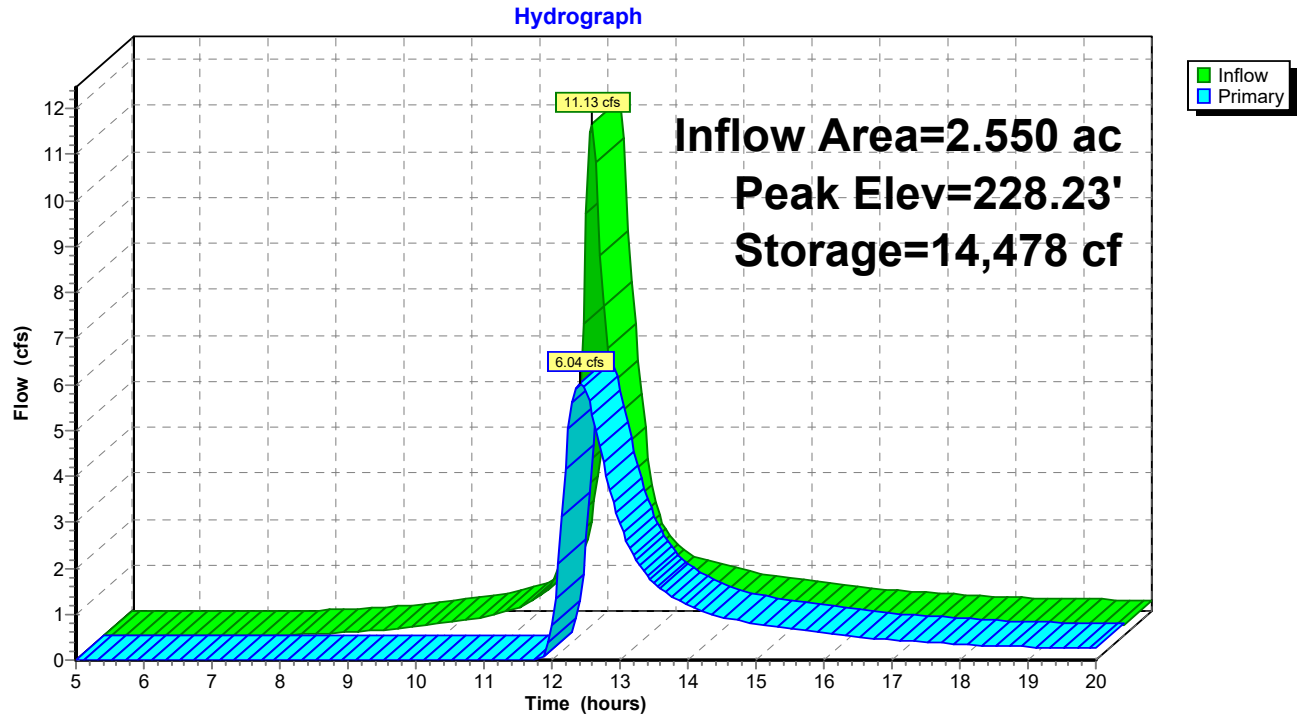
Plug-Flow detention time= 91.6 min calculated for 0.765 af (83% of inflow)
Center-of-Mass det. time= 46.2 min (836.5 - 790.3)

Volume	Invert	Avail.Storage	Storage Description
#1	225.00'	16,125 cf	**40.00'W x 80.00'L x 3.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	226.50'	**1.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=6.02 cfs @ 12.42 hrs HW=228.22' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 6.02 cfs @ 3.49 fps)

Pond 3P: Pond 3



Summary for Pond 4P: Pond 4

Inflow Area = 5.871 ac, 0.00% Impervious, Inflow Depth > 4.33" for 100 year event
Inflow = 23.39 cfs @ 12.22 hrs, Volume= 2.117 af
Outflow = 14.21 cfs @ 12.46 hrs, Volume= 1.496 af, Atten= 39%, Lag= 14.5 min
Primary = 14.21 cfs @ 12.46 hrs, Volume= 1.496 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 186.00' Surf.Area= 11,484 sf Storage= 20,436 cf
Peak Elev= 188.76' @ 12.46 hrs Surf.Area= 15,384 sf Storage= 57,384 cf (36,948 cf above start)

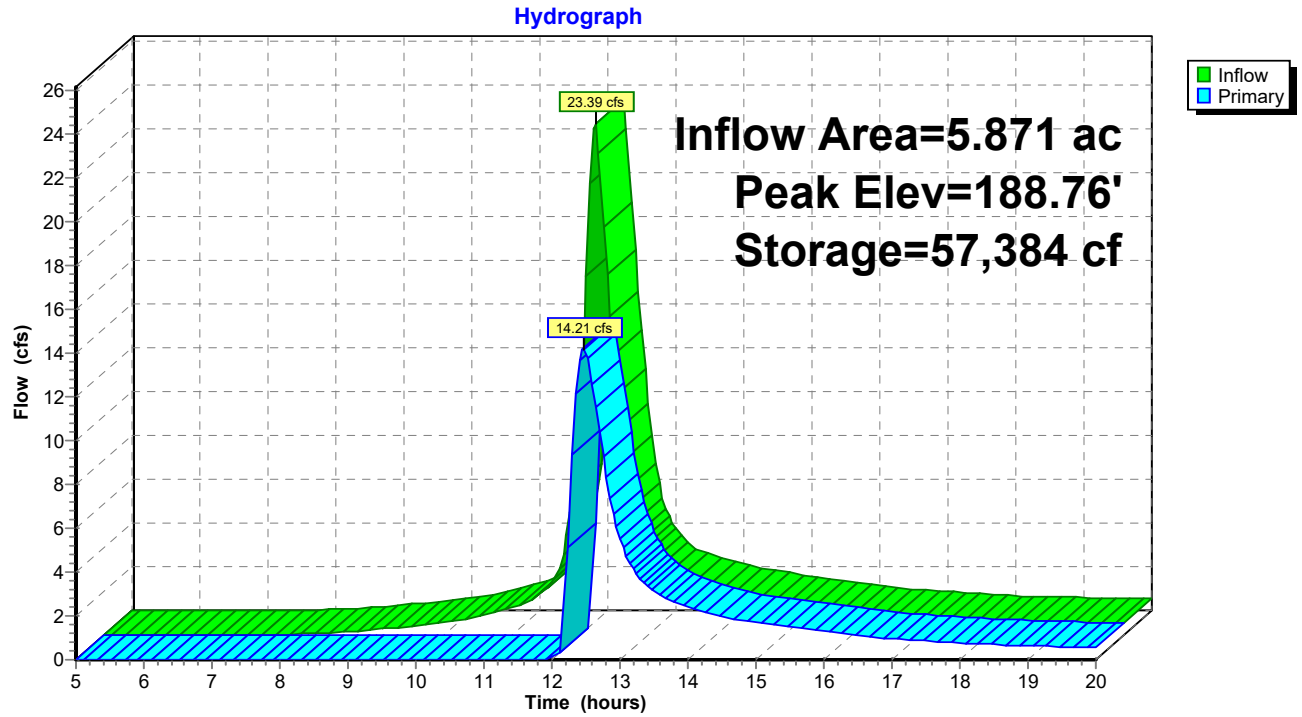
Plug-Flow detention time= 181.7 min calculated for 1.023 af (48% of inflow)
Center-of-Mass det. time= 54.4 min (847.6 - 793.2)

Volume	Invert	Avail.Storage	Storage Description
#1	184.00'	77,652 cf	**75.00'W x 120.00'L x 6.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	188.00'	**8.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=14.14 cfs @ 12.46 hrs HW=188.76' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 14.14 cfs @ 2.33 fps)

Pond 4P: Pond 4



Summary for Pond 5P: Pond 5

Inflow Area = 2.637 ac, 0.00% Impervious, Inflow Depth > 3.79" for 100 year event
Inflow = 10.76 cfs @ 12.15 hrs, Volume= 0.832 af
Outflow = 6.09 cfs @ 12.35 hrs, Volume= 0.648 af, Atten= 43%, Lag= 12.1 min
Primary = 6.09 cfs @ 12.35 hrs, Volume= 0.648 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 219.09' @ 12.35 hrs Surf.Area= 5,385 sf Storage= 12,784 cf

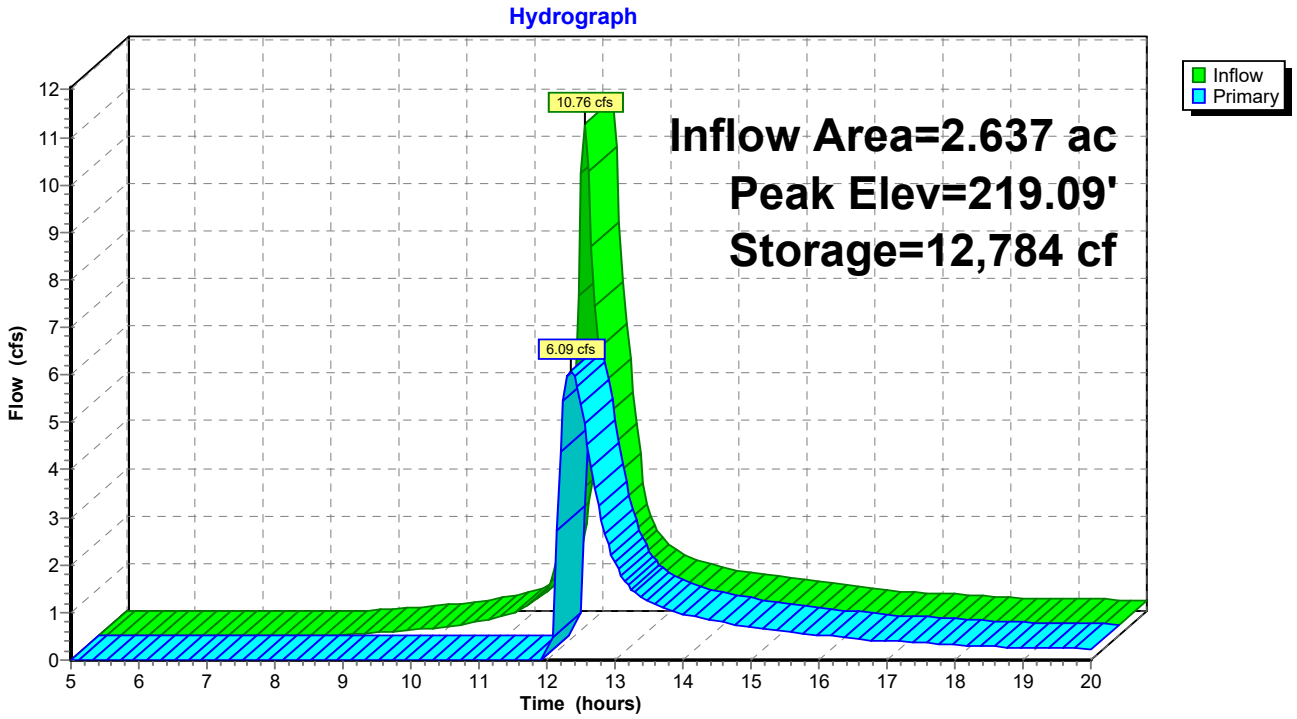
Plug-Flow detention time= 99.8 min calculated for 0.648 af (78% of inflow)
Center-of-Mass det. time= 43.6 min (840.8 - 797.2)

Volume	Invert	Avail.Storage	Storage Description
#1	216.00'	18,048 cf	**60.00'W x 50.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	218.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=6.08 cfs @ 12.35 hrs HW=219.09' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 6.08 cfs @ 2.79 fps)

Pond 5P: Pond 5



Summary for Pond 6P: Pond 6

Inflow Area = 3.201 ac, 0.00% Impervious, Inflow Depth > 4.34" for 100 year event
Inflow = 15.98 cfs @ 12.12 hrs, Volume= 1.157 af
Outflow = 10.50 cfs @ 12.24 hrs, Volume= 0.929 af, Atten= 34%, Lag= 7.5 min
Primary = 10.50 cfs @ 12.24 hrs, Volume= 0.929 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 207.00' Surf.Area= 3,844 sf Storage= 6,296 cf
Peak Elev= 210.20' @ 12.24 hrs Surf.Area= 6,592 sf Storage= 22,788 cf (16,492 cf above start)

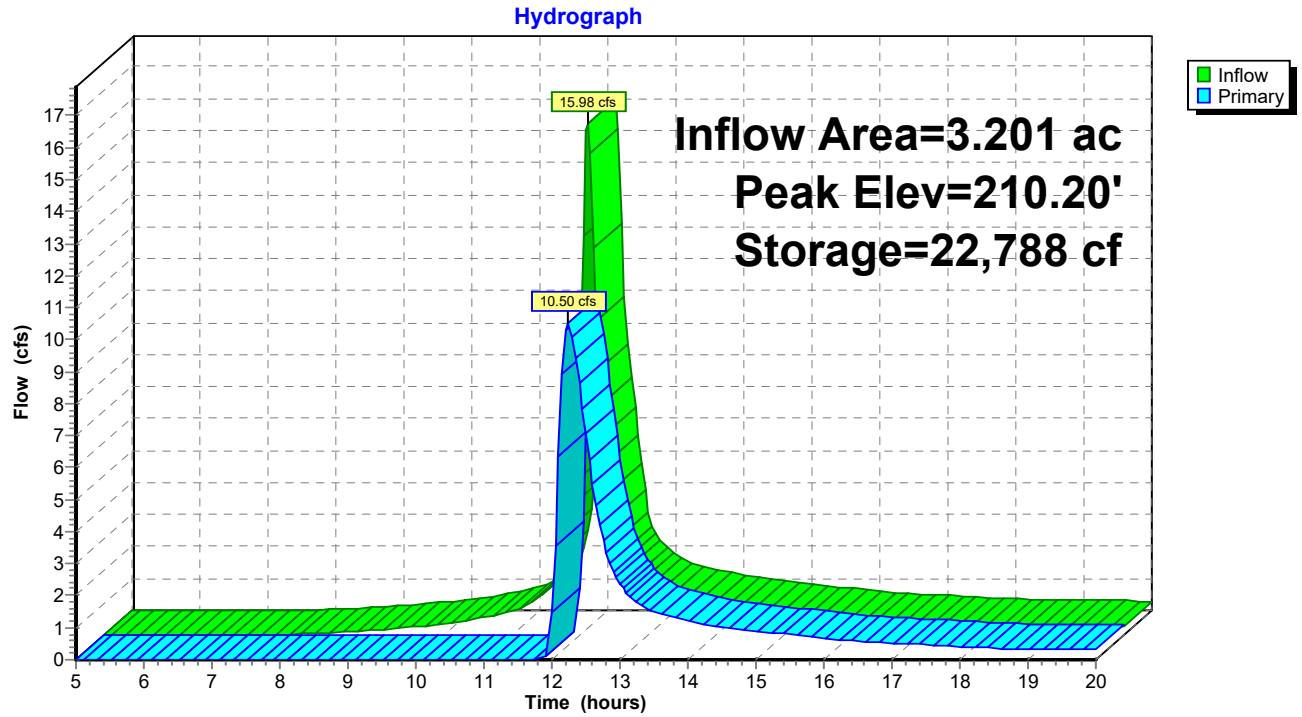
Plug-Flow detention time= 127.6 min calculated for 0.784 af (68% of inflow)
Center-of-Mass det. time= 40.3 min (827.1 - 786.8)

Volume	Invert	Avail.Storage	Storage Description
#1	205.00'	24,822 cf	**50.00'W x 50.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	209.00'	**3.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=10.46 cfs @ 12.24 hrs HW=210.19' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 10.46 cfs @ 2.92 fps)

Pond 6P: Pond 6



Summary for Pond 7P: Pond 7

Inflow Area = 1.170 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100 year event
Inflow = 5.81 cfs @ 12.09 hrs, Volume= 0.391 af
Outflow = 2.84 cfs @ 12.27 hrs, Volume= 0.314 af, Atten= 51%, Lag= 10.8 min
Discarded = 0.26 cfs @ 12.27 hrs, Volume= 0.169 af
Primary = 2.57 cfs @ 12.27 hrs, Volume= 0.146 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 226.61' @ 12.27 hrs Surf.Area= 2,570 sf Storage= 5,802 cf

Plug-Flow detention time= 109.6 min calculated for 0.314 af (80% of inflow)
Center-of-Mass det. time= 57.0 min (847.1 - 790.2)

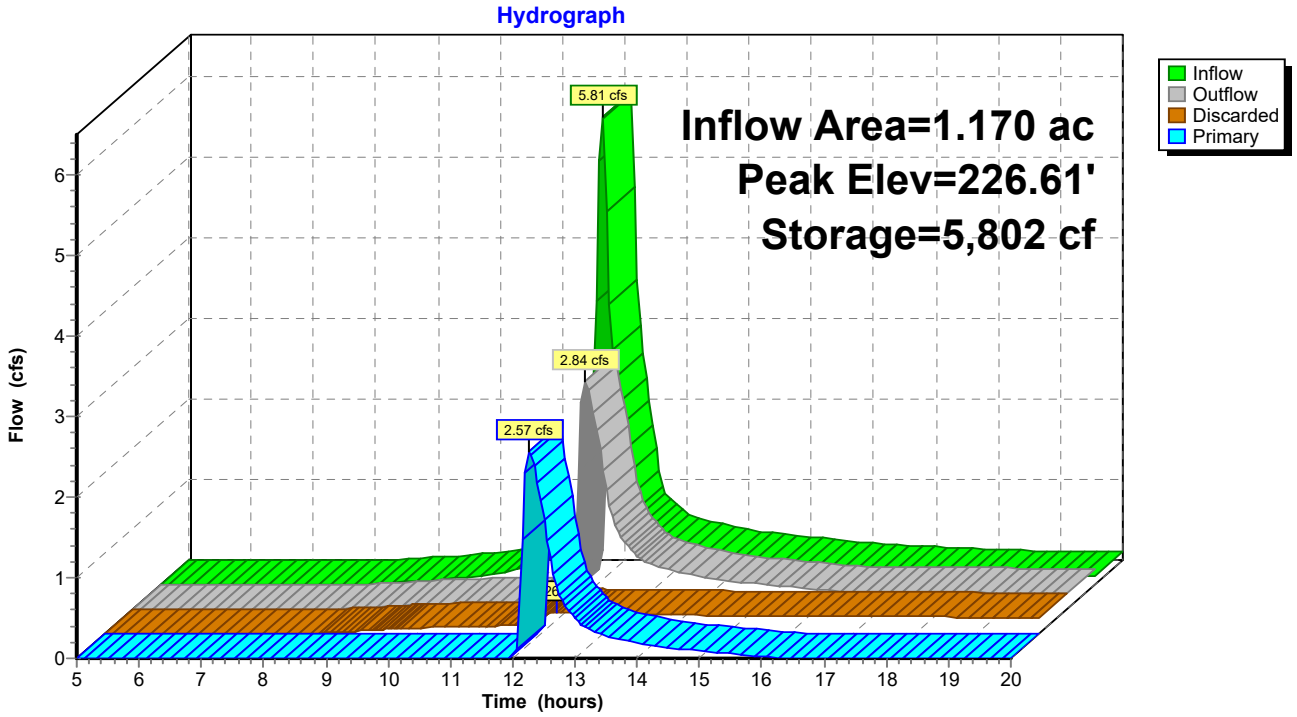
Volume	Invert	Avail.Storage	Storage Description
#1	223.00'	8,339 cf	**20.00'W x 40.00'L x 4.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	226.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	223.00'	**3.900 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 200.00'

Discarded OutFlow Max=0.26 cfs @ 12.27 hrs HW=226.61' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.26 cfs)

Primary OutFlow Max=2.54 cfs @ 12.27 hrs HW=226.61' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 2.54 cfs @ 2.09 fps)

Pond 7P: Pond 7



Summary for Pond 8P: Pond 8

Inflow Area = 4.686 ac, 0.00% Impervious, Inflow Depth > 4.22" for 100 year event
Inflow = 21.42 cfs @ 12.15 hrs, Volume= 1.650 af
Outflow = 11.88 cfs @ 12.34 hrs, Volume= 1.416 af, Atten= 45%, Lag= 11.9 min
Primary = 11.88 cfs @ 12.34 hrs, Volume= 1.416 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 190.56' @ 12.34 hrs Surf.Area= 8,657 sf Storage= 24,022 cf

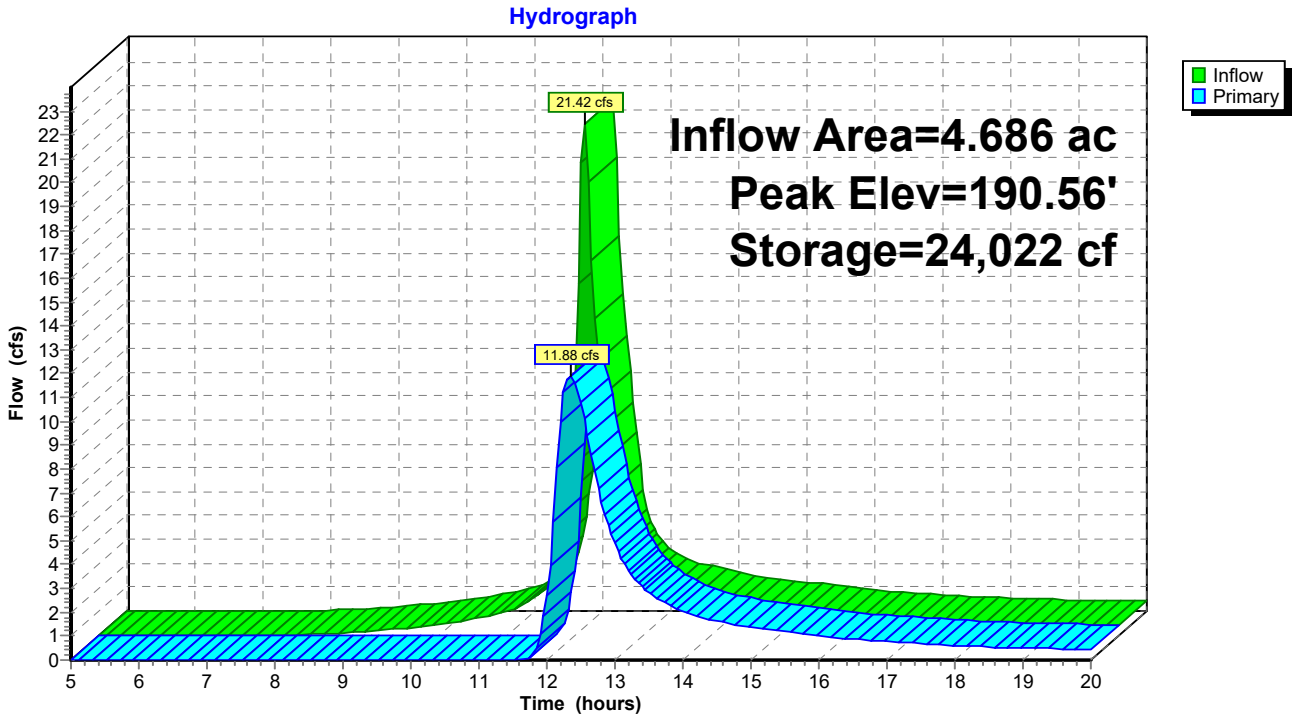
Plug-Flow detention time= 82.0 min calculated for 1.411 af (86% of inflow)
Center-of-Mass det. time= 41.0 min (831.1 - 790.1)

Volume	Invert	Avail.Storage	Storage Description
#1	187.00'	27,968 cf	**50.00'W x 100.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	188.50'	**1.5' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=11.87 cfs @ 12.34 hrs HW=190.56' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 11.87 cfs @ 3.85 fps)

Pond 8P: Pond 8



Summary for Pond 9P: Pond 9

Inflow Area = 1.521 ac, 0.00% Impervious, Inflow Depth > 4.34" for 100 year event
Inflow = 8.02 cfs @ 12.10 hrs, Volume= 0.550 af
Outflow = 3.52 cfs @ 12.32 hrs, Volume= 0.386 af, Atten= 56%, Lag= 13.2 min
Primary = 3.52 cfs @ 12.32 hrs, Volume= 0.386 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 188.00' Surf.Area= 2,664 sf Storage= 4,116 cf
Peak Elev= 190.75' @ 12.32 hrs Surf.Area= 4,739 sf Storage= 14,188 cf (10,072 cf above start)

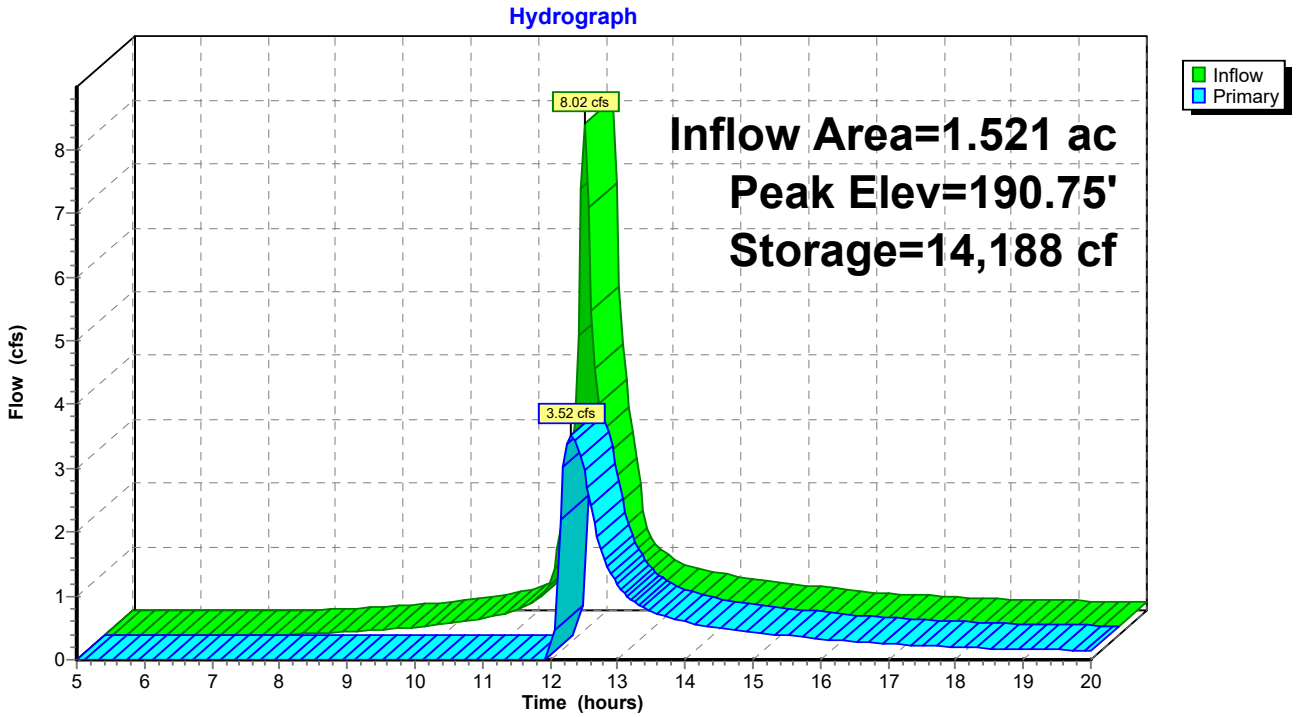
Plug-Flow detention time= 170.8 min calculated for 0.291 af (53% of inflow)
Center-of-Mass det. time= 57.3 min (842.7 - 785.4)

Volume	Invert	Avail.Storage	Storage Description
#1	186.00'	17,960 cf	**25.00'W x 60.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	190.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=3.50 cfs @ 12.32 hrs HW=190.75' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 3.50 cfs @ 2.33 fps)

Pond 9P: Pond 9



Summary for Pond 10P: Pond 10

Inflow Area = 2.304 ac, 0.00% Impervious, Inflow Depth > 4.22" for 100 year event
Inflow = 10.28 cfs @ 12.16 hrs, Volume= 0.811 af
Outflow = 5.31 cfs @ 12.39 hrs, Volume= 0.600 af, Atten= 48%, Lag= 14.3 min
Primary = 5.31 cfs @ 12.39 hrs, Volume= 0.600 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 169.50' @ 12.39 hrs Surf.Area= 5,980 sf Storage= 14,040 cf

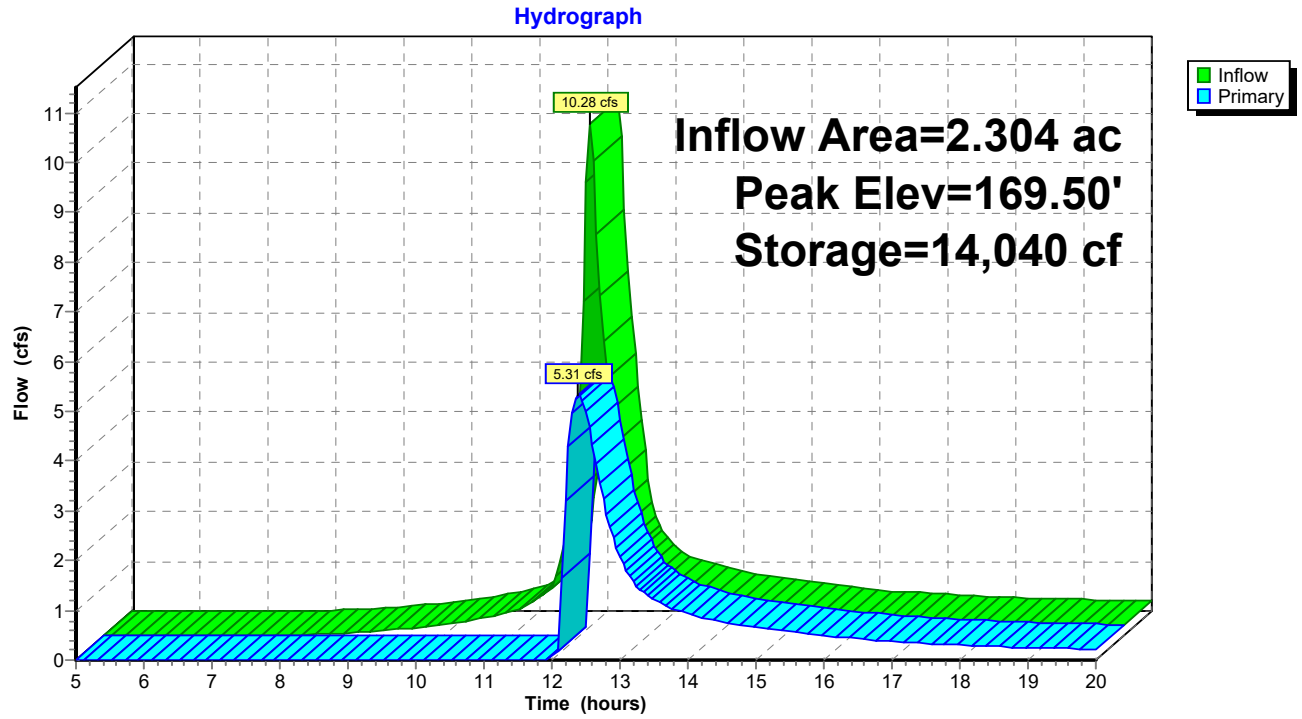
Plug-Flow detention time= 113.8 min calculated for 0.600 af (74% of inflow)
Center-of-Mass det. time= 52.4 min (843.2 - 790.8)

Volume	Invert	Avail.Storage	Storage Description
#1	166.50'	17,175 cf	**50.00'W x 70.00'L x 3.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	168.50'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=5.30 cfs @ 12.39 hrs HW=169.49' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 5.30 cfs @ 2.66 fps)

Pond 10P: Pond 10



Summary for Pond 11P: Pond 11

Inflow Area = 1.126 ac, 0.00% Impervious, Inflow Depth > 4.45" for 100 year event
Inflow = 6.23 cfs @ 12.08 hrs, Volume= 0.418 af
Outflow = 2.24 cfs @ 12.36 hrs, Volume= 0.263 af, Atten= 64%, Lag= 16.9 min
Primary = 2.24 cfs @ 12.36 hrs, Volume= 0.263 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 149.50' Surf.Area= 1,776 sf Storage= 2,043 cf
Peak Elev= 152.56' @ 12.36 hrs Surf.Area= 3,913 sf Storage= 10,577 cf (8,534 cf above start)

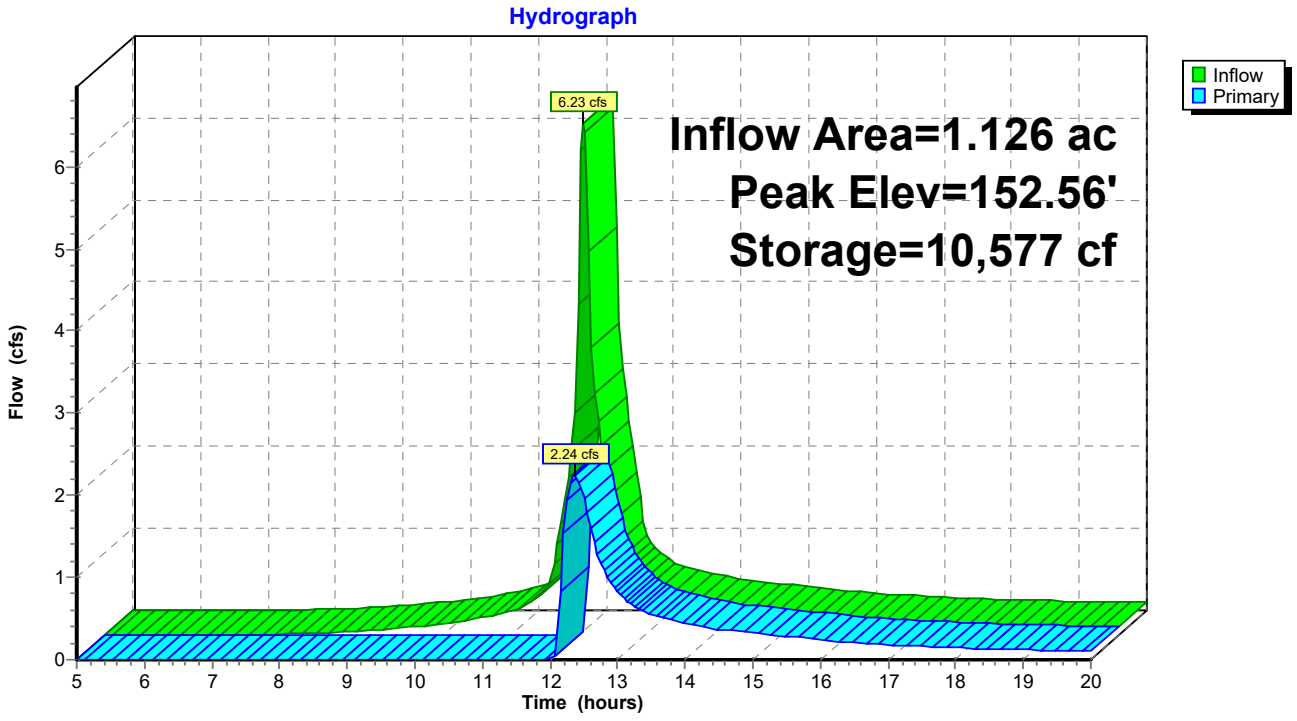
Plug-Flow detention time= 174.8 min calculated for 0.216 af (52% of inflow)
Center-of-Mass det. time= 68.6 min (851.4 - 782.8)

Volume	Invert	Avail.Storage	Storage Description
#1	148.00'	14,619 cf	**15.00'W x 65.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	152.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=2.22 cfs @ 12.36 hrs HW=152.56' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 2.22 cfs @ 1.99 fps)

Pond 11P: Pond 11



Summary for Pond 12P: Pond 12

Inflow Area = 3.677 ac, 0.00% Impervious, Inflow Depth > 4.12" for 100 year event
Inflow = 17.60 cfs @ 12.11 hrs, Volume= 1.262 af
Outflow = 9.87 cfs @ 12.28 hrs, Volume= 1.059 af, Atten= 44%, Lag= 9.8 min
Primary = 9.87 cfs @ 12.28 hrs, Volume= 1.059 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 157.00' Surf.Area= 4,384 sf Storage= 6,836 cf
Peak Elev= 160.01' @ 12.28 hrs Surf.Area= 7,764 sf Storage= 24,964 cf (18,128 cf above start)

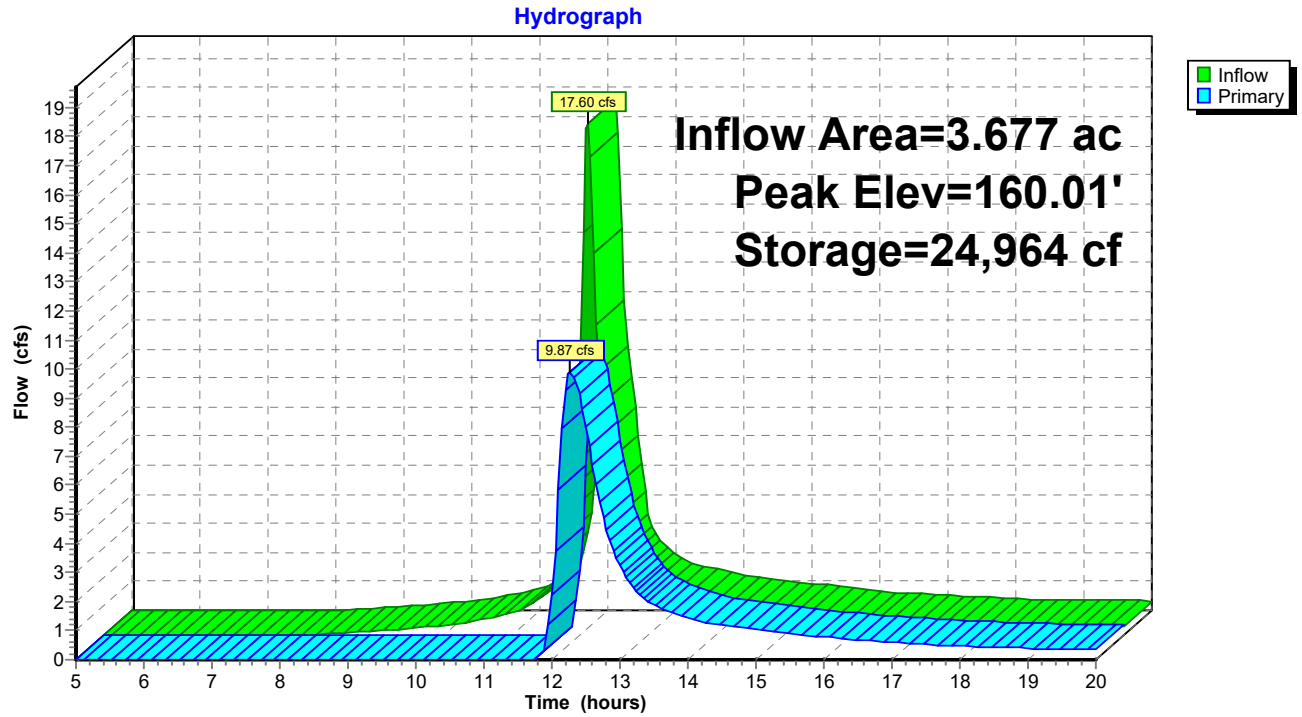
Plug-Flow detention time= 121.8 min calculated for 0.899 af (71% of inflow)
Center-of-Mass det. time= 39.6 min (829.7 - 790.1)

Volume	Invert	Avail.Storage	Storage Description
#1	155.00'	28,905 cf	**20.00'W x 125.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	158.50'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=9.83 cfs @ 12.28 hrs HW=160.01' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 9.83 cfs @ 3.26 fps)

Pond 12P: Pond 12



Summary for Pond 13.1P: Pond 13.1

Inflow Area = 3.117 ac, 0.00% Impervious, Inflow Depth > 4.56" for 100 year event
Inflow = 17.02 cfs @ 12.10 hrs, Volume= 1.185 af
Outflow = 9.16 cfs @ 12.26 hrs, Volume= 0.940 af, Atten= 46%, Lag= 9.4 min
Primary = 9.16 cfs @ 12.26 hrs, Volume= 0.940 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 224.77' @ 12.26 hrs Surf.Area= 18,412 sf Storage= 19,219 cf

Plug-Flow detention time= 101.5 min calculated for 0.936 af (79% of inflow)
Center-of-Mass det. time= 48.5 min (830.6 - 782.1)

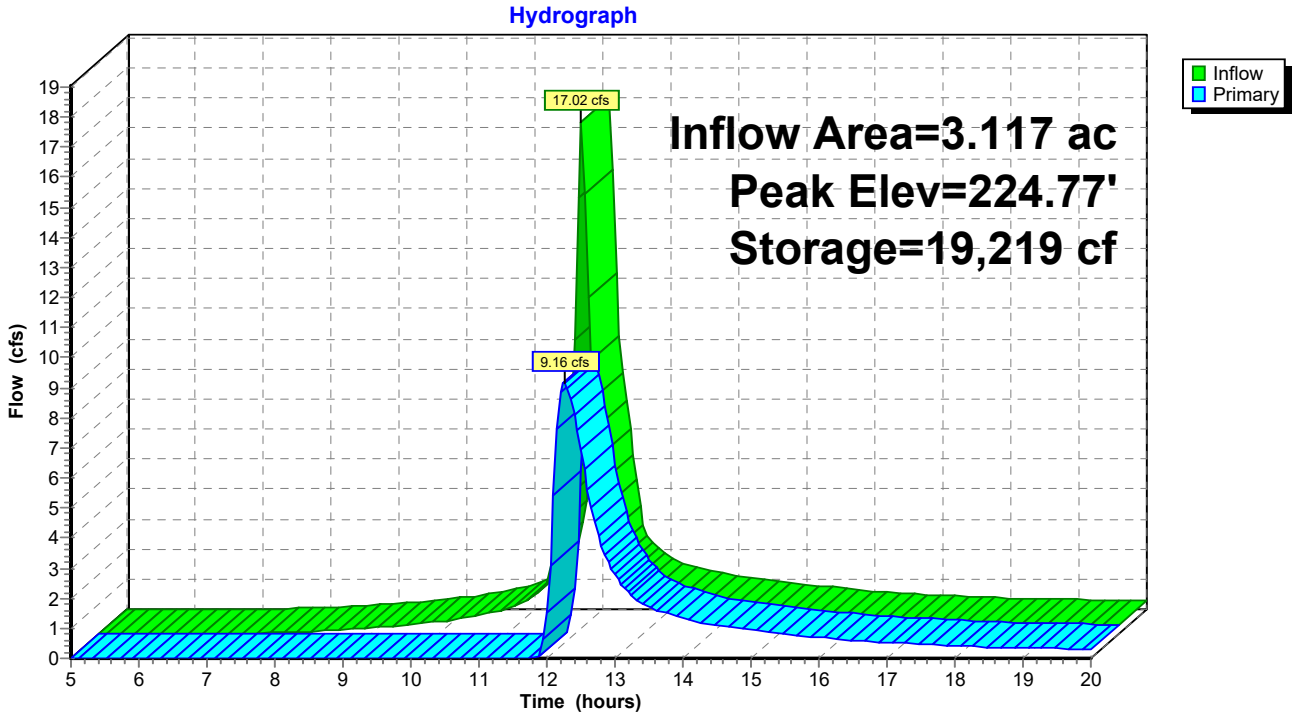
Volume	Invert	Avail.Storage	Storage Description
#1	223.00'	27,720 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
223.00	1,200	0	0
224.20	15,000	9,720	9,720
225.20	21,000	18,000	27,720

Device	Routing	Invert	Outlet Devices
#1	Primary	224.20'	**8.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=9.12 cfs @ 12.26 hrs HW=224.77' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 9.12 cfs @ 2.01 fps)

Pond 13.1P: Pond 13.1



Summary for Pond 13P: Pond 13

Inflow Area = 12.425 ac, 0.00% Impervious, Inflow Depth > 4.15" for 100 year event
Inflow = 45.84 cfs @ 12.17 hrs, Volume= 4.297 af
Outflow = 14.67 cfs @ 12.68 hrs, Volume= 2.815 af, Atten= 68%, Lag= 30.2 min
Discarded = 1.92 cfs @ 12.68 hrs, Volume= 1.387 af
Primary = 12.75 cfs @ 12.68 hrs, Volume= 1.428 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 188.71' @ 12.68 hrs Surf.Area= 21,456 sf Storage= 81,861 cf

Plug-Flow detention time= 137.0 min calculated for 2.806 af (65% of inflow)
Center-of-Mass det. time= 65.9 min (865.5 - 799.6)

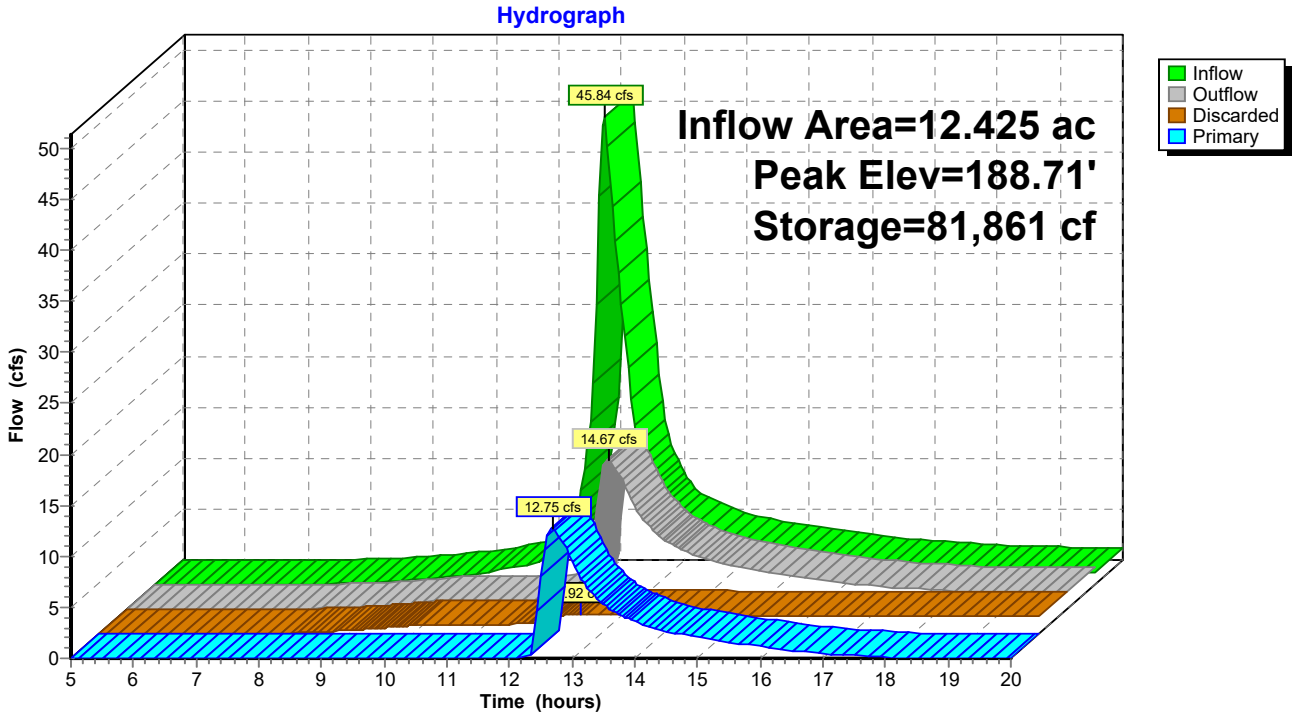
Volume	Invert	Avail.Storage	Storage Description
#1	184.00'	99,484 cf	**80.00'W x 170.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	188.00'	**8.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	184.00'	**2.700 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 175.00'

Discarded OutFlow Max=1.92 cfs @ 12.68 hrs HW=188.70' (Free Discharge)
↑└**2=Exfiltration** (Controls 1.92 cfs)

Primary OutFlow Max=12.70 cfs @ 12.68 hrs HW=188.70' (Free Discharge)
↑└**1=Broad-Crested Rectangular Weir** (Weir Controls 12.70 cfs @ 2.25 fps)

Pond 13P: Pond 13



Summary for Pond 14P: Pond 14

Inflow Area = 4.438 ac, 0.00% Impervious, Inflow Depth > 3.68" for 100 year event
Inflow = 18.18 cfs @ 12.13 hrs, Volume= 1.361 af
Outflow = 11.44 cfs @ 12.28 hrs, Volume= 1.145 af, Atten= 37%, Lag= 9.0 min
Discarded = 0.62 cfs @ 12.28 hrs, Volume= 0.358 af
Primary = 10.82 cfs @ 12.28 hrs, Volume= 0.787 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 191.61' @ 12.28 hrs Surf.Area= 5,320 sf Storage= 16,929 cf

Plug-Flow detention time= 77.0 min calculated for 1.141 af (84% of inflow)
Center-of-Mass det. time= 32.1 min (830.0 - 797.9)

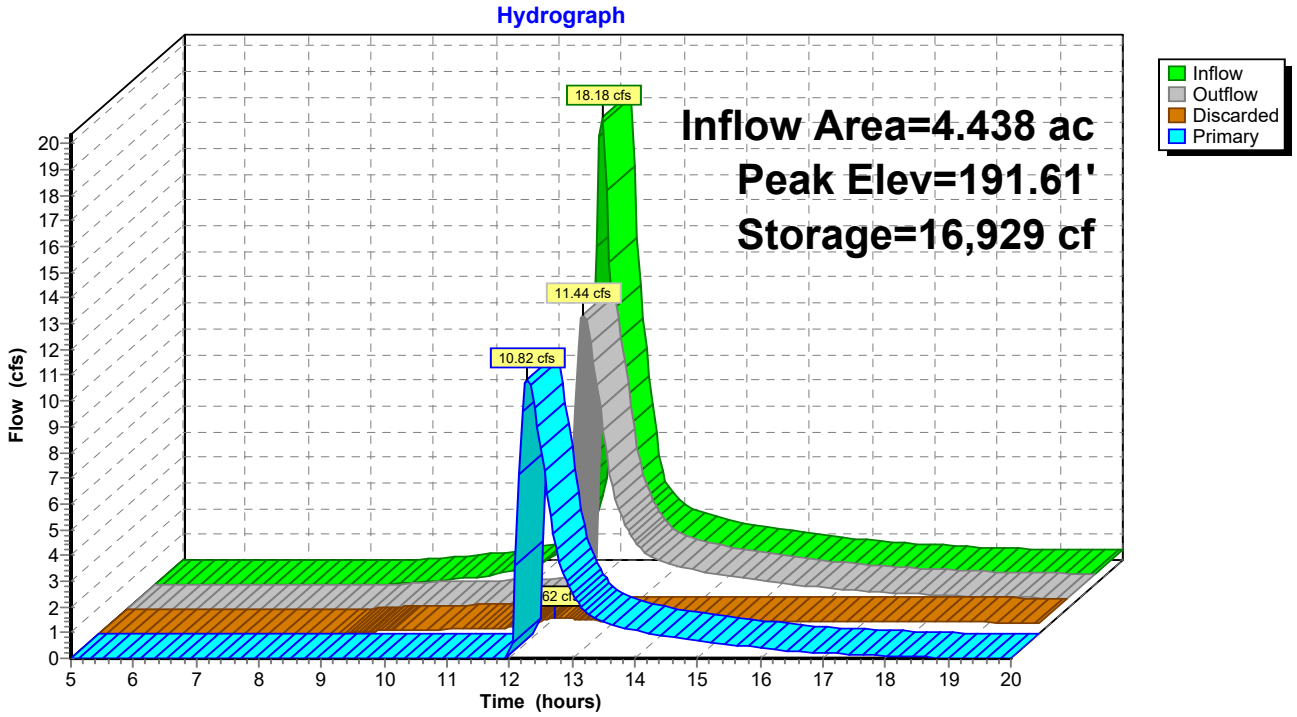
Volume	Invert	Avail.Storage	Storage Description
#1	186.50'	19,102 cf	**25.00'W x 65.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	190.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	186.50'	**3.900 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 175.00'

Discarded OutFlow Max=0.62 cfs @ 12.28 hrs HW=191.60' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.62 cfs)

Primary OutFlow Max=10.76 cfs @ 12.28 hrs HW=191.60' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 10.76 cfs @ 3.36 fps)

Pond 14P: Pond 14



Summary for Pond 16P: Pond 16

Inflow Area = 16.919 ac, 0.00% Impervious, Inflow Depth > 4.42" for 100 year event
Inflow = 52.49 cfs @ 12.43 hrs, Volume= 6.227 af
Outflow = 27.30 cfs @ 12.84 hrs, Volume= 3.823 af, Atten= 48%, Lag= 24.7 min
Primary = 27.30 cfs @ 12.84 hrs, Volume= 3.823 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 191.00' Surf.Area= 17,554 sf Storage= 31,256 cf
Peak Elev= 196.51' @ 12.84 hrs Surf.Area= 29,535 sf Storage= 160,095 cf (128,839 cf above start)

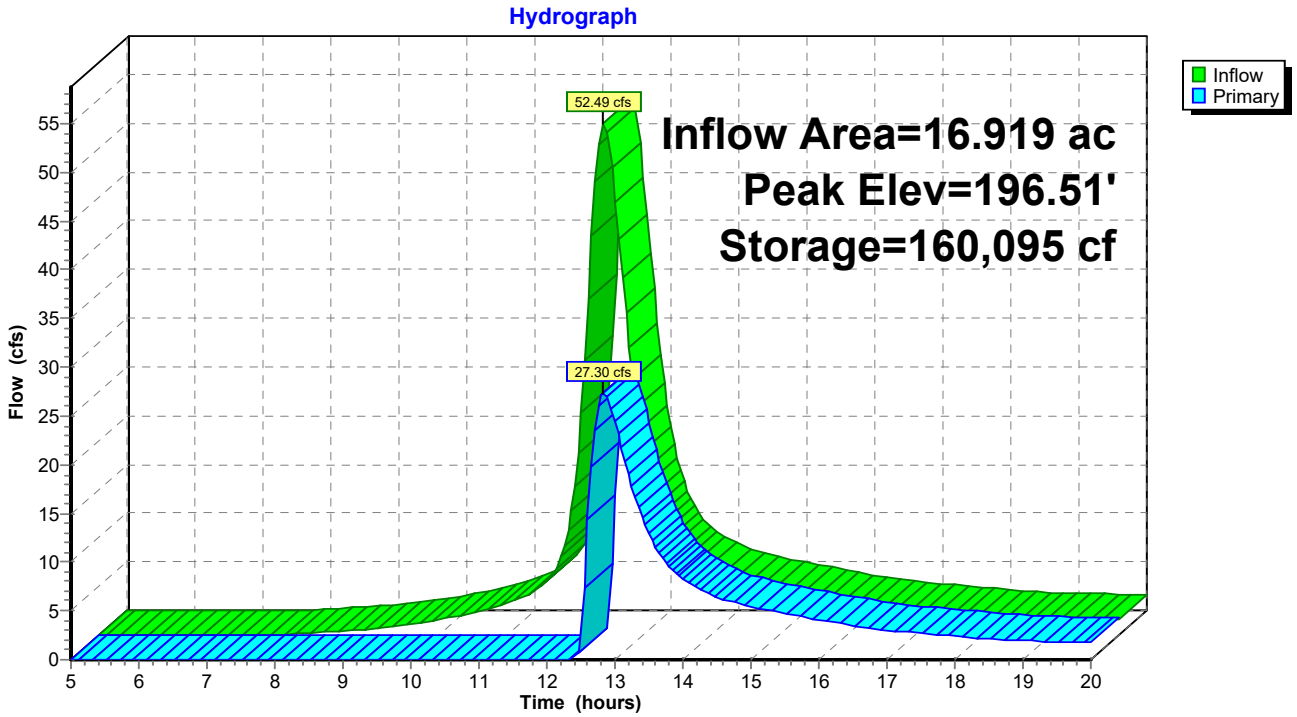
Plug-Flow detention time= 177.8 min calculated for 3.095 af (50% of inflow)
Center-of-Mass det. time= 71.7 min (874.7 - 803.1)

Volume	Invert	Avail.Storage	Storage Description
#1	189.00'	174,704 cf	**55.00'W x 250.00'L x 8.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	195.50'	**10.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=27.23 cfs @ 12.84 hrs HW=196.51' (Free Discharge)
↳**1=Broad-Crested Rectangular Weir** (Weir Controls 27.23 cfs @ 2.69 fps)

Pond 16P: Pond 16



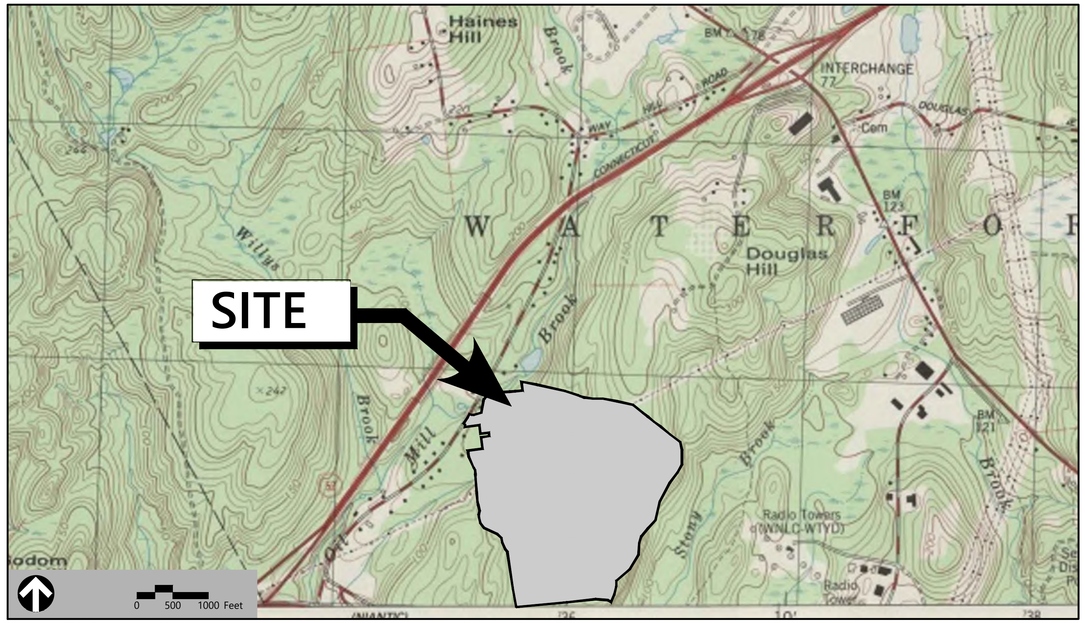
Appendix F
Site Plans

Site Plans

Issued for	Construction
Date Issued	December 2, 2019
Latest Issue	January 12, 2021

Photovoltaic Installation

117 Oil Mill Road
Waterford, Connecticut



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Suite 200
Wethersfield, CT 06109
860.807.4300

Applicant
GRE Gacrux, LLC
10 Main Street, Suite E
Middletown, CT 06457

Map / Lot:
80 / 5497

Owner
Rosalie Irene Maguire & Todd Carl Willis
149 Watson Road
Preston, CT 06365

Sheet Index

No.	Drawing Title	Latest Issue
C-1	Legend and General Notes	January 12, 2021
C-2	Key Plan	January 12, 2021
C-3.0	Layout and Materials Plan - Overall	January 12, 2021
C-3.1-3.12	Layout and Materials Plan	January 12, 2021
C-4.0	Grading and Drainage Plan - Overall	January 12, 2021
C-4.1-4.12	Grading and Drainage Plan	January 12, 2021
C-5.0	Erosion and Sediment Control Plan - Overall	January 12, 2021
C-5.1-5.12	Erosion and Sediment Control Plan	January 12, 2021
C-6.1-6.2	Site Details	January 12, 2021

Reference Drawings

No.	Drawing Title	Latest Issue
Sheets 1 & 2	Property Survey	February 22, 2018



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VHB Project : 42496.00 Waterford Solar
Issued for : Review

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Legend

Exist.	Prop.	
		PROPERTY LINE
		PROJECT LIMIT LINE
		RIGHT-OF-WAY/PROPERTY LINE
		EASEMENT
		BUILDING SETBACK
		PARKING SETBACK
10+00	10+00	BASELINE
		CONSTRUCTION LAYOUT
		ZONING LINE
		TOWN LINE
		LIMIT OF DISTURBANCE
		WETLAND LINE WITH FLAG
		FLOODPLAIN
		100-YEAR FLOOD LIMITS
		GRAVEL ROAD
EOP	EOP	EDGE OF PAVEMENT
BB	BB	BITUMINOUS BERM
BC	BC	BITUMINOUS CURB
CC	CC	CONCRETE CURB
	CG	CURB AND GUTTER
CC	ECC	EXTRUDED CONCRETE CURB
CC	MCC	MONOLITHIC CONCRETE CURB
CC	PCC	PRECAST CONC. CURB
SGE	SGE	SLOPED GRAN. EDGING
VCC	VCC	VERT. GRAN. CURB
		LIMIT OF CURB TYPE
		SAWCUT
		BUILDING
	EN	BUILDING ENTRANCE
	LD	LOADING DOCK
		BOLLARD
D	D	DUMPSTER PAD
		SIGN
		DOUBLE SIGN
		STEEL GUARDRAIL
		WOOD GUARDRAIL
		PATH
		TREE LINE
		WIRE FENCE
		FENCE
		STOCKADE FENCE
		STONE WALL
		RETAINING WALL
		STREAM / POND / WATER COURSE
		DETENTION BASIN
		HAY BALES
		SILT FENCE
		SILT SOCK / STRAW WATTLE
4	4	MINOR CONTOUR
20	20	MAJOR CONTOUR
10	10	PARKING COUNT
	C10	COMPACT PARKING STALLS
DYL	DYL	DOUBLE YELLOW LINE
SL	SL	STOP LINE
		CROSSWALK
		ACCESSIBLE CURB RAMP
		ACCESSIBLE PARKING
VAN	VAN	VAN-ACCESSIBLE PARKING

Exist.	Prop.	
		CONCRETE
		HEAVY DUTY PAVEMENT
		BUILDINGS
		RIPRAP
		CONSTRUCTION EXIT
27.35 TC×	27.35 TC×	TOP OF CURB ELEVATION
26.85 BC×	26.85 BC×	BOTTOM OF CURB ELEVATION
132.75 ×	132.75 ×	SPOT ELEVATION
45.0 TW 38.5 BW	45.0 TW 38.5 BW	TOP & BOTTOM OF WALL ELEVATION
		BORING LOCATION
		TEST PIT LOCATION
MW	MW	MONITORING WELL
UD	UD	UNDERDRAIN
12"D	12"D	DRAIN
6"RD	6"RD	ROOF DRAIN
12"S	12"S	SEWER
FM	FM	FORCE MAIN
OHW	OHW	OVERHEAD WIRE
6"W	6"W	WATER
4"FP	4"FP	FIRE PROTECTION
	2"DW	DOMESTIC WATER
3"G	G	GAS
E	E	ELECTRIC
STM	STM	STEAM
T	T	TELEPHONE
FA	FA	FIRE ALARM
CATV	CATV	CABLE TV
		CATCH BASIN
		DOUBLE CATCH BASIN
		GUTTER INLET
Ⓓ		DRAIN MANHOLE
TD		TRENCH DRAIN
C	C	PLUG OR CAP
CO	CO	CLEANOUT
		FLARED END SECTION
		HEADWALL
Ⓢ		SEWER MANHOLE
CS	CS	CURB STOP & BOX
WV	WV	WATER VALVE & BOX
TSV	TSV	TAPPING SLEEVE, VALVE & BOX
		SIAMESE CONNECTION
HYD	HYD	FIRE HYDRANT
WM	WM	WATER METER
PIV	PIV	POST INDICATOR VALVE
Ⓦ	Ⓦ	WATER WELL
GG	GG	GAS GATE
GM	GM	GAS METER
Ⓔ	EMH	ELECTRIC MANHOLE
EM	EM	ELECTRIC METER
		LIGHT POLE
Ⓣ	TMH	TELEPHONE MANHOLE
T	T	TRANSFORMER PAD
		UTILITY POLE
		GUY POLE
		GUY WIRE & ANCHOR
HH	HH	HAND HOLE
PB	PB	PULL BOX
Matchline	Matchline	MATCHLINE

Abbreviations

General

ABAN	ABANDON
ACR	ACCESSIBLE CURB RAMP
ADJ	ADJUST
APPROX	APPROXIMATE
BIT	BITUMINOUS
BS	BOTTOM OF SLOPE
BWLL	BROKEN WHITE LANE LINE
CONC	CONCRETE
DYCL	DOUBLE YELLOW CENTER LINE
EL	ELEVATION
ELEV	ELEVATION
EX	EXISTING
FDN	FOUNDATION
FFE	FIRST FLOOR ELEVATION
GRAN	GRANITE
GTD	GRADE TO DRAIN
LA	LANDSCAPE AREA
LOD	LIMIT OF DISTURBANCE
MAX	MAXIMUM
MIN	MINIMUM
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
PERF	PERFORATED
PROP	PROPOSED
REM	REMOVE
RET	RETAIN
R&D	REMOVE AND DISPOSE
R&R	REMOVE AND RESET
SWEL	SOLID WHITE EDGE LINE
SWLL	SOLID WHITE LANE LINE
TS	TOP OF SLOPE
TYP	TYPICAL

Utility

CB	CATCH BASIN
CMP	CORRUGATED METAL PIPE
CO	CLEANOUT
DCB	DOUBLE CATCH BASIN
DMH	DRAIN MANHOLE
CIP	CAST IRON PIPE
COND	CONDUIT
DIP	DUCTILE IRON PIPE
FES	FLARED END SECTION
FM	FORCE MAIN
F&G	FRAME AND GRATE
F&C	FRAME AND COVER
GI	GUTTER INLET
GT	GREASE TRAP
HDPE	HIGH DENSITY POLYETHYLENE PIPE
HH	HANDHOLE
HW	HEADWALL
HYD	HYDRANT
INV	INVERT ELEVATION
I=	INVERT ELEVATION
LP	LIGHT POLE
MES	METAL END SECTION
PIV	POST INDICATOR VALVE
PWW	PAVED WATER WAY
PVC	POLYVINYLCHLORIDE PIPE
RCP	REINFORCED CONCRETE PIPE
R=	RIM ELEVATION
SMH	SEWER MANHOLE
TSV	TAPPING SLEEVE, VALVE AND BOX
UG	UNDERGROUND
UP	UTILITY POLE

Notes

General

1. CONTRACTOR SHALL NOTIFY "CALL BEFORE YOU DIG" (811 OR 1-800-922-4455) AT LEAST 72 HOURS BEFORE EXCAVATING.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR SITE SECURITY AND JOB SAFETY. CONSTRUCTION ACTIVITIES SHALL BE IN ACCORDANCE WITH OSHA STANDARDS AND LOCAL REQUIREMENTS.
3. WORK WITHIN THE LOCAL RIGHTS-OF-WAY SHALL CONFORM TO LOCAL MUNICIPAL STANDARDS.
4. UPON AWARD OF CONTRACT, CONTRACTOR SHALL MAKE NECESSARY CONSTRUCTION NOTIFICATIONS AND APPLY FOR AND OBTAIN NECESSARY PERMITS, PAY FEES, AND POST BONDS ASSOCIATED WITH THE WORK INDICATED ON THE DRAWINGS, IN THE SPECIFICATIONS, AND IN THE CONTRACT DOCUMENTS. DO NOT CLOSE OR OBSTRUCT ROADWAYS, SIDEWALKS, AND FIRE HYDRANTS, WITHOUT APPROPRIATE PERMITS.
5. AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.
6. IN THE EVENT THAT SUSPECTED CONTAMINATED SOIL, GROUNDWATER, AND OTHER MEDIA ARE ENCOUNTERED DURING EXCAVATION AND CONSTRUCTION ACTIVITIES BASED ON VISUAL, OLFACTORY, OR OTHER EVIDENCE, THE CONTRACTOR SHALL STOP WORK IN THE VICINITY OF THE SUSPECT MATERIAL TO AVOID FURTHER SPREADING OF THE MATERIAL, AND SHALL NOTIFY THE OWNER IMMEDIATELY SO THAT THE APPROPRIATE TESTING AND SUBSEQUENT ACTION CAN BE TAKEN.
7. CONTRACTOR SHALL PREVENT DUST, SEDIMENT, AND DEBRIS FROM EXITING THE SITE AND SHALL BE RESPONSIBLE FOR CLEANUP, REPAIRS AND CORRECTIVE ACTION IF SUCH OCCURS.
8. DAMAGE RESULTING FROM CONSTRUCTION LOADS SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO OWNER.
9. CONTRACTOR SHALL CONTROL STORMWATER RUNOFF DURING CONSTRUCTION TO PREVENT ADVERSE IMPACTS TO OFF SITE AREAS, AND SHALL BE RESPONSIBLE TO REPAIR RESULTING DAMAGES, IF ANY, AT NO COST TO OWNER.
10. THIS PROJECT DISTURBS MORE THAN FIVE ACRES OF LAND AND WILL REQUIRE ADHERENCE TO AND REGISTRATION FOR THE CONNECTICUT DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION GENERAL PERMIT FOR THE DISCHARGE OF STORMWATER AND DEWATERING WASTEWATERS FROM CONSTRUCTION ACTIVITIES, EFFECTIVE OCTOBER 1, 2019.
11. STAGING AND STOCKPILE AREAS SHALL NOT BE LOCATED WITHIN ANY WETLAND AND ABUTTING RESOURCE AREA AND SHALL BE LOCATED WITHIN THE LIMITS OF DISTURBANCE.

Utilities

1. THE LOCATIONS, SIZES, AND TYPES OF EXISTING UTILITIES ARE SHOWN AS AN APPROXIMATE REPRESENTATION ONLY. THE OWNER OR IT'S REPRESENTATIVE(S) HAVE NOT INDEPENDENTLY VERIFIED THIS INFORMATION AS SHOWN ON THE PLANS. THE UTILITY INFORMATION SHOWN DOES NOT GUARANTEE THE ACTUAL EXISTENCE, SERVICEABILITY, OR OTHER DATA CONCERNING THE UTILITIES, NOR DOES IT GUARANTEE AGAINST THE POSSIBILITY THAT ADDITIONAL UTILITIES MAY BE PRESENT THAT ARE NOT SHOWN ON THE PLANS. PRIOR TO ORDERING MATERIALS AND BEGINNING CONSTRUCTION, THE CONTRACTOR SHALL VERIFY AND DETERMINE THE EXACT LOCATIONS, SIZES, AND ELEVATIONS OF THE POINTS OF CONNECTIONS TO EXISTING UTILITIES AND, SHALL CONFIRM THAT THERE ARE NO INTERFERENCES WITH EXISTING UTILITIES AND THE PROPOSED UTILITY ROUTES, INCLUDING ROUTES WITHIN THE PUBLIC RIGHTS OF WAY.
2. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, OR EXISTING CONDITIONS DIFFER FROM THOSE SHOWN SUCH THAT THE WORK CANNOT BE COMPLETED AS INTENDED, THE LOCATION, ELEVATION, AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED IN WRITING TO THE OWNER'S REPRESENTATIVE FOR THE RESOLUTION OF THE CONFLICT AND CONTRACTOR'S FAILURE TO NOTIFY PRIOR TO PERFORMING ADDITIONAL WORK RELEASES OWNER FROM OBLIGATIONS FOR ADDITIONAL PAYMENTS WHICH OTHERWISE MAY BE WARRANTED TO RESOLVE THE CONFLICT.
3. RIM ELEVATIONS FOR DRAIN AND SEWER MANHOLES, WATER VALVE COVERS, GAS GATES, ELECTRIC AND TELEPHONE PULL BOXES, AND MANHOLES, AND OTHER SUCH ITEMS, ARE APPROXIMATE AND SHALL BE SET/RESET AS FOLLOWS:
   A. PAVEMENTS AND CONCRETE SURFACES: FLUSH
   B. ALL SURFACES ALONG ACCESSIBLE ROUTES: FLUSH
   C. LANDSCAPE, LOAM AND SEED, AND OTHER EARTH SURFACE AREAS: ONE INCH ABOVE SURROUNDING AREA AND TAPER EARTH TO THE RIM ELEVATION.
4. THE LOCATION, SIZE, DEPTH, AND SPECIFICATIONS FOR CONSTRUCTION OF PROPOSED PRIVATE UTILITY SERVICES SHALL BE INSTALLED ACCORDING TO THE REQUIREMENTS PROVIDED BY, AND APPROVED BY, THE RESPECTIVE UTILITY COMPANY (GAS, TELEPHONE, ELECTRIC, FIRE ALARM, ETC.). FINAL DESIGN LOADS AND LOCATIONS TO BE COORDINATED WITH OWNER AND ARCHITECT.
5. CONTRACTOR SHALL MAKE ARRANGEMENTS FOR AND SHALL BE RESPONSIBLE FOR PAYING FEES FOR POLE RELOCATION AND FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE, FIRE ALARM, AND ANY OTHER PRIVATE UTILITIES, WHETHER WORK IS PERFORMED BY CONTRACTOR OR BY THE UTILITIES COMPANY.
6. CONTRACTOR SHALL COORDINATE WITH ELECTRICAL CONTRACTOR AND SHALL FURNISH EXCAVATION, INSTALLATION, AND BACKFILL OF ELECTRICAL FURNISHED SITEWORK RELATED ITEMS SUCH AS PULL BOXES, CONDUITS, DUCT BANKS, LIGHT POLE BASES, AND CONCRETE PADS. SITE CONTRACTOR SHALL FURNISH CONCRETE ENCASEMENT OF DUCT BANKS IF REQUIRED BY THE UTILITY COMPANY AND AS INDICATED ON THE DRAWINGS.

Layout and Materials

1. PROPOSED BOUNDS AND ANY EXISTING PROPERTY LINE MONUMENTATION DISTURBED DURING CONSTRUCTION SHALL BE SET OR RESET BY A PROFESSIONAL LICENSED SURVEYOR.
2. PRIOR TO START OF CONSTRUCTION, CONTRACTOR SHALL VERIFY EXISTING PAVEMENT ELEVATIONS AT INTERFACE WITH PROPOSED PAVEMENTS, AND EXISTING GROUND ELEVATIONS ADJACENT TO DRAINAGE OUTLETS TO ASSURE PROPER TRANSITIONS BETWEEN EXISTING AND PROPOSED FACILITIES.
3. FINAL LAYOUT SUBJECT TO CONDITIONS ENCOUNTERED IN THE FIELD.

Demolition

1. CONTRACTOR SHALL DISPOSE OF DEMOLITION DEBRIS IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS, ORDINANCES AND STATUTES.
2. THE DEMOLITION LIMITS DEPICTED IN THE PLANS IS INTENDED TO AID THE CONTRACTOR DURING THE BIDDING AND CONSTRUCTION PROCESS AND IS NOT INTENDED TO DEPICT EACH AND EVERY ELEMENT OF DEMOLITION. THE CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING THE DETAILED SCOPE OF DEMOLITION BEFORE SUBMITTING ITS BID/PROPOSAL TO PERFORM THE WORK AND SHALL MAKE NO CLAIMS AND SEEK NO ADDITIONAL COMPENSATION FOR CHANGED CONDITIONS OR UNFORESEEN OR LATENT SITE CONDITIONS RELATED TO ANY CONDITIONS DISCOVERED DURING EXECUTION OF THE WORK.
3. UNLESS OTHERWISE SPECIFICALLY PROVIDED ON THE PLANS OR IN THE SPECIFICATIONS, THE ENGINEER HAS NOT PREPARED DESIGNS FOR AND SHALL HAVE NO RESPONSIBILITY FOR THE PRESENCE, DISCOVERY, REMOVAL, ABATEMENT OR DISPOSAL OF HAZARDOUS MATERIALS, TOXIC WASTES OR POLLUTANTS AT THE PROJECT SITE. THE ENGINEER SHALL NOT BE RESPONSIBLE FOR ANY CLAIMS OF LOSS, DAMAGE, EXPENSE, DELAY, INJURY OR DEATH ARISING FROM THE PRESENCE OF HAZARDOUS MATERIAL AND CONTRACTOR SHALL INDEMNIFY AND HOLD HARMLESS THE ENGINEER FROM ANY CLAIMS MADE IN CONNECTION THEREWITH. MOREOVER, THE ENGINEER SHALL HAVE NO ADMINISTRATIVE OBLIGATIONS OF ANY TYPE WITH REGARD TO ANY CONTRACTOR AMENDMENT INVOLVING THE ISSUES OF PRESENCE, DISCOVERY, REMOVAL, ABATEMENT OR DISPOSAL OF ASBESTOS OR OTHER HAZARDOUS MATERIALS.

Erosion Control

1. PRIOR TO STARTING ANY OTHER WORK ON THE SITE, THE CONTRACTOR SHALL NOTIFY APPROPRIATE AGENCIES AND SHALL INSTALL EROSION CONTROL MEASURES AS SHOWN ON THE PLANS AND AS IDENTIFIED IN FEDERAL, STATE, AND LOCAL APPROVAL DOCUMENTS PERTAINING TO THIS PROJECT.
2. CONTRACTOR OR QUALIFIED INSPECTOR SHALL INSPECT AND MAINTAIN EROSION CONTROL MEASURES ON A WEEKLY BASIS OR MORE FREQUENTLY AS NEEDED, (MINIMUM) OR AS REQUIRED PER THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP). THE CONTRACTOR SHALL ADDRESS DEFICIENCIES AND MAINTENANCE ITEMS WITHIN TWENTY-FOUR HOURS OF INSPECTION. CONTRACTOR SHALL PROPERLY DISPOSE OF SEDIMENT SUCH THAT IT DOES NOT ENCUMBER OTHER DRAINAGE STRUCTURES AND PROTECTED AREAS.
3. CONTRACTOR SHALL BE FULLY RESPONSIBLE TO CONTROL CONSTRUCTION SUCH THAT SEDIMENTATION SHALL NOT AFFECT REGULATORY PROTECTED AREAS, WHETHER SUCH SEDIMENTATION IS CAUSED BY WATER, WIND, OR DIRECT DEPOSIT.
4. CONTRACTOR SHALL PERFORM CONSTRUCTION SEQUENCING SUCH THAT EARTH MATERIALS ARE EXPOSED FOR A MINIMUM OF TIME BEFORE THEY ARE COVERED, SEEDED, OR OTHERWISE STABILIZED TO PREVENT EROSION.
5. UPON COMPLETION OF CONSTRUCTION AND ESTABLISHMENT OF PERMANENT GROUND COVER, CONTRACTOR SHALL REMOVE AND DISPOSE OF EROSION CONTROL MEASURES AND CLEAN SEDIMENT AND DEBRIS FROM ENTIRE DRAINAGE AND SEWER SYSTEMS.
6. VEGETATIVE SLOPE STABILIZATION WILL BE IMPLEMENTED WITHIN 72 HOURS AFTER GRADING OR CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED. VEGETATIVE SLOPE STABILIZATION WILL BE USED TO MINIMIZE EROSION ON SLOPES OF 3:1 OR STEEPER. ESTABLISHMENT OF TEMPORARY AND PERMANENT VEGETATIVE COVER MAY BE ESTABLISHED BY HYDRO-SEEDING OR SODDING. A SUITABLE TOPSOIL, GOOD SEEDBED PREPARATION, AND ADEQUATE LIME, FERTILIZER AND WATER WILL BE PROVIDED FOR EFFECTIVE ESTABLISHMENT OF THESE VEGETATIVE STABILIZATION METHODS. MULCH WILL ALSO BE USED AFTER PERMANENT SEEDING TO PROTECT SOIL FROM THE IMPACT OF FALLING RAIN AND TO INCREASE THE CAPACITY OF THE SOIL TO ABSORB WATER.

Document Use

1. THESE PLANS AND CORRESPONDING CADD DOCUMENTS ARE INSTRUMENTS OF PROFESSIONAL SERVICE, AND SHALL NOT BE USED, IN WHOLE OR IN PART, FOR ANY PURPOSE OTHER THAN FOR WHICH IT WAS CREATED WITHOUT THE EXPRESSED, WRITTEN CONSENT OF VHB. ANY UNAUTHORIZED USE, REUSE, MODIFICATION OR ALTERATION, INCLUDING AUTOMATED CONVERSION OF THIS DOCUMENT SHALL BE AT THE USER'S SOLE RISK WITHOUT LIABILITY OR LEGAL EXPOSURE TO VHB.
2. CONTRACTOR SHALL NOT RELY SOLELY ON ELECTRONIC VERSIONS OF PLANS, SPECIFICATIONS, AND DATA FILES THAT ARE OBTAINED FROM THE DESIGNERS, BUT SHALL VERIFY LOCATION OF PROJECT FEATURES IN ACCORDANCE WITH THE PAPER COPIES OF THE PLANS AND SPECIFICATIONS THAT ARE SUPPLIED AS PART OF THE CONTRACT DOCUMENTS.
3. SYMBOLS AND LEGENDS OF PROJECT FEATURES ARE GRAPHIC REPRESENTATIONS AND ARE NOT NECESSARILY SCALED TO THEIR ACTUAL DIMENSIONS OR LOCATIONS ON THE DRAWINGS. THE CONTRACTOR SHALL REFER TO THE DETAIL SHEET DIMENSIONS, MANUFACTURERS' LITERATURE, SHOP DRAWINGS AND FIELD MEASUREMENTS OF SUPPLIED PRODUCTS FOR LAYOUT OF THE PROJECT FEATURES.

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Photovoltaic Installation

117 Oil Mill Road
Waterford, Connecticut

No.	Revision	Date	Appvd.
1	CTDEEP Comments	3/12/2020	SJK
2	CSC & CTDEEP Comments	7/28/2020	SJK
3	CSC D&M Plan	1/12/2021	SJK

Designed by | Checked by

Issued for | Date

Final Approvals — December 2, 2019

Issued for Construction

Drawing Title

Legend and General Notes

Drawing Number

C-1

Sheet 1 of 43

Project Number

42496.00

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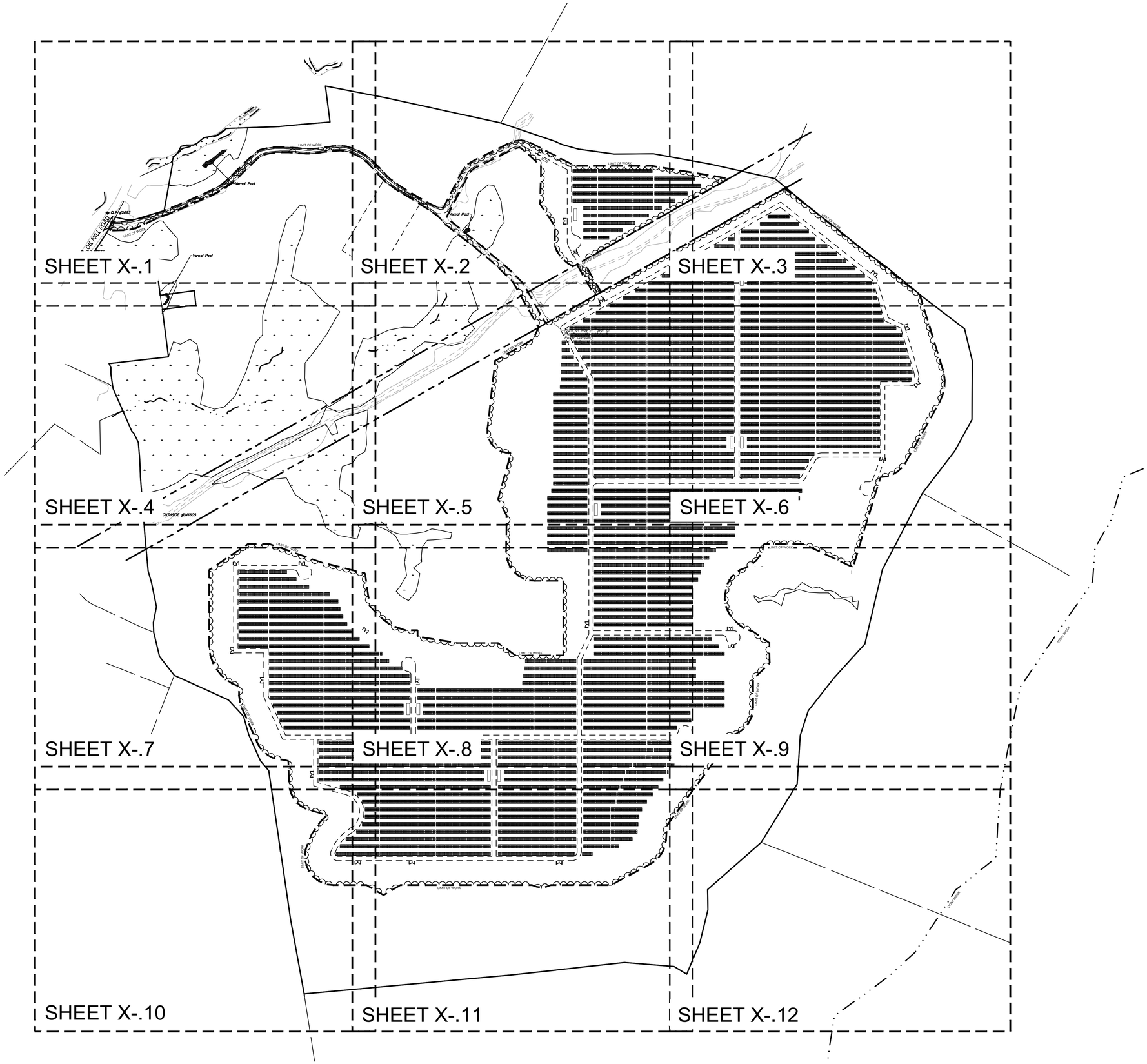

Photovoltaic Installation

117 Oil Mill Road
Waterford, Connecticut

No.	Revision	Date	Appvd.
1	CTDEEP Comments	3/12/2020	SJK
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3	CSC D&M Plan	1/12/2021	SJK

Designed by

Checked by

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Final Approvals

Date

December 2, 2019

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Drawing Title

Key Plan

Drawing Number

C-2

Sheet 2 of 43

Project Number

42496.00

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PROJECT INFORMATION

PARCEL SIZE: ±152 ACRES

ZONE DESIGNATION: RU-120 RURAL RESIDENTIAL

LIMIT OF WORK: ±75 ACRES

AREA OF PROPOSED TREE CLEARING: ±75 ACRES (PRE-TIMBER HARVEST)

NON-DISTURBANCE BUFFER TO WETLANDS: >100'

PROPOSED NUMBER OF PANELS: 45,566

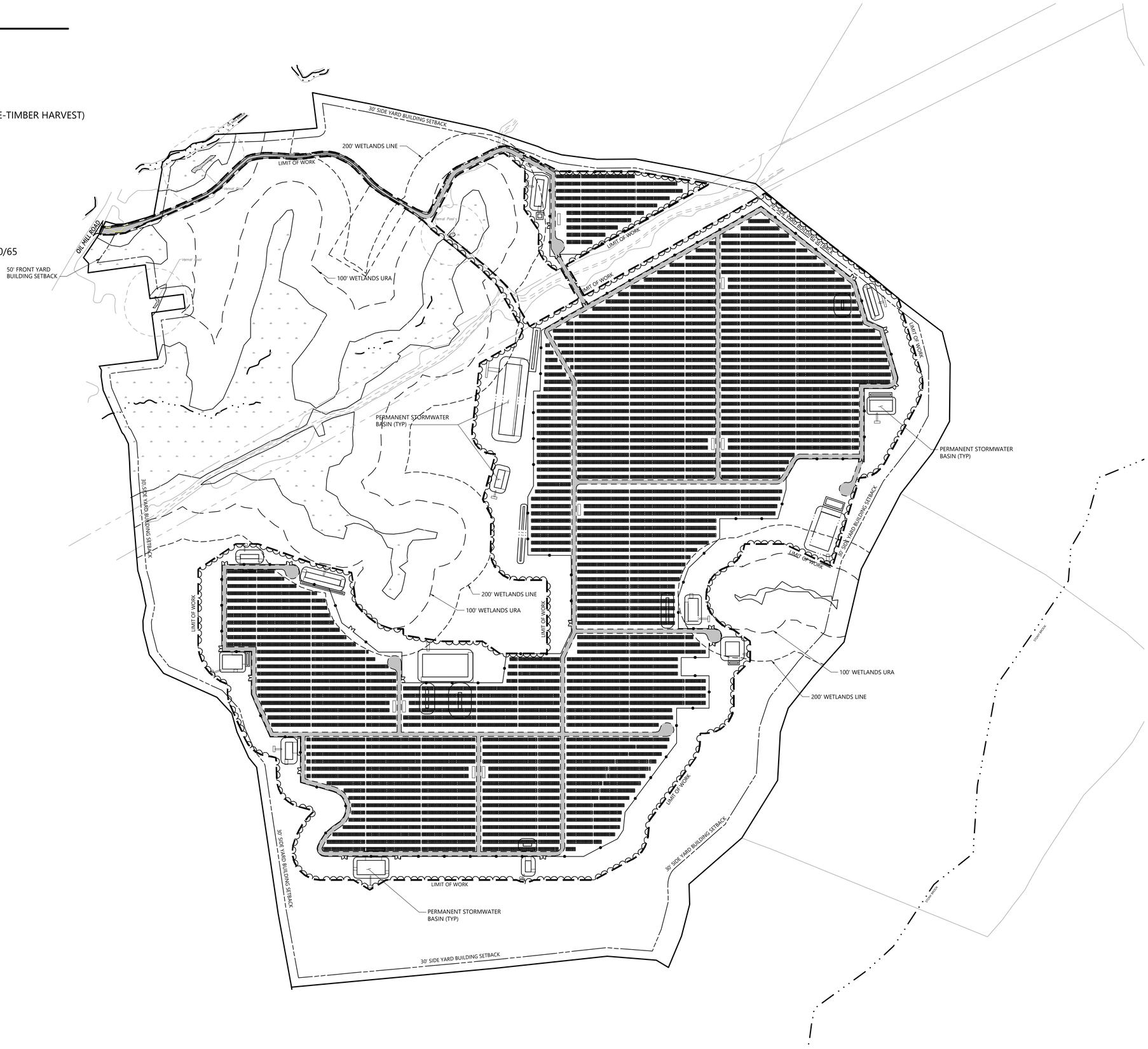
PANEL TYPE: JINKO SOLAR EAGLE HC 72M G2 400W

ROW SPACING: 14.5' CLEAR

TILT ANGLE: 25°

INVERTER TYPE: SOLECTRIA RENEWABLES XGI 1000-60/65

SYSTEM POWER: 18.23 MW-DC / ±15.33 MW-AC



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C-3.1	C-3.2	C-3.3
C-3.4	C-3.5	C-3.6
C-3.7	C-3.8	C-3.9
C-3.10	C-3.11	C-3.12

Key

Not To Scale

0 80 160 320Feet

Photovoltaic Installation

117 Oil Mill Road
Waterford, Connecticut

No.	Revision	Date	Appvd.
1	CTDEEP Comments	3/12/2020	SJK
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Issued for | Date

Final Approvals | December 2, 2019

Issued for Construction

Drawing Title

Layout and Materials Plan - Overall

Drawing Number

C-3.0

Sheet 3 of 43

Project Number 42496.00

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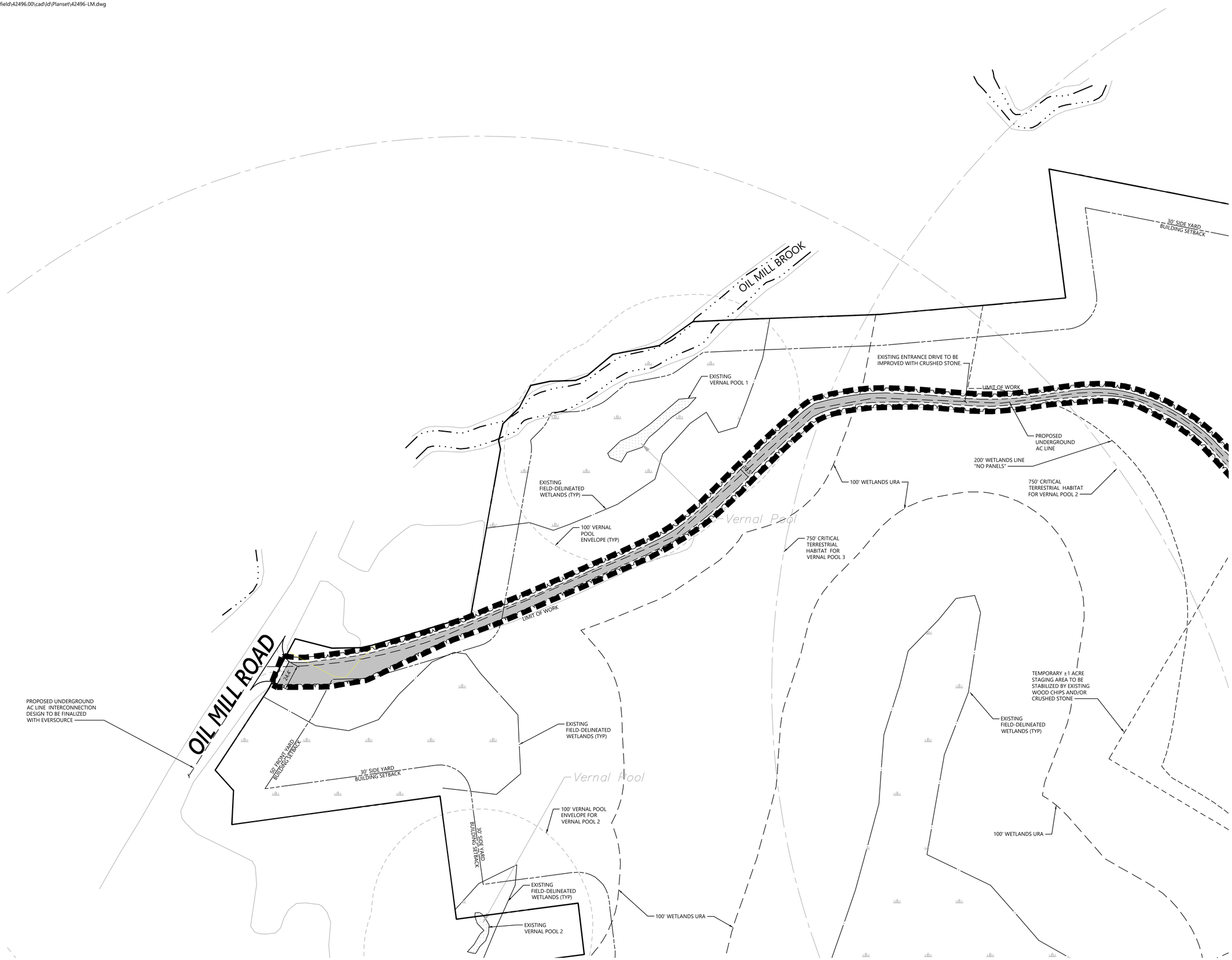

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C-3.1	C-3.2	C-3.3
C-3.4	C-3.5	C-3.6
C-3.7	C-3.8	C-3.9
C-3.10	C-3.11	C-3.12

Key

Not To Scale

0 20 40 80 Feet

Photovoltaic Installation

117 Oil Mill Road
Waterford, Connecticut

No.	Revision	Date	Appvd.
1	CTDEEP Comments	3/12/2020	SJK
2	CSC & CTDEEP Comments	7/28/2020	SJK
3	CSC D&M Plan	1/12/2021	SJK

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C-3.1

Sheet 4 of 43

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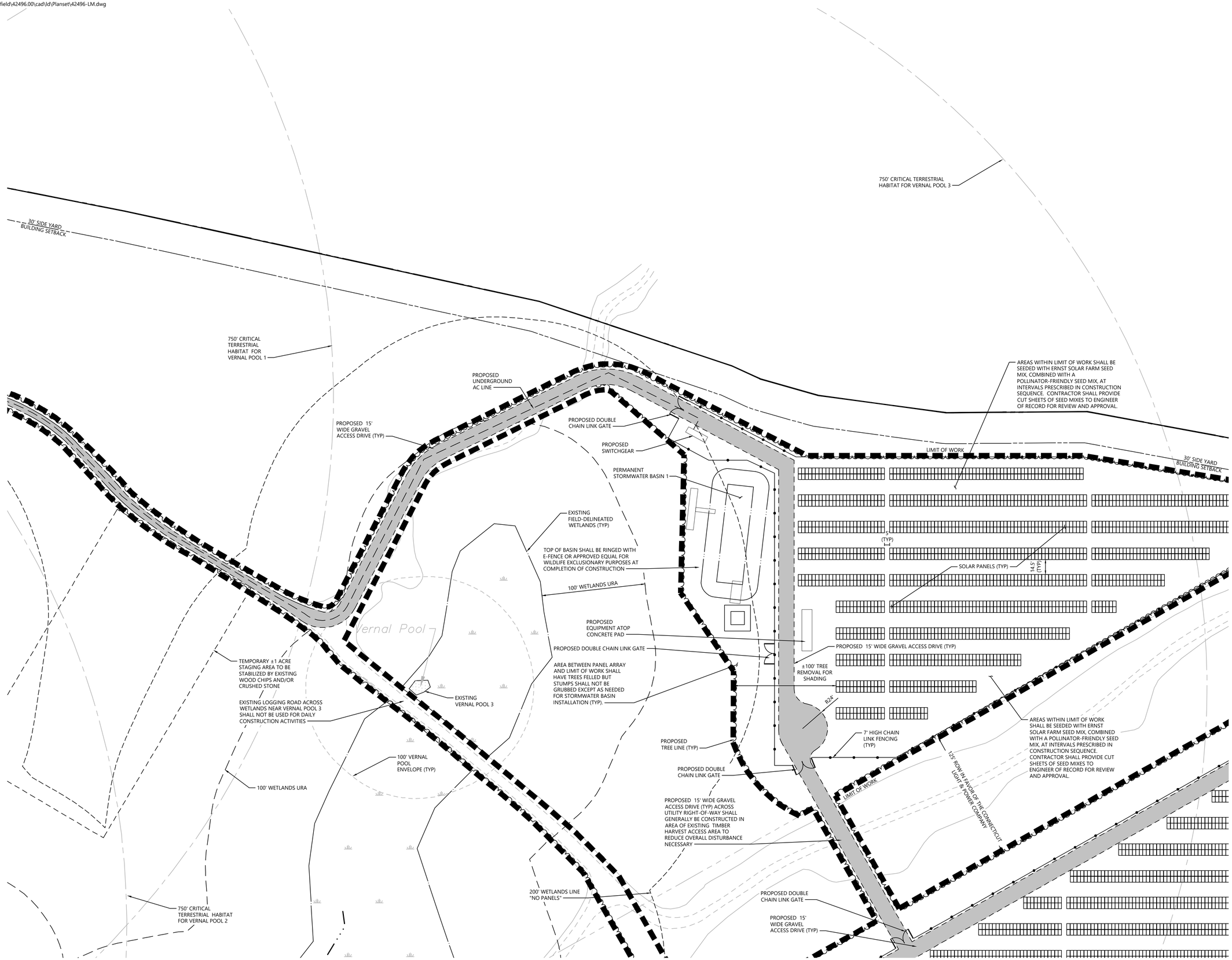

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C-3.1	C-3.2	C-3.3
C-3.4	C-3.5	C-3.6
C-3.7	C-3.8	C-3.9
C-3.10	C-3.11	C-3.12

Key

Not To Scale

0 20 40 80 Feet

Photovoltaic Installation

117 Oil Mill Road
Waterford, Connecticut

No.	Revision	Date	Appvd.
1	CTDEEP Comments	3/12/2020	SJK
2	CSC & CTDEEP Comments	7/28/2020	SJK
3	CSC D&M Plan	1/12/2021	SJK

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C-3.2

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Project Number
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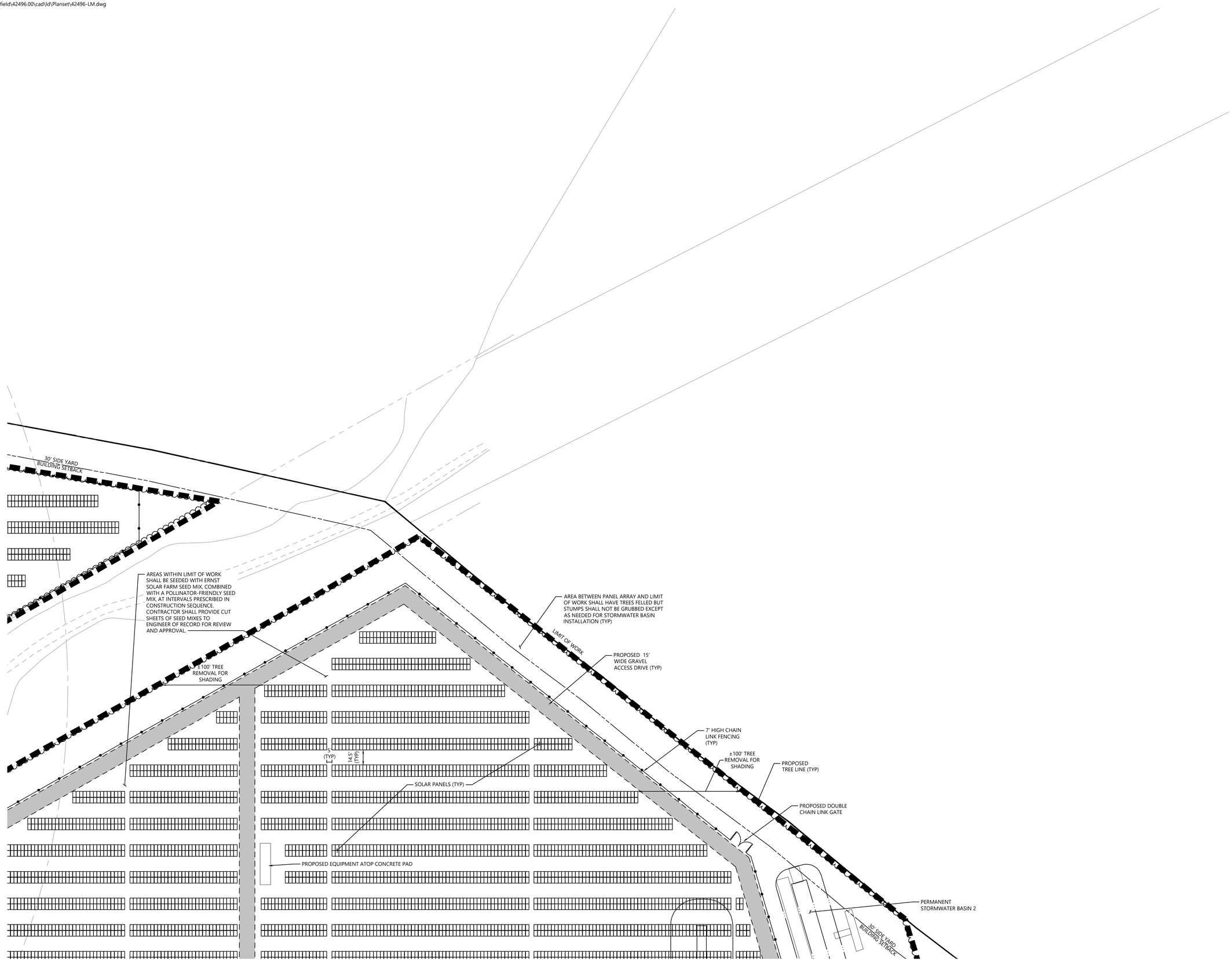

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C-3.1	C-3.2	C-3.3
C-3.4	C-3.5	C-3.6
C-3.7	C-3.8	C-3.9
C-3.10	C-3.11	C-3.12

Key

Not To Scale

0 20 40 80 Feet

Photovoltaic Installation

117 Oil Mill Road
Waterford, Connecticut

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C-3.3

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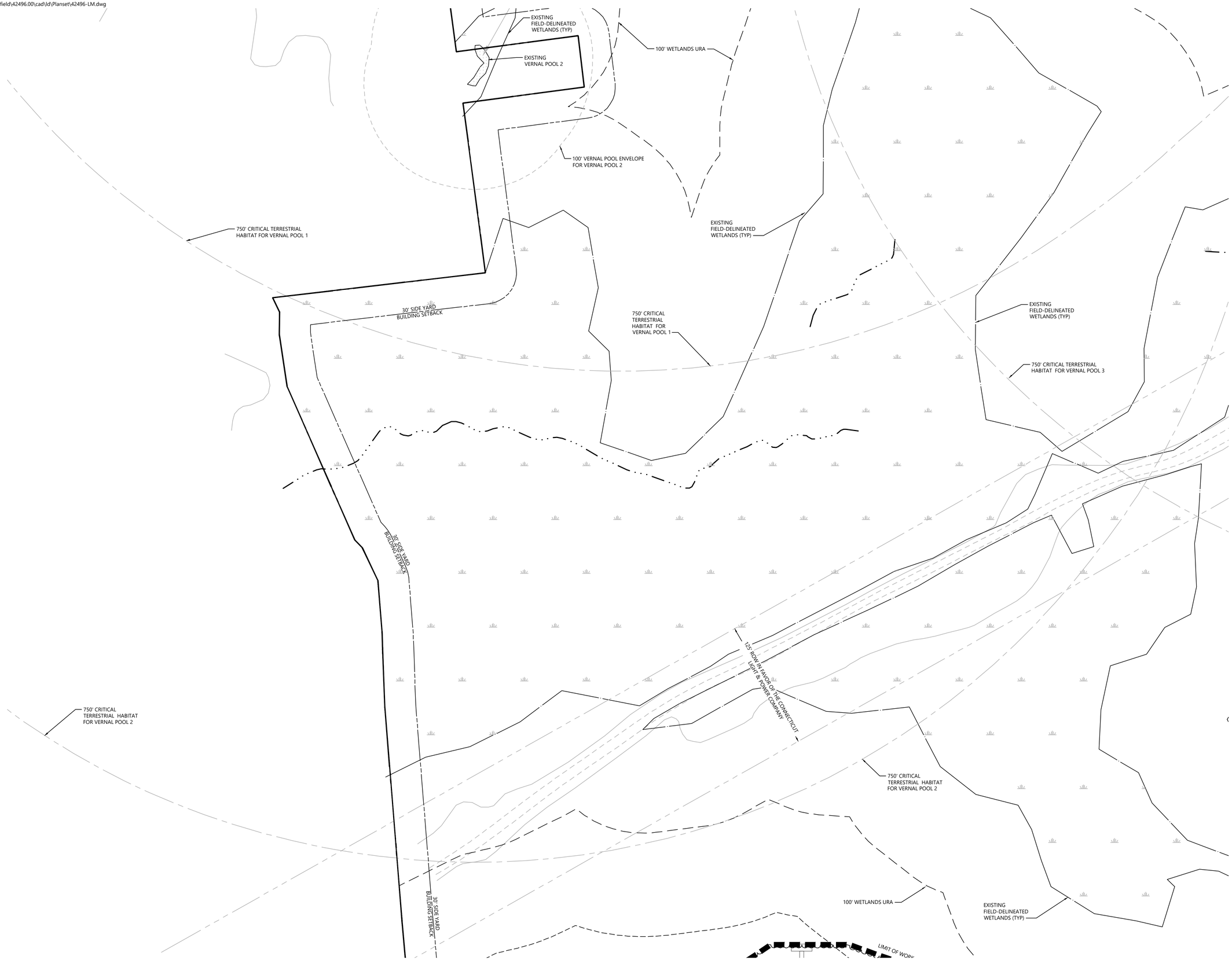

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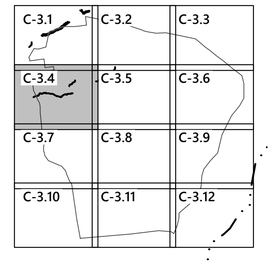

Key

Not To Scale

0 20 40 80 Feet

Photovoltaic Installation

117 Oil Mill Road
Waterford, Connecticut

No.	Revision	Date	Appvd.
1	CTDEEP Comments	3/12/2020	SJK
2	CSC & CTDEEP Comments	7/28/2020	SJK
3	CSC D&M Plan	1/12/2021	SJK

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750' CRITICAL TERRESTRIAL HABITAT FOR VERNAL POOL 2

EXISTING FIELD-DELINEATED WETLANDS (TYP)

100' WETLANDS URA

125' ROW IN FAVOR OF THE CONNECTICUT LIGHT & POWER COMPANY

200' WETLANDS LINE "NO PANELS"

LIMIT OF WORK

PROPOSED DOUBLE CHAIN LINK GATE

PROPOSED 15' WIDE GRAVEL ACCESS DRIVE (TYP)

±100' TREE REMOVAL FOR SHADING

PERMANENT STORMWATER BASIN 16

TOP OF BASIN SHALL BE RINGED WITH E-FENCE OR APPROVED EQUAL FOR WILDLIFE EXCLUSIONARY PURPOSES AT COMPLETION OF CONSTRUCTION

750' CRITICAL TERRESTRIAL HABITAT FOR VERNAL POOL 3

AREA BETWEEN PANEL ARRAY AND LIMIT OF WORK SHALL HAVE TREES FELLED BUT STUMPS SHALL NOT BE GRUBBED EXCEPT AS NEEDED FOR STORMWATER BASIN INSTALLATION (TYP).

AREAS WITHIN LIMIT OF WORK SHALL BE SEEDED WITH ERNST SOLAR FARM SEED MIX, COMBINED WITH A POLLINATOR-FRIENDLY SEED MIX, AT INTERVALS PRESCRIBED IN CONSTRUCTION SEQUENCE. CONTRACTOR SHALL PROVIDE CUT SHEETS OF SEED MIXES TO ENGINEER OF RECORD FOR REVIEW AND APPROVAL.

PERMANENT STORMWATER BASIN 14

SOLAR PANELS (TYP)

14.5'

PROPOSED EQUIPMENT ATOP CONCRETE PAD

EXISTING FIELD-DELINEATED WETLANDS (TYP)

PROPOSED TREE LINE (TYP)

7' HIGH CHAIN LINK FENCING (TYP)

AREAS WITHIN LIMIT OF WORK SHALL BE SEEDED WITH ERNST SOLAR FARM SEED MIX, COMBINED WITH A POLLINATOR-FRIENDLY SEED MIX, AT INTERVALS PRESCRIBED IN CONSTRUCTION SEQUENCE. CONTRACTOR SHALL PROVIDE CUT SHEETS OF SEED MIXES TO ENGINEER OF RECORD FOR REVIEW AND APPROVAL.

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C-3.4	C-3.5	C-3.6
C-3.7	C-3.8	C-3.9
C-3.10	C-3.11	C-3.12

Key

Not To Scale

0 20 40 80 Feet

Photovoltaic Installation

117 Oil Mill Road
Waterford, Connecticut

No.	Revision	Date	Appvd.
1	CTDEEP Comments	3/12/2020	SJK
2	CSC & CTDEEP Comments	7/28/2020	SJK
3	CSC D&M Plan	1/12/2021	SJK

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C-3.5

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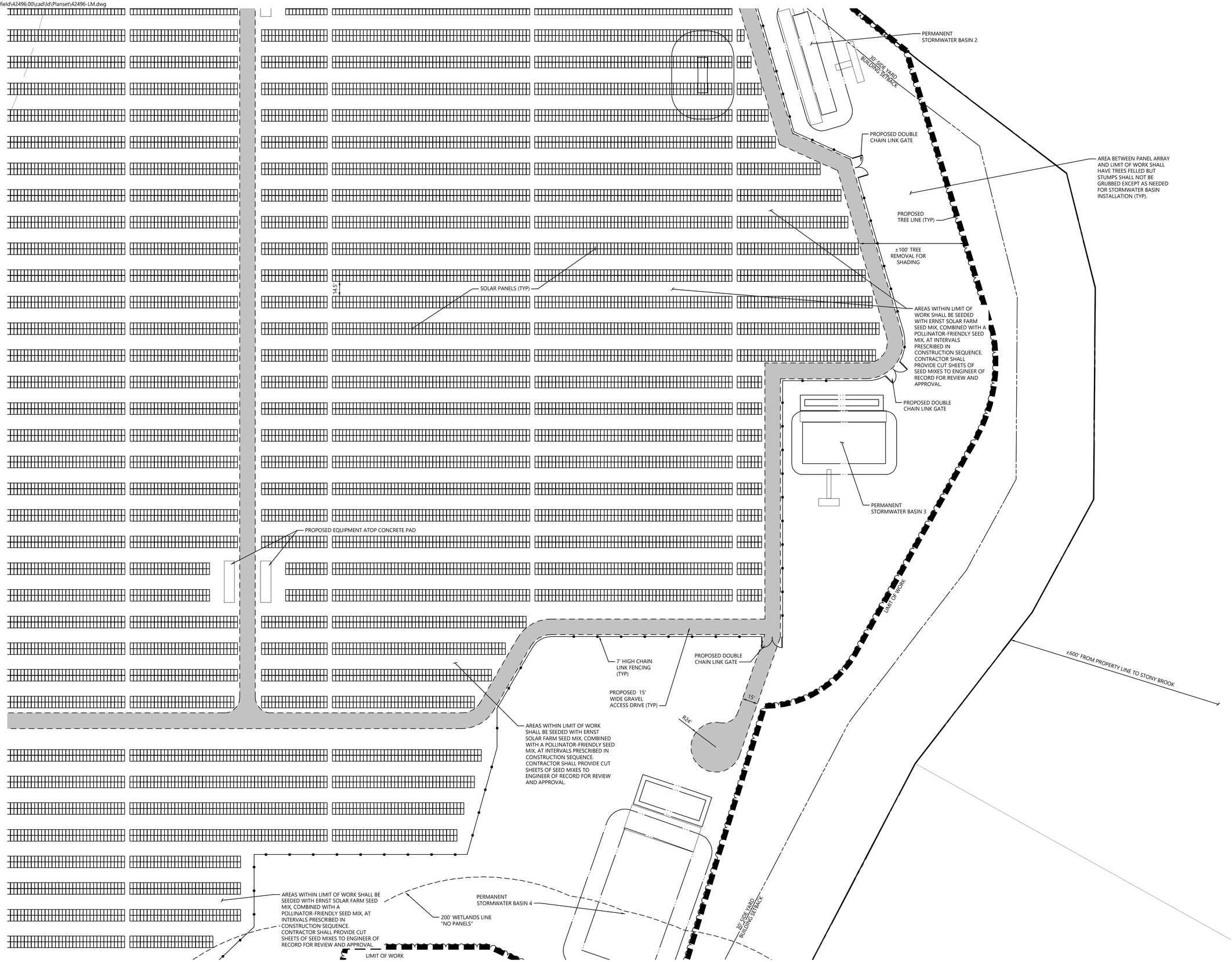

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C-3.1	C-3.2	C-3.3
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C-3.10	C-3.11	C-3.12

Key

Not To Scale

0 20 40 80 Feet

Photovoltaic Installation

117 Oil Mill Road
Waterford, Connecticut

No.	Revision	Date	Appvd.
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2	CSC & CTDEEP Comments	7/28/2020	SJK
3	CSC D&M Plan	1/12/2021	SJK

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Layout and Materials Plan

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C-3.6

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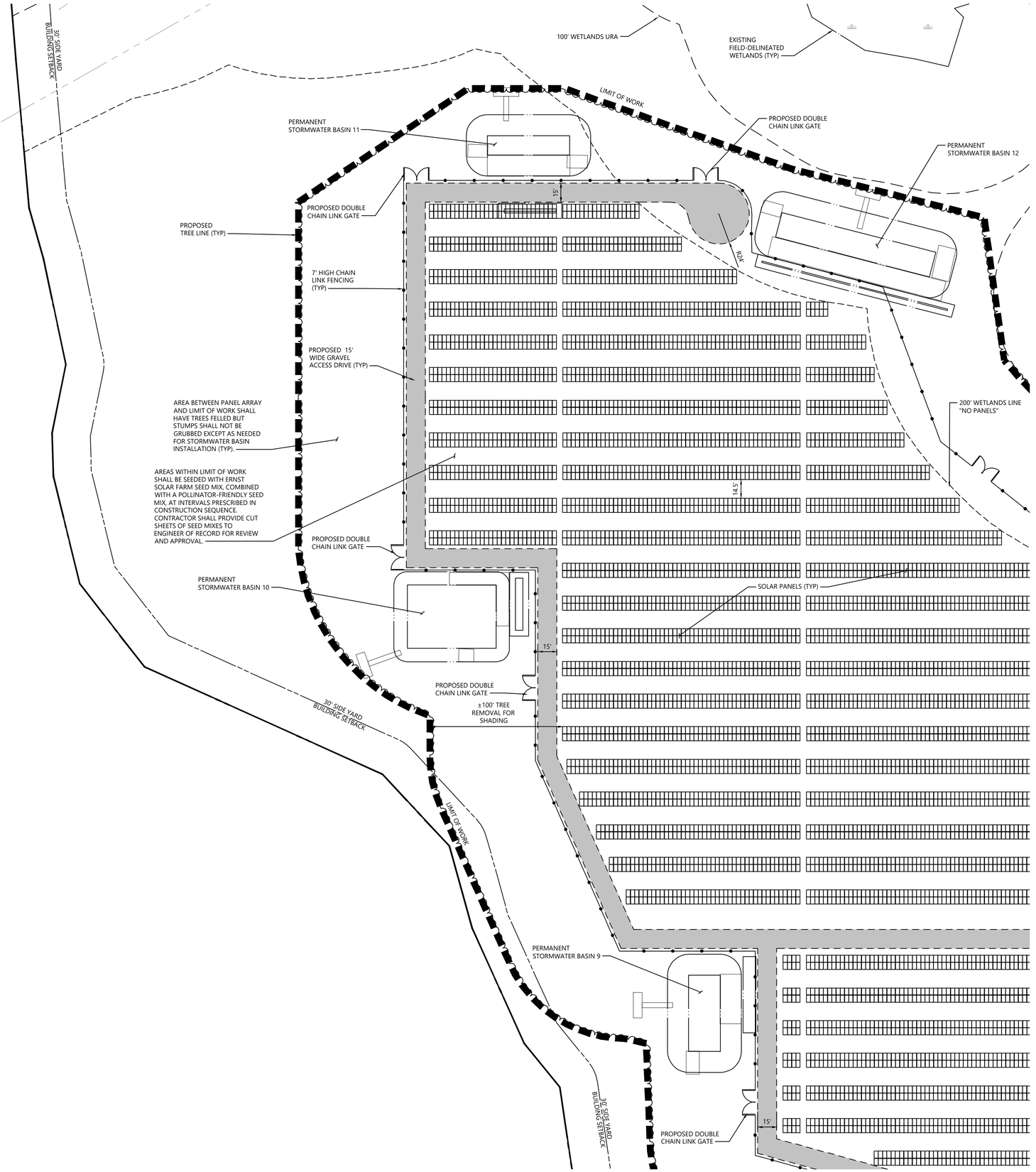

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C-3.4	C-3.5	C-3.6
C-3.7	C-3.8	C-3.9
C-3.10	C-3.11	C-3.12

Key

Not To Scale

0 20 40 80 Feet

Photovoltaic Installation

117 Oil Mill Road
Waterford, Connecticut

No.	Revision	Date	Appvd.
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2	CSC & CTDEEP Comments	7/28/2020	SJK
3	CSC D&M Plan	1/12/2021	SJK

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C-3.7

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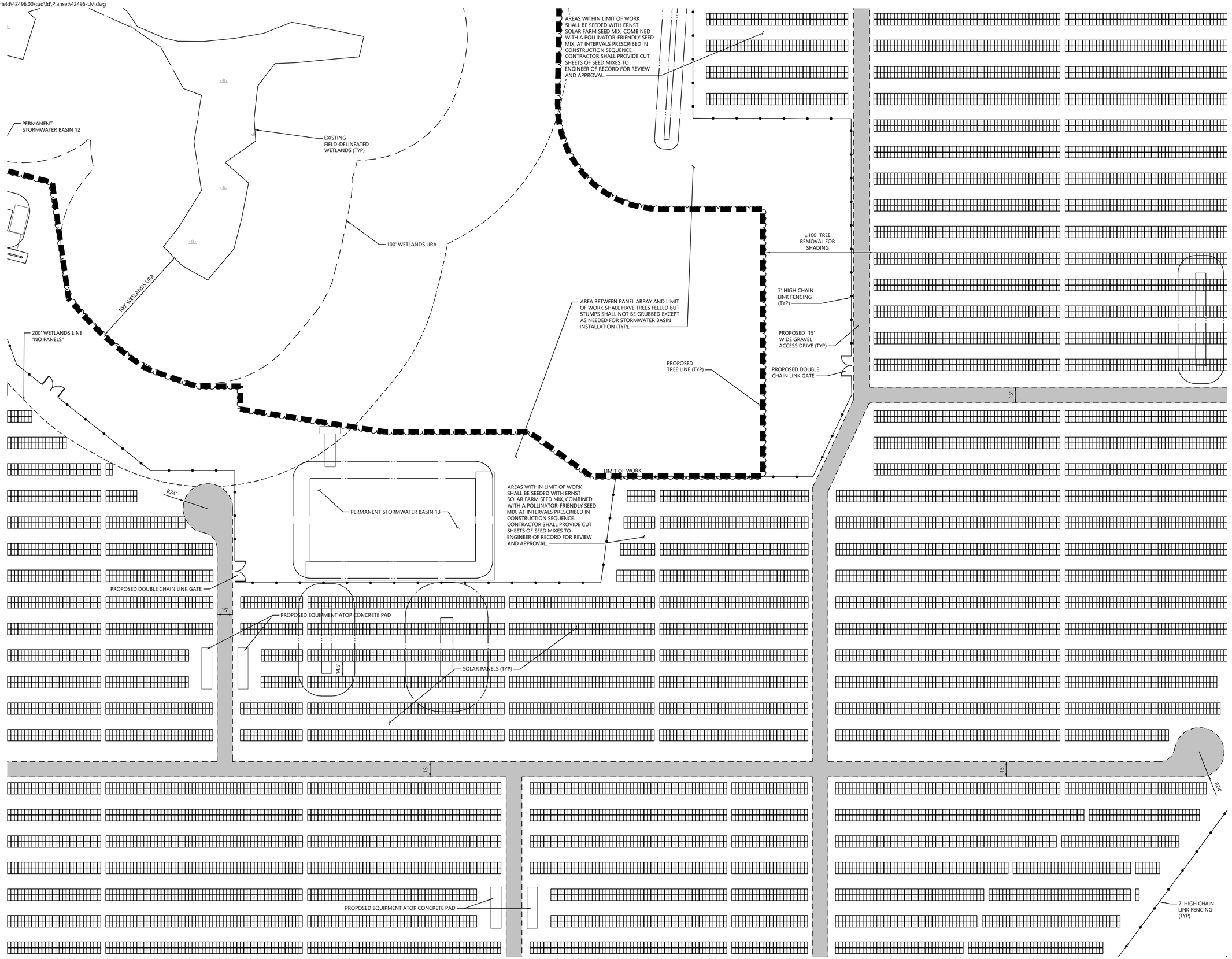

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C-3.1	C-3.2	C-3.3
C-3.4	C-3.5	C-3.6
C-3.7	C-3.8	C-3.9
C-3.10	C-3.11	C-3.12

Key

Not To Scale

0 20 40 80 Feet

Photovoltaic Installation

117 Oil Mill Road
Waterford, Connecticut

No.	Revision	Date	Appvd.
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2	CSC & CTDEEP Comments	7/28/2020	SJK
3	CSC D&M Plan	1/12/2021	SJK

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C-3.8

Sheet 11 of 43

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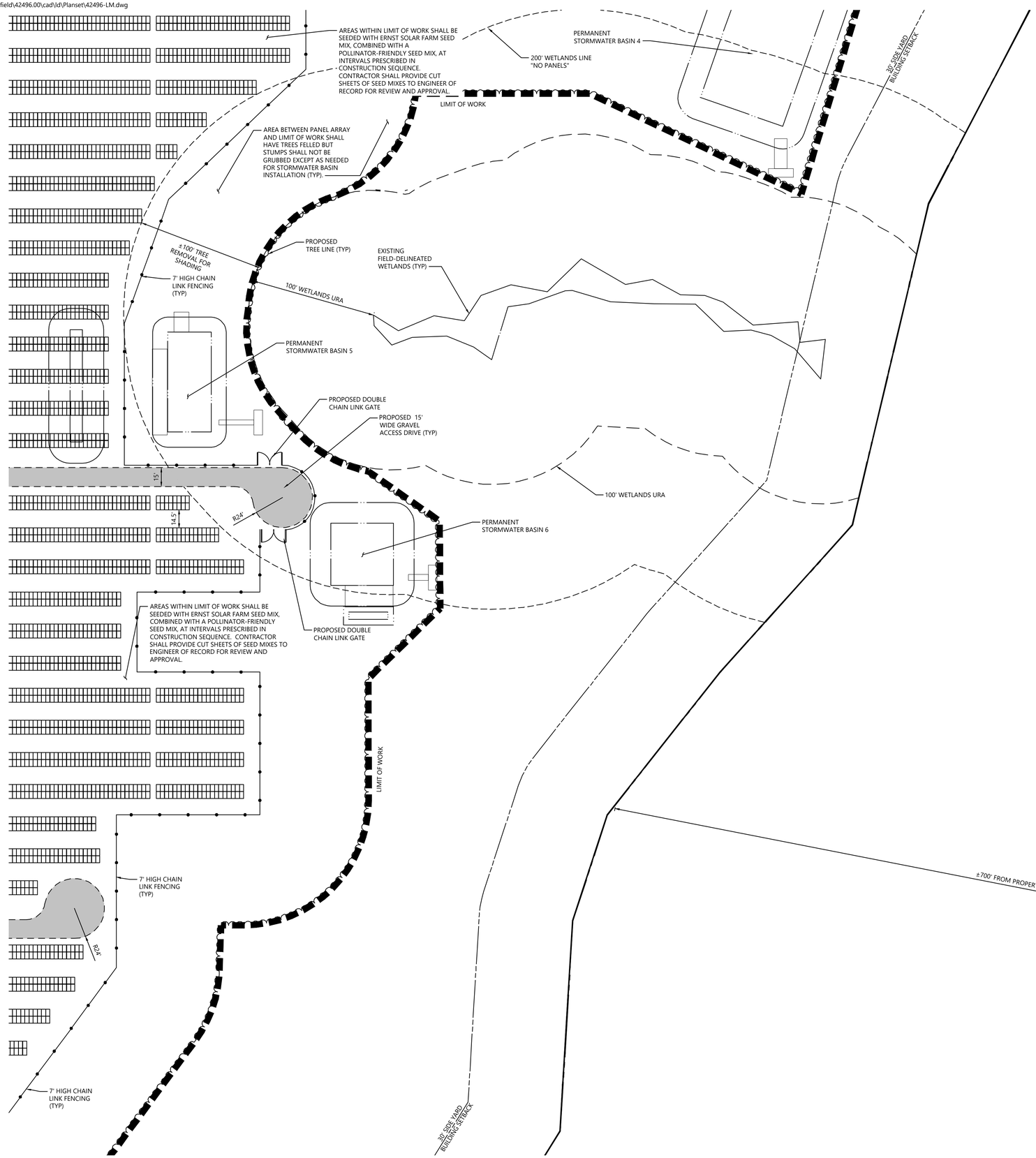

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C-3.4	C-3.5	C-3.6
C-3.7	C-3.8	C-3.9
C-3.10	C-3.11	C-3.12

Key

Not To Scale

0 20 40 80 Feet

Photovoltaic Installation

117 Oil Mill Road
Waterford, Connecticut

No.	Revision	Date	Appvd.
1	CTDEEP Comments	3/12/2020	SJK
2	CSC & CTDEEP Comments	7/28/2020	SJK
3	CSC D&M Plan	1/12/2021	SJK

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Layout and Materials Plan

Drawing Number

C-3.9

Sheet 12 of 43

Project Number

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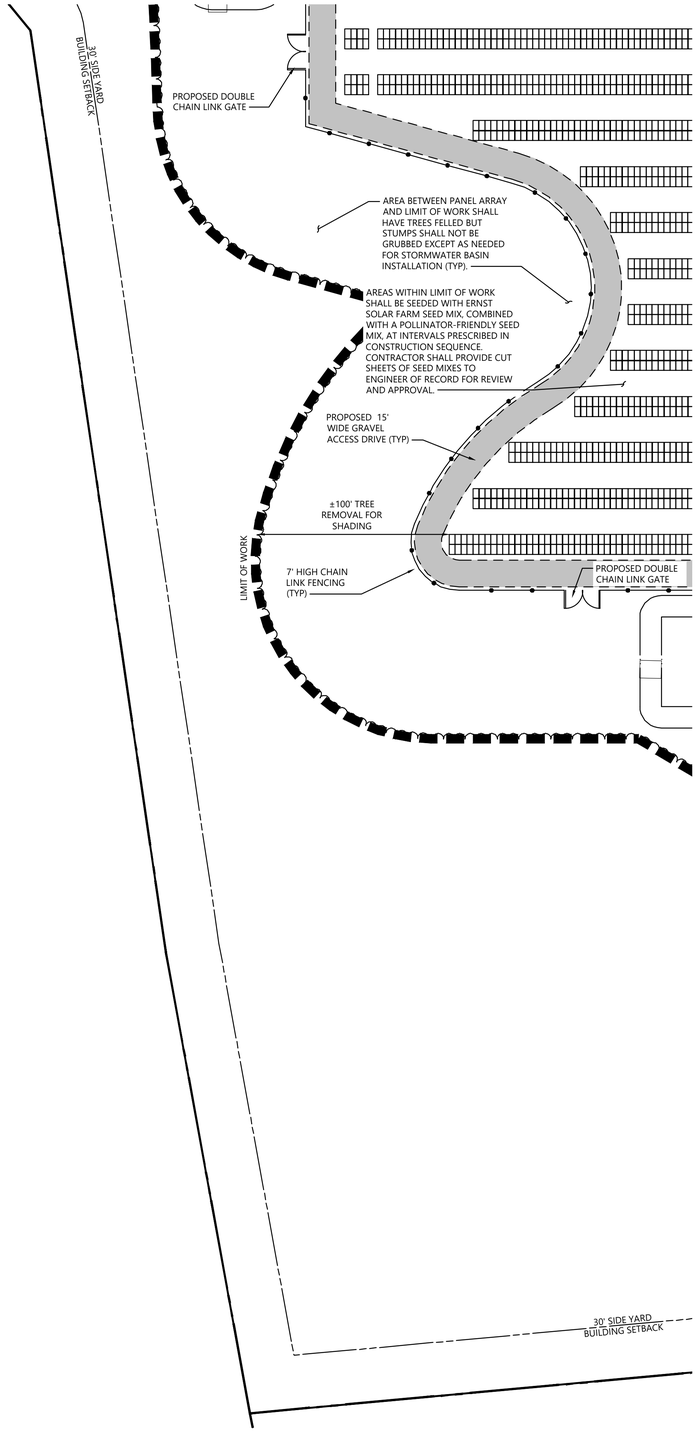

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C-3.4	C-3.5	C-3.6
C-3.7	C-3.8	C-3.9
C-3.10	C-3.11	C-3.12

Key

Not To Scale

0 20 40 80 Feet

Photovoltaic Installation

117 Oil Mill Road
Waterford, Connecticut

No.	Revision	Date	Appvd.
1	CTDEEP Comments	3/12/2020	SJK
2	CSC & CTDEEP Comments	7/28/2020	SJK
3	CSC D&M Plan	1/12/2021	SJK

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Layout and Materials Plan

Drawing Number

C-3.10

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Project Number

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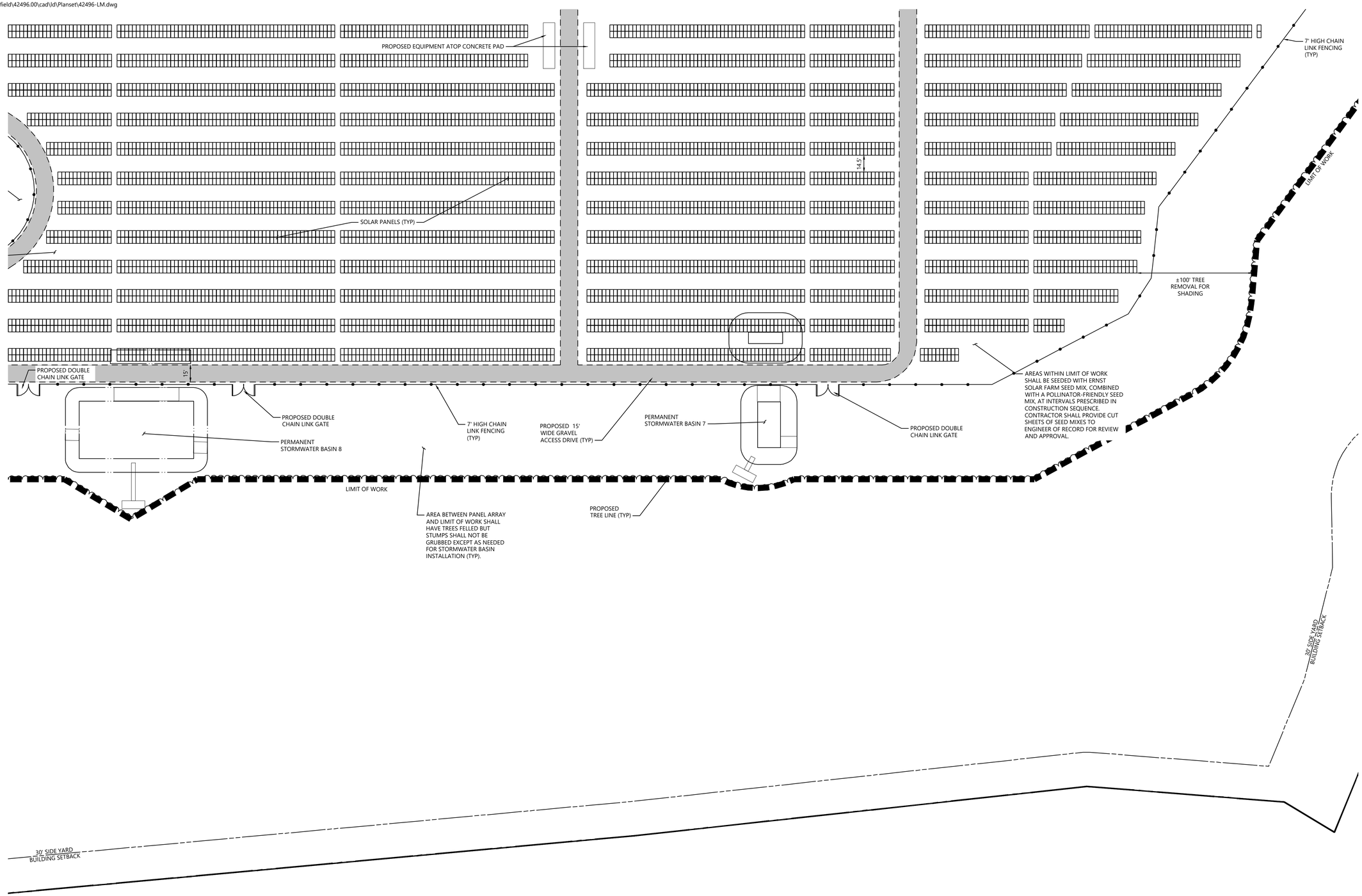

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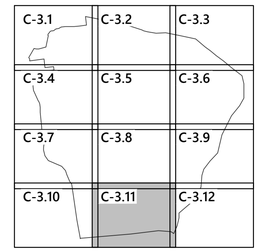

Key

Not To Scale

0 20 40 80 Feet

Photovoltaic Installation

117 Oil Mill Road
Waterford, Connecticut

No.	Revision	Date	Appvd.
1	CTDEEP Comments	3/12/2020	SJK
2	CSC & CTDEEP Comments	7/28/2020	SJK
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Drawing Title

Layout and Materials Plan

Drawing Number

C-3.11

Sheet 14 of 43

Project Number

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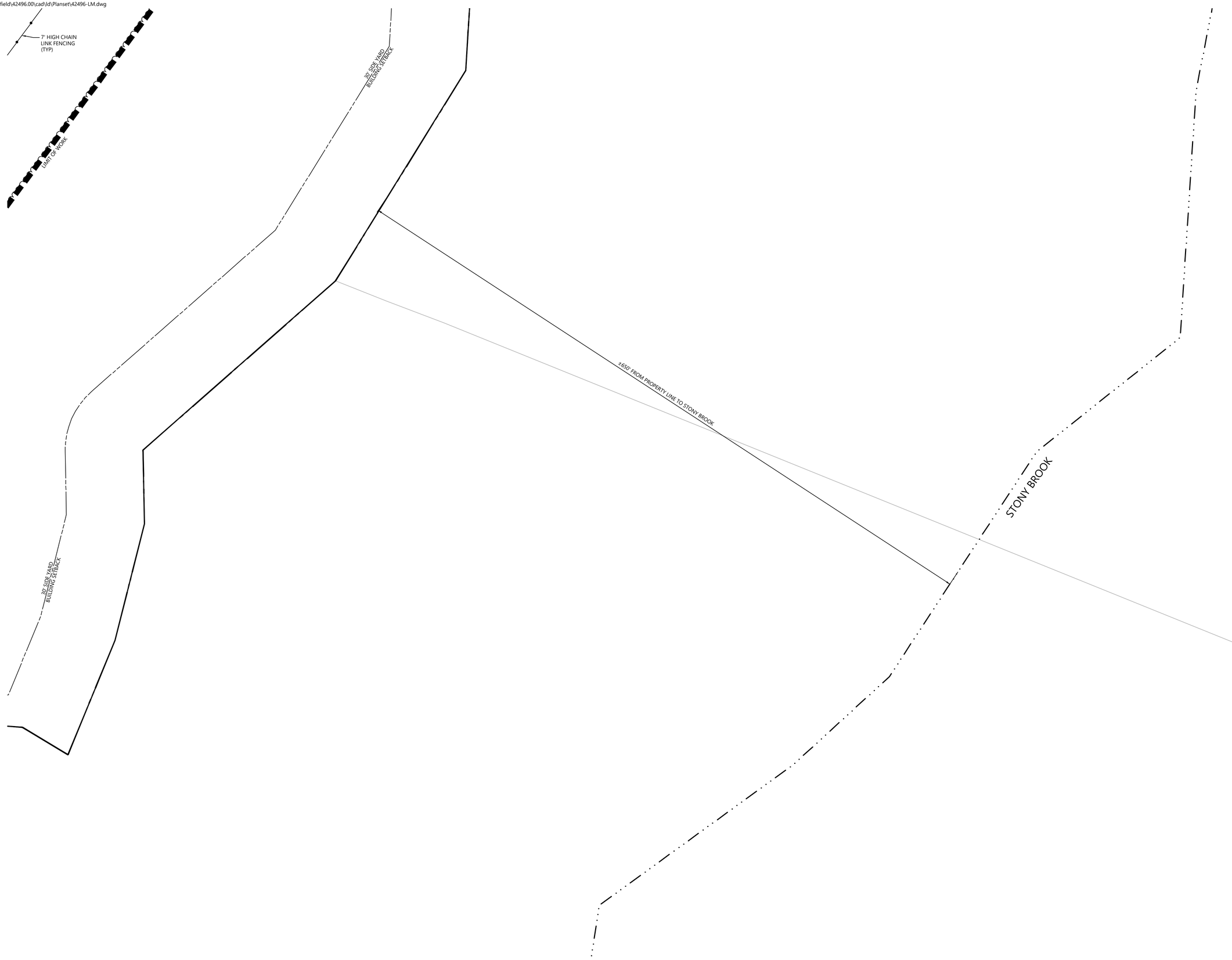

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C-3.4	C-3.5	C-3.6
C-3.7	C-3.8	C-3.9
C-3.10	C-3.11	C-3.12

Key

Not To Scale

0 20 40 80 Feet

Photovoltaic Installation

117 Oil Mill Road
Waterford, Connecticut

No.	Revision	Date	Appvd.
1	CTDEEP Comments	3/12/2020	SJK
2	CSC & CTDEEP Comments	7/28/2020	SJK
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Layout and Materials Plan

Drawing Number

C-3.12

Sheet 15 of 43

Project Number

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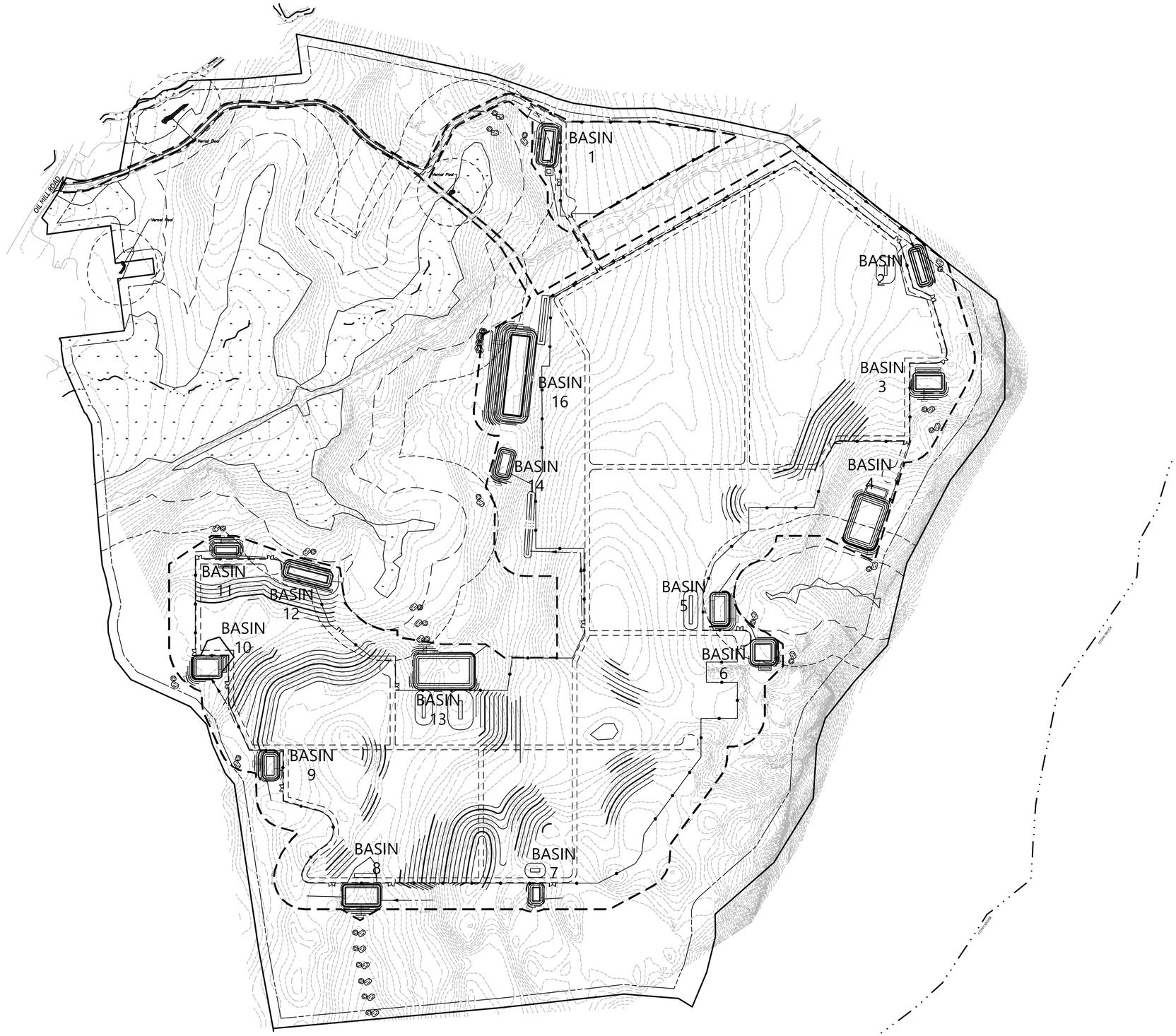

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C-4.1	C-4.2	C-4.3
C-4.4	C-4.5	C-4.6
C-4.7	C-4.8	C-4.9
C-4.10	C-4.11	C-4.12

Key
Not To Scale

0 80 160 320Feet

Photovoltaic Installation
117 Oil Mill Road
Waterford, Connecticut

No.	Revision	Date	Appvd.
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2	CSC & CTDEEP Comments	7/28/2020	SJK
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Drawing Title
Grading and Drainage Plan - Overall

Drawing Number
C-4.0

Sheet 16 of 43

Project Number
42496.00

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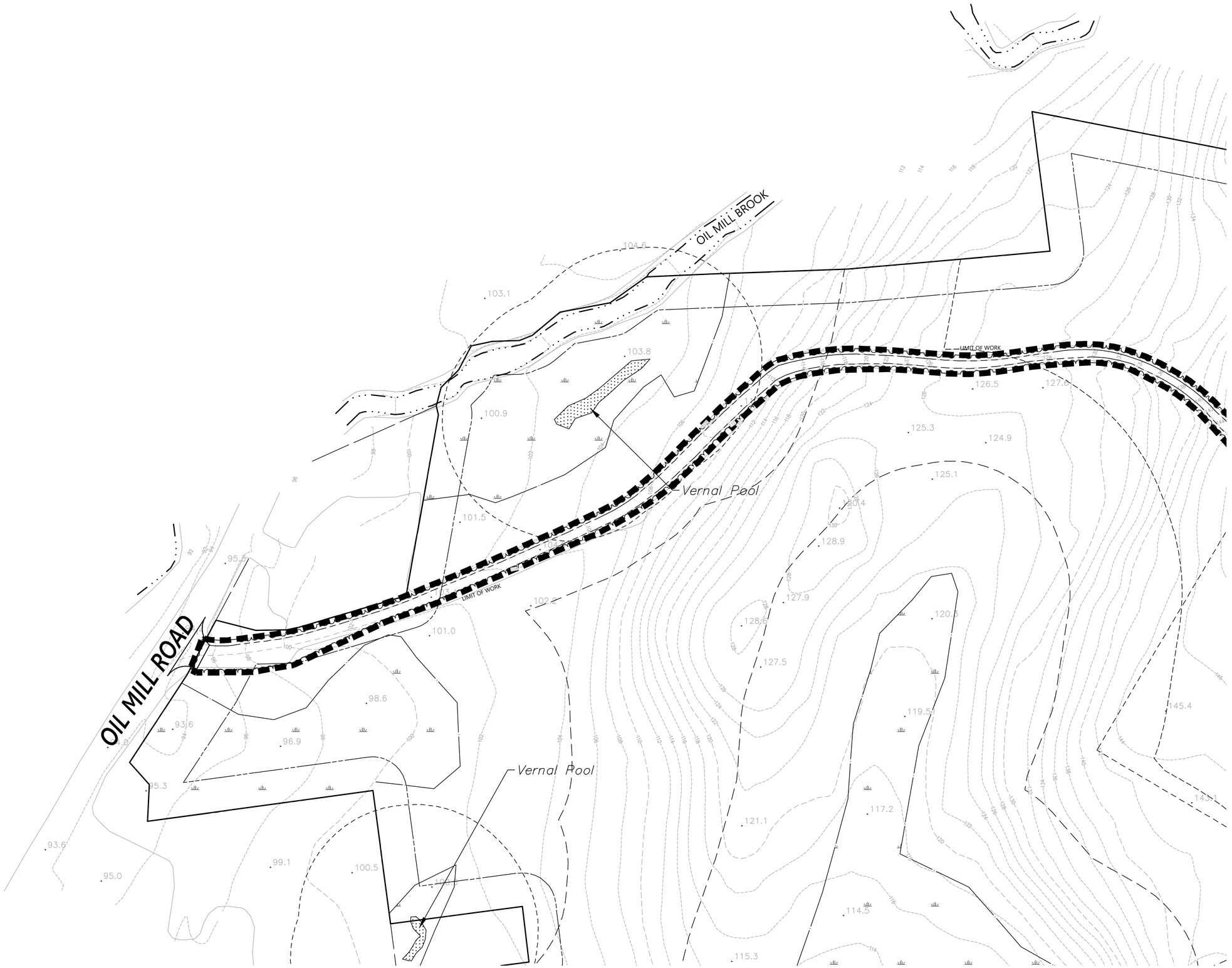

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C-4.4	C-4.5	C-4.6
C-4.7	C-4.8	C-4.9
C-4.10	C-4.11	C-4.12

Key

Not To Scale

0 20 40 80 Feet

Photovoltaic Installation

117 Oil Mill Road
Waterford, Connecticut

No.	Revision	Date	Appvd.
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2	CSC & CTDEEP Comments	7/28/2020	SJK
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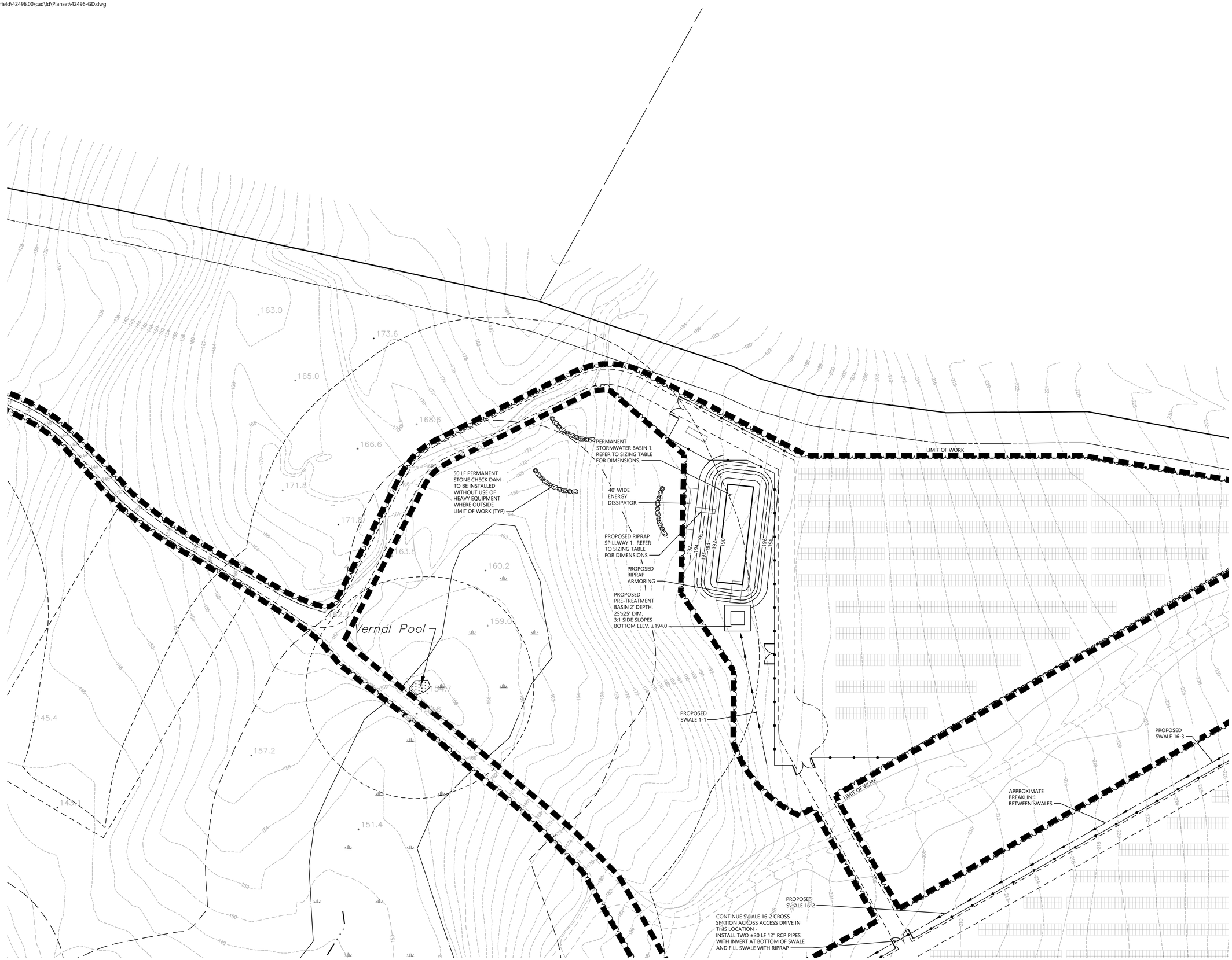

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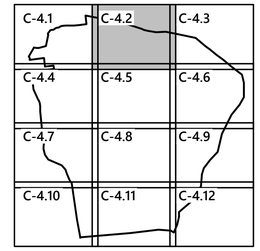

Key

Not To Scale

0 20 40 80 Feet

Photovoltaic Installation

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No.	Revision	Date	Appvd.
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3	CSC D&M Plan	1/12/2021	SJK

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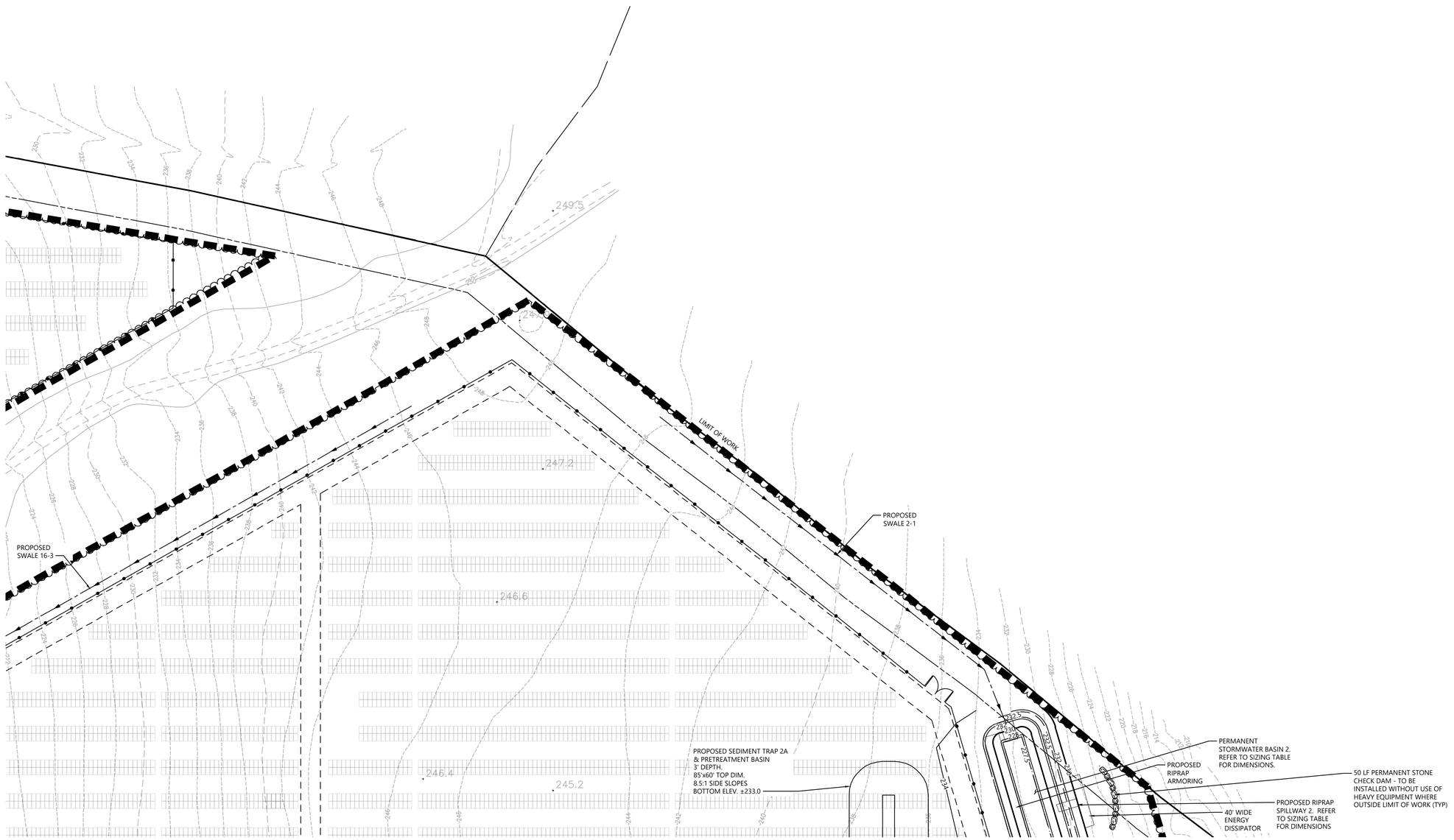

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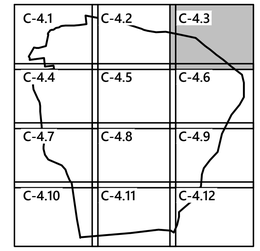

Key

Not To Scale

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Photovoltaic Installation

117 Oil Mill Road
Waterford, Connecticut

No.	Revision	Date	Appvd.
1	CTDEEP Comments	3/12/2020	SJK
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C-4.1	C-4.2	C-4.3
C-4.4	C-4.5	C-4.6
C-4.7	C-4.8	C-4.9
C-4.10	C-4.11	C-4.12

Key

Not To Scale

0 20 40 80 Feet

Photovoltaic Installation

117 Oil Mill Road
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1	CTDEEP Comments	3/12/2020	SJK
2	CSC & CTDEEP Comments	7/28/2020	SJK
3	CSC D&M Plan	1/12/2021	SJK

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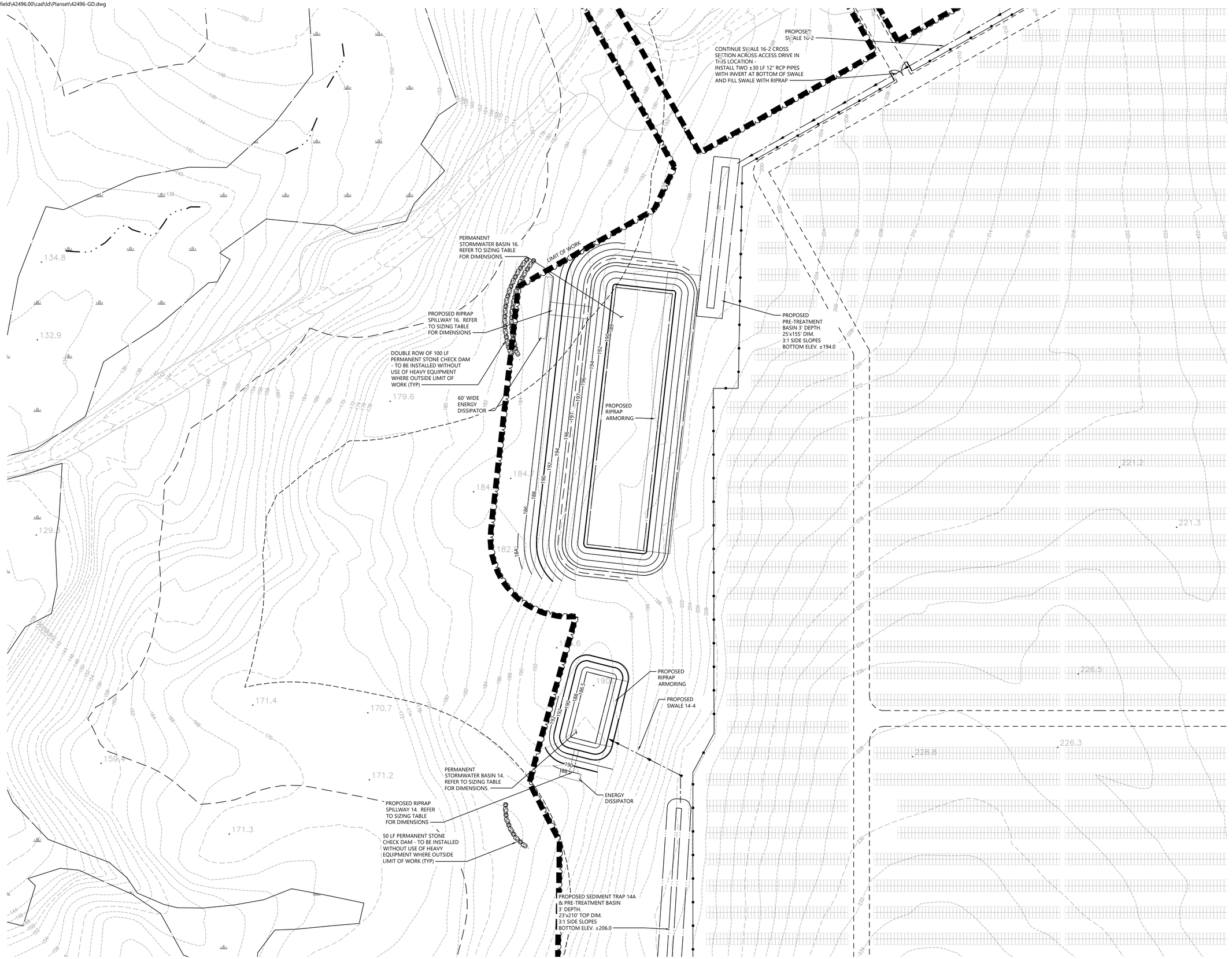

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Key

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Photovoltaic Installation

117 Oil Mill Road
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No.	Revision	Date	Appvd.
1	CTDEEP Comments	3/12/2020	SJK
2	CSC & CTDEEP Comments	7/28/2020	SJK
3	CSC D&M Plan	1/12/2021	SJK

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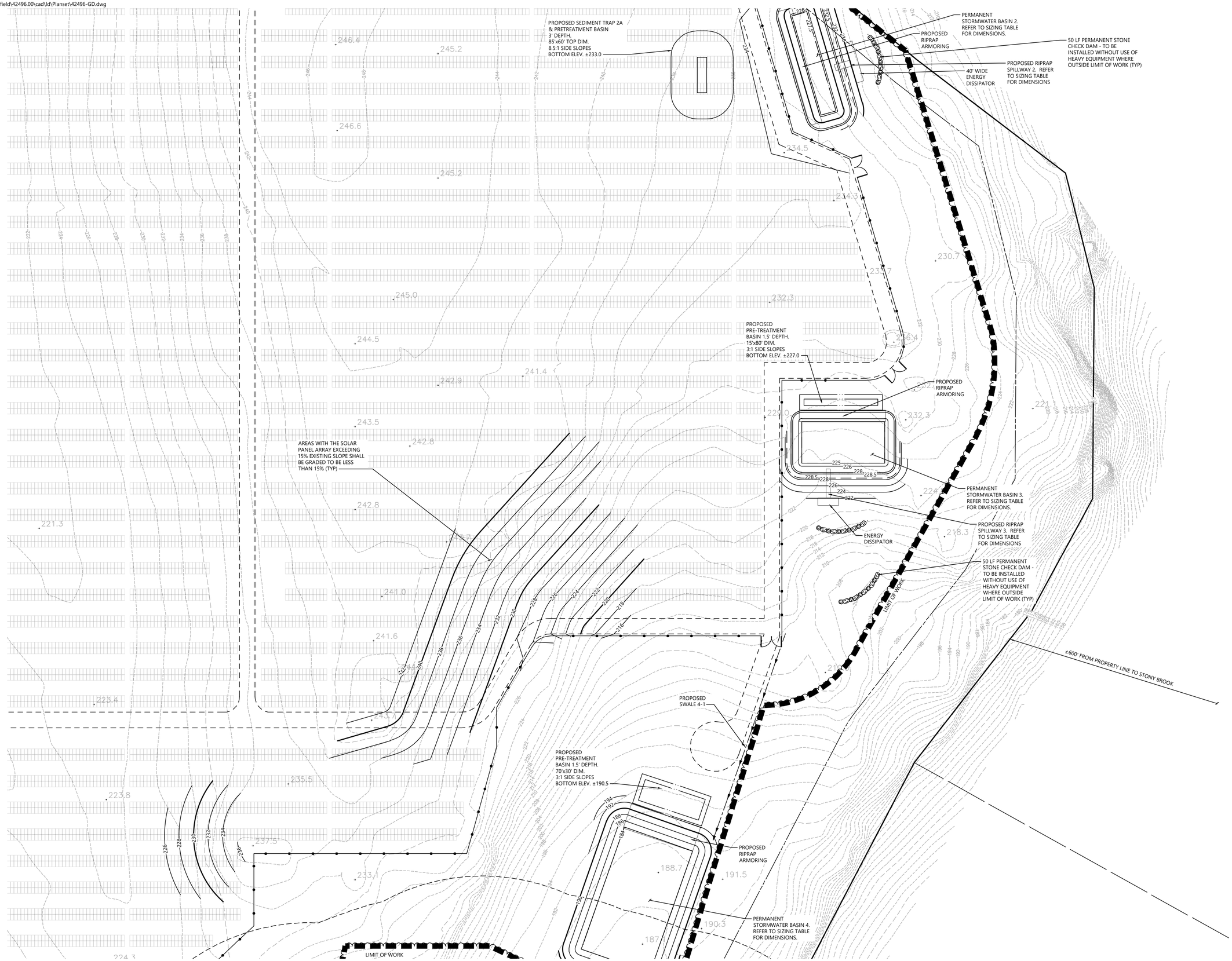

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Key

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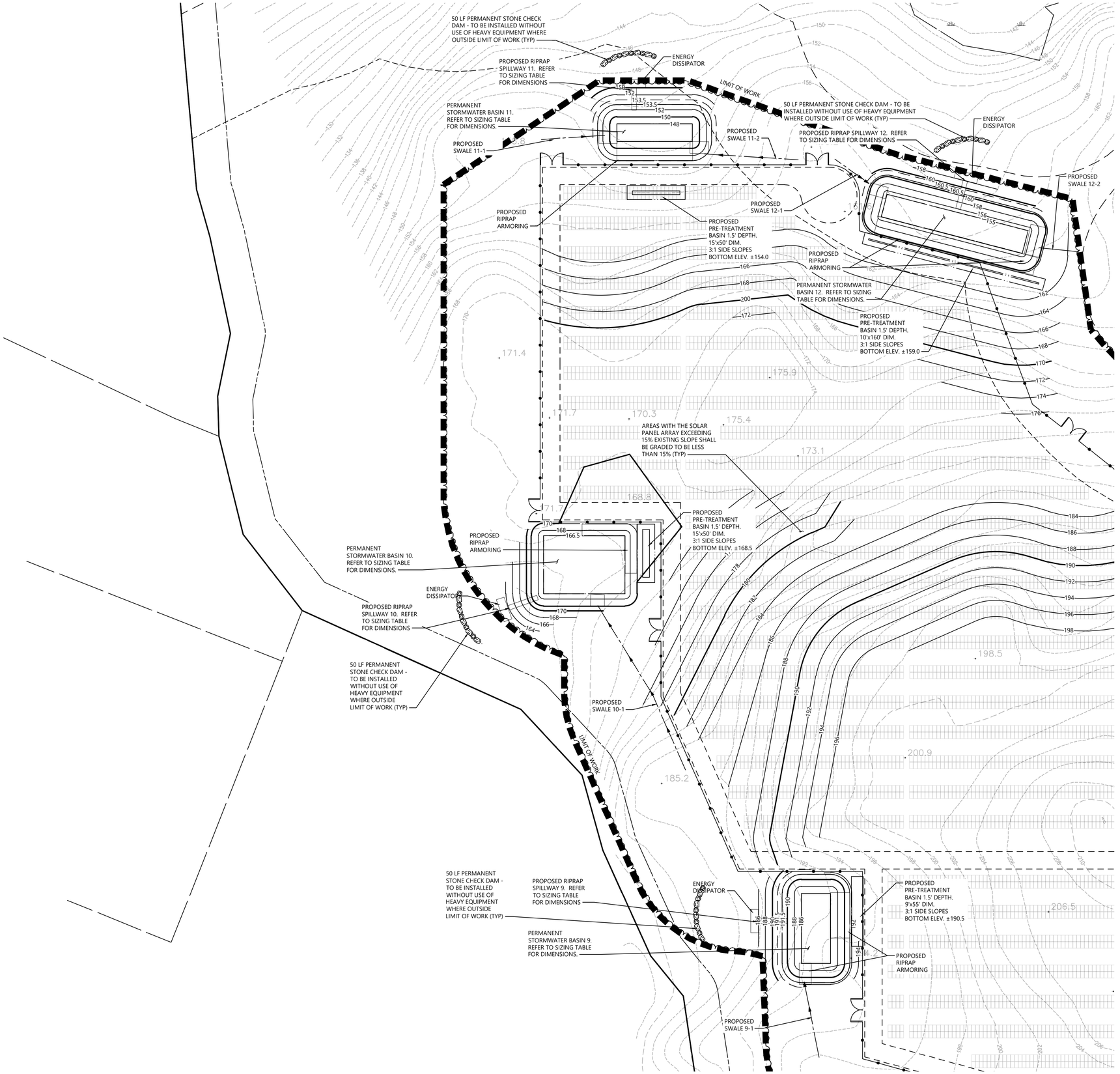

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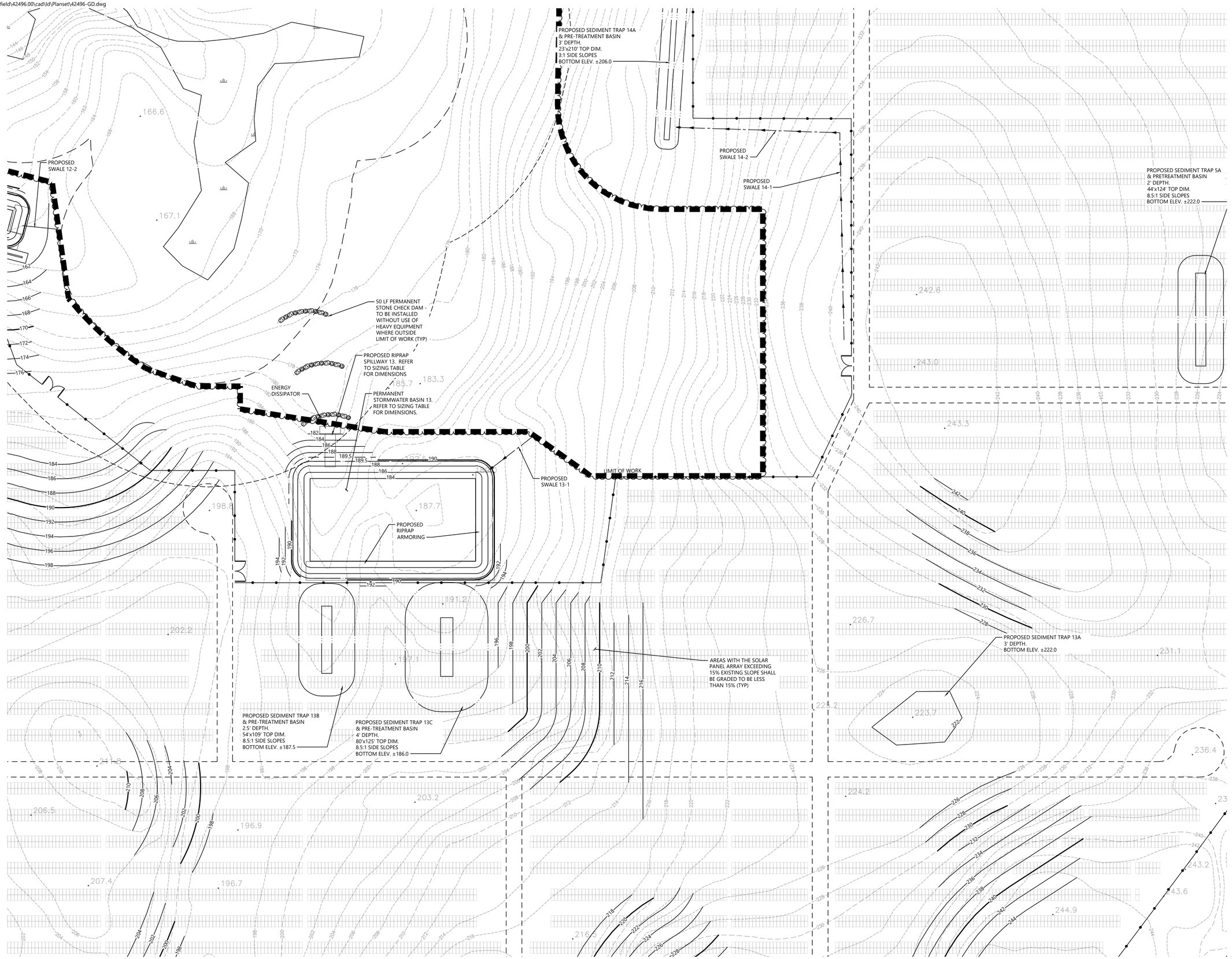

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Key

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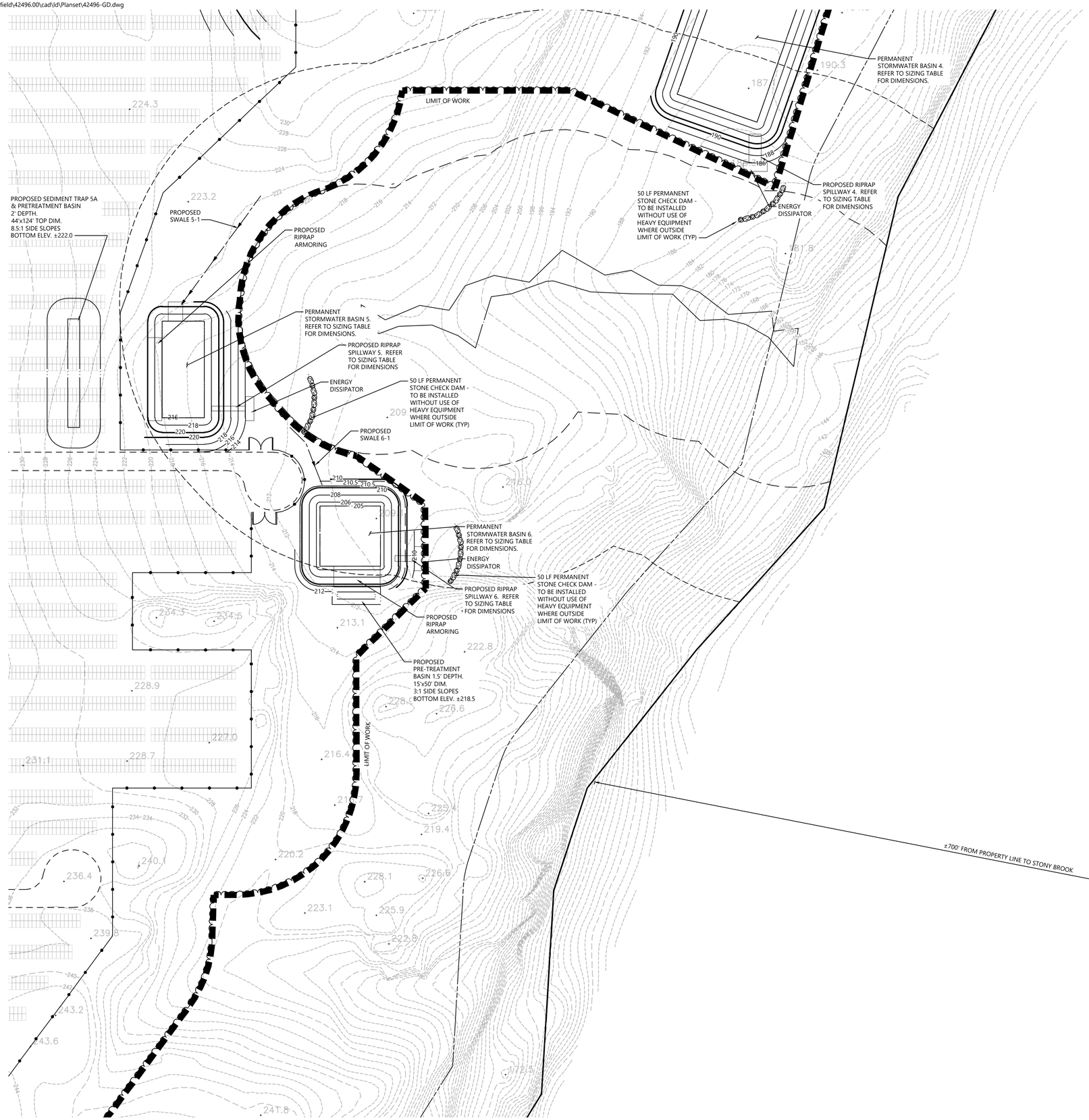

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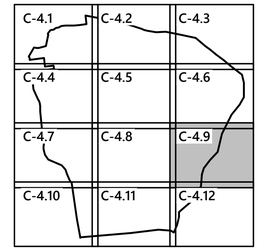

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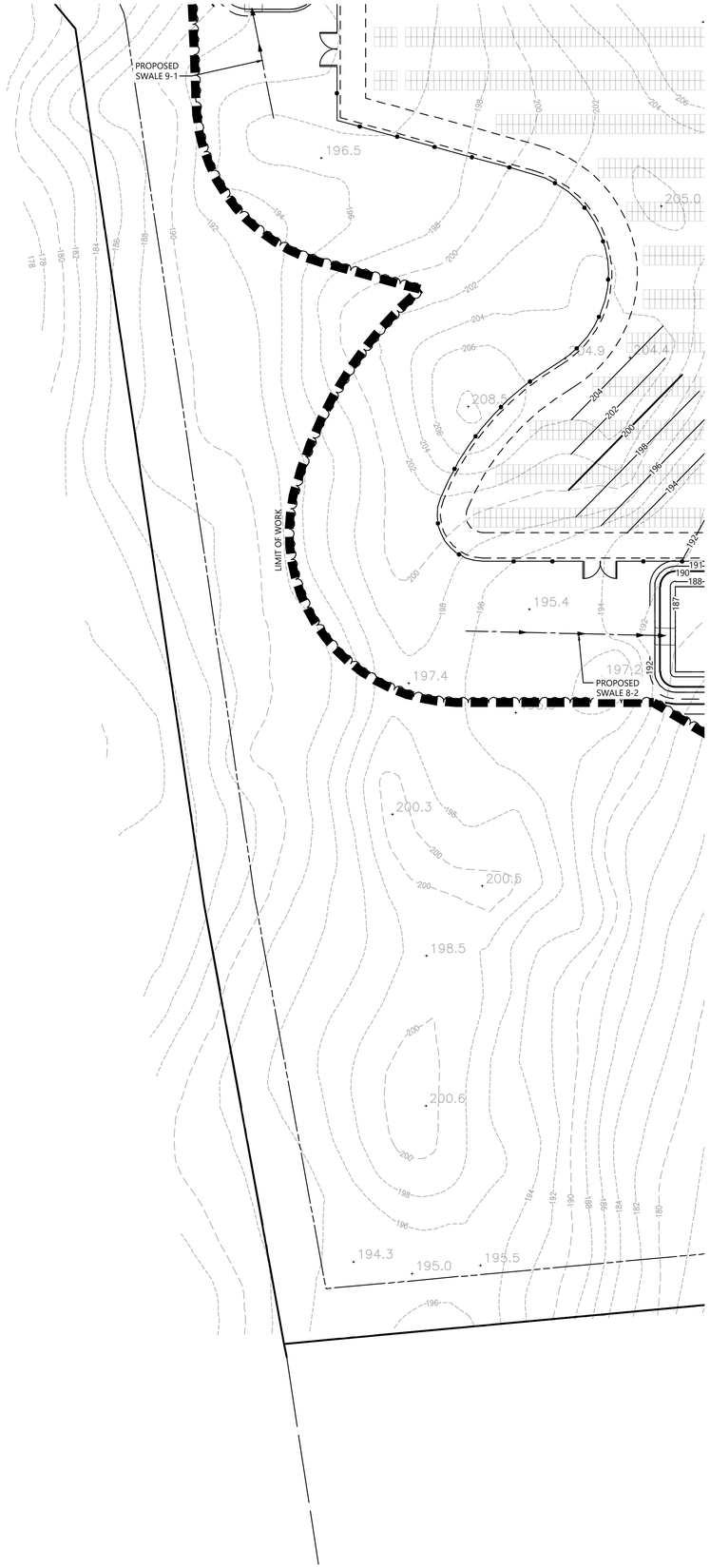

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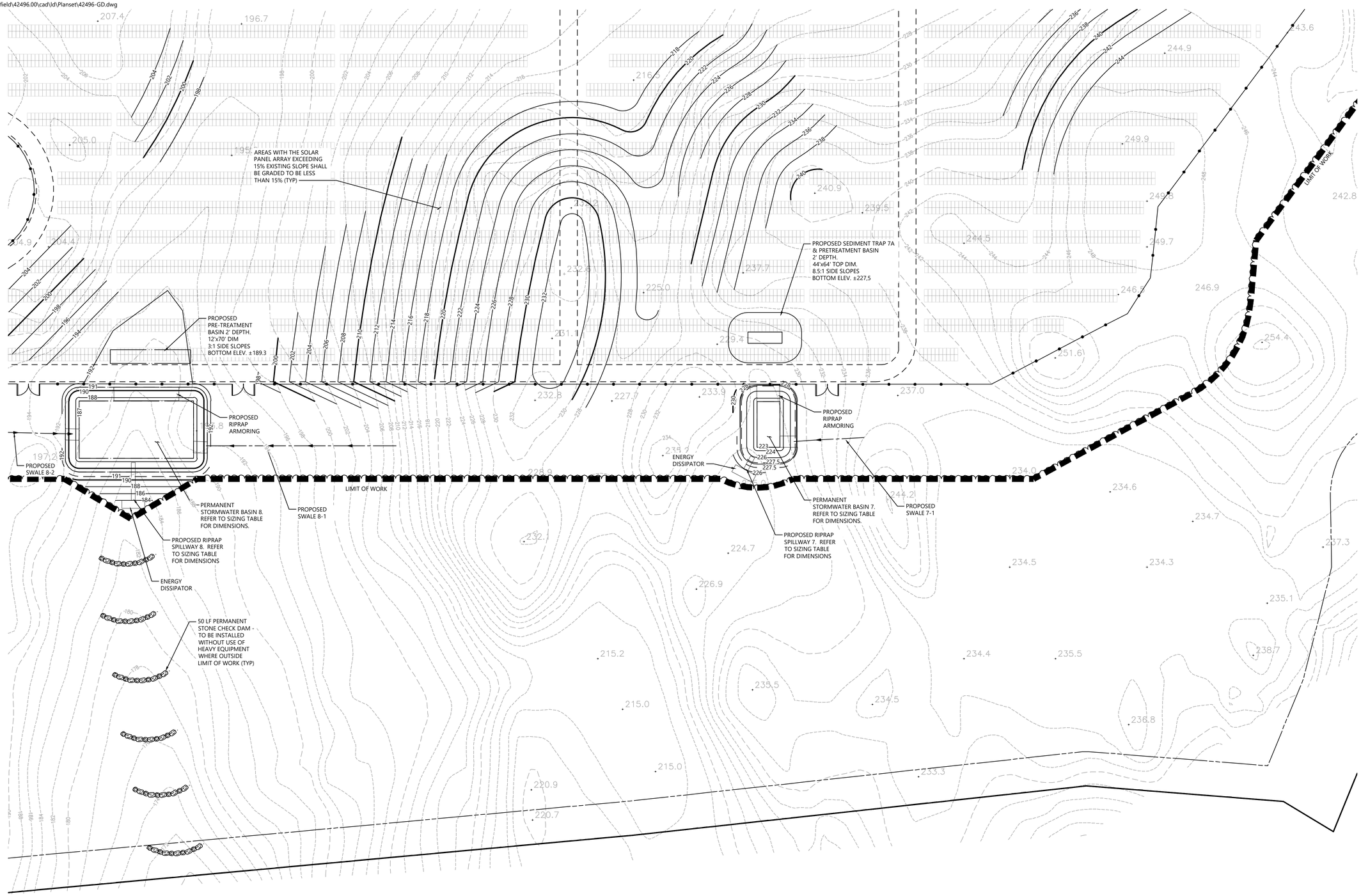

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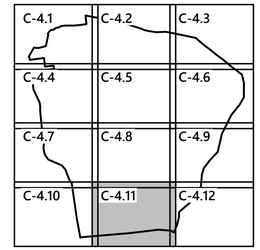

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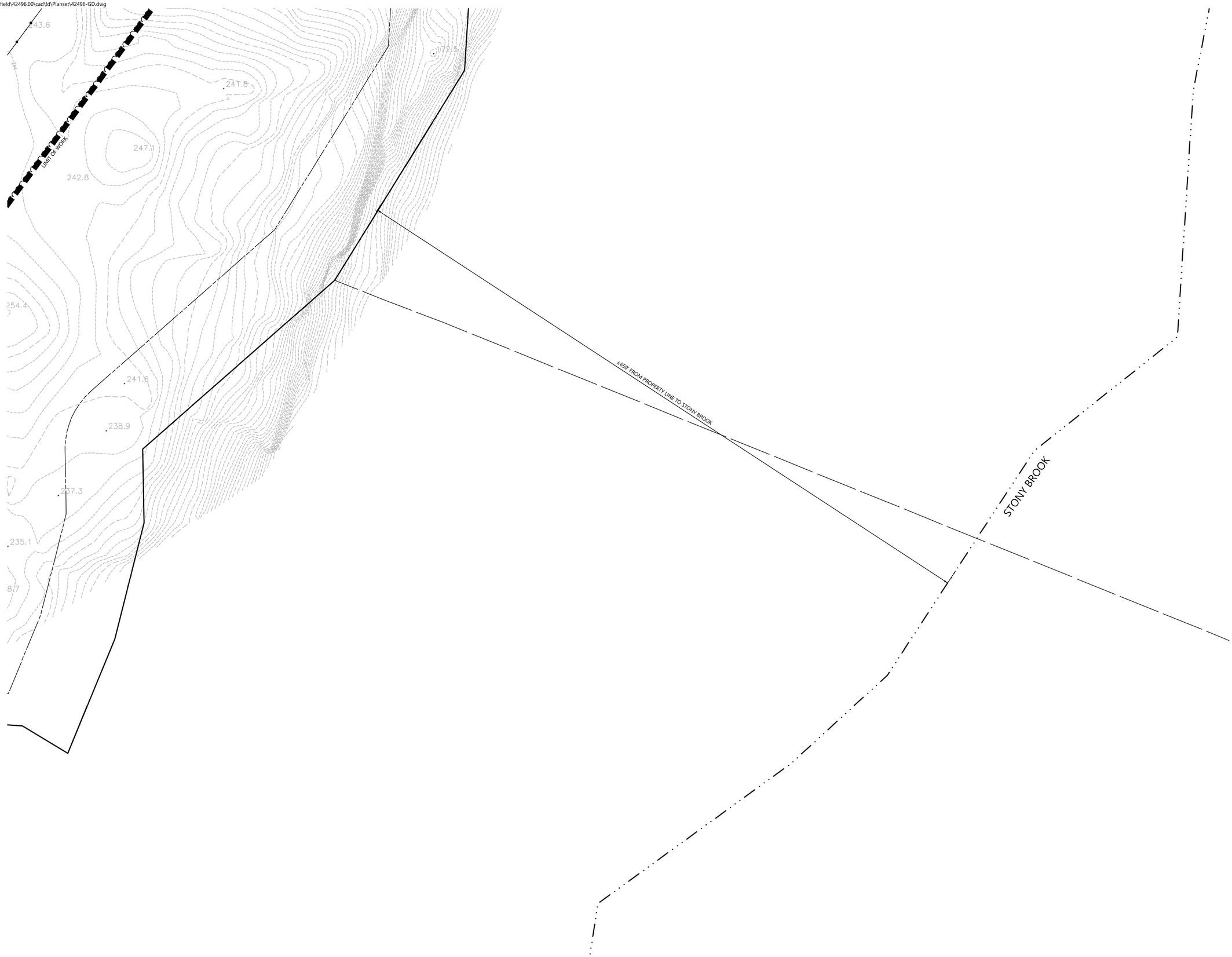

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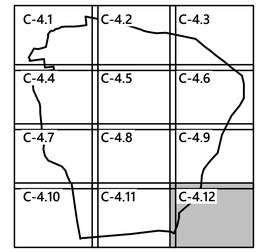

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CONSTRUCTION SEQUENCING

ALL CONSTRUCTION ACTIVITIES ARE EXPECTED TO BEGIN IN THE SUMMER/FALL OF 2020 AND BE COMPLETED BY THE END OF 2021. THE GENERAL CONSTRUCTION NOTES ARE AS FOLLOWS:

1. THE SITE CONTRACTOR SHALL BE FULLY RESPONSIBLE TO CONTROL CONSTRUCTION SUCH THAT SEDIMENTATION SHALL NOT AFFECT ROADS/HIGHWAYS AND THEIR DRAINAGE SYSTEM, NEIGHBORING PROPERTIES, WETLANDS AND REGULATORY PROTECTED AREAS, WHETHER SUCH SEDIMENTATION IS CAUSED BY WATER, WIND, OR DIRECT DEPOSIT. DESIGNATED ACCESS DRIVES MUST BE USED TO THE MAXIMUM EXTENTS POSSIBLE. IT IS REQUIRED THAT THE SITE CONTRACT PERFORM A DAILY INSPECTION OF ALL EROSION AND SEDIMENT CONTROL MEASURES EMPLOYED AT THE SITE.
2. A CTDEEP-APPROVED QUALIFIED INSPECTOR SHALL BE ASSIGNED TO BE RESPONSIBLE FOR PERFORMING INSPECTIONS AND PREPARING REPORTS IN ACCORDANCE WITH SECTION 5(B)(4)(B) OF THE CONSTRUCTION GENERAL PERMIT. THESE INSPECTIONS SHALL TAKE PLACE WEEKLY, AT A MINIMUM, AND SHALL BE REQUIRED WITHIN 24 HOURS OF A RAINFALL EVENT EXCEEDING 0.5 INCHES. IT IS ALSO ANTICIPATED THAT REPRESENTATIVES FROM CTDEEP AND/OR THE STATE CONSERVATION DISTRICT WILL PERFORM PERIODIC INSPECTIONS.
3. ENGINEER OF RECORD SHALL PERFORM THREE (3) MONTHLY PLAN IMPLEMENTATION INSPECTIONS WITHIN THE FIRST 90 DAYS OF CONSTRUCTION ACTIVITY, AS REQUIRED BY CONNECTICUT DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION.
4. THROUGHOUT THE COURSE OF THE CONSTRUCTION PROJECT, ADDITIONAL SEDIMENT AND EROSION CONTROL MEASURES MAY BE WARRANTED AT THE DISCRETION OF THE QUALIFIED INSPECTOR AND/OR DESIGN ENGINEER. THESE IMPROVEMENTS MUST BE IMPLEMENTED IN A TIMELY FASHION IN ACCORDANCE WITH THE REQUIREMENTS OF THE CONSTRUCTION GENERAL PERMIT. ADDITIONALLY, AREAS OF PROPOSED COMPACTED NATIVE SOIL ROADS SHALL BE CONVERTED TO STABLE GRAVEL ROADS IF/AS DETERMINED BY THE QUALIFIED INSPECTOR OR ENGINEER OF RECORD.
5. PRIOR TO CONSTRUCTION, THE APPLICANT SHALL PROVIDE THE TOWN OF WATERFORD WITH THE NAME OF CONTACT AND 24-HOUR CONTACT INFORMATION.
6. CONTRACTOR SHALL ADHERE TO 2002 CONNECTICUT GUIDELINES FOR EROSION AND SEDIMENT CONTROL, AS AMENDED.
7. THE CONTRACTOR SHALL FLAG THE LIMITS OF CLEARING NECESSARY TO FACILITATE THE PRE-CONSTRUCTION MEETING.
8. THE CONTRACTOR SHALL HOLD PRE-CONSTRUCTION MEETING(S). ATTENDEES SHALL INCLUDE, BUT NOT BE LIMITED TO, REPRESENTATIVES OF THE GENERAL CONTRACTOR, SITE CONTRACTOR, CTDEEP, TOWN OF WATERFORD, ENGINEER OF RECORD, AND QUALIFIED SWPPP INSPECTOR.
9. THE CONTRACTOR SHALL CONTACT CALL-BEFORE-YOU-DIG (1-800-922-4455) PRIOR TO ENGAGING IN ANY EXCAVATION ACTIVITIES AT THE SITE.
10. THE CONTRACTOR SHALL NOTIFY THE TOWN OF WATERFORD AGENT, ZONING ENFORCEMENT OFFICER, AND ENGINEERING DEPARTMENT, 48 HOURS PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION ACTIVITY.
11. NO CONSTRUCTION OF SITE IMPROVEMENTS MAY BEGIN UNTIL THE PROPER EROSION CONTROL MEASURES SERVING THE AREA TO BE DISTURBED ARE IN PLACE.
12. ANTICIPATED WORK HOURS WILL BE BETWEEN 6:30 AM AND 5:00 PM.
13. HIGH FLOTATION TIRE EQUIPMENT SHALL BE USED TO THE MAXIMUM EXTENTS PRACTICABLE IN LIEU OF TRACK CONSTRUCTION EQUIPMENT IN AN EFFORT TO AVOID COMPACTION OF THE NATIVE SOILS.

PRE-CONSTRUCTION SITE PROTECTION SEQUENCE (2021)

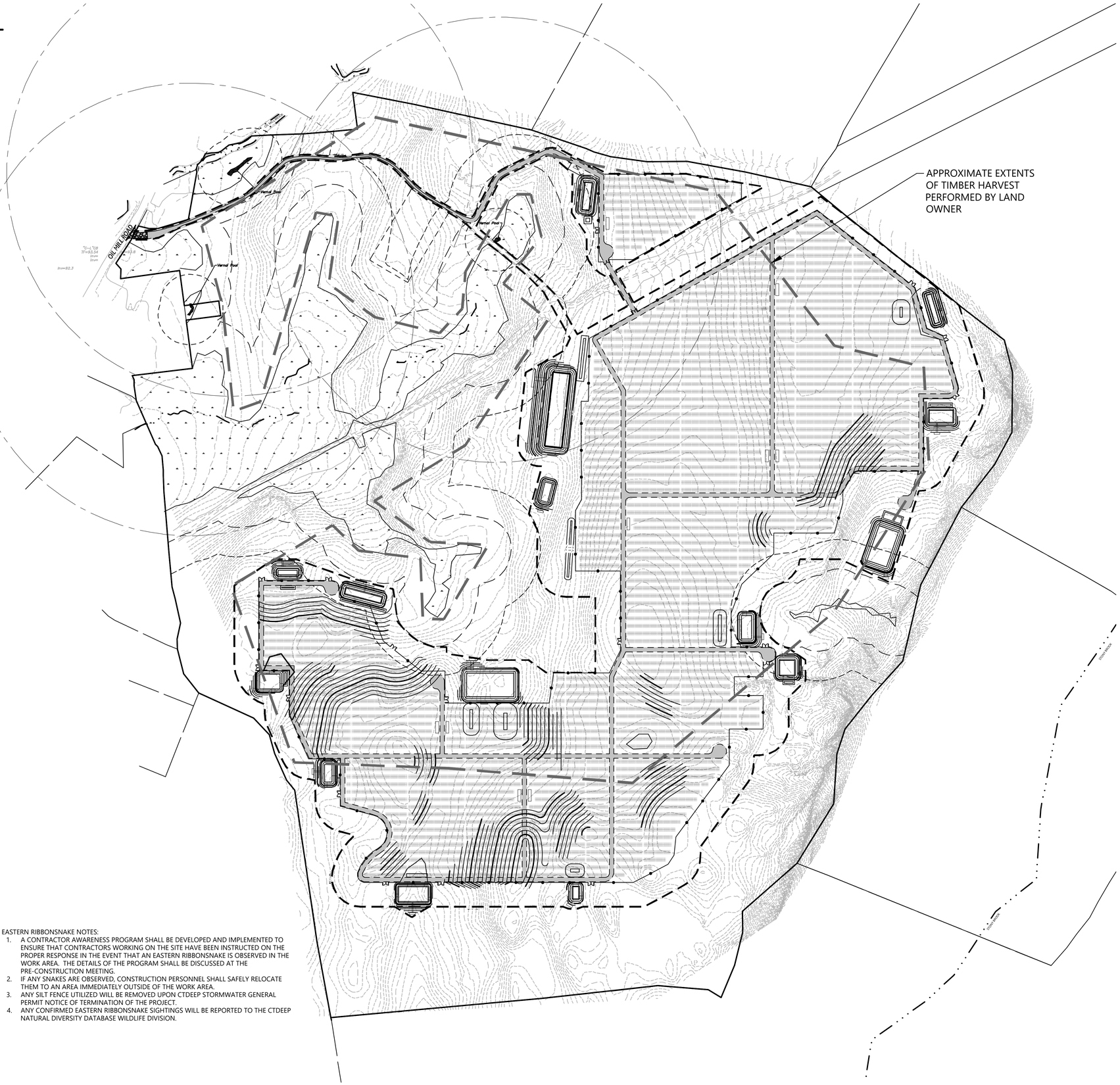
1. INSTALL STABILIZED VEHICLE CONSTRUCTION EXIT AT THE EXISTING ROAD INTERSECTING WITH OIL MILL ROAD.
2. SURVEY AND MARK ALL WOODLAND CLEARING LIMITS.
3. MARK TREES TO BE FELLED WITHIN 10 FEET OF CLEARING LIMITS AND INSTALL TREE PROTECTION FOR TREES TO BE PRESERVED WITHIN 10 FEET OF CLEARING LIMITS.
4. FIELD SURVEY AND MARK BOUNDARY BETWEEN CLEARING LIMITS AND GRUBBING LIMITS.
5. THE USE OF A TUB GRINDER IS RECOMMENDED FOR THE MULCHING OF FELLED TREES.
6. AS TREES ARE CLEARED AND GRUBBED, GRIND TOPS AND ROOT BALLS IN TUB GRINDER TO CREATE MATERIAL FOR WOOD CHIP MULCH BERM. TO THE EXTENTS FEASIBLE, GRUBBING SHALL TAKE PLACE FOLLOWING THE INSTALLATION OF THE SEDIMENT BASINS.
7. ACCESS ROADS SHALL BE DESIGNATED AS EARLY AS FEASIBLE AND USED PRIMARILY FOR CONSTRUCTION TRAFFIC.
8. AS MATERIAL IS PRODUCED, INSTALL MULCH BERM AT THE LIMIT OF DISTURBANCE GENERALLY IN AREAS OF CLEARED FOREST. MULCH BERM HAS NOMINAL DIMENSIONS OF 1.5 TO 2 FEET HIGH BY 4-FOOT WIDE.
9. IMMEDIATELY INSIDE THE PERIMETER MULCH BERM, INSTALL ENTRENCHED SILT FENCE FOLLOWING STANDARDS OF THE 2002 CONNECTICUT GUIDELINES FOR EROSION AND SEDIMENT CONTROL. MULCH BERM AND PERIMETER SILT FENCE SHALL BE MAINTAINED IN PERPETUITY UNTIL COMPLETION OF CONSTRUCTION. NO WORK SHALL BE ALLOWED OUTSIDE OF THESE LIMITS.
10. CONCURRENT WITH ITEMS 2 THROUGH 9 ABOVE, THE CONTRACTOR SHALL ADDRESS ONGOING EROSION PROBLEMS USING TEMPORARY DIVERSIONS AND FILLING AND GRADING GULLIES. TRACK GULLIES UP AND DOWN SLOPE AND HYDROSEED WITH A THERMALLY-TREATED WOOD BONDED FIBER MATRIX (BFM) MULCH WITH TACKIFIER. A STAPLED BIODEGRADABLE EROSION CONTROL BLANKET WITHOUT MONOFILAMENT MESH IS AN ACCEPTABLE ALTERNATIVE FOR HYDROSEED AND BFM.
11. INSTALL TEMPORARY SEDIMENT TRAPS IN ACCORDANCE WITH THE APPROVED SITE-SPECIFIC SWPCP AND CT GUIDELINES. THE ENGINEER OF RECORD SHALL INSPECT FEATURES TO CONFIRM REQUIRED STORAGE CAPACITIES ARE PROVIDED AND THAT OUTLETS AND/OR SPILLWAYS ARE CONSTRUCTED CORRECTLY. DISCHARGE AREAS BELOW OUTFALLS MUST BE INSPECTED TO CONFIRM FLOW WILL BE OVER STABLE GROUND AND SHEET FLOW IS ENCOURAGED. IF DISTURBED SOILS ARE PRESENT, THE ENGINEER OF RECORD TO PROVIDE CORRECT MEASURES TO ADDRESS CONDITION.
12. SEED AND PROTECT DISTURBED SOILS AROUND SEDIMENT TRAPS AND BASINS WITHIN 72 HOURS OF COMPLETION. SECURE SEED WITH A THERMALLY-TREATED BFM APPLIED FOLLOWING MANUFACTURER'S SPECIFICATIONS FOR USE AT SPECIFIED APPLICATION RATES. AN ANIONIC POLYACRYLAMIDE PRODUCT MAY BE INCLUDED WITH THE TACKIFIER TO PROMOTE SOIL STABILITY. ALL OTHER AMENDMENTS SHOULD BE PRESCRIBED BASED ON THE RESULT OF SOIL TESTS.
13. INSTALL OTHER EROSION AND SEDIMENT CONTROLS FOLLOWING THE CT GUIDELINES AND MANUFACTURER'S DIRECTIONS. DURING CONSTRUCTION, THE CONTRACTOR SHALL INSTALL MEASURES AS REQUIRED BY THE ENGINEER OF RECORD OR QUALIFIED INSPECTOR, TO PREVENT SEDIMENT-LADEN RUNOFF FROM REACHING WETLANDS OR DISCHARGING OFFSITE.
14. ESTABLISH DESIGNATED VEHICULAR TRAFFIC ACCESS ROADS (GRAVEL, OR COMPACTED NATIVE SOIL, PER PLANS) THAT SHALL BE USED AS PRIMARY ACCESSES. EFFORTS MUST BE MADE TO MINIMIZE VEHICULAR TRAFFICKING ACROSS NON-DESIGNATED AREAS TO THE EXTENTS POSSIBLE.
15. AREAS DISTURBED DURING THIS SEQUENCE MUST BE HYDROSEEDED AND ALLOWED TO GROW THROUGH A GROWING SEASON (SPRING, OR FALL) PRIOR TO INITIATION OF CONSTRUCTION SEQUENCE.
16. SPREADED MULCH AND FELLED BRANCHES FROM PRE-EXISTING TIMBER HARVEST ON SITE SHALL BE CLEANED AND AREAS SEEDED. MATERIAL CLEANED IN THIS WAY MAY BE REPURPOSED FOR THE USE OF WOOD CHIP MULCH BERMS ALONG THE SITE PERIMETER OR REMOVED FROM THE SITE. THE USE OF HYDROSEED COMBINED WITH TACKIFIER AND POLYACRLAMIDE (PAM) IS RECOMMENDED FOR THIS RESEEDING. THE CLEANUP AREAS SHALL BE LEFT UNDISTURBED THROUGH A FULL GROWING SEASON BEFORE INITIATION OF THE CONSTRUCTION SEQUENCE CAN TAKE PLACE.

CONSTRUCTION SEQUENCE (2022)

1. PERFORM MASS EARTHWORK ON THE SITE AND INSTALL PERIMETER FENCE TO SERVE AS CONSTRUCTION BARRIER. MASS EARTHWORK SHALL ONLY MEAN REGRADING TO MEET THE PROPOSED GRADING DEPICTED ON THE PLANS. TOPSOIL SHALL BE STRIPPED AND STOCKPILED FROM AREAS PROPOSED FOR REGRADING. EXCESS SOIL WHICH IS NOT REUSED IN PROPOSED SITE GRADING AS DEPICTED ON PLANS SHALL BE HAULED OFF-SITE.
2. TOPSOIL SHALL BE REPLACED TO 3" MINIMUM DEPTH OVER REGRADED AREAS UPON COMPLETION OF MASS EARTHWORK ACTIVITIES AND AREAS WHICH WERE DISTURBED BY MASS EARTHWORK OPERATIONS SHALL BE RESEEDED WITHIN 72 HOURS OF COMPLETION.
3. AREAS DISTURBED BY MASS EARTHWORK SHALL BE RESEEDED WITH HYDROSEED, COMBINED WITH TACKIFIER AND PAM.
4. DRIVE PILES FOR SOLAR PANEL RACKING.
5. THE INSTALLATION OF RACKING SHALL FOLLOW THE PILE DRIVING BY ROUGHLY ONE WEEK STARTING FROM THE SAME POINT. IT IS ANTICIPATED THAT APPROXIMATELY 13 ACRES OF PILES WILL BE IN AHEAD OF RACKING ON AVERAGE.
6. RESEED AND REGRADE ALL AREAS DISTURBED BY CONSTRUCTION TRAFFIC WITHIN THE ARRAYS WHERE RACKS ARE INSTALLED AS EARLY AS POSSIBLE. RUTS AND RILLS SHALL BE SMOOTHED AND GRADED AS DISCOVERED.
7. INSTALL SOLAR PANEL MODULES IN THE RACKING. MUCH OF THIS WORK IS ANTICIPATED TO BE PERFORMED BY HAND AND LIGHT CONSTRUCTION EQUIPMENT WHICH WILL CAUSE MINIMAL DISTURBANCE COMPARED TO THE USE OF HEAVY EQUIPMENT. DESIGNATED ACCESS ROADS SHALL STILL BE USED TO THE MAXIMUM EXTENTS POSSIBLE.
8. UPON COMPLETION OF CONSTRUCTION, RE-SEED ALL DISTURBED AREAS WITHIN 72 HOURS AND PREVENT VEHICULAR TRAFFICKING OVER THESE AREAS. INSTALL FINAL LANDSCAPING.
9. THE TEMPORARY SEDIMENT TRAPS/BASINS AND THEIR ASSOCIATED DIVERSION CHANNELS MAY BE REMOVED ONCE ALL TRIBUTARY AREAS UPSTREAM OF THEM HAVE BEEN COMPLETED AND STABILIZED WITH 80 PERCENT VEGETATED COVER, AT THE DIRECTION OF THE QUALIFIED INSPECTOR AND/OR DESIGN ENGINEER.
10. AFTER SITE IS STABILIZED, AND AFTER INSPECTION BY DESIGN ENGINEER, OR OTHER OWNER'S REPRESENTATIVE, REMOVE TEMPORARY EROSION AND SEDIMENT CONTROLS. ENTIRE SITE SHALL BE CHECKED FOR AND CLEANED OF SEDIMENT AS NEEDED.

EASTERN RIBBONSNAKE NOTES:

1. A CONTRACTOR AWARENESS PROGRAM SHALL BE DEVELOPED AND IMPLEMENTED TO ENSURE THAT CONTRACTORS WORKING ON THE SITE HAVE BEEN INSTRUCTED ON THE PROPER RESPONSE IN THE EVENT THAT AN EASTERN RIBBONSNAKE IS OBSERVED IN THE WORK AREA. THE DETAILS OF THE PROGRAM SHALL BE DISCUSSED AT THE PRE-CONSTRUCTION MEETING.
2. IF ANY SNAKES ARE OBSERVED, CONSTRUCTION PERSONNEL SHALL SAFELY RELOCATE THEM TO AN AREA IMMEDIATELY OUTSIDE OF THE WORK AREA.
3. ANY SILT FENCE UTILIZED WILL BE REMOVED UPON CTDEEP STORMWATER GENERAL PERMIT NOTICE OF TERMINATION OF THE PROJECT.
4. ANY CONFIRMED EASTERN RIBBONSNAKE SIGHTINGS WILL BE REPORTED TO THE CTDEEP NATURAL DIVERSITY DATABASE WILDLIFE DIVISION.



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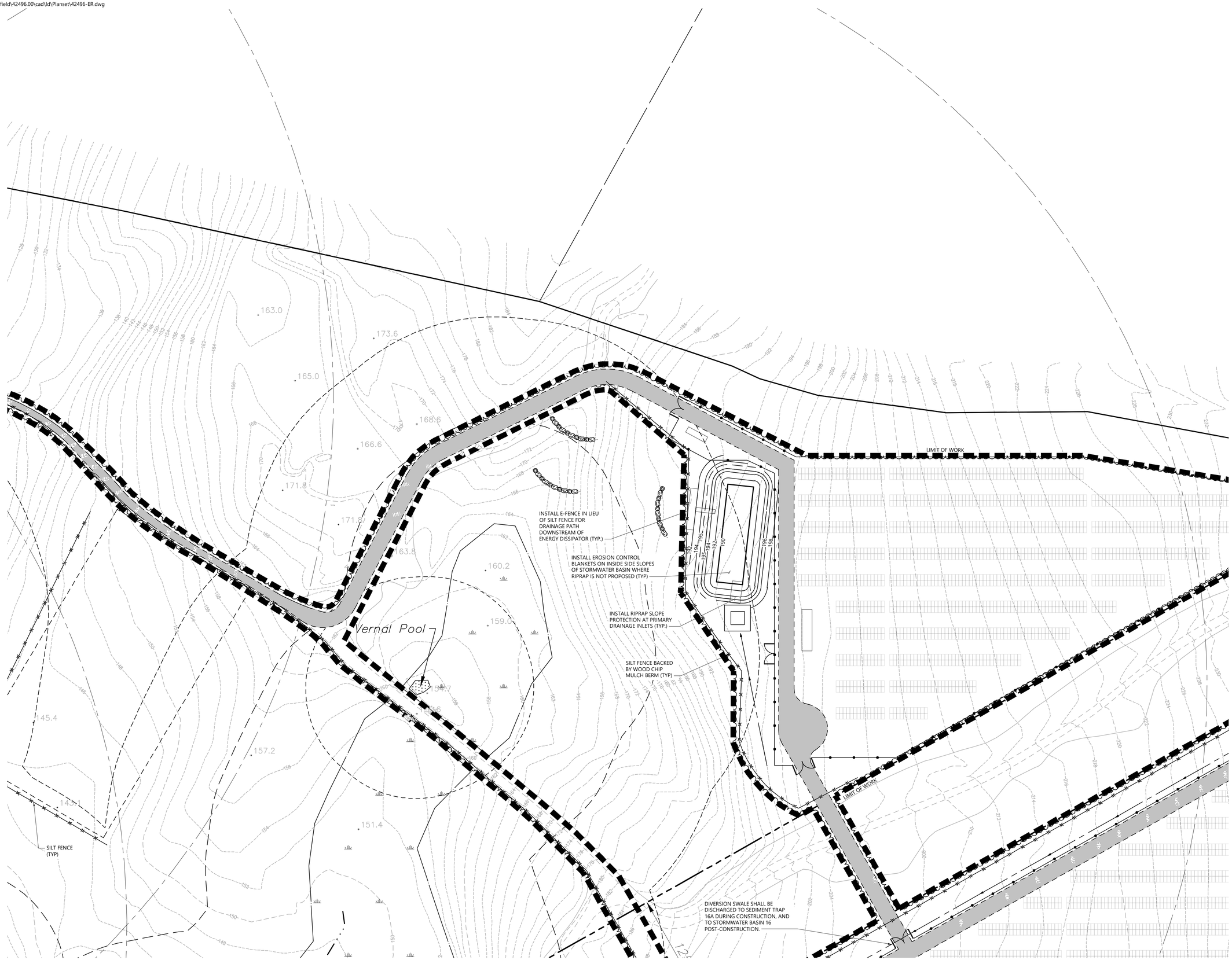

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C-5.1	C-5.2	C-5.3
C-5.4	C-5.5	C-5.6
C-5.7	C-5.8	C-5.9
C-5.10	C-5.11	C-5.12

Key

Not To Scale

0 20 40 80 Feet

Photovoltaic Installation

117 Oil Mill Road
Waterford, Connecticut

No.	Revision	Date	Appvd.
1	CTDEEP Comments	3/12/2020	SJK
2	CSC & CTDEEP Comments	7/28/2020	SJK
3	CSC D&M Plan	1/12/2021	SJK

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Erosion and Sediment Control Plan

Drawing Number

C-5.2

Sheet 31 of 43

Project Number 42496.00

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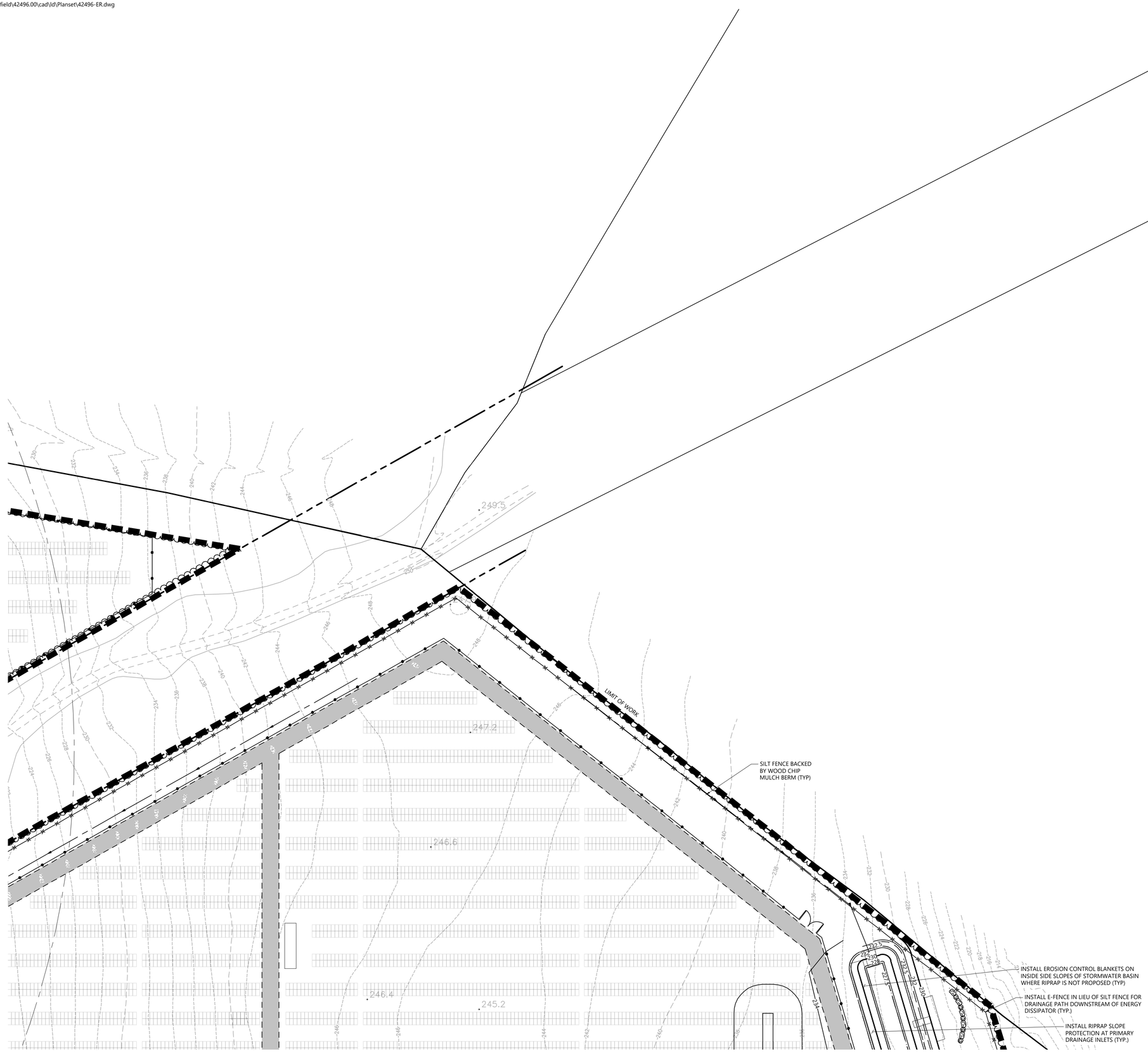

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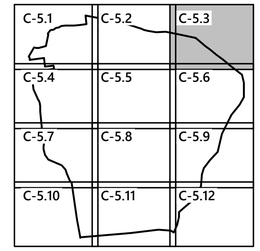

Key

Not To Scale

0 20 40 80 Feet

Photovoltaic Installation

117 Oil Mill Road
Waterford, Connecticut

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Erosion and Sediment Control Plan

Drawing Number

C-5.3

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Project Number

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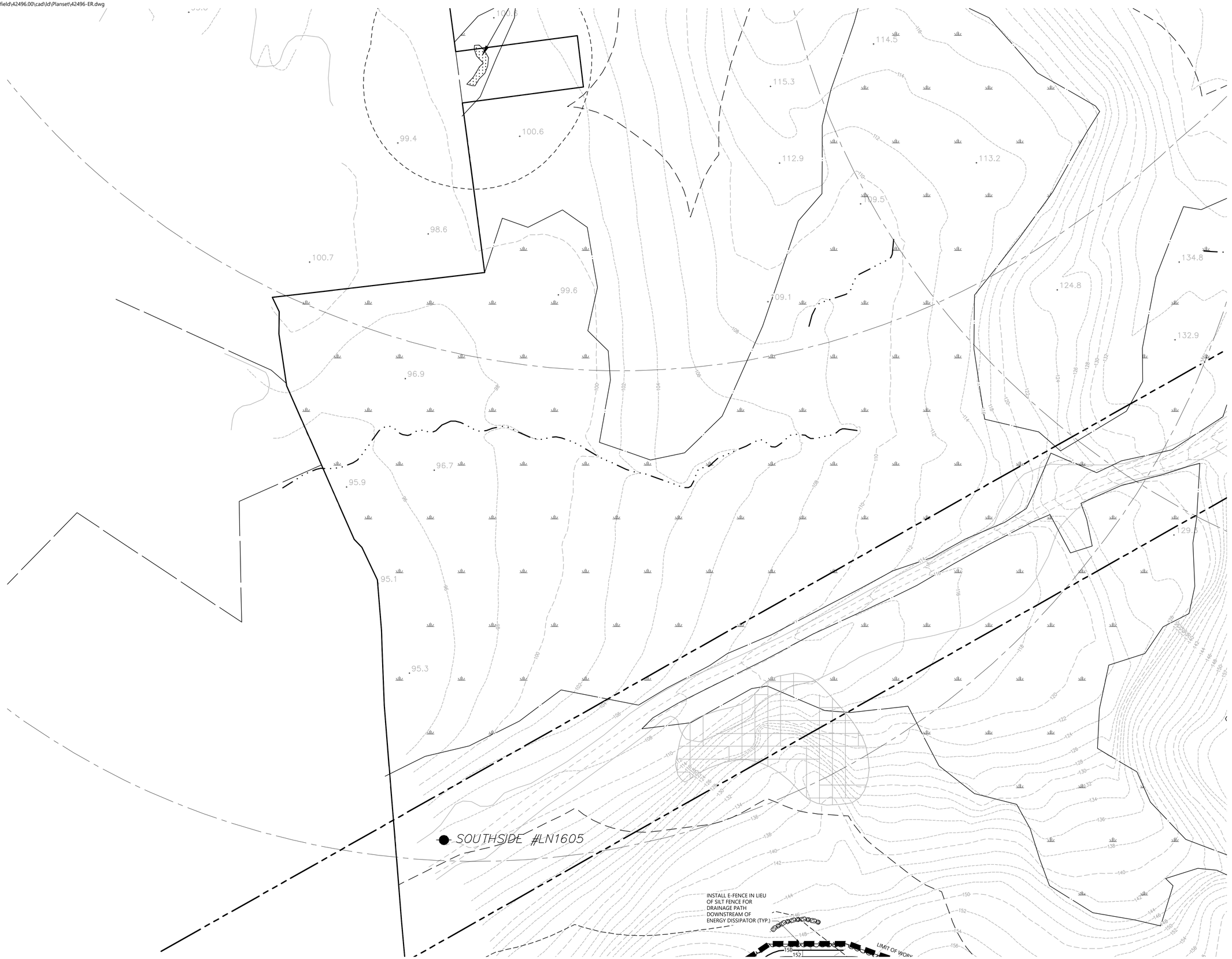

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C-5.4	C-5.5	C-5.6
C-5.7	C-5.8	C-5.9
C-5.10	C-5.11	C-5.12

Key

Not To Scale

0 20 40 80 Feet

Photovoltaic Installation

117 Oil Mill Road
Waterford, Connecticut

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Erosion and Sediment Control Plan

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C-5.4

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DIVERSION SWALE SHALL BE DISCHARGED TO SEDIMENT TRAP 16A DURING CONSTRUCTION, AND TO STORMWATER BASIN 16 POST-CONSTRUCTION.

125'

Right of Way In Favor of
The Connecticut Light &
Power Company
Vol. 66 Pg. 163

LIMIT OF WORK

370 LF COMPOST FILTER SOCK (TYP)

INSTALL E-FENCE IN LIEU OF SILT FENCE FOR DRAINAGE PATH DOWNSTREAM OF ENERGY DISSIPATOR (TYP.)

INSTALL RIPRAP SLOPE PROTECTION AT PRIMARY DRAINAGE INLETS (TYP.)

INSTALL EROSION CONTROL BLANKETS ON INSIDE SIDE SLOPES OF STORMWATER BASIN WHERE RIPRAP IS NOT PROPOSED (TYP)

INSTALL EROSION CONTROL BLANKETS ON INSIDE SIDE SLOPES OF STORMWATER BASIN WHERE RIPRAP IS NOT PROPOSED (TYP)

INSTALL RIPRAP SLOPE PROTECTION AT PRIMARY DRAINAGE INLETS (TYP.)

INSTALL E-FENCE IN LIEU OF SILT FENCE FOR DRAINAGE PATH DOWNSTREAM OF ENERGY DISSIPATOR (TYP.)

50 LF COMPOST FILTER SOCK (TYP)

50 LF COMPOST FILTER SOCK (TYP)

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C-5.7	C-5.8	C-5.9
C-5.10	C-5.11	C-5.12

Key

Not To Scale

0 20 40 80 Feet

Photovoltaic Installation

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Erosion and Sediment Control Plan

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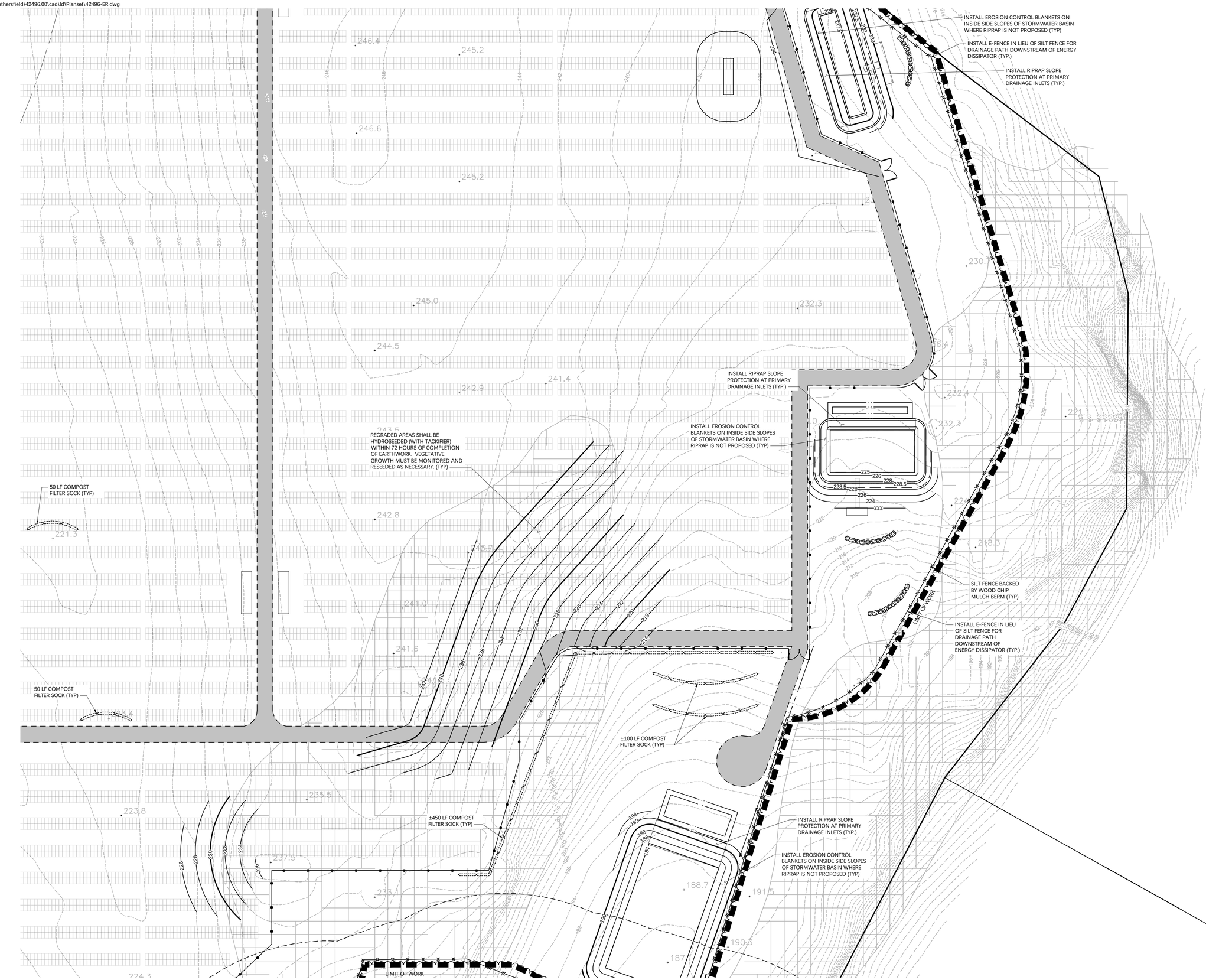
C-5.5

Sheet 34 of 43

Project Number 42496.00



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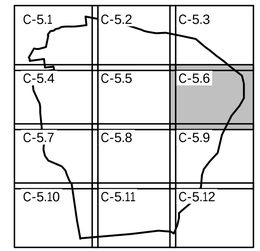

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Erosion and Sediment Control Plan

Drawing Number

C-5.6

Sheet 35 of 43

Project Number 42496.00

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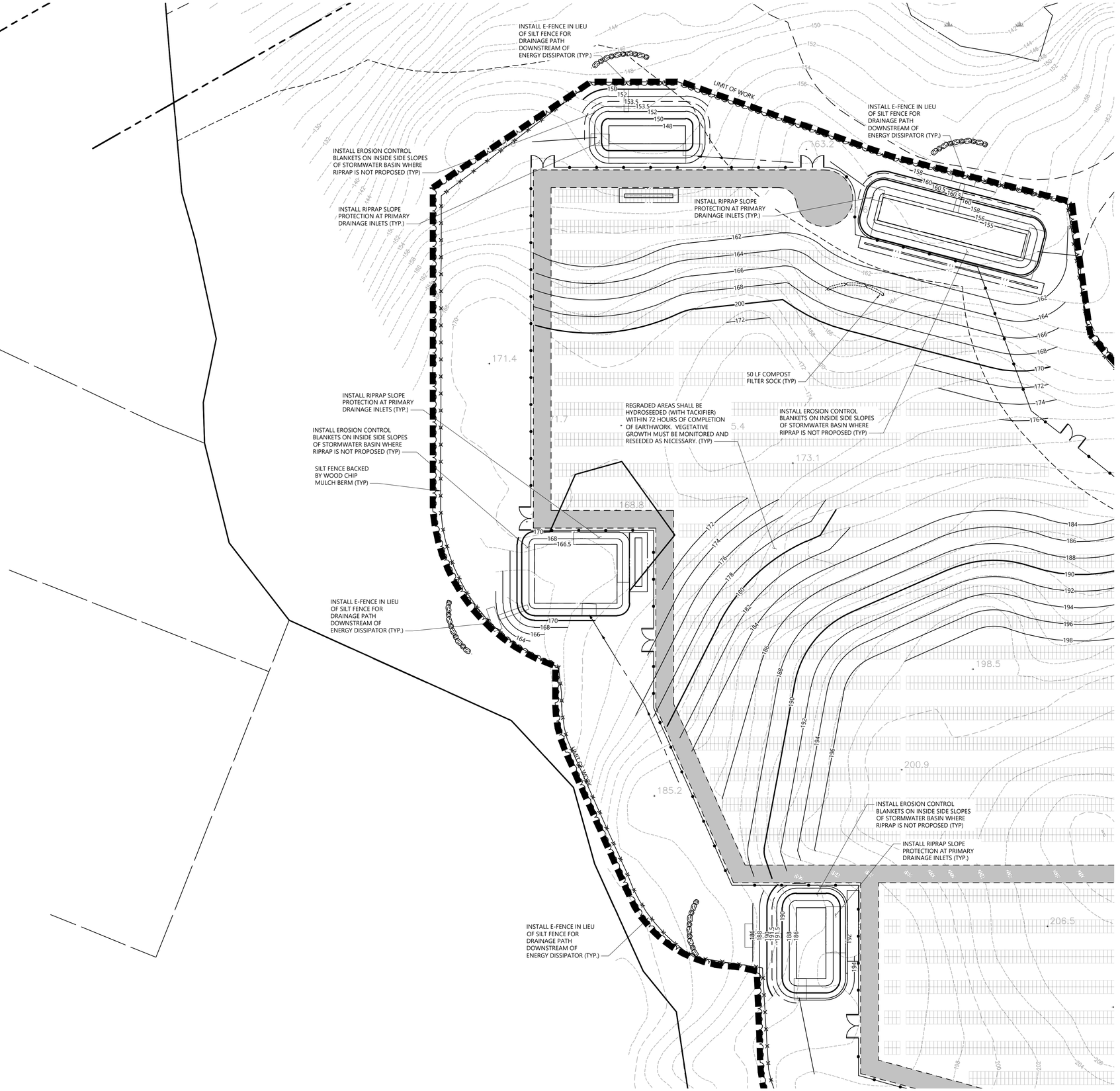

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C-5.4	C-5.5	C-5.6
C-5.7	C-5.8	C-5.9
C-5.10	C-5.11	C-5.12

Key

Not To Scale

0 20 40 80 Feet

Photovoltaic Installation

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Erosion and Sediment Control Plan

Drawing Number

C-5.7

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Project Number

42496.00

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INSTALL E-FENCE IN LIEU OF SILT FENCE FOR DRAINAGE PATH DOWNSTREAM OF ENERGY DISSIPATOR (TYP.)

SILT FENCE BACKED BY WOOD CHIP MULCH BERM (TYP)

LIMIT OF WORK

INSTALL EROSION CONTROL BLANKETS ON INSIDE SIDE SLOPES OF STORMWATER BASIN WHERE RIPRAP IS NOT PROPOSED (TYP)

INSTALL RIPRAP SLOPE PROTECTION AT PRIMARY DRAINAGE INLETS (TYP.)

REGRADED AREAS SHALL BE HYDROSEEDED (WITH TACKIFIER) WITHIN 72 HOURS OF COMPLETION OF EARTHWORK. VEGETATIVE GROWTH MUST BE MONITORED AND RESEEDED AS NECESSARY. (TYP)

50 LF COMPOST FILTER SOCK (TYP)

PROPOSED SEDIMENT TRAP 13A. REFER TO DETAIL SHEET FOR SIZING.

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C-5.7	C-5.8	C-5.9
C-5.10	C-5.11	C-5.12

Key

Not To Scale

0 20 40 80 Feet

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Erosion and Sediment Control Plan

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C-5.8

Sheet 37 of 43

Project Number

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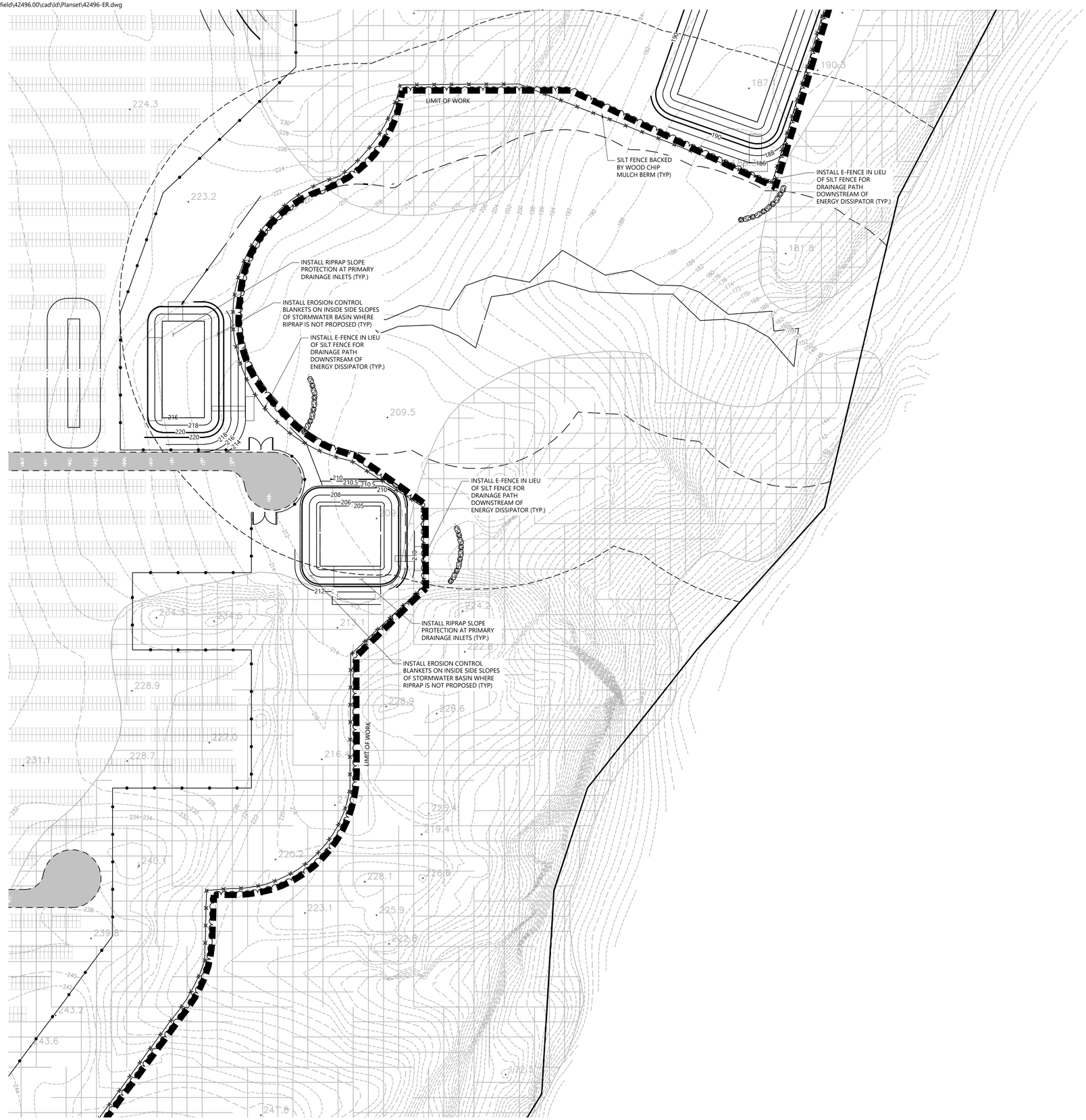

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C-5.4	C-5.5	C-5.6
C-5.7	C-5.8	C-5.9
C-5.10	C-5.11	C-5.12

Key

Not To Scale

0 20 40 80 Feet

Photovoltaic Installation

117 Oil Mill Road
Waterford, Connecticut

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Erosion and Sediment Control Plan

Drawing Number

C-5.9

Sheet 38 of 43

Project Number

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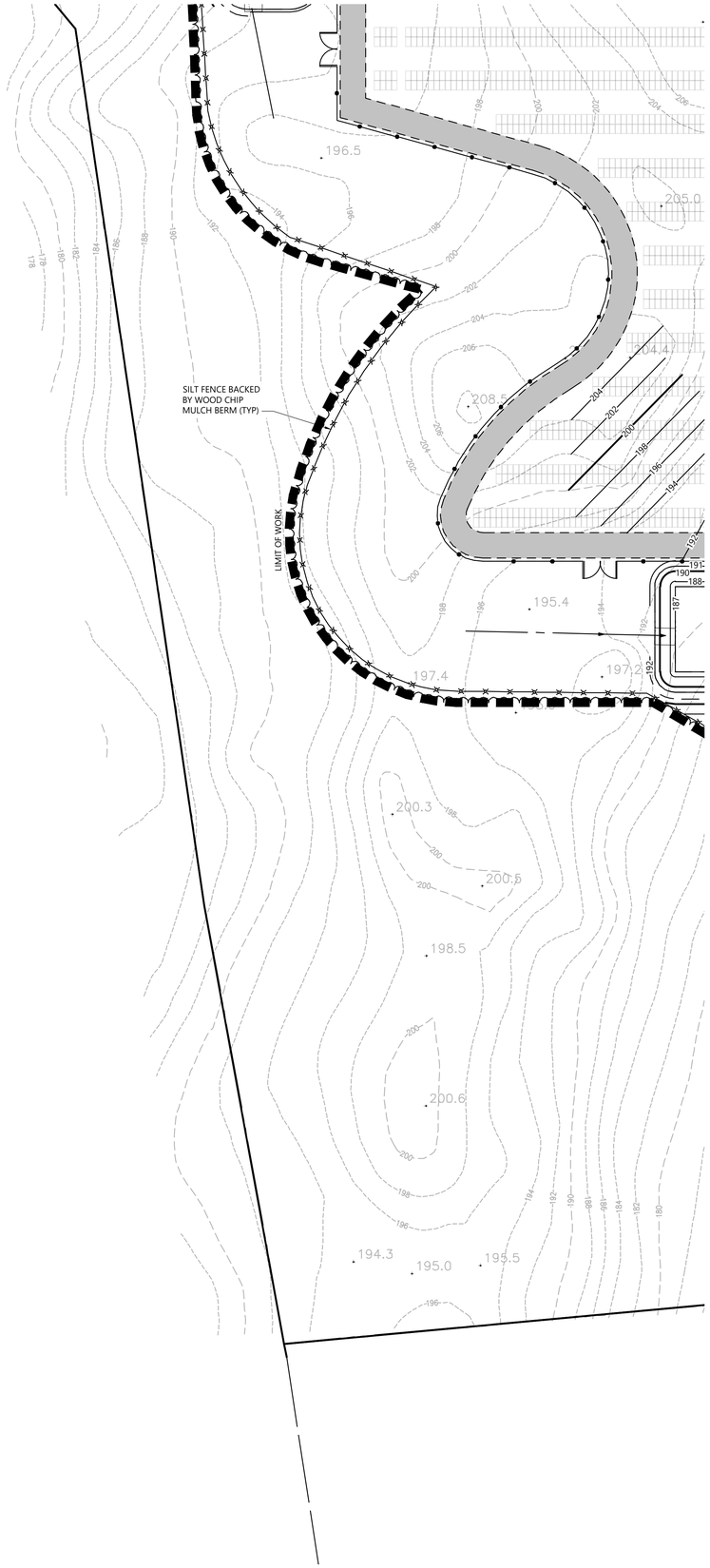

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C-5.4	C-5.5	C-5.6
C-5.7	C-5.8	C-5.9
C-5.10	C-5.11	C-5.12

Key

Not To Scale

0 20 40 80 Feet

Photovoltaic Installation

117 Oil Mill Road
Waterford, Connecticut

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Erosion and Sediment Control Plan

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C-5.10

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Project Number

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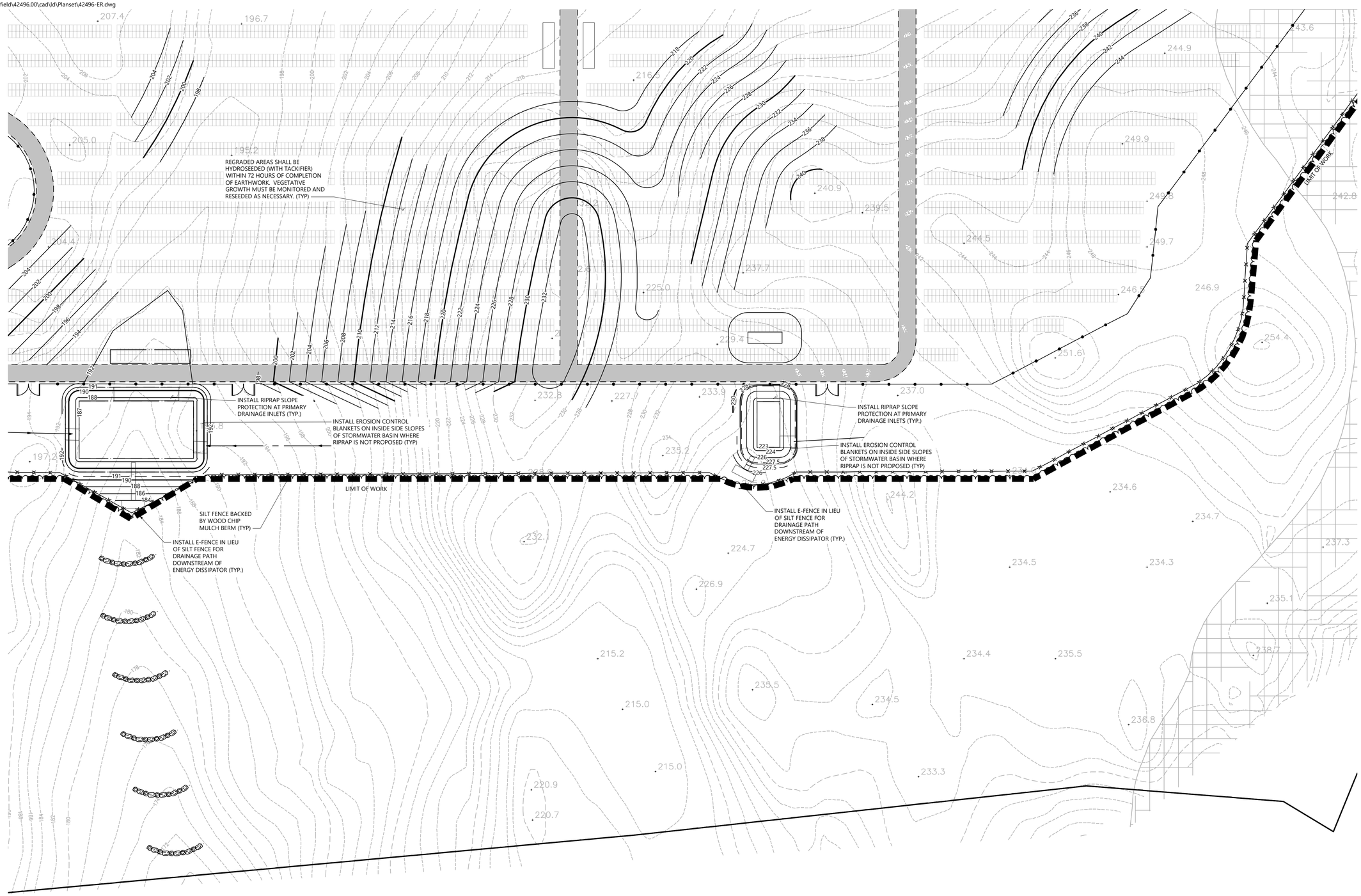

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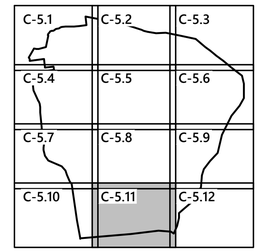

Key

Not To Scale

0 20 40 80 Feet

Photovoltaic Installation

117 Oil Mill Road
Waterford, Connecticut

No.	Revision	Date	Appvd.
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Erosion and Sediment Control Plan

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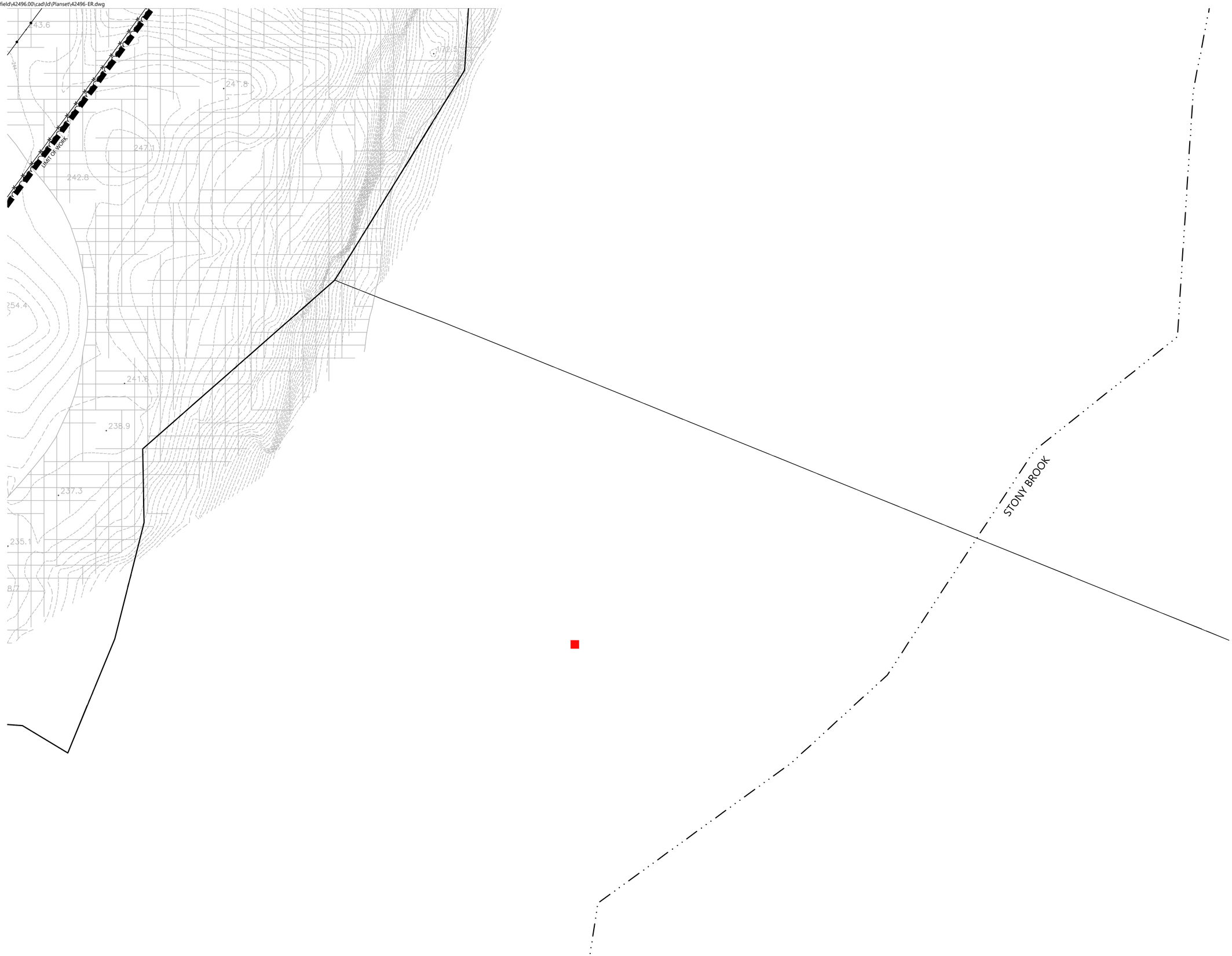

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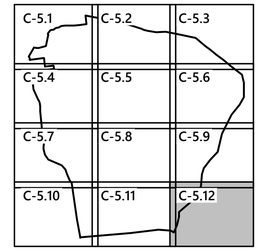

Key
Not To Scale

0 20 40 80 Feet

Photovoltaic Installation
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Waterford, Connecticut

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Erosion and Sediment Control Plan

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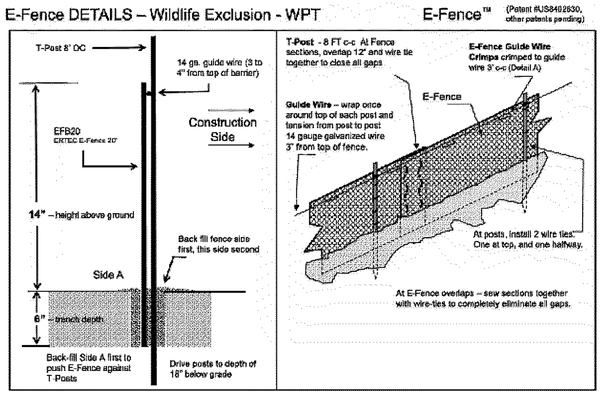
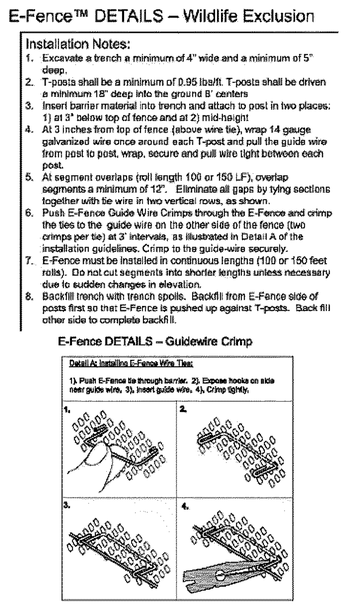
E-Fence Installation Details

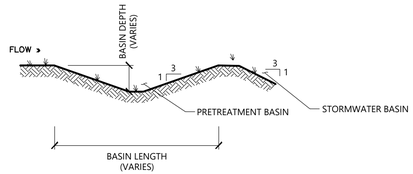
N.T.S. Source: Ertec Environmental Systems





Pretreatment Basin

N.T.S. Source: VHB

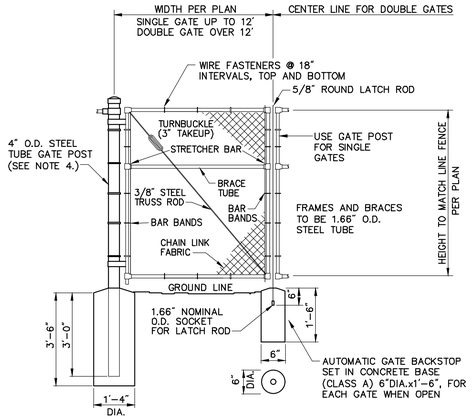


NOTE:
1. PRETREATMENT BASIN LENGTH, WIDTH, AND DEPTH AS NOTED ON SITE PLANS.
2. SIDE SLOPES SHALL BE 3:1.

Chain Link Fence Gate

6/08

N.T.S. Source: VHB LD_482



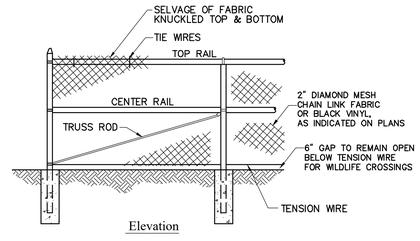
Notes:

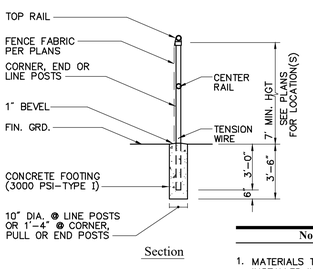
1. CHAIN LINK FABRIC FOR GATES TO BE THE SAME AS REQUIRED FOR FENCE.
2. GATE POST BASE–PORTLAND CEMENT CONCRETE (3000 PSI).
3. FENCE FABRIC, POSTS, FRAMEWORKS, AND HARDWARE SHALL BE GALVANIZED STEEL OR BLACK VINYL (AS INDICATED ON PLANS) PER SPECIFICATIONS.
4. GATE POSTS TO BE USED ON EACH SIDE OF SINGLE AND DOUBLE GATE OPENINGS.

7' Chain Link Fence

6/08

N.T.S. Source: VHB LD_480



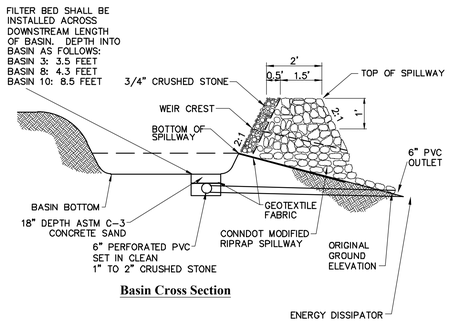


Note:

1. MATERIALS TO BE SUPPLIED AND INSTALLED IN CONFORMANCE WITH "CHAIN LINK MANUFACTURER'S INSTITUTE" PRODUCT MANUAL.

Earthen Surface Sand Filter Basin

N.T.S. Source: VHB

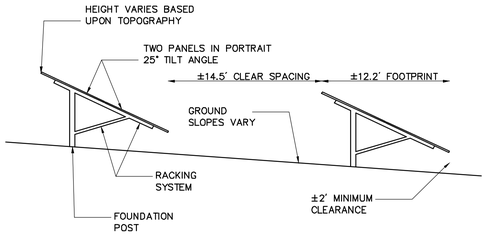


NOTE:
1. ALL SIDE SLOPES SHALL NOT EXCEED 3:1
2. TOP OF EMBANKMENT SHALL BE 2' (MIN.) WIDTH AND 1' (MIN.) ABOVE TOP OF SPILLWAY.
3. SIDE SLOPES OF EMBANKMENT SHALL BE STABILIZED BY TEMPORARY SEEDING OR EROSION CONTROL BLANKETS AS DIRECTED BY THE ENGINEER.
4. REFER TO "PERMANENT STORMWATER BASIN SIZING" TABLE FOR VARIABLE SIZING.
5. PERIMETER SILT FENCE SHALL BE REMOVED IMMEDIATELY DOWNSTREAM FROM SPILLWAY AND REPLACED WITH E-FENCE.
6. PERFORATED PVC AND CONCRETE SAND FOR SAND FILTERS SHALL BE INSTALLED ONLY UPON FULL STABILIZATION OF UPSTREAM AREAS. 6" PVC SHALL BE INSTALLED AND CAPPED AT TIME OF BASIN EXCVAVATION.
7. PERFORATIONS IN UNDERDRAIN PIPING SHALL BE 0.5 INCH SPACED 6 INCHES APART.
8. FILTER BEDS HAVE BEEN SIZED TO DRAIN THE STORMWATER BASIN WITHIN ONE DAY IN ACCORDANCE WITH 2004 STORMWATER QUALITY MANUAL. ASSUMPTION OF 20 FEET/DAY HYDRAULIC CONDUCTIVITY FOR MEDIUM SAND AND BASIN VOLUME UNDER BOTTOM OF SPILLWAY.

Cross Section of Panel Array

7/20

N.T.S. Source: VHB

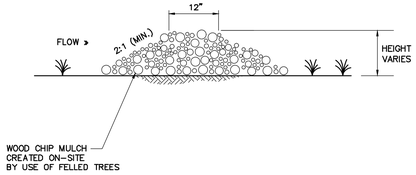


Notes:

1. FINAL DETERMINATION OF PANEL TYPE, RACKING SYSTEM, AND FOUNDATION POSTS TO BE DETERMINED PENDING BEST AVAILABLE TECHNOLOGY AT TIME OF CONSTRUCTION AND STRUCTURAL GROUND TESTING.

Wood Chip Mulch Berm

N.T.S. Source: VHB



NOTES:

1. WOOD CHIP MULCH BERM TO BE INSTALLED DOWNSTREAM OF PERIMETER SILT FENCE IN VARIOUS LOCATIONS AROUND SITE.

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Photovoltaic Installation

117 Oil Mill Road
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Drawing Title

Site Details

Drawing Number

C-6.1

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Project Number

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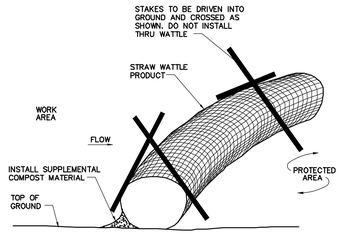
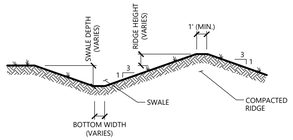


Straw Wattle Installation

8/12

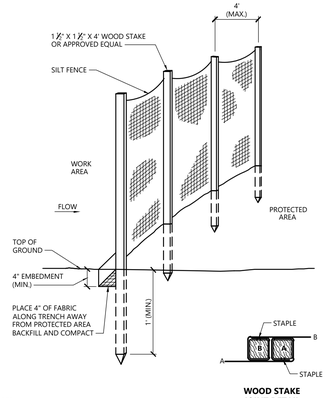
N.T.S. Source: VHB LD_658



NOTE:
1. ALL SIDE SLOPES SHALL NOT EXCEED 3:1
2. REFER TO "DIVERSION SWALE SIZING" TABLE FOR SELECTION OF LINING MATERIAL TO BE INSTALLED OVER ENTIRE SWALE AREA.
3. REFER TO "DIVERSION SWALE SIZING" TABLE FOR VARIABLE SIZING.
4.THE INTENT IS TO USE THE MATERIAL EXCAVATED FROM THE SWALE TO CONSTRUCT THE RIDGE.

Diversion Swale

N.T.S. Source: VHB



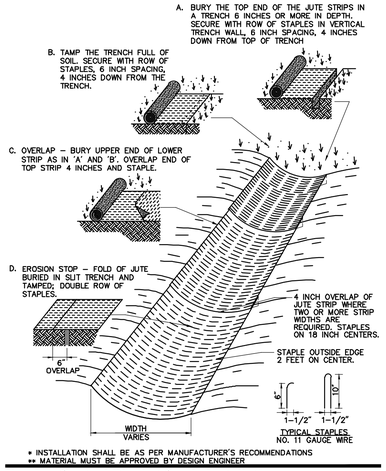
WOOD STAKE JOINT DETAIL

NOTE:
1. IN THE EVENT THAT BOULDERS OR SHALLOW LEDGE ARE ENCOUNTERED WHERE SILT FENCE IS PROPOSED, THE CONTRACTOR SHALL REMOVE THE OBTRUSION IN ORDER TO BE ABLE TO ACHIEVE PROPER EMBEDMENT DEPTHS, OR RELOCATE THE SILT FENCE UPHILL SUCH THAT IT DOES IMPACT THE PROJECT.

Silt Fence Barrier

1/16

N.T.S. Source: VHB LD_650

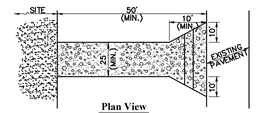


* INSTALLATION SHALL BE AS PER MANUFACTURER'S RECOMMENDATIONS
** MATERIAL MUST BE APPROVED BY DESIGN ENGINEER

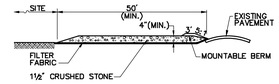
Erosion Control Blanket Swale Installation

6/08

N.T.S. Source: VHB LD_681



Plan View



Cross-section

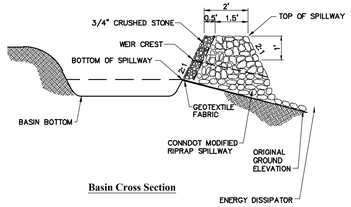
Notes:

1. ENTRANCE WIDTH SHALL BE A TWENTY-FIVE (25) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
2. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH SHALL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY. BERM SHALL BE PERMITTED. PERIODIC INSPECTION AND MAINTENANCE SHALL BE PROVIDED AS NEEDED.
3. STABILIZED CONSTRUCTION EXIT SHALL BE REMOVED PRIOR TO FINAL FINISH MATERIALS BEING INSTALLED.

Stabilized Construction Exit

6/08

N.T.S. Source: VHB LD_682

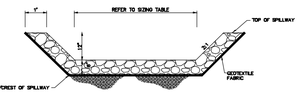


Basin Cross Section

NOTE:
1. ALL SIDE SLOPES SHALL NOT EXCEED 3:1
2. TOP OF EMBANKMENT SHALL BE 2' (MIN.) WIDTH AND 1' (MIN.) ABOVE TOP OF SPILLWAY.
3. SIDE SLOPES OF EMBANKMENT SHALL BE STABILIZED BY TEMPORARY SEEDING OR EROSION CONTROL BLANKETS AS DIRECTED BY THE ENGINEER.
4. REFER TO "PERMANENT STORMWATER BASIN SIZING" TABLE FOR VARIABLE SIZING.
5. PERIMETER SILT FENCE SHALL BE REMOVED IMMEDIATELY DOWNSTREAM FROM SPILLWAY AND REPLACED WITH E-FENCE.

Permanent Stormwater Basin

N.T.S. Source: VHB

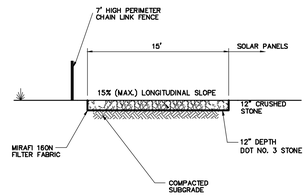


Spillway Cross Section

NOTE:
1. ALL SIDE SLOPES SHALL NOT EXCEED 2:1
2. TOP OF EMBANKMENT SHALL BE 2' (MIN.) WIDTH AND 1' (MIN.) ABOVE TOP OF SPILLWAY.
3. SIDE SLOPES OF EMBANKMENT SHALL BE STABILIZED BY TEMPORARY SEEDING OR EROSION CONTROL BLANKETS AS DIRECTED BY THE ENGINEER.
4. REFER TO "PERMANENT STORMWATER BASIN SIZING" TABLE FOR VARIABLE SIZING.
5. PERIMETER SILT FENCE SHALL BE REMOVED IMMEDIATELY DOWNSTREAM FROM SPILLWAY.

Stormwater Basin Spillway

N.T.S. Source: VHB

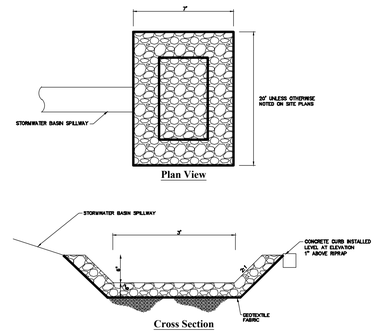


Notes:

1. CRUSHED STONE SHALL BE IN ACCORDANCE WITH THE CURRENT VERSION OF THE CONNECTICUT DEPARTMENT OF TRANSPORTATION SPECIFICATIONS FOR ROADS, BRIDGES, AND INCIDENTAL CONSTRUCTION.
2. ON-SITE ROCK MATERIAL SHALL BE CRUSHED AND USED IN THE CONSTRUCTION OF ACCESS ROAD TO THE MAXIMUM EXTENTS FEASIBLE.

Perimeter Access Cross Section

N.T.S. Source: VHB



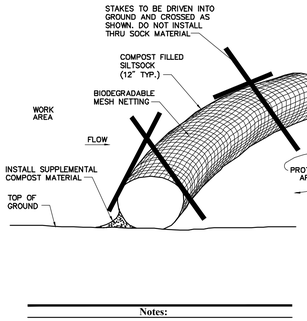
Plan View

Cross Section

NOTE:
1. SHALL BE INSTALLED AT THE OUTLET FROM EACH STORMWATER BASIN SPILLWAY.

Energy Dissipator

N.T.S. Source: VHB



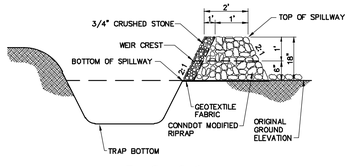
Notes:

1. SILTSOCK SHALL BE 12" DIAMETER FILTREXX SILTSOXX, OR APPROVED EQUAL.
2. SILTSOCKS SHALL OVERLAP A MINIMUM OF 12 INCHES.
3. SILTSOCK SHALL BE INSPECTED PERIODICALLY AND AFTER ALL STORM EVENTS, AND REPAIR OR REPLACEMENT SHALL BE PERFORMED PROMPTLY AS NEEDED.
4. COMPOST MATERIAL SHALL BE DISPERSED ON SITE, AS DETERMINED BY THE ENGINEER.
5. IF NON BIODEGRADABLE NETTING IS USED THE NETTING SHALL BE COLLECTED AND DISPOSED OF OFFSITE.

Compost Filter Sock (CFS)

8/12

N.T.S. Source: VHB LD_658

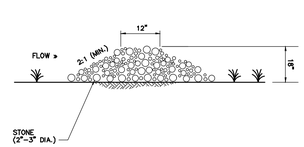


Trap Cross Section

NOTE:
1. ALL SIDE SLOPES SHALL NOT EXCEED 3:1
2. SIDE SLOPES OF EMBANKMENT SHALL BE STABILIZED BY TEMPORARY SEEDING OR EROSION CONTROL BLANKETS AS DIRECTED BY THE ENGINEER.
3. TRAP SHALL BE DRAINED AND CLEANED OF SEDIMENT ONCE SEDIMENT IS > 1' ABOVE TRAP BOTTOM.

Temporary Sediment Trap (TST)

N.T.S. Source: VHB



NOTES:

1. STONE CHECKDAM TO BE A PERMANENT STRUCTURE AFTER CONSTRUCTION.

Stone Check Dam

N.T.S. Source: VHB



PHOTOVOLTAIC INSTALLATION
Site Location: 117 Oil Mill Road, Waterford, CT 06385
Owner: GRE Gacrux, LLC
Attn: Jean-Paul LaMarche
363 Centennial Parkway, Suite 105
Louisville, CO 80027
IN CASE OF EMERGENCY CALL 911
WATERFORD POLICE DEPARTMENT - (860) 442-9451

Notes:

1. THE SITE FACILITY SIGN IS A DRAFT SHOWING THE MINIMUM AMOUNT OF INFORMATION THAT WILL BE PROVIDED. SIGN WILL BE 18" X 24".
2. ALL SIGNS WILL BE MOUNTED ONTO THE CHAIN LINK FENCE.

Danger and Site Facility Signs

1/16

N.T.S. Source: VHB

PERMANENT STORMWATER BASIN SIZING

NUMBER	BASIN TYPE	LENGTH AT BASIN BOTTOM (TOE OF SLOPE), FT	WIDTH AT BASIN BOTTOM (TOE OF SLOPE), FT	SIDE SLOPES	BOTTOM ELEVATION, FT	ELEVATION OF BOTTOM/CREST OF SPILLWAY, FT	SPILLWAY WIDTH AT BASE, FT	MINIMUM TOP OF BERM ELEVATION, FT
1	POND	25	95	3:1	190.0	193.0	2	195.0
2	INFILTRATION	15	100	3:1	227.5	231.0	4	232.5
3	SAND FILTER	40	80	3:1	224.0	226.5	2	228.5
4	POND	75	120	3:1	184.0	188.0	8	190.0
5	INFILTRATION	80	35	3:1	216.0	218.0	2	220.0
6	POND	50	50	3:1	205.0	209.0	3	210.5
7	INFILTRATION	20	40	3:1	223.0	226.0	2	227.5
8	SAND FILTER	50	100	3:1	186.0	188.5	1.5	191.0
9	POND	25	60	3:1	186.0	190.0	2	191.5
10	SAND FILTER	50	70	3:1	165.5	168.5	2	170.0
11	POND	15	65	3:1	148.0	152.0	2	153.5
12	POND	20	125	3:1	155.0	158.5	2	160.5
13	INFILTRATION	80	170	3:1	184.0	188.0	8	189.5
14	INFILTRATION	25	65	3:1	186.5	190.0	2	192.0
16	POND	55	250	3:1	189.0	195.5	10	197.0

DIVERSION SWALE SIZING

NAME	APPROXIMATE TRIBUTARY AREA, AC	APROXIMATE LENGTH, FT	BOTTOM WIDTH, FT	SIDE SLOPES	SWALE DEPTH, FT	LINING MATERIAL
1-1	2.2	160	1	3:1	1.5	ECB
2-1	0.5	360	1	3:1	1	ECB
4-1	0.2	210	1	3:1	1	ECB
5-1	0.9	140	1	3:1	1.5	ECB
6-1	0.1	60	1	3:1	1	ECB
7-1	0.1	60	1	3:1	1	ECB
8-1	0.4	170	2	3:1	1	ECB
8-2	0.1	120	1	3:1	1	ECB
9-1	0.6	70	1	3:1	1	ECB
10-1	0.5	160	2	3:1	1	ECB
11-1	0.2	50	1	3:1	1	ECB
11-2	0.2	80	1	3:1	1	ECB
12-1	0.1	40	1	3:1	1	ECB
12-2	1.5	40	1	3:1	1.5	ECB
13-1	0.4	60	1	3:1	1	ECB
14-1	0.3	280	1	3:1	1	ECB
14-2	0.3	150	2	3:1	1.5	15" RIPRAP
14-4	1.5	80	5	3:1	1.5	15" RIPRAP
16-2	4.1	400	6	3:1	2	15" RIPRAP
16-3	1.3	400	6	3:1	1	ECB

Sizing Tables for Temporary & Permanent Stormwater Features

N.T.S. Source: VHB

vhb.com
vhb
100 Great Meadow Road
Suite 200
Wethersfield, CT 06109
860.807.4300

Photovoltaic Installation

117 Oil Mill Road
Waterford, Connecticut

No.	Revision	Date	Appvd.
1	CTDEEP Comments	3/12/2020	SJK
2	CSC & CTDEEP Comments	7/28/2020	SJK
3	CSC D&M Plan	1/12/2021	SJK

Designed by Checked by

Issued for Date

Final Approvals December 2, 2019

Issued for Construction

Drawing Title

Site Details

Drawing Number

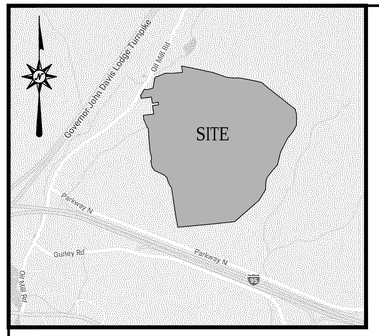
C-6.2

Sheet 43 of 43

Project Number 42496.00

LOCATION MAP

NOT TO SCALE



LEGEND

- Property Line
- Easement Line
- FEMA FIRM Zone Line
- Limit of Wetlands
- Stone Wall
- Fence
- Edge of Water
- Treeline
- Major Contour
- Minor Contour
- Transmisson Utility Pole
- Deciduous Tree
- Coniferous Tree

MAP REFERENCES

A. "PLAN OF BARRETT HEIGHTS PARK, WATERFORD, NEW LONDON COUNTY, CONNECTICUT", SCALE 1"=100', DATE 10/1926, PREPARED BY K.H. HOLMES, NEW LONDON, CT.

B. "LOCATION OF RIGHT OF WAY OF THE CONNECTICUT LIGHT & POWER COMPANY ACROSS THE PROPERTY OF SARAH S. HOLBROOK, TOWN OF WATERFORD COUNTY OF NEW LONDON, STATE OF CONNECTICUT", SCALE 1"=200', DATE 2/1943, SHEETS 1 & 2, MONTVILLE-FLANDERS LINE.

C. "SURVEY OF PROPERTY ON OIL MILL ROAD, TOWN OF WALLINGFORD, CONN. BELONGING TO ESTATE OF ROBERT A. BRUBECK", DATE 9/1949, SCALE 1"=100', PRFEPARED BY ERNEST L. DESHEFY, NEW LONDON, CT.

D. "PLAN OF SALTER PROPERTY, OIL MILL ROAD, WATERFORD, CONN", SCALE 1"=40', DATE 5/1956, PREPARED BY KENNETH H. HOLMES.

E. "PLAT OF LANDS OF ANNIE G. KRAVCHUCK, GILEAD & OIL MILL ROADS, WATERFORD CONN.", SCALE 1"=100', DATE 5/1981, PREPARED BY ROBERT L. BUCHER, NEW LONDON, CT.

F. "PROPERTY MAP PARCELS ABUTTING CLAM LANE AND FARGO ROAD, WATERFORD, CONNECTICUT, FOR: BERNHARD ASSOCIATES, NO. HAVEN, CT", SCALE 1"=100', DATE 4/7/1989, PREPARED BY CASCIO, BECHIR & ASSOCIATES, INC. NORTH HAVEN, CT.

G. "MONUMENTED PROPERTY SURVEY ON LAND OF MARIA G. POLIZZI, 101 OIL MILL ROAD, WATERFORD, CONNECTICUT", SCALE 1"=50,' DATE 1/15/2006, PREPARED BY ROBERT C. SIMONI, OLD SAYBROOK, CONNECTICUT.

GENERAL NOTES

1. A) THIS MAP HAS BEEN PREPARED IN ACCORDANCE WITH THE REGULATIONS OF CONNECTICUT STATE AGENCIES, SECTIONS 20-300b-1 THROUGH 20-300b-20 AND THE "STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ADOPTED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. ON SEPTEMBER 26, 1996.

   B) THIS PLAN CONFORMS TO HORIZONTAL ACCURACY CLASS A-2 AND TOPOGRAPHICAL ACCDURACY T-3.

   C) BOUNDARY DETERMINATION IS BASED UPON A FIRST SURVEY.

   D) THE TYPE OF SURVEY PERFORMED IS A PROPERTY/TOPOGRAPHIC SURVEY AND IS INTENDED TO DEPICT THE EXISTING CONDITIONS WITH RESPECT TO MONUMENTATION FOUND, STRUCTURES, EASEMENTS, ENCROACHMENTS, VISIBLE UTILITIES, ROADWAYS AND CONTOURS.

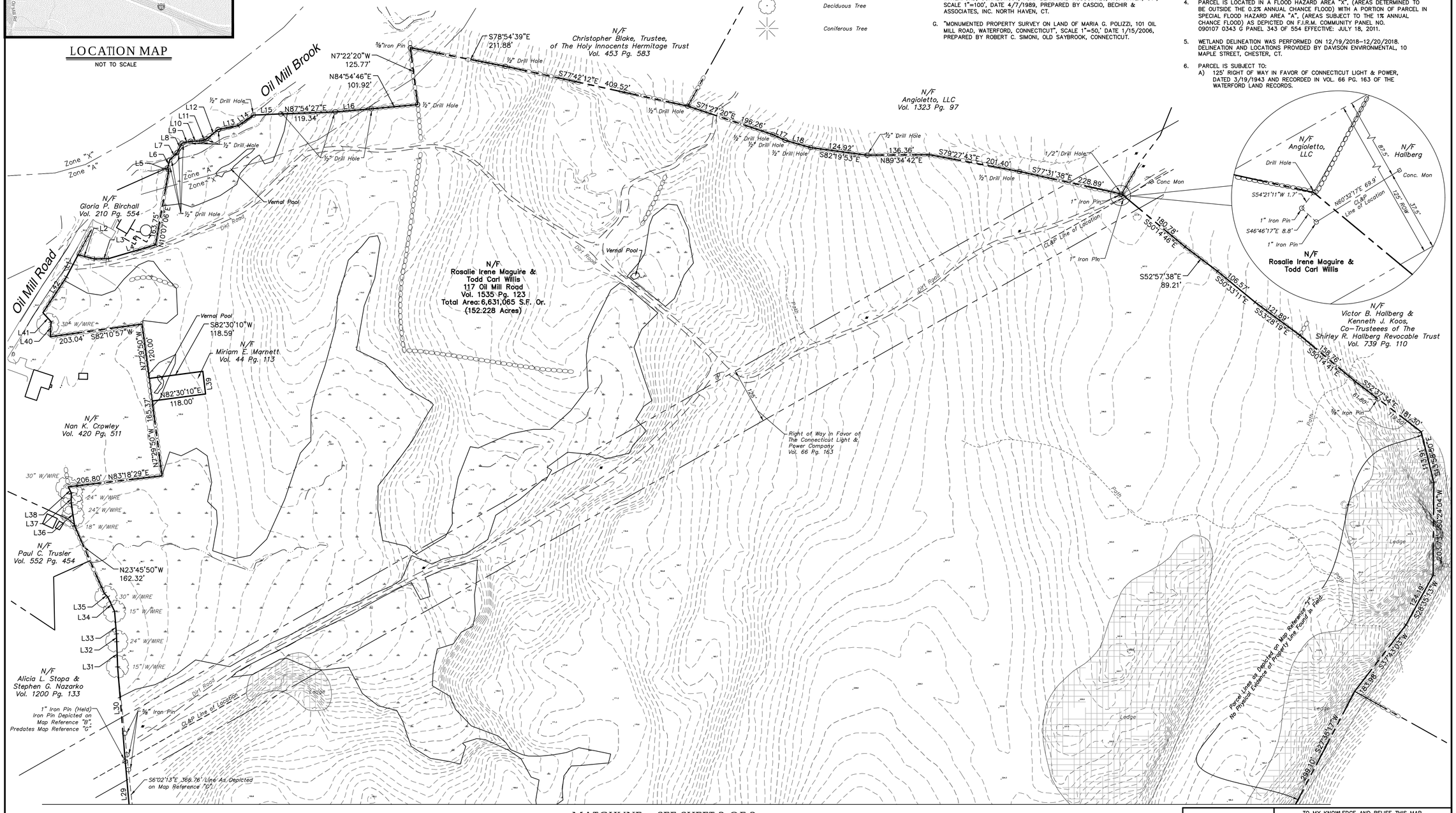
2. NORTH ARROW AND BEARINGS REFER TO NAD 83 AND ARE BASED ON GPS OBSERVATIONS PERFORMED BY BL COMPANIES ON 2/15/2018.

3. ELEVATIONS REFER TO NAVD 88 AND ARE BASED ON GPS OBSERVATIONS PERFORMED BY BL COMPANIES ON 2/15/2018.

4. PARCEL IS LOCATED IN A FLOOD HAZARD AREA "X", (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD) WITH A PORTION OF PARCEL IN SPECIAL FLOOD HAZARD AREA "A", (AREAS SUBJECT TO THE 1% ANNUAL CHANCE FLOOD) AS DEPICTED ON F.I.R.M. COMMUNITY PANEL NO. 090107 0343 G PANEL 343 OF 554 EFFECTIVE: JULY 18, 2011.

5. WETLAND DELINEATION WAS PERFORMED ON 12/19/2018-12/20/2018. DELINEATION AND LOCATIONS PROVIDED BY DAVISON ENVIRONMENTAL, 10 MAPLE STREET, CHESTER, CT.

6. PARCEL IS SUBJECT TO:
   A) 125' RIGHT OF WAY IN FAVOR OF CONNECTICUT LIGHT & POWER, DATED 3/19/1943 AND RECORDED IN VOL. 66 PG. 163 OF THE WATERFORD LAND RECORDS.



MATCHLINE ~ SEE SHEET 2 OF 2

GRAPHIC SCALE
100 50 0 100
SCALE IN FEET

TO MY KNOWLEDGE AND BELIEF THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

ROBERT H. ROPER L.S. #18469

NO CERTIFICATION IS EXPRESSED OR IMPLIED UNLESS THIS MAP BEARS THE ORIGINAL SIGNATURE AND EMBOSSED SEAL OF THE ABOVE NAMED LAND SURVEYOR.

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Architecture
Engineering
Environmental
Land Surveying

BL Companies

355 Research Parkway
Meriden, CT 06450
(203) 630-1406
(203) 630-2615 Fax

ROSALIE IRENE MAGUIRE &
TODD CARL WILLIS
117 OIL MILL ROAD
WATERFORD, CONNECTICUT

REVISIONS

No.	Date	Desc.

Surveyed	AV/SB
Drawn	AV
Reviewed	RHR
Scale	1"=100'
Project No.	17D3515
Date	2/22/2018
Field Book	519
CAD File: BS17D351501	

Title

PROPERTY SURVEY

Sheet No. 1 OF 2

BS-1

Jun 12, 2018 3:19pm zach.ehr G:\17D3515\17D3515DWG\BS17D351501.dwg Layout: BS ANSI B | 1 of 2

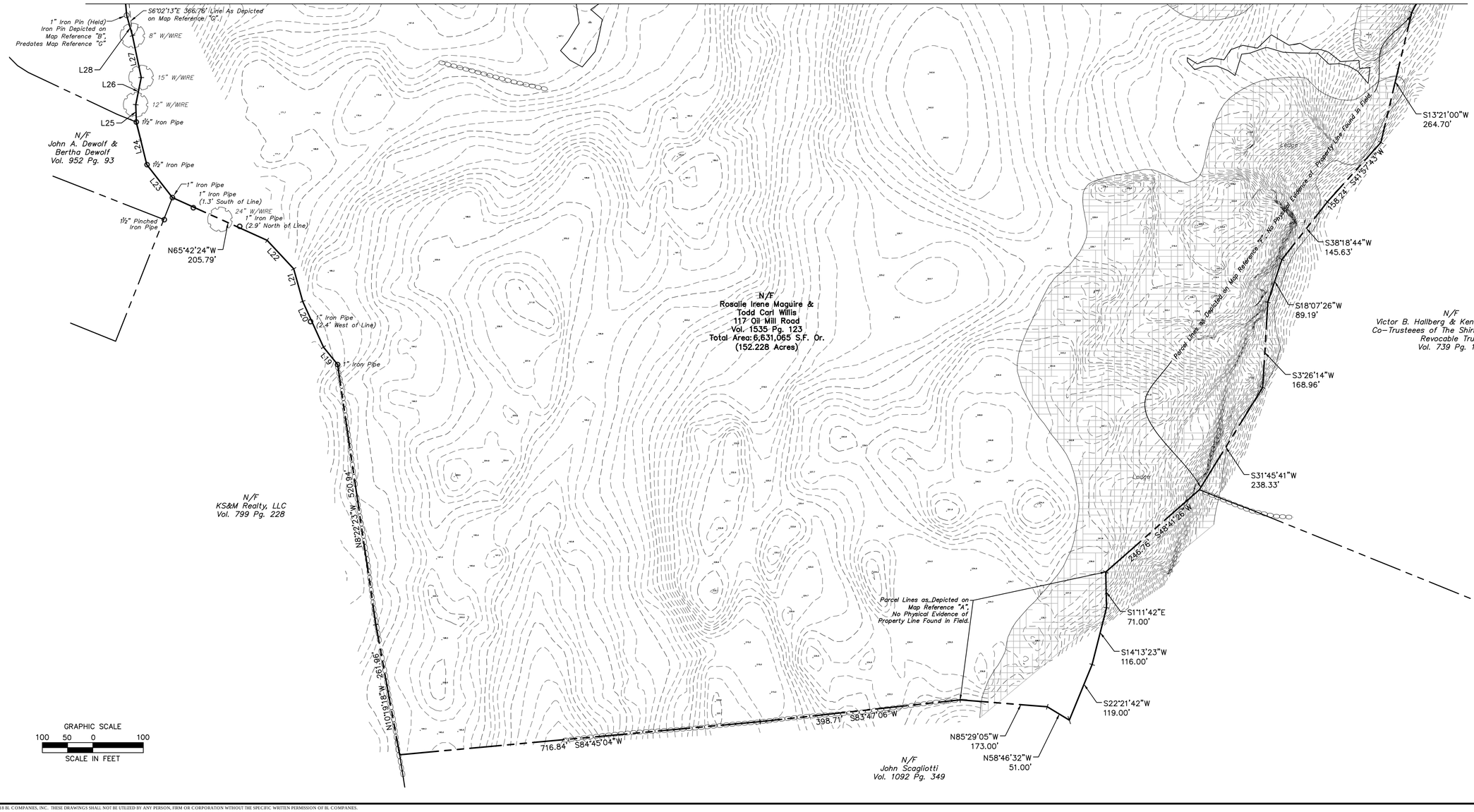
Xref GS - XS17D351501-100 scale - XS17D351501

Line Table			Line Table			Line Table		
Line #	Direction	Length (ft)	Line #	Direction	Length (ft)	Line #	Direction	Length (ft)
L1	N 27° 59' 52" E	55.18	L15	N 87° 27' 40" E	60.38	L29	N 05° 02' 35" W	117.66
L2	S 75° 32' 39" E	36.59	L16	N 85° 03' 09" E	79.20	L30	N 04° 37' 15" W	207.69
L3	N 88° 48' 53" E	31.12	L17	S 65° 18' 56" E	29.37	L31	N 02° 01' 32" W	55.03
L4	N 73° 31' 18" E	107.42	L18	S 73° 57' 46" E	58.40	L32	N 02° 20' 19" W	17.34
L5	N 13° 15' 04" W	8.28	L19	N 39° 05' 54" W	44.40	L33	N 04° 38' 16" W	49.37
L6	N 14° 24' 24" E	17.08	L20	N 24° 21' 09" W	99.55	L34	N 25° 21' 29" W	34.74
L7	N 45° 11' 11" E	22.36	L21	N 15° 27' 19" W	66.91	L35	N 43° 52' 10" W	10.74
L8	N 27° 32' 22" E	23.84	L22	N 42° 58' 29" W	77.22	L36	N 08° 25' 41" W	50.50
L9	N 77° 52' 03" E	19.12	L23	N 37° 52' 55" W	82.77	L37	N 00° 39' 54" E	21.55
L10	N 88° 03' 07" E	24.45	L24	N 13° 49' 05" W	86.87	L38	N 25° 32' 45" W	15.38
L11	N 67° 30' 14" E	12.22	L25	N 01° 44' 11" W	34.34	L39	N 06° 49' 36" W	50.00
L12	N 50° 13' 40" E	32.18	L26	N 11° 25' 11" E	54.86	L40	N 03° 05' 11" E	33.00
L13	N 79° 16' 06" E	45.36	L27	N 11° 52' 16" W	84.79	L41	N 42° 00' 53" W	26.55
L14	N 54° 51' 09" E	39.98	L28	N 15° 50' 40" W	42.11	L42	N 33° 17' 06" E	93.49

LEGEND

- Property Line
- Easement Line
- FEMA FIRM Zone Line
- Limit of Wetlands
- Stone Wall
- Fence
- Edge of Water
- Treeline
- Major Contour
- Minor Contour
- Transmisson Utility Pole
- Deciduous Tree
- Coniferous Tree

MATCHLINE ~ SEE SHEET 1 OF 2



GRAPHIC SCALE
100 50 0 100
SCALE IN FEET

Architecture
Engineering
Environmental
Land Surveying

BL Companies

355 Research Parkway
Meriden, CT 06450
(203) 630-1406
(203) 630-2615 Fax

ROSALIE IRENE MAGUIRE &
TODD CARL WILLIS
117 OIL MILL ROAD
WATERFORD, CONNECTICUT

REVISIONS

No.	Date	Desc.

Surveyed	AV/SB
Drawn	AV
Reviewed	RHR
Scale	1"=100'
Project No.	17D3515
Date	2/22/2018
Field Book	519
CAD File: BS17D351501	

Title

PROPERTY SURVEY

Sheet No. 2 OF 2

BS-1

Jun 12, 2018 1:13pm archaffer:C:\17D3515\17D3515.DWG; BS17D351501.dwg
Layout: BS-1 24X36 2 OF 2

Xref's: XS17D351501-100 scale: XS17D351501

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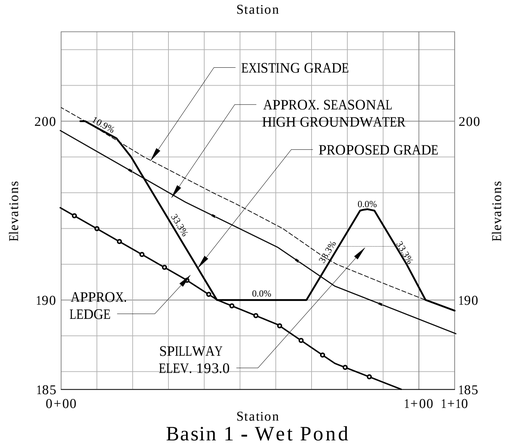
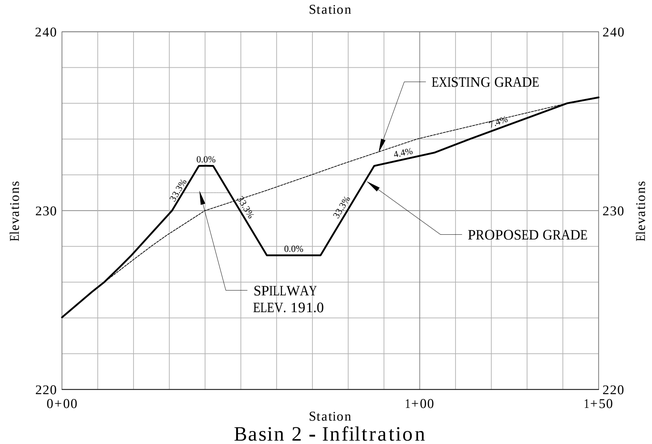
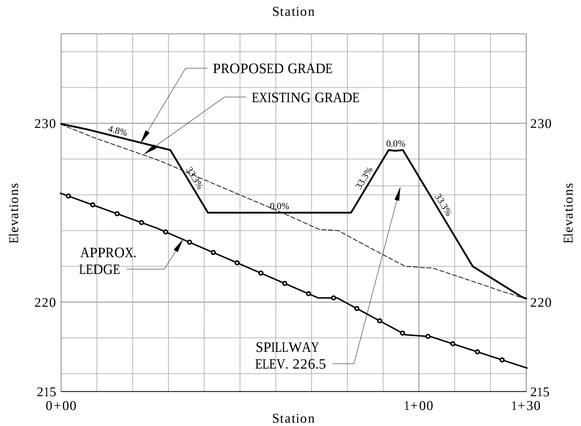
Appendix G
Basin Profiles & Offsite Watershed Map



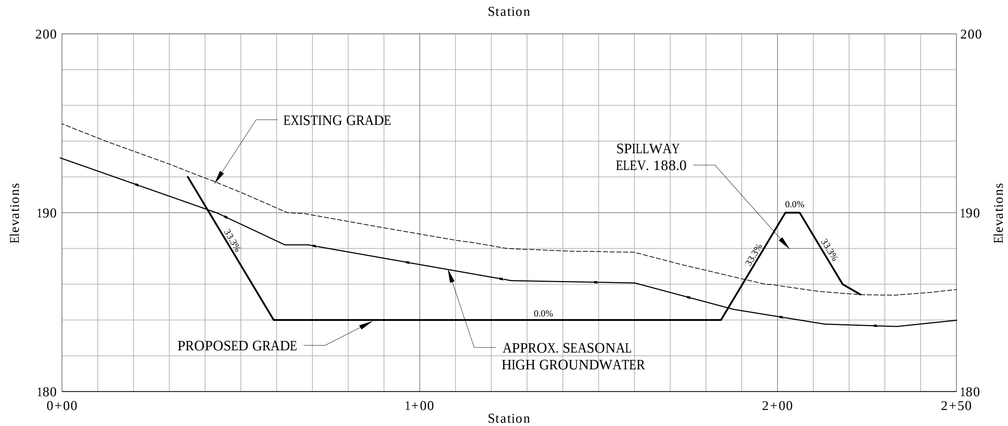
Basin 1 - Wet Pond



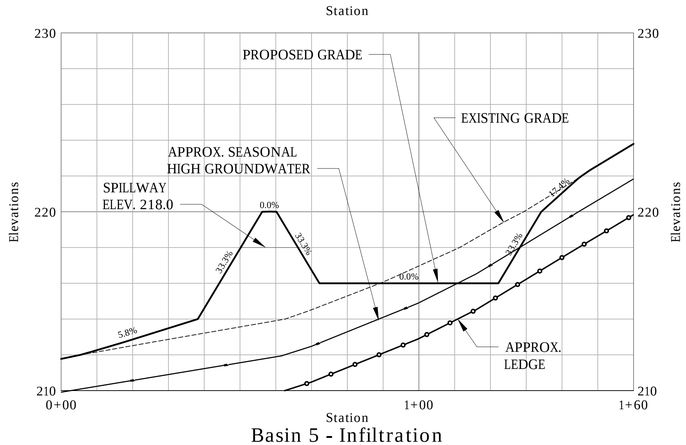
Basin 2 - Infiltration



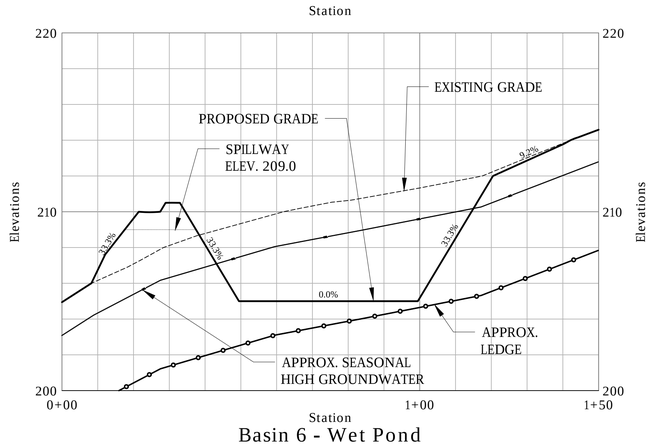
Basin 3 - Sand Filter



Basin 4 - Wet Pond



Basin 5 - Infiltration



Basin 6 - Wet Pond

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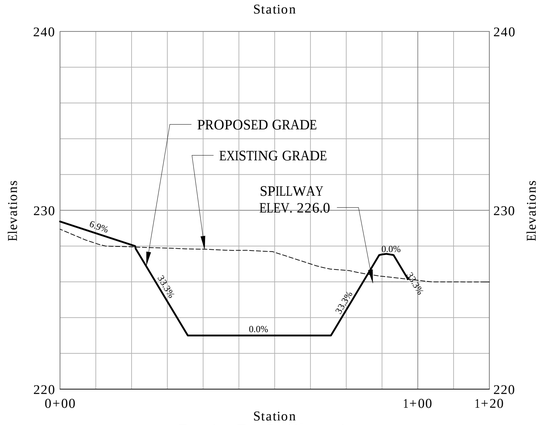
Drawing Title: Basin Profiles

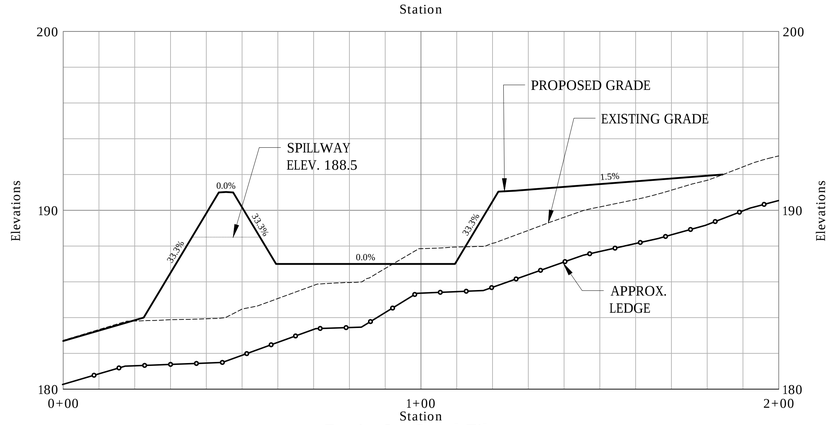
Drawing Number: BP-1

Sheet 1 of 3

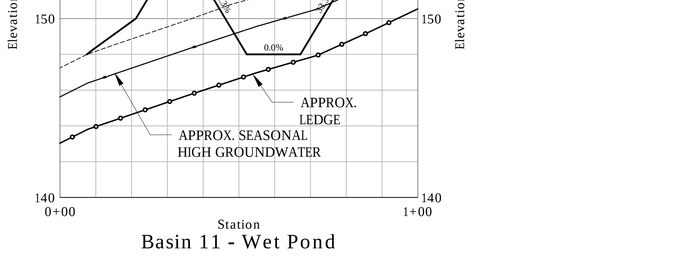
Project Number: 42496.00



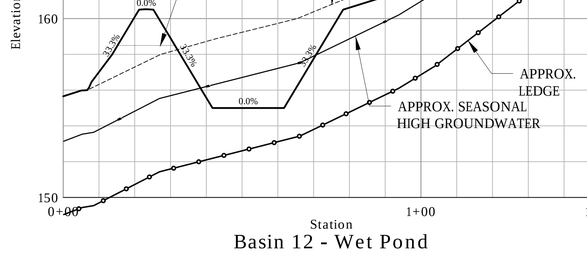
Basin 7 - Infiltration



Basin 8 - Sand Filter



Basin 9 - Wet Pond



Basin 10 - Sand Filter

Basin 11 - Wet Pond

Basin 12 - Wet Pond

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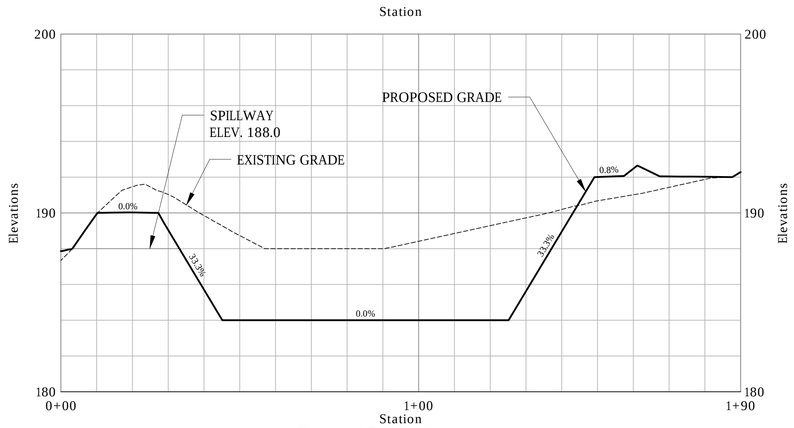
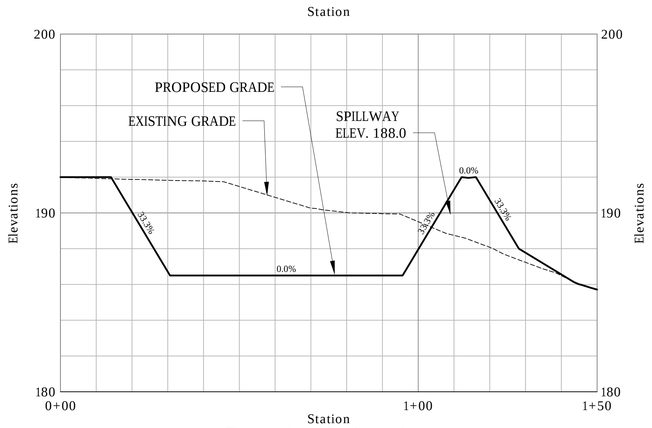
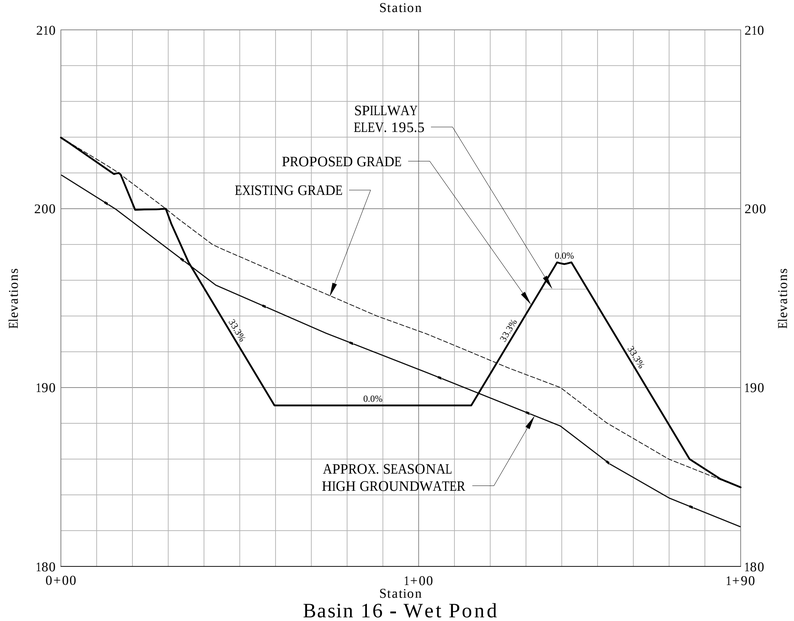


Basin 13 - Infiltration



Basin 14 - Infiltration



Basin 16 - Wet Pond

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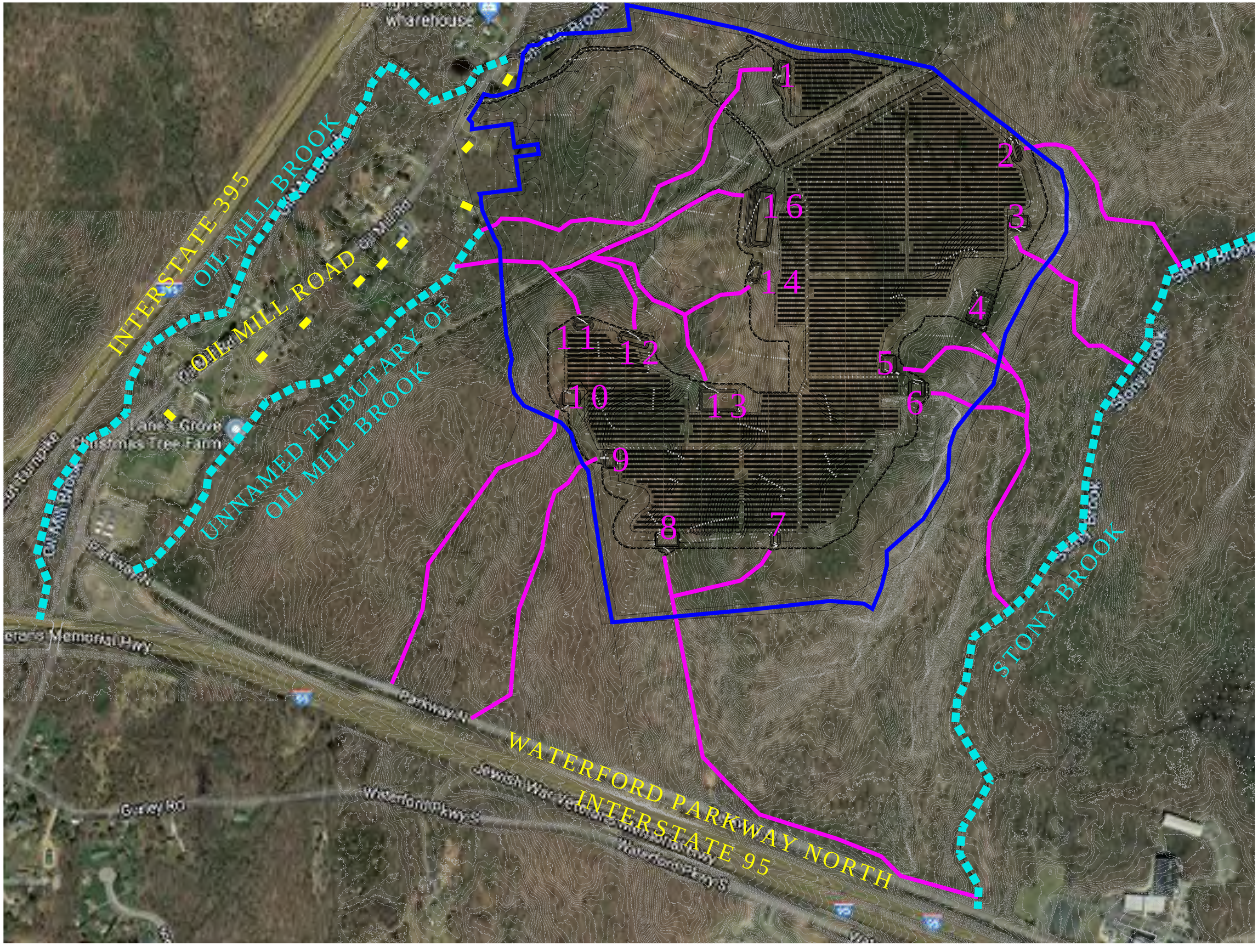
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