

November 12, 2024



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Consulting Engineers & Surveyors
33 West Elm Street
Greenwich, CT 06830

City of Stamford
Engineering Department
Stamford Government Center
888 Washington Blvd.
Stamford, CT 06901
Att.: Susan Kiskien: Coordinator of Inspections & Plans Review

Re: Property of Adam Aglietti
0 South Brook Drive Lot No. 13
Stamford, CT

Dear Susan Kiskien,

Enclosed you will find a copy of the site development plan application showing revisions in response to your comments dated September 19, 2024 for the above referenced property.

- 1) *A formal address for the property shall be obtained from the Engineering Department. An application for a formal address for the property was submitted to the Engineering Department.*

An request for a formal address for the property has been submitted to the Engineering Department.

- 2) *Provide an existing conditions survey in accordance with the City of Stamford Stormwater Drainage Manual. Survey shall be based on NAVD88 datum, and signed and sealed by a surveyor licensed in the State of Connecticut.*

The existing conditions survey has been resubmitted. An assumed datum was used for the survey. The as-built survey will be based on NAVD88 datum, and signed and sealed by a surveyor licensed in the State of Connecticut.

- 3) *Is there any proposed pool patio or other patios or walks.*

There are no additional patios or walks that are being proposed. What is shown is what is

Proposed.

- 4) *TP#1 located near the proposed raingarden indicates hardpan as the restrictive layer. Bottom of raingarden shall be set at least one foot above the restrictive layer. If the stone and other material below the system is used for storage, the bottom of the stone and material needs to be at least one foot above the restrictive layer.*

The rain garden is for filtration purposes only. We are taking no storage or infiltration credit in the rain garden. An impermeable polyliner will be provided and is shown on the revised rain garden detail. Therefore, separation from the restrictive layer is not required.

- 5) *Cultec system shall be set at least one foot above the restrictive layer. If the stone below the system is used for storage, the bottom of the stone needs to be at least one foot above the restrictive layer.*

The proposed cultec is a minimum of one foot above the restrictive layer.

The proposed bottom of stone inv. is at 93.0, and the restrictive layer is found at elevation 92.0. The restrictive layer (mottling/hardpan) is at 92.0.

- 6) *Provide cleanouts for roof drainage system. Label plan accordingly.*

Cleanouts to finished grade for the roof drainage system have been added to the plans.

- 7) *Provide additional top and bottom of wall elevations.*

Additional top and bottom of wall elevations have been added to the plan. The wall height is proposed to not exceed 4 feet.

- 8) *Roof drainage that discharges at grade shall be supplied with splash pads.*

All roof leaders are to be routed towards the cultec system. No roof leaders will discharge at grade. Additional roof leaders have been added in the front of the property to help route water towards the cultec in the rear.

- 9) *Identify concrete wash down area.*

A typical concrete wash down area has been added to the erosion control plan.

10) Show all proposed utilities.

Approximate location of proposed utilities, including gas and electric, have been added to the site plan. These locations will be verified and finalized in the field.

11) Show location and outfall for any proposed footing drain. Footing drain drainage shall be in accordance with the City of Stamford Stormwater Drainage Manual.

A footing drain location has been added to the site plan in accordance with the City of Stamford Stormwater Drainage Manual.

12) Provide maintenance schedule for stormwater management systems on plan.

The proposed maintenance schedule for stormwater management systems has been added to the details & notes sheet.

13) Provide clear detail of raingarden with proposed grades.

The detail of the proposed raingarden has been revised.

14) Show proposed polyliner on raingarden detail.

The proposed polyliner has been added to the raingarden detail.

15) Provide one foot of free board in the raingarden and emergency overflow.

The raingarden has been revised to provide emergency overflow and one foot of free board.

16) Provide pavement detail for driveway.

A typical pavement detail for the driveway has been added to the details & notes sheet.

17) Provide curb detail for driveway.

A typical curb detail for the driveway has been added to the details and notes sheet.

18) Provide standard City of Stamford trench repair detail.

The standard City of Stamford trench repair detail has been added to the details & notes sheet.

19) Provide junction box detail.

There is a proposed junction box detail on the details and notes sheet.

20) Provide retaining wall detail.

A typical detail for the retaining wall has been added to the details and notes sheet.

21) Provide sight distance for proposed driveway.

Sight distance has been added to the sight plan. 200' of sight distance is shown running in both directions.

22) Provide additional spot elevations around the dwelling to ensure positive drainage.

Additional spot elevations around the dwelling have been added to the site plan to ensure positive drainage.

23) There shall be no catchment structure to catchment structure connections.

The site plan has been revised to have no catchment-to-catchment structure connections.

24) Trench drain shall discharge into a structure supporting a 2-foot sump with elbow on the outlet pipe.

A junction box with a 2' sump and outlet elbow has been added to the site plan at the point of discharge for the trench drain.

25) Level spreader is subject to freezing. Increase depth of stone or include other modifications.

The Level Spreader is now being proposed to have 42" of gravel trench down to the frost layer.

26) Will the proposed raingarden or cultec system result in hydrostatic pressure on the wall?

The wall will be designed to be able to handle the hydrostatic pressure from the drainage structures. See the retaining wall detail on the details and notes sheet for reference.

27) TC's for existing condition shall not be less than proposed. Calculate existing TC.

The TC for existing conditions is 10.8 minutes. The TC for proposed conditions is 9.7 minutes. The existing TC is longer/higher than the proposed TC.

28) Provide DT#9 data on plan.

DT#9 data is shown on the plan set.

29) No pipe bend shall exceed 45 degrees. Provide note on drawing.

A note has been provided on the plan calling for no pipe bends to exceed 45 degrees.

30) Review all notes as they pertain to this site. Revisions are warranted.

Notes have been reviewed as they pertain to this site.

31) Provide drawdown calculation for rain garden.

The rain garden is for filtration purposes only. We are taking no storage or infiltration credit in the rain garden. Therefore, drawdown calculations are not necessary for this system.

32) Is there any proposed low flow pipe for cultec system?

There is no low flow pipe for the cultec system.

33) Clarify how the easterly portion of the roof drainage is tributary to the cultec system.

An additional roof leader manifold has been added to the front of the house to direct flow towards the cultec system in the rear.

34) Provide pipe conveyance calculations showing proposed flow and pipe capacity provided.

Pipe conveyance calculations have been resubmitted showing compliance.

35) Health Department approval will be required.

It is acknowledged that Health Department approval will be required for this application.

36) The Engineering Department reserves the right to make additional comments once revised drawing and drainage report are received.

It is acknowledged that the Engineering Department reserves the right to make additional comments once revised drawings and drainage reports are received.

Please contact us should you have any questions regarding this matter.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert W. Flood". The signature is written in a cursive, flowing style.

Robert W. Flood, EIT
Assistant Project Engineer



City of Stamford
Engineering Bureau
888 Washington Boulevard, 7th Floor Stamford, CT 06901
Phone 203-977-4189

CHECKLISTS

Project Name: Adam Aglietti
Project Address 13 South Brook Drive
Property Owner(s) Adam Aglietti
Tax Account Number(s) 004-0002
Engineer's Signature *[Signature]* Date: 11/12/2024

All checklists must be completed and submitted. Provide a brief explanation for any items not provided. Check boxes as completed or N/A as not applicable.

✓	Existing Conditions Plan
✓	Stormwater Management Report
✓	Stormwater Management Plan / Construction Plan
	Certificate of Occupancy

Checklist for Existing Conditions Plan

I. General Information

✓	Site address
✓	Orientation, block, zone, City, street name
✓	Applicant name and legal address
✓	Surveyor name, address, contact information
✓	North arrow, bar scale, horizontal and vertical datum
✓	24" x 36" sheet size unless otherwise approved
✓	Existing conditions survey shall be prepared in accordance with the Minimum Standards for Surveys and Maps in the State of Connecticut. The class of survey shall be A-2 and T-2 and shall be represented as such on the map. The base map shall be sealed and signed by a Professional Land Surveyor licensed in the State of Connecticut.
✓	Drawing scale shall be set at 1" = 20' or 1" = 40' when possible



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II. Existing Conditions Plan Elements

✓	Show and label all property boundaries with linear bearing / distances and curve information
✓	Required zoning setbacks
✓	Show and label monument information
✓	Show and label at least one permanent benchmark on the parcel with northing, easting and elevation
✓	Label adjacent property ownership information
	Existing contours based on NAVD 88 (no exceptions) at 2 foot contour interval or 1 foot contour interval when slope is flatter than 2 percent at a minimum of 20 ft. beyond the property boundaries of the subject parcel
✓	Show spot elevations at low points, high points, and where topography is flatter than 2 percent
✓	All buildings and structures (label current use and finished floor elevations)
✓	All pavement, parking, driveways, property access points
✓	All roadways, streets, and rights-of-way. Label streets as public or private with street name
✓	All patios, decks, walkways, sidewalks, curb ramps (both adjacent to and opposite and existing roadways or intersections)
✓	Show and label (size, material, inverts) all existing utilities (overhead and underground) within the right-of-way and the project site (label ownership) including but not limited to water, gas and electrical services, wells, storm sewers, sanitary sewers and subsurface sewerage disposal systems.
✓	Show and label existing conveyance systems (swales, ditches, storm drains) including dimensions, elevations, sizes, slopes, and direction of flow
✓	Show and label boundaries of all easements, both public and private, with type, owner, and width
✓	Show and label all other existing features and improvements (e.g. light poles, mature trees of 8" (dbh) diameter or greater, vegetation, walls with top and bottom elevations, fences, pavement markings)

III. Resource Areas

✓	Show and label limits of inland wetlands, tidal wetlands and any associated setbacks.
✓	Show and label existing natural site features including tree canopy, outcroppings, permanent and intermittent watercourses, waterbodies, streams
✓	Show and label limits of floodplain and floodway along with FIRM references (Community Number, Panel, Suffix, and Date) including any effective Letters of Map Revision/Amendment, zone designation and elevation.
✓	Show and label any Conservation Easement Areas
✓	Show and label Connecticut Coastal Jurisdiction Line (CJL)
✓	Show and label existing steep slopes (25% and greater)



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Checklist for Stormwater Management Report

I. Project Report

A. Applicant / Site Information

✓	Applicant name, legal address, contact information (email & phone)
✓	Engineers name, legal address, contact information (email & phone)
✓	Site address and legal description
✓	Current / proposed zoning and land use
✓	Site vicinity map (8.5" x 11")

B. Project Description and Purpose

✓	Project description including proposed project elements and anticipated construction schedule
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C. Existing Conditions Description

✓	Site area, ground cover, vegetation, features (roads, buildings, utilities, etc.)
✓	Site topography, slopes, drainage patterns, conveyances systems (swales, storm drains, etc.), stormwater discharge locations
✓	Receiving waterbody information including stormwater impairments and TMDL information (See the most recent State of Connecticut Integrated Water Quality Report)
✓	Site soils information including soil types, hydrologic soil group, bedrock / outcroppings, groundwater elevation, significant geologic features
✓	Provide NRCS Soils Mapping
✓	Resource protection areas (wetlands, streams, lakes, etc.), buffers, floodplains, floodways

D. Summary of Applicable General Design Criteria

✓	Methodology, design storm frequency
✓	Hydrologic design criteria
✓	Hydraulic design criteria
✓	Flood hazard areas

	<u>Applying under "Lite" Stormwater Management: Skip to Section I</u> (Refer to Flow Chart on page vii of the City of Stamford Stormwater Drainage Manual)
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E. Project Type in Accordance with Standard 1 Definitions

✓	Area of disturbance, receiving waterbody classification (High Quality, Tidal Wetlands, Direct Waterfront)
✓	Project type (development, redevelopment, linear development)
✓	Pollutant reduction standard per flowchart Section 2.4



F. Summary of LID Site Constraints

✓	Description of sensitive areas for protection
✓	Mature tree inventory, which shall include 8-inch (dbh) diameter trees or greater
✓	Steep slopes
✓	Ledge and bedrock depth
✓	Seasonal high groundwater elevation
✓	Pollutant hotspots
✓	Summary of infiltration rates

G. Summary of Proposed Stormwater Treatment Practices

✓	Proposed LID controls (i.e. minimize impervious, minimize DCIA, minimize disturbance, increase time of concentrations, other LID controls and strategies)
✓	Location, size, types
✓	Design criteria and references
✓	Stormwater treatment practice, drainage area characteristics / details

H. Summary of Compliance with Standards 1

✓	Required pollutant reduction criteria
✓	Provided pollutant reduction (WQV) by stormwater treatment practice
✓	Summary of compliance with Standard 1

I. Summary of Compliance with Standards 2, 3, and 4

✓	Description of proposed stormwater management system
✓	Pre-development site hydrology with delineation of each watershed area and sub-basin
✓	Post-development site hydrology with delineation of each watershed area and sub-basin
✓	Comparison table of pre- and post-development hydrology, peak flow, volume, and percent difference
✓	Summary table of watershed areas and sub-basin areas, time of concentration and runoff coefficients
	Summary table demonstrating the 2-year, 24-hour post development peak flow rate is less than or equal to the lowest of either: - The pre-development 1-year, 24-hour storm peak flow rate - 50 percent of the pre-development 2-year, 24-hour storm peak flow rate
✓	Conveyance protection, emergency outlet sizing
✓	Hydraulic grade line summary and tail water elevation used in analysis
✓	Construction erosion and sediment control description, Standard 3
✓	Operation and Maintenance, maintenance tasks and schedule on construction plans per Standard 4



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J. Summary of Compliance with Applicable Drainage Facility Design Requirements

✓	Description of applicable design requirements and compliance
✓	Description of proposed drainage facilities and compliance

K. Stormwater Management Report

✓	Signed and stamped by professional engineer licensed in the State of Connecticut
✓	Drainage impact statement in accordance with Standard 5B.

II. Supporting Calculations (as appendix to Project Report)

	<u>Applying under "Lite" Stormwater Management: Skip to Section N</u>
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L. Water Quality Volume / Water Quality Flow Calculations

✓	Calculations demonstrating the total Water Quality Volume generated by the post-development site and the required retention/treatment volume per Standard 1 in cubic feet.
✓	Calculations demonstrating the total Water Quality Volume retained/treated by each stormwater treatment practice and the total Water Quality Volume generated by the post-development contributing drainage area to each stormwater treatment practice

M. Stormwater Treatment Practice Sizing Calculations

	Calculations demonstrating how each stormwater treatment practice has been designed and sized in accordance with the Structural Stormwater BMP Design references in Appendix B. Calculations will vary by stormwater treatment practice, but a minimum, applicants shall provide calculations in accordance with design criteria from the Connecticut Stormwater Quality Manual.
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N. Hydrologic and Hydraulic Design Calculations

	Stream channel protection, Standard 2A
✓	Conveyance protection, Standard 2B
✓	Peak flow control (1-year, 2-year, 5-year, 10-year, 25-year, and 50-year storms), Standard 2C
✓	Inlet analysis
	Gutter flow (Site by site basis as requested by Engineering Bureau)
✓	Storm sewers and culverts (velocities, capacity, hydraulics)
	Hydraulic grade line required when pipe is flowing at full capacity <ul style="list-style-type: none"> ○ Provide existing and proposed summary table ○ Provide existing and proposed mapping, label structures
	Detention facilities (outlet structure, stage/storage, freeboard)
	Emergency outlet sizing, safely pass the 100 year storm, Standard 2D
	Outlet protection calculations, based on conveyance protection (i.e. riprap, energy dissipater)



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O. Hydrologic and Hydraulic Model, Existing and Proposed

✓	Drainage routing diagram
✓	Summary
✓	Storage pond input

P. Downstream analysis (Site by site basis as required by the Engineering Bureau)

	Downstream analysis, Standard 2E
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III. Supporting Mapping (as appendix to Project Report)

Q. Pre-Development Drainage Basin Area Mapping

✓	11" x 17" or 8.5" x 11" sheet size
✓	Topography, drainage patterns, drainage area boundaries and sub basins, flow paths, times of concentration
✓	Locations of existing stormwater discharges
✓	Perennial and intermittent streams, wetlands, and floodplain / floodways
✓	NRCS soil types, locations, boring locations, infiltration testing locations
✓	Vegetation and groundcover
✓	Existing roads, buildings, driveways, parking areas, walks, patios, pools and other impervious surfaces, decks and other structures
✓	Location, size, type of existing structural stormwater controls, facilities and conveyance systems

R. Post-Development Drainage Basin Area Mapping

✓	11" x 17" or 8.5" x 11" sheet size
✓	Topography, drainage patterns, drainage area boundaries and sub basins, flow paths, times of concentration
✓	Locations of proposed stormwater discharges
✓	Perennial and intermittent streams, wetlands, and floodplain / floodways
✓	NRCS soil types, locations, boring locations, infiltration testing locations
✓	Vegetation, ground cover and proposed limits of clearing/disturbance
✓	Proposed, roads, buildings, driveways, parking areas, walks, patios, pools and other impervious surfaces, decks and other structures
✓	Location, size, type of proposed structural stormwater controls, facilities and conveyance systems

IV. DCIA Tracking Worksheet (as appendix to Project Report)

✓	DCIA Tracking Worksheet (Use form found in Appendix E)
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V. Proposed LID Review Map

	Applying under "Lite" Stormwater Management - Proposed LID Review Map NOT required.
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A. General

	Site address
	Applicant name, legal address, contact information
	Engineers name, address, contact information
	North arrow, bar scale, horizontal and vertical datum
	Drawing scale shall be set at 1"=20' or 1"=40' when possible
	Signed and stamped by a Licensed Professional Engineer in the State of Connecticut
	11" x 17" or 24" x 36" sheet size unless otherwise approved
	Existing and proposed contours based on NAVD 88 at 2 foot contour interval or 1 foot contour interval when slope is flatter than 2 percent
	Locations of existing stormwater discharges
	Roads, buildings, driveways, parking areas, walks, patios, pools and other impervious surfaces, and decks and other structures
	Location, size, ownership of stormwater conveyance systems (swales, pipes, etc.)

B. LID Constraints:

	Boring / test pit locations
	Infiltration testing locations and results
	Vegetation and proposed limits of clearing / disturbance
	NRCS soils mapping
	Steep slopes
	Surface waters / Perennial and intermittent streams
	Resource protection areas and buffers, wetlands, floodplain / floodways
	Existing vegetation and mature trees, which shall include 8-inch (dbh) diameter trees or greater
	Poor soils (HSG C & D)
	Shallow bedrock / ledge
	Seasonal high groundwater elevation
	Other site constraints (e.g. brownfield caps)

C. Proposed Stormwater Treatment Measures:

	Location, size, type, limits, and WQV provided by each proposed stormwater treatment practices
	Drainage area to each proposed stormwater treatment practice (total area, impervious area, WQV)

D. Site Summary Table:

	Total site area, disturbed area, pre- and post-development impervious areas
	Required pollutant reduction volume (retention or detention)
	Provided pollutant reduction volume (retention or detention)



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Checklist for Stormwater Management Plan / Construction Plans

A. General

✓	Site orientation, address and legal description
✓	Applicant name, legal address, contact information
✓	Engineers name, address, contact information
✓	North arrow, bar scale, horizontal and vertical datum
✓	Drawing scale shall be set at 1"=20' or 1"=40' when possible
✓	Stamped by a Licensed Professional Engineer in the State of Connecticut
✓	24" x 36" sheet size unless otherwise approved

B. Site Development Plans

✓	City of Stamford Standard Notes
✓	As required by the Drainage Maintenance Agreement, provide a written narrative describing the nature of the proposed development activity and the program for operation and maintenance of drainage facilities and control measures throughout the life of the project.
✓	Existing and proposed contours based on NAVD 88 at 2 foot contour interval or 1 foot contour interval when slope is flatter than 2 percent
✓	All required spot elevations to clearly depict positive pitch
✓	Top and bottom elevation of all walls
✓	Roads, buildings, driveways, parking areas, walks, patios, pools and other impervious surfaces, and decks and other structures
✓	All utilities and easements
✓	Location, size, maintenance access, type of proposed structural stormwater controls and facilities with elevations and inverts
✓	Location, size, maintenance access, type of proposed non-structural stormwater controls and facilities with elevations and inverts
✓	Location, size, type of proposed stormwater infrastructure, inlets, manholes, infiltration and detentions systems, control structures with elevations and inverts
✓	Location, size, ownership of stormwater conveyance systems (swales, pipes, etc.) with elevations and inverts
✓	Identify roof leaders, curtain drains and foundation drains with elevations and inverts
✓	Proposed water quality treatment systems, size and model type
✓	Final stabilization measures which may include slope stabilization

C. Erosion and Sedimentation Control Plan

✓	Phasing and schedule
✓	Construction access and staging and stock pile areas
✓	Operation and maintenance of erosion and sedimentation controls
✓	Tree protection
✓	Downstream protection such as location of silt fencing
✓	Limit of disturbance
✓	Construction fencing



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D. Construction Details

✓	Standard City of Stamford details
✓	Infiltration system details
✓	Control structure details
✓	Water quality treatment details
✓	Infiltration testing results

Checklist for Certificate of Occupancy

	Final Improvement Location Survey
	Stormwater Management Certification Form
	Final DCIA Tracking Worksheet
	Standard City of Stamford Drainage Maintenance Agreement (Agreement Covenant)

Other Certifications at the discretion of the Engineering Bureau and/or EPB

	Wall Certification
	Landscape Certification
	Landscape Maintenance Agreement
	Waiver Covering Storm Sewer Connection
	Waiver Covering Granite Block, Depressed Curb, and Driveway Aprons
	Flood Certification

Drainage Summary Report

Property of Adam Aglietti

13 South Brook Drive

Stamford, Connecticut

November 11, 2024

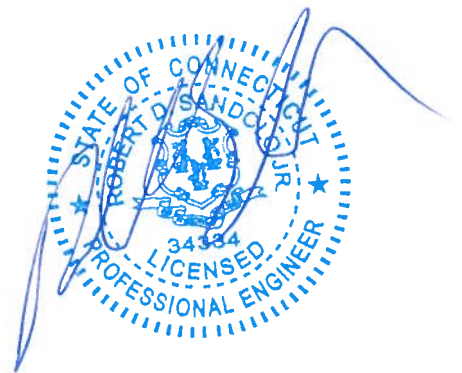


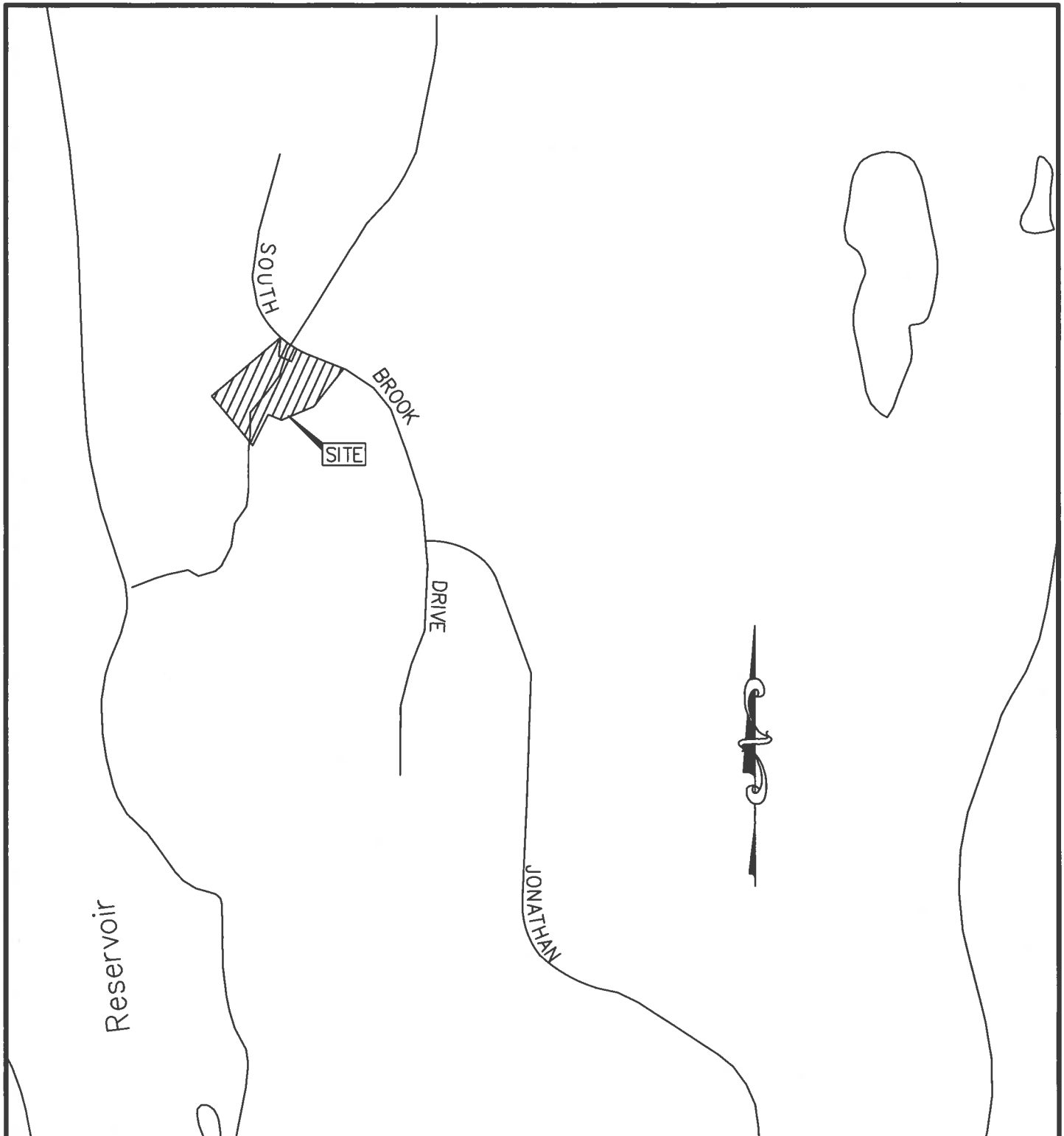
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GENERAL DISCUSSION & SUMMARY REPORT

1

- **Site Vicinity Map**
- **Drainage Summary Report**



SITE VICINITY MAP

13 SOUTH BROOK DRIVE
STAMFORD, CT 06903
TAX I.D. No. 004-0002
ZONE RA-3
SINGLE FAMILY RESIDENCE

S.E. MINOR & CO., INC.



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Environmental Scientists
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SCALE: 1"=500'



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Drainage Summary Report

Property of
Adam Aglietti
13 South Brook Drive
Stamford, Connecticut

Project Description and Purpose

The existing lot is currently undeveloped and completely wooded. It is proposed to construct a new residence, driveway, pool and some walk area [4,788 SF]. The extent of our proposed project is confined to the lot area. The neighboring properties are to be undisturbed by the proposed construction. Sedimentation and erosion controls will be implemented to ensure that this will be the case (see site sedimentation and erosion control plan for specific details).

Existing Conditions Description

The subject site is located on the Southwest side of South Brook Drive and is located in the RA-3 zone. As stated above, the site is currently undeveloped and all vegetated areas consist of wooded conditions. There is a brook with surrounding wetlands that runs through the middle of the lot. The property is serviced by existing private septic and private well. The North and South portions of the property both drains towards the wetlands that lead to the brook in the middle of the property. The North side of the brook is not going to be developed as a part of this project scope. Therefore, the Southern part of the property was only taken into consideration in the drainage model.

In accordance with Section 5.6 of the Stamford Drainage Manual, the NRCS Web Soil Survey was used to conduct the initial soils feasibility evaluation. According to the survey, the property mostly consists of Hollis-Chatfield-Rock outcrop complex, 3-15% slopes (HSG D), and Hollis-Chatfield-Rock outcrop complex, 15-45% slopes (HSG D). A small portion of the property that is out of the construction envelope may consist of Charlton-Chatfield complex, 0-15% slopes (HSG B). Because this is such a small area, all areas in the drainage model are modelled as HSG D soils to create a more conservative existing condition.

Summary of Applicable General Design Criteria

General Design Criteria will follow Section 3 of the Stamford Drainage Manual. Using HydroCAD, which incorporates the SCS TR – 20 Unit Hydrograph Method, the peak rate of runoff discharging through each of the POCs were computed for a 1, 2, 5, 10, 25, 50, and 100-year 24-hour storm events, under existing and proposed conditions. The total peak rates of runoff discharging after development will be maintained at or below current discharge levels for a 1, 2, 5, 10, 25, 50 and 100-year 24-hour storm event. These results are summarized in Drainage Summary Tables I-V.

The hydrologic model was prepared by utilizing the SCS Runoff Curve Number Method from SCS TR-20. Drainage areas are created from field surveys information in conjunction with USGS topographic maps or GIS topographic maps. If topographic information other than a direct field survey is used as the basis for delineating drainage area boundaries (e.g., USGS or GIS topographic maps), the topographic map reference and latest map revision date will be identified.

Flood Hazard Areas have been delineated and shown on the site plan. The entirety of the site lies within Zone “X” which is considered an area of minimal flood hazards, as shown on Flood Insurance Rate Map (FIRM) Number 090015 Community Number 363 F, effective June 18, 2010.

Summary of Compliance with Standards 2, 3, and 4

Existing conditions of the affected drainage area (node 1.EX) consist of a total area of 35,646 SQ. FT. 100% of this area is modelled as Woods, Good, HSG D. The Time of Concentration (Tc) for each was taken as a sheet flow for the first 100’, after which the flow converges into a shallow concentrated flow until draining into each area’s respective POC. When a drainage area lacked either sufficient distance or slope, a direct Tc of 5.0 minutes was assumed.

Area ID	Point of Concern	Description	Area (ft ²)	Ground Cover			Impervious Coverage	Curve Number	Tc (min.)
				Impervious (CN=98)	Lawn (CN=80)	Woods (CN=77)			
1.EX	1	Wetlands	35,646	0	0	35,646	0.00%	77	10.80

Table 1 : Summary of Drainage Areas - Existing Conditions

Area ID	Point of Concern	Description	Area (ft ²)	Ground Cover			Impervious Coverage	Curve Number	Tc (min.)
				Impervious (CN=98)	Lawn (CN=80)	Woods (CN=77)			
1A.PR	1	Direct Flow	19,394	0	8,577	11,806	0.00%	78	9.70
1B.PR	1	House and Drive	5,049	5,049	0	0	100.00%	98	5.00
1C.PR	1	Walk and Yard	11,203	238	7,448	3,517	2.12%	79	5.00
Total	-	-	35,646	5,287	16,025	15,323	14.83%	81	-

Table 2 : Summary of Drainage Areas - Proposed Conditions

STANDARD 2: Peak Flow Control

- A. The Stream Channel Protection criteria are not required to be met for this project as the site has less than 1 acre of impervious cover.
- B. Conveyance Protection Calculation for critical segments are included in section 6 for the drainage report. The proposed system should be able to handle flows associated with a 50-year storm event at any point in the flow path.
- C. Peak Flow Control

DRAINAGE SUMMARY TABLE I

WATERSHED	POC 1 - WETLANDS					
STORM	EQ	PQ	%	EV	PV	%
1	0.78	0.73	-6.41%	2977	2791	-6.25%
2	1.08	0.97	-10.19%	4030	3932	-2.43%
5	1.66	1.42	-14.46%	6088	6135	0.77%
10	2.21	1.82	-17.65%	8041	8191	1.87%
25	3.13	3.09	-1.28%	11379	11659	2.46%
50	3.99	3.98	-0.25%	14581	14954	2.56%
100	5.08	4.90	-3.54%	18691	19152	2.47%

Utilizing HydroCAD modeling, the site conditions were analyzed, and necessary stormwater management structures implemented to maintain pre-construction peak flow rates to the affected point of concern. Two separate BMPs are proposed to help meet the drainage requirements. Both systems will utilize deep sump yard drains and junction boxes to provide pretreatment. A culvec system is utilized to collect, treat, infiltrate, and provide storage for house, driveway, and pool area runoff. A filtrating raingarden is proposed to collect and treat walk area as well as lawn and woods area. Both systems will eventually outlet towards a level spreader downslope of the proposed development that discharges towards the point of concern.

D. Conveyance protection and outlet protection is provided to ensure compliance.

E. No detention is proposed

STANDARD 3: Construction Erosion and Sediment Control

Construction erosion and sediment control design and details are indicated on the site plan drawing set. This plan has been created in accordance with Section 15C of the Stamford Zoning Regulations, the Connecticut Guidelines for Soil Erosion and Sediment Control (as amended), and the requirements of the CTDEEP General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities.

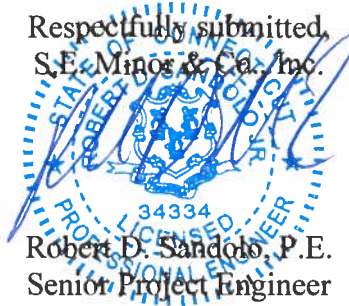
STANDARD 4: Operation and Maintenance

- A. Refer to the Operations and Maintenance Plan Report for specific maintenance activities necessary to ensure functionality of the proposed stormwater management system.
- B. The Operations and Maintenance Plan shall identify all applicable items in Section 2.4 Standard 4 and Appendix G of the City of Stamford Stormwater Drainage Manual.
- C. The Operations and Maintenance Plan Report will identify the parties legally responsible for implementing the Operations and Maintenance Plan.
- D. The parties legally responsible for maintaining the stormwater management system will be instructed to keep records of all maintenance or repair activities necessary to ensure system functionality.
- E. The parties legally responsible for maintaining the stormwater management system will be instructed to keep records of all maintenance or repair activities, and to provide these to the approving authority during inspections and/or upon request.
- F. When the parties legally responsible fails to implement the Operation and Maintenance Plan, the municipality is authorized to assume responsibility for their

implementation, and to secure reimbursement for associated expenses from the parties legally responsible, including, if necessary, placing a lien on the subject property.

“Based on the above information, the proposed improvements are designed in accordance with the City of Stamford Stormwater Drainage Manual and will not adversely impact adjacent or downstream properties or City-owned drainage facilities.”

Respectfully submitted,
S.E. Minor & Co., Inc.



Robert D. Sandoz, P.E.
Senior Project Engineer

Date: November 11, 2024

SOIL SURVEY DATA
- NRCS Soil Data

2


Hydrologic Soil Group—State of Connecticut, Western Part





MAP LEGEND


Area of Interest (AOI)

Area of Interest (AOI)

 C


 C/D


 D


 Not rated or not available


Soils


Soil Rating Polygons


 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


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

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: State of Connecticut, Western Part
Survey Area Data: Version 1, Sep 15, 2023

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

Date(s) aerial images were photographed: Oct 21, 2022—Oct 27, 2022

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
73C	Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky	B	0.1	4.0%
75C	Hollis-Chatfield-Rock outcrop complex, 3 to 15 percent slopes	D	1.8	67.9%
75E	Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes	D	0.7	28.1%
Totals for Area of Interest			2.6	100.0%

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

SOIL EVALUATION TEST RESULTS			
Engineer's Name: Robert W. Flood, E.I.T.		Engineering Firm's Name: S.E. Minor & Co., Inc.	
TEST PIT #:	DT-9	GROUND ELEVATION:	95
Elevation	Soil Texture (Percent Sand, Silt and Clay)	Depth Range in Inches	
95.0	TOP SOIL	0"-7"	Existing Ground Elevation: Top Elevation of Proposed Infiltration System: Bottom Elevation of Proposed Infiltration System: Elevation of Test*:
94.4	ORANGE BROWN SANDY LOAM	7"-36"	Test Method (check one of the following acceptable methods**): Borehole infiltration test (NHDES, 2008)
92.0	GRAY SANDY GRAVEL	36"-60"	Guelph permeameter - ASTN D5126-90 Method Falling Head Permeameter - ASTM D5126-90 Method Double ring permeator or infiltrometer - ASTM D3385-03, D5093-02, D5126-90 Methods Amoozegar or Amoozegar (constant head) permeator - Amoozegar 1992
90.0			Attach field data form for the respective infiltration test method. Calculated Saturated Hydraulic Conductivity Rate:
Elevation		Depth in Inches	** A percolation test, performed in accordance with the guidelines of the Connecticut State Health Code or otherwise, is not an acceptable test for saturated hydraulic conductivity. Percolation tests overestimate the saturated hydraulic conductivity rate.
92.0	Hardpan	36"	
-	Mottling	-	
-	Groundwater	-	
90.0	Ledge	60"	
-	Roots	-	* All field infiltration tests must be conducted in the actual location and soil layer where stormwater infiltration is proposed. All percolation tests shall be done in the soil layer below bottom elevation of the proposed infiltrators.
*All test pit or soil borings shall be excavated to an elevation four feet below the proposed bottom elevation of the infiltration system			
TEST CERTIFICATION			
I HEREBY CERTIFY THAT THE DATA CONTAINED IN THIS DEEP TEST AND PERCOLATION TEST REPORT IS TRUE AND CORRECT			
Name of Test Conductor:		Signature of Test Conductor:	Date:

Storm Water Quality Calculations - WQV - Water Quality Volume

WQV=Water Quality Volume

WQV=
$$\frac{(1'')(R)(A)}{12 \text{ IN/FT.}}$$

R=(RvI x %I) + (RvT x %T) + (RvF x %F)A=Site area

$$RvT=(RvT \text{ A x \%T OF HSG A}) + (RvT \text{ B x \%T OF HSG B}) + (RvT \text{ C x \%T OF HSG C}) + (RvT \text{ D x \%T OF HSG D})$$

$$RvF=(RvF \text{ A x \%F OF HSG A}) + (RvF \text{ B x \%F OF HSG B}) + (RvF \text{ C x \%F OF HSG C}) + (RvF \text{ D x \%F OF HSG D})$$

TURF RUNOFF COEFFICIENT CALCULATION

TOTAL SF											
Drain Area	RvT A	RvT B	RvT C	RvT D	%T A	%T B	%T C	%T D	RvT		
	0.15	0.2	0.22	0.25					0.000		
	0.15	0.2	0.22	0.25					0.000		

FOREST RUNOFF COEFFICIENT CALCULATION

TOTAL SF											
Drain Area	RvF A	RvF B	RvF C	RvF D	%F A	%F B	%F C	%F D	RvF		
	0.02	0.03	0.04	0.05					0.000		
	0.02	0.03	0.04	0.05					0.000		

WATER QUALITY VOLUME CALCULATION

BMP#	Description	Drain Area	Total SF	RvI	%I	RvT	%T	RvF	%F	R	WQV CF
P1	Cultec	1B.PR	5,049	0.95	100	0.250	0	0.050	0	0.950	400
P2	Raingarden	1C.PR	11,203	0.95	2.12	0.250	66.48	0.050	31.4	0.202	189
				0.95	0	0.250	0	0.050	0	0.000	0
TOTAL										TOTAL	588

HSG A	IMPERV	TURF	FORREST
HSG B	0.95	0.15	0.02
	0.95	0.20	0.03

Bioretention Area Sizing Calculation

Storm Water Quality Calculations - Bioretention Design - Per Standard Rain Garden Design Criteria

SURFACE AREA "STATIC METHOD"

$SA = (WQV) / [PD + (SD \times n) + (GD \times n)]$ ENTER ALL VALUES IN FT.

WQV=	189	As Calculated
PD=	1.5	"A" soils=12" "B" soils=9" "C" soils=6" "underdrainage = 18"
SD=	1.5	Bio Soil Depth
GD=	2	Gravel Depth
n=	0.3	Soil Mix
n=	0.4	Gravel Layer

$SA = \frac{PD + (SD \times n)}{68.7} = 2.75$

TSS REMOVAL CALCULATION WORKSHEET

- Instructions:
- 1. Column A and B: See TSS removal efficiency table
 - 2. Complete only highlighted cells

Location: P.1 - Cultec and P.2 Raingarden

A	B		C		D		E	
	TSS REMOVAL	RATE ¹	STARTING TSS	LOAD*	AMOUNT	REMOVED (B*C)	REMAINING	LOAD (C-D)
BMP ¹								
DEEP SUMP		25%		1		0.25		0.75
BMP		80%		0.75		0.6		0.15

TOTAL TSS REMOVAL = 85.0%

*Equals remaining load form previous BMP (E) which enters the BMP

RUNOFF REDUCTION CALCULATIONS
- RRV Worksheet

4

Storm Water Quality Calculations - RRV - Runoff Volume Reduction

RRV for POC1 - Wetlands

RRV=	Vpost	(POST 1year, 24hr st	Subtract	Vpre	(PRE 1year, 24hr storm)
	Vpost	3,915	Proposed without BMPs		
	Vpre	2,977	Existing		
RRV=				938	Cubic Feet (cf)

P.1 - Cultec provides 1,123 cf of storage

GROUNDWATER RECHARGE CALCULATIONS

5

- **GRV Worksheet**
- **Drawdown Worksheet**

Storm Water Quality Calculations - GRV - Groundwater Recharge Volume

GRV= Groundwater Recharge Volume:

GRV=	F x I
	Target Depth Factor F see Table 5-2. for Target Depth by Hydrologic Soil Group (Factor F)
F=	"A" Soils 0.60 Inches
F=	"B" Soils 0.35 Inches
F=	"C" Soils 0.25 Inches
F=	"D" Soils 0.10 Inches

A= Total Site Area 2.027 Acres

Percent of Increase of Impervious area (decimal value used for computation):

Proposed Impervious area = 5287 = 0.121373 Acres

43560

Existing Impervious area = 0 = 0 Acres

43560

I= 0.1214 = 0.0599

2.027

GRV= (F)(I) = 0.00354 Acre Feet

12

= 154.20 Cubic Feet Storage Required

Drawdown Calculation

BMP Drawdown Calculations
Infiltration Rates (Use field infiltration rate for C soils or if the
Dynamic Field Method is used for sizing of the infiltration system)

Retention System No. 1: P.1 - CULTEC

T =	$\frac{V}{(K)(\text{Bottom Area})n}$	T = Drawdown Time (hours)
V =	1130	V = Storage Volume (cf)
K =	1	K = Infiltration Rate (in/hr)
BA =	675	Bottom Area(BA) = Bottom Area of Recharge Structure (sf)
n =	0.4	n = Porosity of stone
T =	$\frac{V}{(K)(\text{Bottom Area})n}$	=

50.2 Hours

CONVEYANCE CALCULATIONS
- Conveyance Worksheet

6

Conveyence Calculations

Flow = Q(max) = (1.49 / n) * A * S^(1/2) * R^(2/3)

n = 0.01 (constant for PVC)

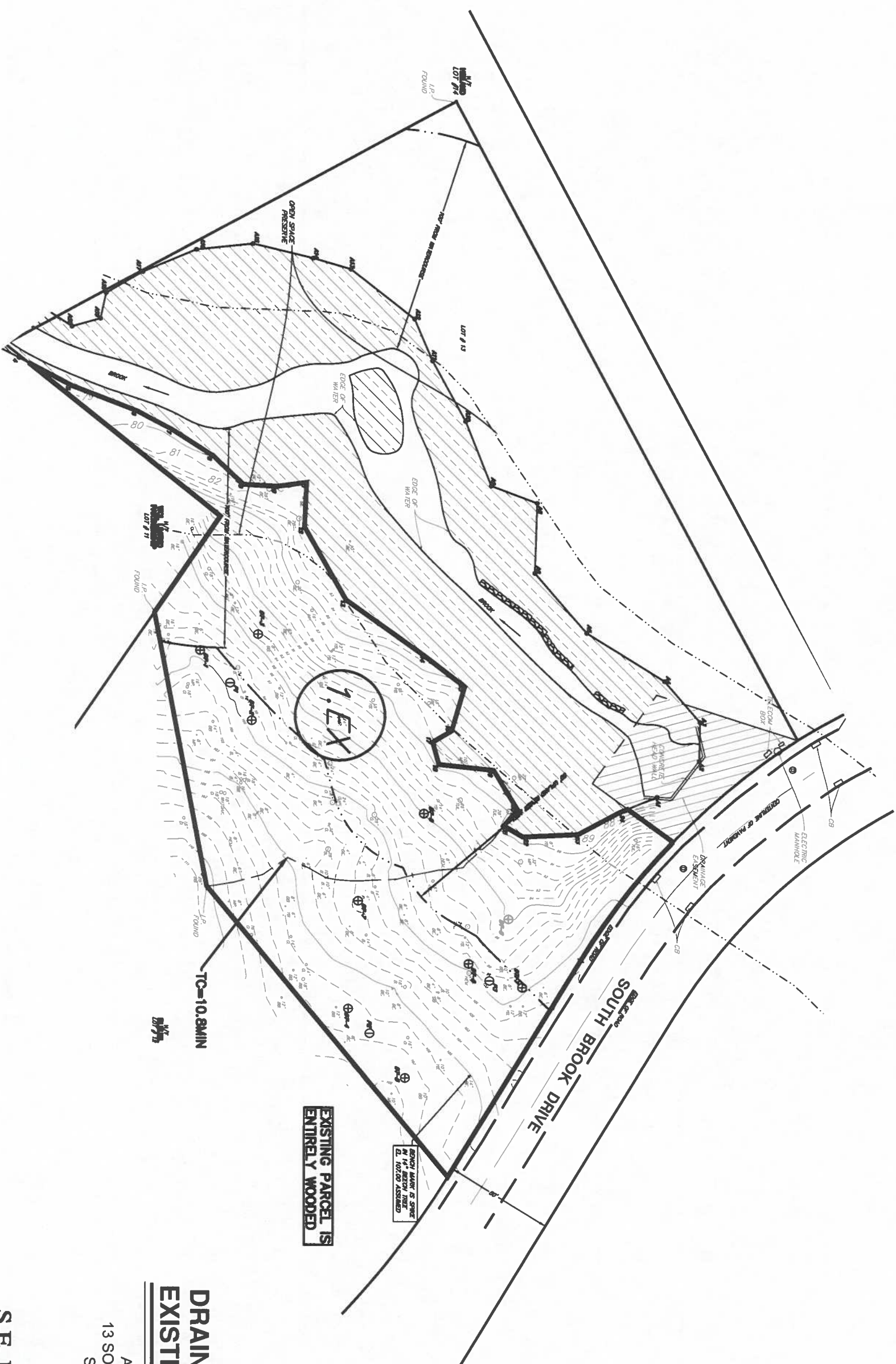
DIAMETER	DIAMETER	RADIUS	AREA	SLOPE	HYDRAULIC RADIUS	FLOW
D (in)	D (ft)	r (ft)	A (ft^2)	S (ft/ft)	R (ft)	Q (cfs)
4	0.333333333	0.166666667	0.087	0.01	0.083333333	0.248
6	0.5	0.25	0.196	0.014	0.125	0.865
8	0.666666667	0.333333333	0.349	0.01	0.166666667	1.575

Pipe Run	50 yr cfs from Hydrocad	Min Slope	Min Pipe Diameter
P.1 CULTEC TO LS	0.68	1%	6"
P.2 RAINGARDEN TO LS	0.84	1.4%	6"

HYDROLOGICAL & HYDRAULIC CALCULATIONS EXISTING CONDITIONS

7

- **PRE-DEVELOPMENT DRAINAGE BASIN AREA MAP**
- **1, 2, 5, 10, 25 and 100 Year 24 Hour Storm Events Model**
 - **Routing Diagram**
 - **Drainage Area Map**
 - **Node Listings**
 - **Node Totals**
- **50 Year 24 Hour Storm Event Model**
 - **Summaries**
 - **Wizards**
 - **Hydrograph Plots**
 - **Stage-Discharge Plots**
 - **Stage-Storage Plots**
 - **Stage-Storage Tables**



DRAINAGE AREA MAP EXISTING CONDITIONS

ADAM AGLIETTI
13 SOUTH BROOK DRIVE
STAMFORD, CT

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ESTABLISHED 1887
Engineering • Land Surveying
Environmental Scientists
33 West Elm Street
Greenwich, Connecticut 06830
203-869-0136
www.seminor.com



SCALE: 1"=50'

FILE NO. STAMFORD
COMPARED C.F.S. & J.A.M.



Wetlands



Routing Diagram for 2024-11-11_13 South Brook
Prepared by S.E. Minor & Co., Inc., Printed 11/12/2024
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2024-11-11_13 South Brook

Type III 24-hr 1-YEAR Rainfall=2.90"

Prepared by S.E. Minor & Co., Inc.

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Page 2

Time span=0.00-27.00 hrs, dt=0.02 hrs, 1351 points x 2

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1.EX: Wetlands

Runoff Area=35,646 sf 0.00% Impervious Runoff Depth=1.00"
Flow Length=150' Tc=10.8 min CN=77 Runoff=0.78 cfs 2,977 cf

Total Runoff Area = 35,646 sf Runoff Volume = 2,977 cf Average Runoff Depth = 1.00"
100.00% Pervious = 35,646 sf 0.00% Impervious = 0 sf

2024-11-11_13 South Brook

Type III 24-hr 2-YEAR Rainfall=3.40"

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Time span=0.00-27.00 hrs, dt=0.02 hrs, 1351 points x 2

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1.EX: Wetlands

Runoff Area=35,646 sf 0.00% Impervious Runoff Depth=1.36"
Flow Length=150' Tc=10.8 min CN=77 Runoff=1.08 cfs 4,030 cf

Total Runoff Area = 35,646 sf Runoff Volume = 4,030 cf Average Runoff Depth = 1.36"
100.00% Pervious = 35,646 sf 0.00% Impervious = 0 sf

2024-11-11_13 South Brook

Type III 24-hr 5-YEAR Rainfall=4.30"

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Runoff by SCS TR-20 method, UH=SCS

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1.EX: Wetlands

Runoff Area=35,646 sf 0.00% Impervious Runoff Depth=2.05"

Flow Length=150' Tc=10.8 min CN=77 Runoff=1.66 cfs 6,088 cf

Total Runoff Area = 35,646 sf Runoff Volume = 6,088 cf Average Runoff Depth = 2.05"

100.00% Pervious = 35,646 sf 0.00% Impervious = 0 sf

2024-11-11_13 South Brook

Type III 24-hr 10-YEAR Rainfall=5.10"

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Time span=0.00-27.00 hrs, dt=0.02 hrs, 1351 points x 2

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1.EX: Wetlands

Runoff Area=35,646 sf 0.00% Impervious Runoff Depth=2.71"

Flow Length=150' Tc=10.8 min CN=77 Runoff=2.21 cfs 8,041 cf

Total Runoff Area = 35,646 sf Runoff Volume = 8,041 cf Average Runoff Depth = 2.71"

100.00% Pervious = 35,646 sf 0.00% Impervious = 0 sf

2024-11-11_13 South Brook

Type III 24-hr 25-YEAR Rainfall=6.40"

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Page 6

Time span=0.00-27.00 hrs, dt=0.02 hrs, 1351 points x 2

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1.EX: Wetlands

Runoff Area=35,646 sf 0.00% Impervious Runoff Depth=3.83"

Flow Length=150' Tc=10.8 min CN=77 Runoff=3.13 cfs 11,379 cf

Total Runoff Area = 35,646 sf Runoff Volume = 11,379 cf Average Runoff Depth = 3.83"

100.00% Pervious = 35,646 sf 0.00% Impervious = 0 sf

2024-11-11_13 South Brook

Type III 24-hr 100-YEAR Rainfall=9.10"

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Page 7

Time span=0.00-27.00 hrs, dt=0.02 hrs, 1351 points x 2

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1.EX: Wetlands

Runoff Area=35,646 sf 0.00% Impervious Runoff Depth=6.29"

Flow Length=150' Tc=10.8 min CN=77 Runoff=5.08 cfs 18,691 cf

Total Runoff Area = 35,646 sf Runoff Volume = 18,691 cf Average Runoff Depth = 6.29"

100.00% Pervious = 35,646 sf 0.00% Impervious = 0 sf

Summary for Subcatchment 1.EX: Wetlands

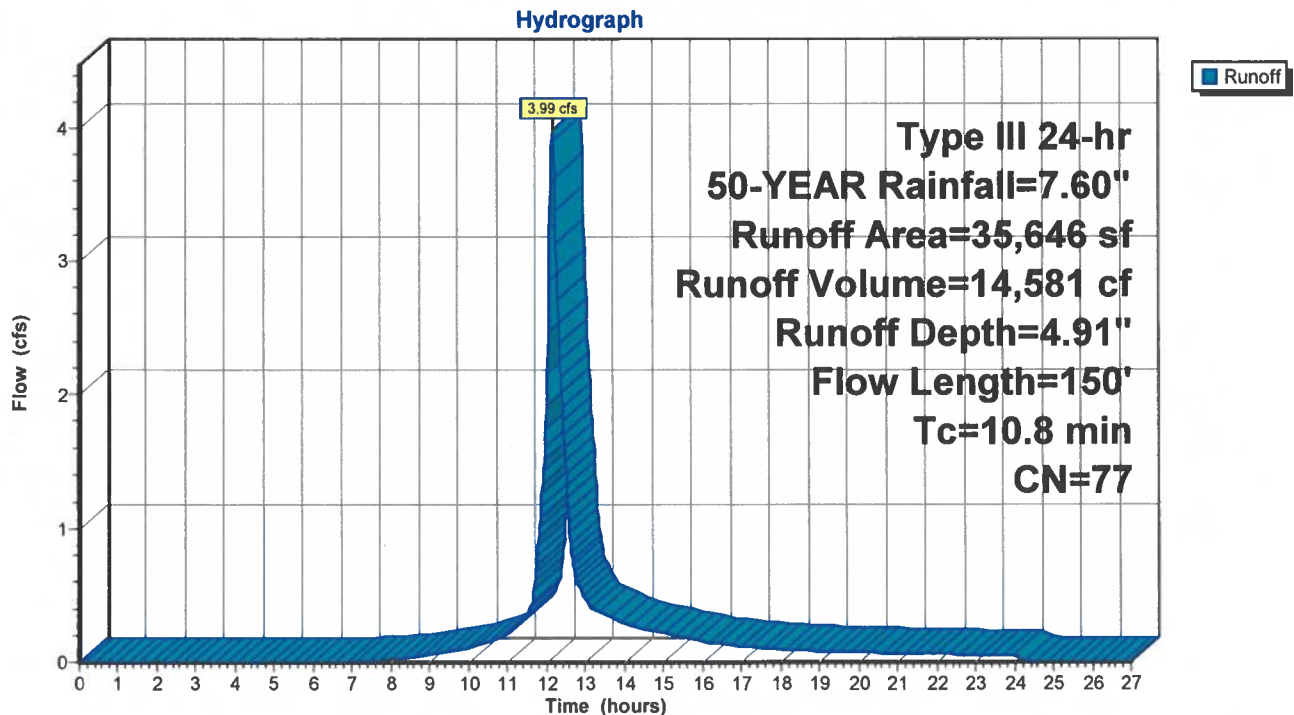
Runoff = 3.99 cfs @ 12.15 hrs, Volume= 14,581 cf, Depth= 4.91"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-27.00 hrs, dt= 0.02 hrs
Type III 24-hr 50-YEAR Rainfall=7.60"

Area (sf)	CN	Description
35,646	77	Woods, Good, HSG D
35,646		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.1180	0.16		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.30"
0.4	50	0.1800	2.12		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
10.8	150	Total			

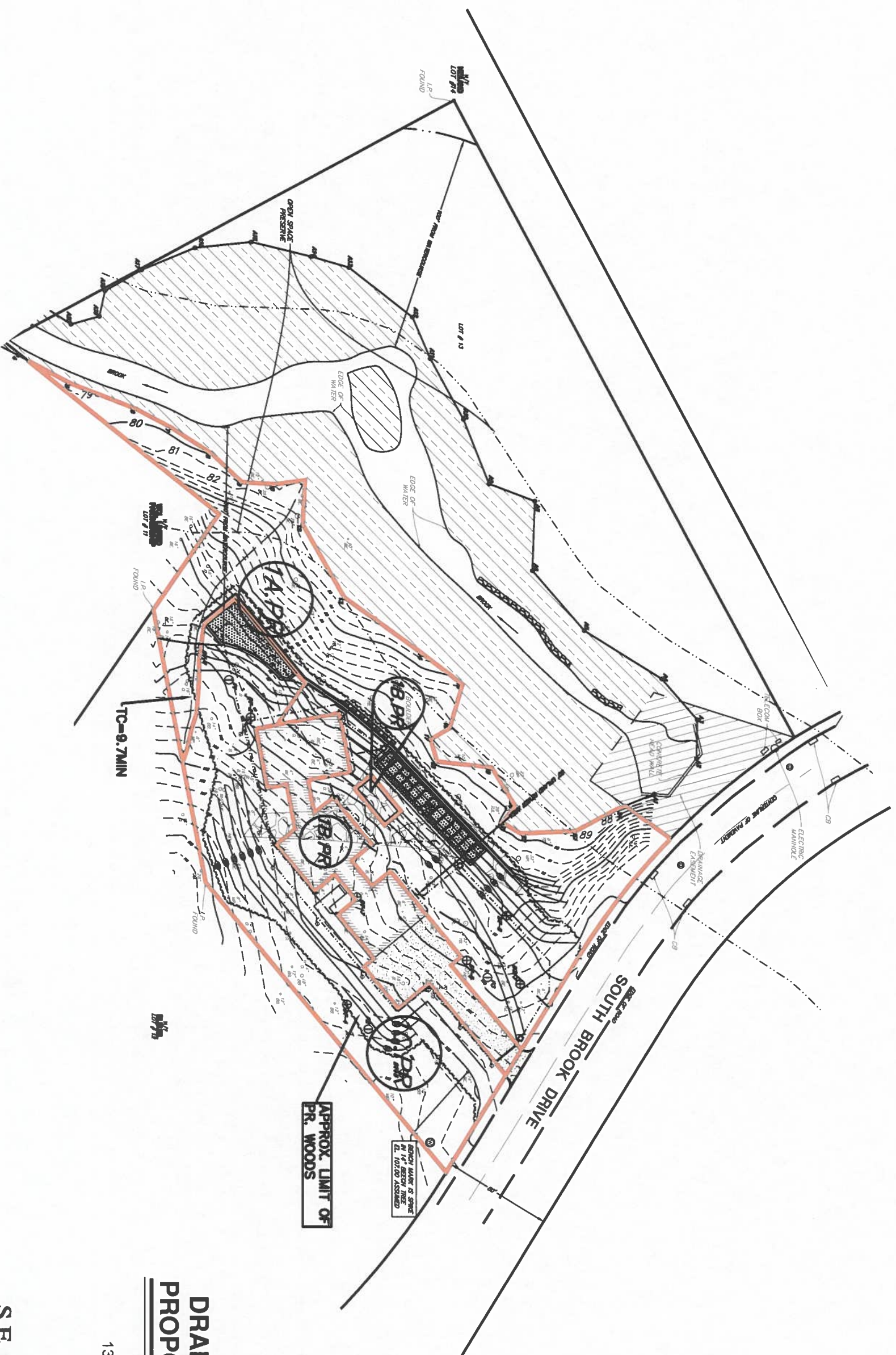
Subcatchment 1.EX: Wetlands



**HYDROLOGICAL & HYDRAULIC CALCULATIONS
PROPOSED CONDITIONS**

8

- **POST-DEVELOPMENT DRAINAGE BASIN AREA MAP**
- **1, 2, 5, 10, 25 and 100 Year 24 Hour Storm Events Model**
 - **Routing Diagram**
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 - **Stage-Storage Plots**
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DRAINAGE AREA MAP PROPOSED CONDITIONS

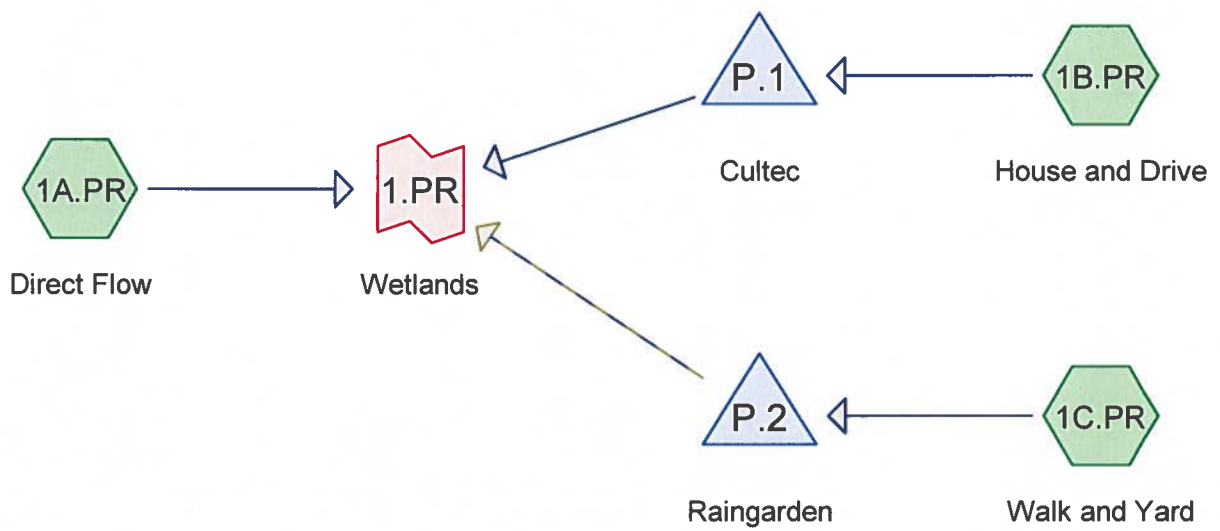
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SCALE: 1"=50'

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COMPILED C.F.S. & J.A.M.



Subcat



Reach



Pond



Link

Routing Diagram for 2024-11-11_13 South Brook
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2024-11-11_13 South Brook

Type III 24-hr 1-YEAR Rainfall=2.90"

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Page 2

Time span=0.00-27.00 hrs, dt=0.02 hrs, 1351 points x 2

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1A.PR: Direct FlowRunoff Area=19,394 sf 0.00% Impervious Runoff Depth=1.07"
Flow Length=146' Tc=9.7 min CN=78 Runoff=0.47 cfs 1,726 cf**Subcatchment 1B.PR: House and Drive**Runoff Area=5,049 sf 100.00% Impervious Runoff Depth=2.67"
Tc=5.0 min CN=98 Runoff=0.34 cfs 1,123 cf**Subcatchment 1C.PR: Walk and Yard**Runoff Area=11,203 sf 2.12% Impervious Runoff Depth=1.14"
Tc=5.0 min CN=79 Runoff=0.35 cfs 1,066 cf**Pond P.1: Cultec**Peak Elev=95.48' Storage=1,123 cf Inflow=0.34 cfs 1,123 cf
Outflow=0.00 cfs 0 cf**Pond P.2: Raingarden**Peak Elev=92.34' Storage=97 cf Inflow=0.35 cfs 1,066 cf
Primary=0.26 cfs 1,065 cf Secondary=0.00 cfs 0 cf Tertiary=0.00 cfs 0 cf Outflow=0.26 cfs 1,065 cf**Link 1.PR: Wetlands**Inflow=0.73 cfs 2,791 cf
Primary=0.73 cfs 2,791 cf**Total Runoff Area = 35,646 sf Runoff Volume = 3,915 cf Average Runoff Depth = 1.32"**
85.17% Pervious = 30,359 sf 14.83% Impervious = 5,287 sf

2024-11-11_13 South Brook

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Type III 24-hr 2-YEAR Rainfall=3.40"

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Time span=0.00-27.00 hrs, dt=0.02 hrs, 1351 points x 2

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1A.PR: Direct FlowRunoff Area=19,394 sf 0.00% Impervious Runoff Depth=1.43"
Flow Length=146' Tc=9.7 min CN=78 Runoff=0.65 cfs 2,316 cf**Subcatchment 1B.PR: House and Drive**Runoff Area=5,049 sf 100.00% Impervious Runoff Depth=3.17"
Tc=5.0 min CN=98 Runoff=0.40 cfs 1,332 cf**Subcatchment 1C.PR: Walk and Yard**Runoff Area=11,203 sf 2.12% Impervious Runoff Depth=1.52"
Tc=5.0 min CN=79 Runoff=0.47 cfs 1,418 cf**Pond P.1: Cultec**Peak Elev=95.56' Storage=1,153 cf Inflow=0.40 cfs 1,332 cf
Outflow=0.01 cfs 199 cf**Pond P.2: Raingarden**Peak Elev=92.57' Storage=138 cf Inflow=0.47 cfs 1,418 cf
Primary=0.33 cfs 1,417 cf Secondary=0.00 cfs 0 cf Tertiary=0.00 cfs 0 cf Outflow=0.33 cfs 1,417 cf**Link 1.PR: Wetlands**Inflow=0.97 cfs 3,932 cf
Primary=0.97 cfs 3,932 cf**Total Runoff Area = 35,646 sf Runoff Volume = 5,067 cf Average Runoff Depth = 1.71"**
85.17% Pervious = 30,359 sf 14.83% Impervious = 5,287 sf

2024-11-11_13 South Brook

Type III 24-hr 5-YEAR Rainfall=4.30"

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Time span=0.00-27.00 hrs, dt=0.02 hrs, 1351 points x 2

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1A.PR: Direct FlowRunoff Area=19,394 sf 0.00% Impervious Runoff Depth=2.14"
Flow Length=146' Tc=9.7 min CN=78 Runoff=0.98 cfs 3,463 cf**Subcatchment 1B.PR: House and Drive**Runoff Area=5,049 sf 100.00% Impervious Runoff Depth=4.06"
Tc=5.0 min CN=98 Runoff=0.50 cfs 1,710 cf**Subcatchment 1C.PR: Walk and Yard**Runoff Area=11,203 sf 2.12% Impervious Runoff Depth=2.25"
Tc=5.0 min CN=79 Runoff=0.70 cfs 2,097 cf**Pond P.1: Cultec**Peak Elev=95.63' Storage=1,180 cf Inflow=0.50 cfs 1,710 cf
Outflow=0.05 cfs 576 cf**Pond P.2: Raingarden**Peak Elev=93.07' Storage=229 cf Inflow=0.70 cfs 2,097 cf
Primary=0.44 cfs 2,096 cf Secondary=0.00 cfs 0 cf Tertiary=0.00 cfs 0 cf Outflow=0.44 cfs 2,096 cf**Link 1.PR: Wetlands**Inflow=1.42 cfs 6,135 cf
Primary=1.42 cfs 6,135 cf**Total Runoff Area = 35,646 sf Runoff Volume = 7,270 cf Average Runoff Depth = 2.45"**
85.17% Pervious = 30,359 sf 14.83% Impervious = 5,287 sf

2024-11-11_13 South Brook*Type III 24-hr 10-YEAR Rainfall=5.10"*

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Time span=0.00-27.00 hrs, dt=0.02 hrs, 1351 points x 2

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1A.PR: Direct FlowRunoff Area=19,394 sf 0.00% Impervious Runoff Depth=2.81"
Flow Length=146' Tc=9.7 min CN=78 Runoff=1.29 cfs 4,546 cf**Subcatchment 1B.PR: House and Drive**Runoff Area=5,049 sf 100.00% Impervious Runoff Depth=4.86"
Tc=5.0 min CN=98 Runoff=0.60 cfs 2,046 cf**Subcatchment 1C.PR: Walk and Yard**Runoff Area=11,203 sf 2.12% Impervious Runoff Depth=2.93"
Tc=5.0 min CN=79 Runoff=0.91 cfs 2,734 cf**Pond P.1: Cultec**Peak Elev=95.76' Storage=1,231 cf Inflow=0.60 cfs 2,046 cf
Outflow=0.18 cfs 912 cf**Pond P.2: Raingarden**Peak Elev=93.61' Storage=326 cf Inflow=0.91 cfs 2,734 cf
Primary=0.54 cfs 2,733 cf Secondary=0.00 cfs 0 cf Tertiary=0.00 cfs 0 cf Outflow=0.54 cfs 2,733 cf**Link 1.PR: Wetlands**Inflow=1.82 cfs 8,191 cf
Primary=1.82 cfs 8,191 cf**Total Runoff Area = 35,646 sf Runoff Volume = 9,326 cf Average Runoff Depth = 3.14"**
85.17% Pervious = 30,359 sf 14.83% Impervious = 5,287 sf

Time span=0.00-27.00 hrs, dt=0.02 hrs, 1351 points x 2

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1A.PR: Direct Flow

Runoff Area=19,394 sf 0.00% Impervious Runoff Depth=3.95"
Flow Length=146' Tc=9.7 min CN=78 Runoff=1.81 cfs 6,388 cf

Subcatchment 1B.PR: House and Drive

Runoff Area=5,049 sf 100.00% Impervious Runoff Depth=6.16"
Tc=5.0 min CN=98 Runoff=0.75 cfs 2,592 cf

Subcatchment 1C.PR: Walk and Yard

Runoff Area=11,203 sf 2.12% Impervious Runoff Depth=4.09"
Tc=5.0 min CN=79 Runoff=1.27 cfs 3,814 cf

Pond P.1: Cultec

Peak Elev=96.00' Storage=1,305 cf Inflow=0.75 cfs 2,592 cf
Outflow=0.47 cfs 1,459 cf

Pond P.2: Raingarden

Peak Elev=95.64' Storage=450 cf Inflow=1.27 cfs 3,814 cf
Primary=0.81 cfs 3,813 cf Secondary=0.00 cfs 0 cf Tertiary=0.00 cfs 0 cf Outflow=0.81 cfs 3,813 cf

Link 1.PR: Wetlands

Inflow=3.09 cfs 11,659 cf
Primary=3.09 cfs 11,659 cf

Total Runoff Area = 35,646 sf Runoff Volume = 12,794 cf Average Runoff Depth = 4.31"
85.17% Pervious = 30,359 sf 14.83% Impervious = 5,287 sf

2024-11-11_13 South Brook

Type III 24-hr 100-YEAR Rainfall=9.10"

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Time span=0.00-27.00 hrs, dt=0.02 hrs, 1351 points x 2

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1A.PR: Direct FlowRunoff Area=19,394 sf 0.00% Impervious Runoff Depth=6.44"
Flow Length=146' Tc=9.7 min CN=78 Runoff=2.92 cfs 10,404 cf**Subcatchment 1B.PR: House and Drive**Runoff Area=5,049 sf 100.00% Impervious Runoff Depth=8.86"
Tc=5.0 min CN=98 Runoff=1.07 cfs 3,728 cf**Subcatchment 1C.PR: Walk and Yard**Runoff Area=11,203 sf 2.12% Impervious Runoff Depth=6.59"
Tc=5.0 min CN=79 Runoff=2.01 cfs 6,156 cf**Pond P.1: Cultec**Peak Elev=96.49' Storage=1,437 cf Inflow=1.07 cfs 3,728 cf
Outflow=0.81 cfs 2,594 cf**Pond P.2: Raingarden**Peak Elev=96.34' Storage=803 cf Inflow=2.01 cfs 6,156 cf
Primary=0.88 cfs 5,843 cf Secondary=0.31 cfs 312 cf Tertiary=0.00 cfs 0 cf Outflow=1.19 cfs 6,155 cf**Link 1.PR: Wetlands**Inflow=4.90 cfs 19,152 cf
Primary=4.90 cfs 19,152 cf**Total Runoff Area = 35,646 sf Runoff Volume = 20,288 cf Average Runoff Depth = 6.83"**
85.17% Pervious = 30,359 sf 14.83% Impervious = 5,287 sf

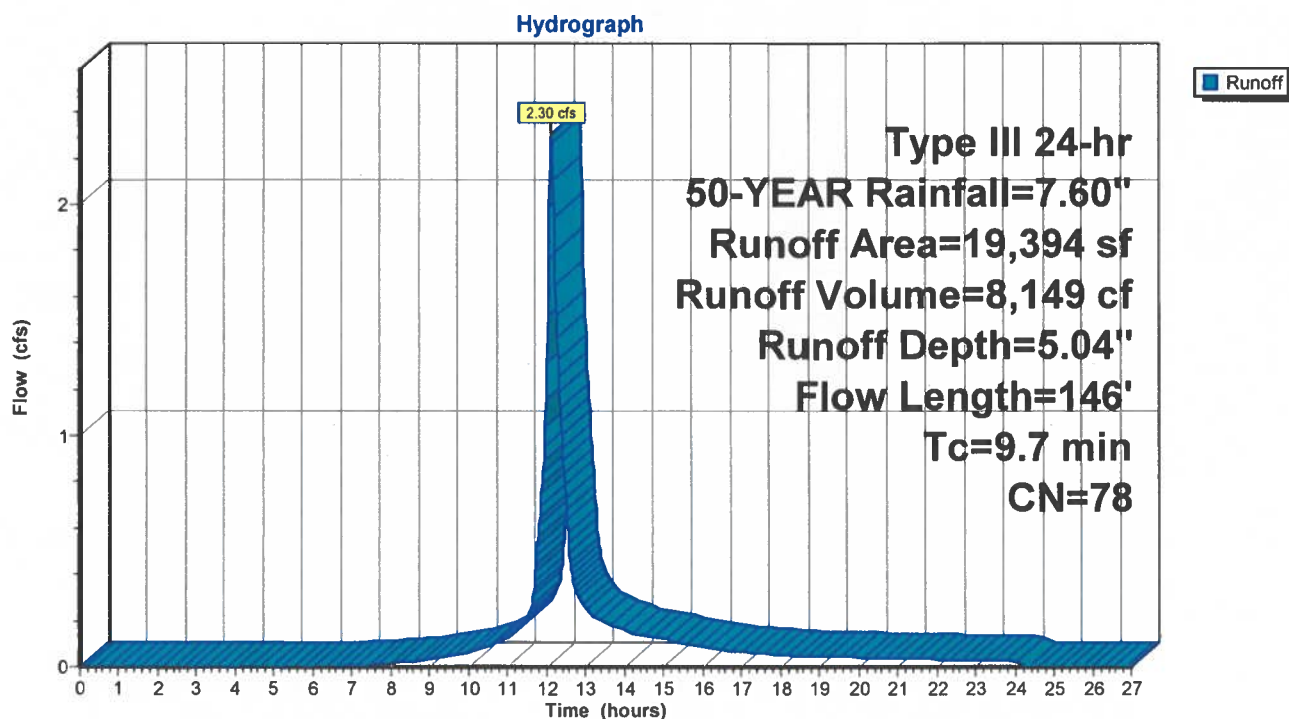
Summary for Subcatchment 1A.PR: Direct Flow

Runoff = 2.30 cfs @ 12.13 hrs, Volume= 8,149 cf, Depth= 5.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-27.00 hrs, dt= 0.02 hrs
Type III 24-hr 50-YEAR Rainfall=7.60"

Area (sf)	CN	Description
11,806	77	Woods, Good, HSG D
7,588	80	>75% Grass cover, Good, HSG D
19,394	78	Weighted Average
19,394		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.1550	0.18		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.30"
0.4	46	0.1848	2.15		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
9.7	146	Total			

Subcatchment 1A.PR: Direct Flow

Summary for Subcatchment 1B.PR: House and Drive

Runoff = 0.89 cfs @ 12.07 hrs, Volume= 3,097 cf, Depth= 7.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-27.00 hrs, dt= 0.02 hrs

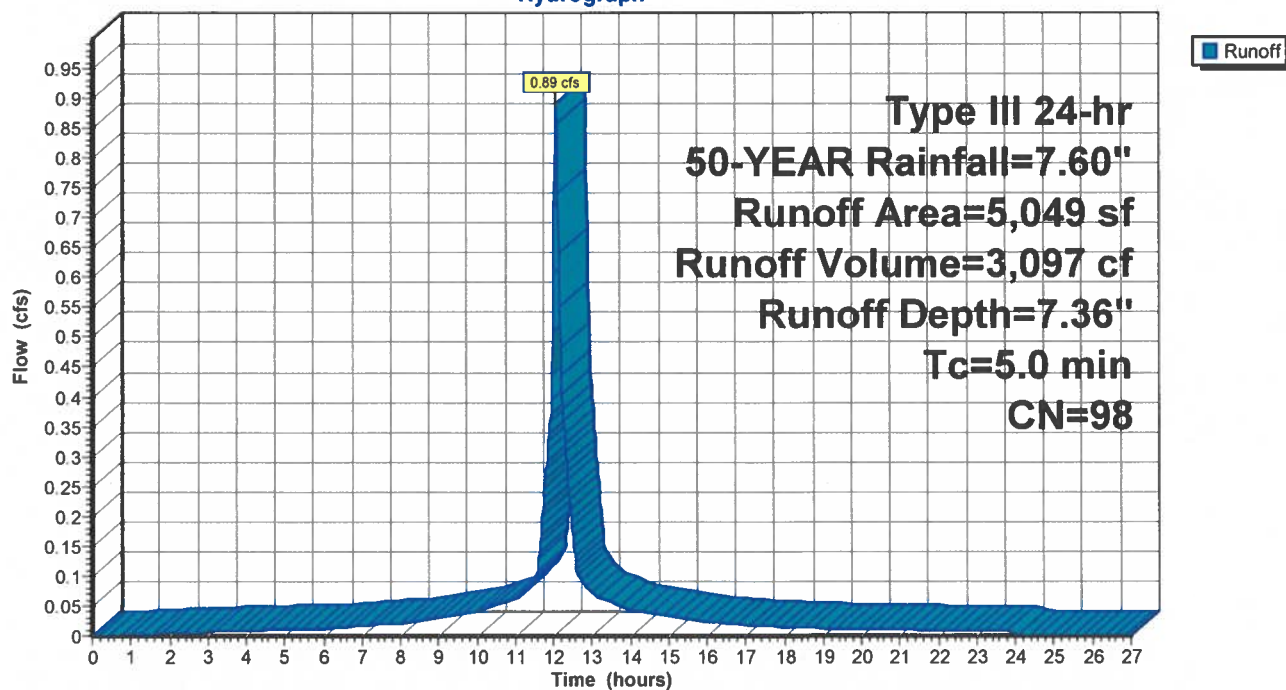
Type III 24-hr 50-YEAR Rainfall=7.60"

	Area (sf)	CN	Description
*	3,207	98	House
*	1,622	98	Drive
*	220	98	Pool
	5,049	98	Weighted Average
	5,049		100.00% Impervious Area

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

Subcatchment 1B.PR: House and Drive

Hydrograph



Summary for Subcatchment 1C.PR: Walk and Yard

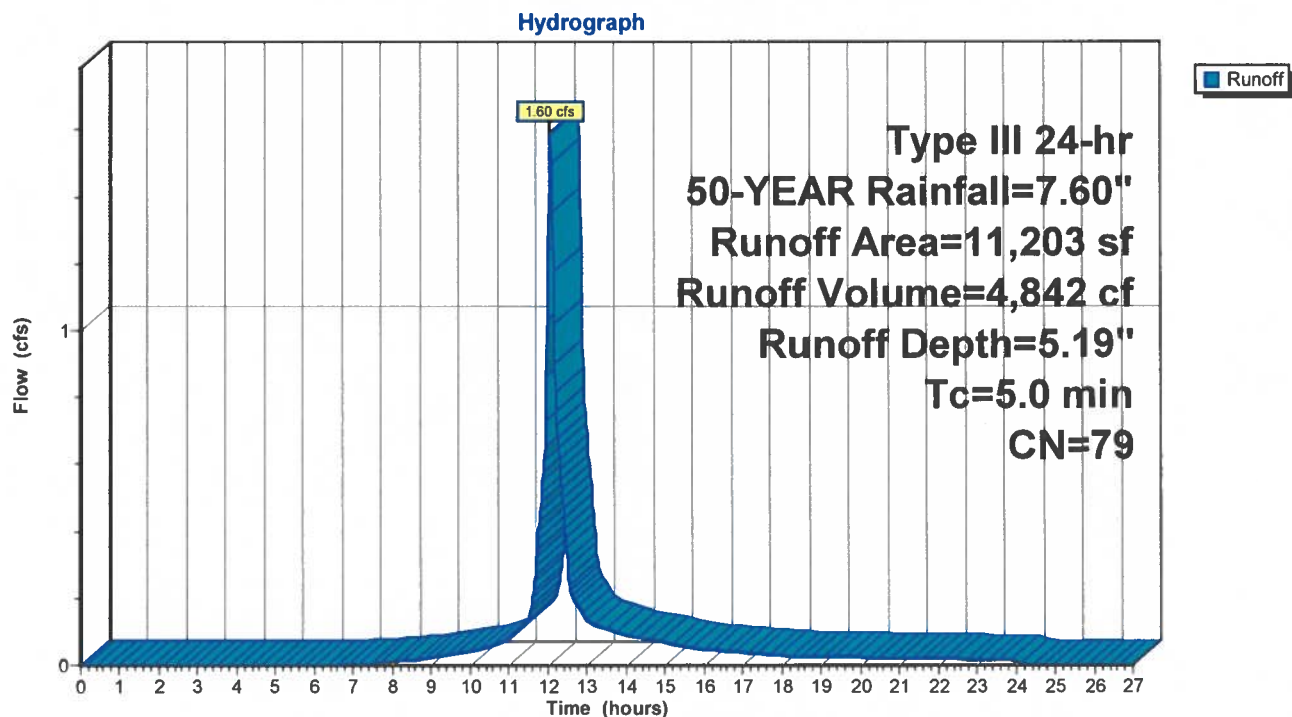
Runoff = 1.60 cfs @ 12.07 hrs, Volume= 4,842 cf, Depth= 5.19"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-27.00 hrs, dt= 0.02 hrs

Type III 24-hr 50-YEAR Rainfall=7.60"

Area (sf)	CN	Description
* 238	98	Walk
7,448	80	>75% Grass cover, Good, HSG D
3,517	77	Woods, Good, HSG D
11,203	79	Weighted Average
10,965		97.88% Pervious Area
238		2.12% Impervious Area

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

Subcatchment 1C.PR: Walk and Yard

Summary for Pond P.1: Cultec

Inflow Area = 5,049 sf, 100.00% Impervious, Inflow Depth = 7.36" for 50-YEAR event
 Inflow = 0.89 cfs @ 12.07 hrs, Volume= 3,097 cf
 Outflow = 0.68 cfs @ 12.13 hrs, Volume= 1,963 cf, Atten= 24%, Lag= 3.8 min
 Primary = 0.68 cfs @ 12.13 hrs, Volume= 1,963 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-27.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 96.27' @ 12.13 hrs Surf.Area= 675 sf Storage= 1,376 cf

Plug-Flow detention time= 221.6 min calculated for 1,962 cf (63% of inflow)
 Center-of-Mass det. time= 115.0 min (856.0 - 740.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	93.00'	628 cf	64.33'W x 10.50'L x 3.54'H Field A 2,392 cf Overall - 823 cf Embedded = 1,569 cf x 40.0% Voids
#2A	93.50'	823 cf	Cultec R-330XLHD x 13 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 13 rows
		1,451 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	95.50'	6.0" Vert. 6" Outlet C= 0.600

Primary OutFlow Max=0.68 cfs @ 12.13 hrs HW=96.26' TW=0.00' (Dynamic Tailwater)

↑ **1=6" Outlet** (Orifice Controls 0.68 cfs @ 3.45 fps)

Pond P.1: Cultec - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 13 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

1 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 8.50' Row Length +12.0" End Stone x 2 = 10.50' Base Length

13 Rows x 52.0" Wide + 6.0" Spacing x 12 + 12.0" Side Stone x 2 = 64.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

13 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 13 Rows = 823.3 cf Chamber Storage

2,392.4 cf Field - 823.3 cf Chambers = 1,569.1 cf Stone x 40.0% Voids = 627.6 cf Stone Storage

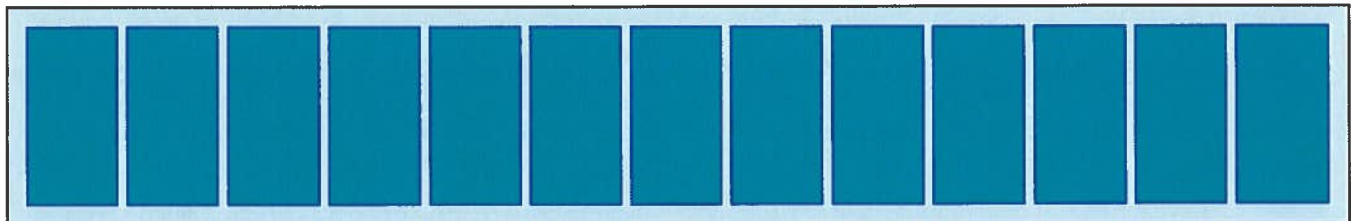
Stone + Chamber Storage = 1,451.0 cf = 0.033 af

Overall Storage Efficiency = 60.6%

13 Chambers

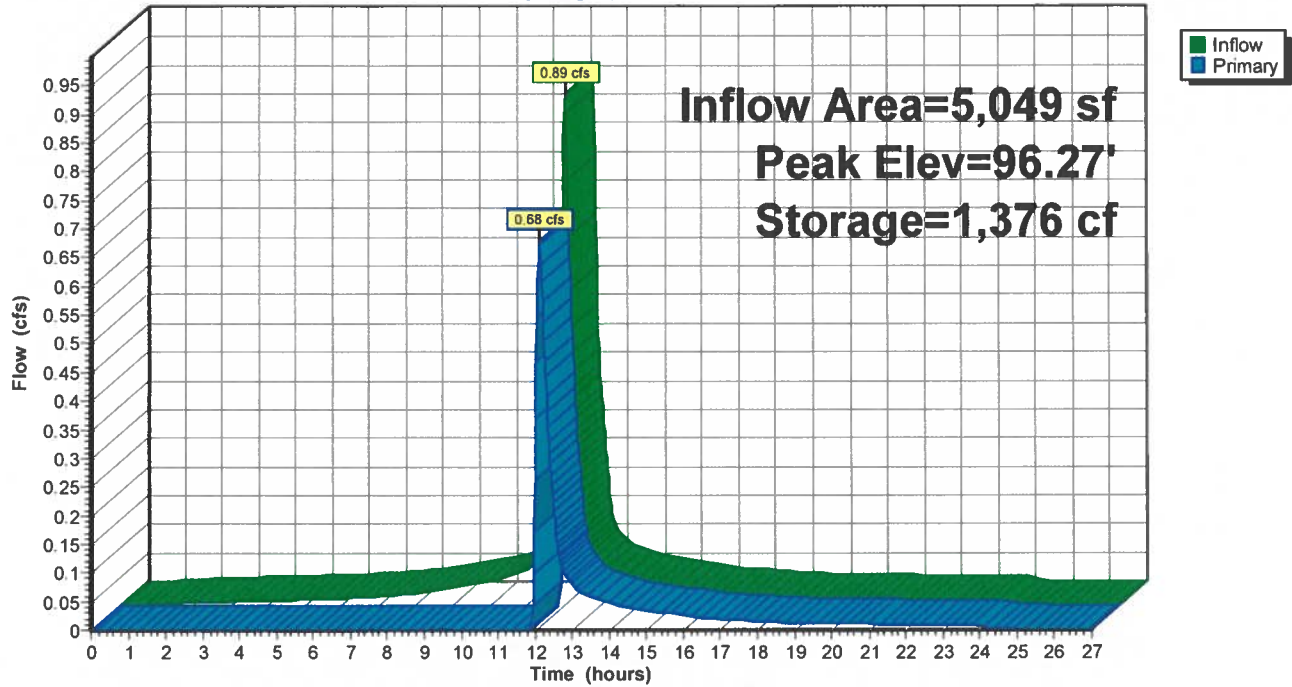
88.6 cy Field

58.1 cy Stone



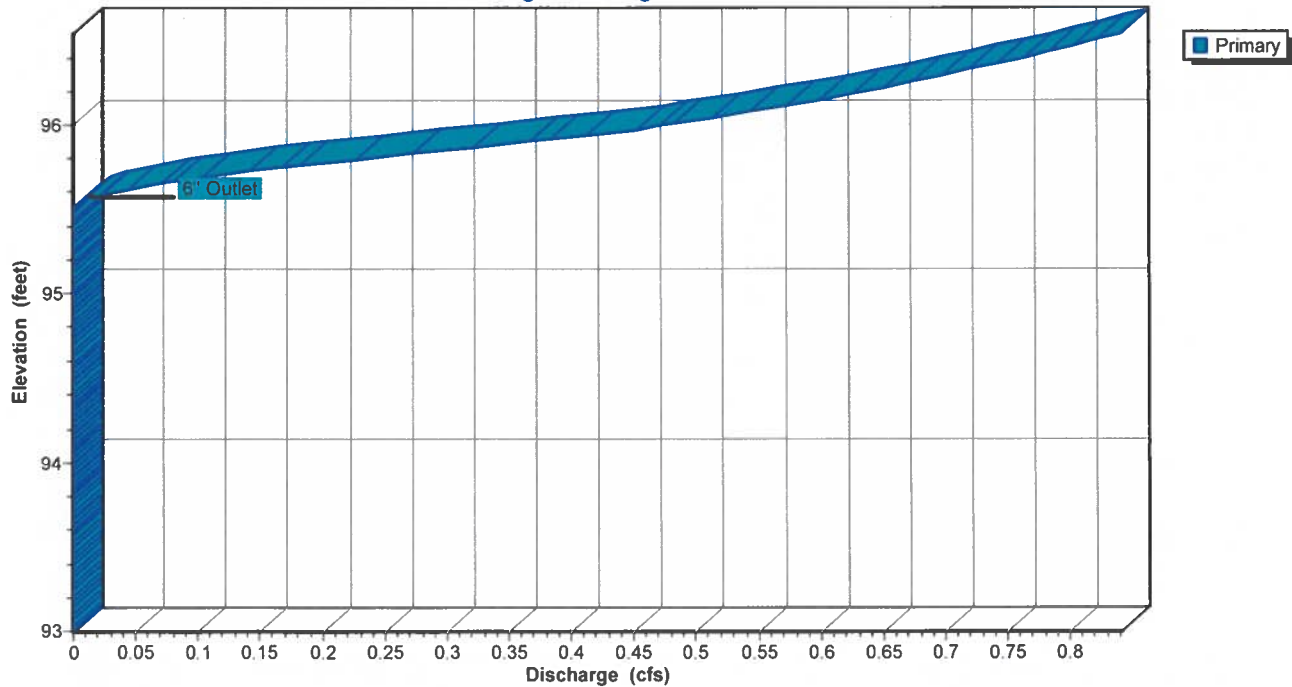
Pond P.1: Cultec

Hydrograph



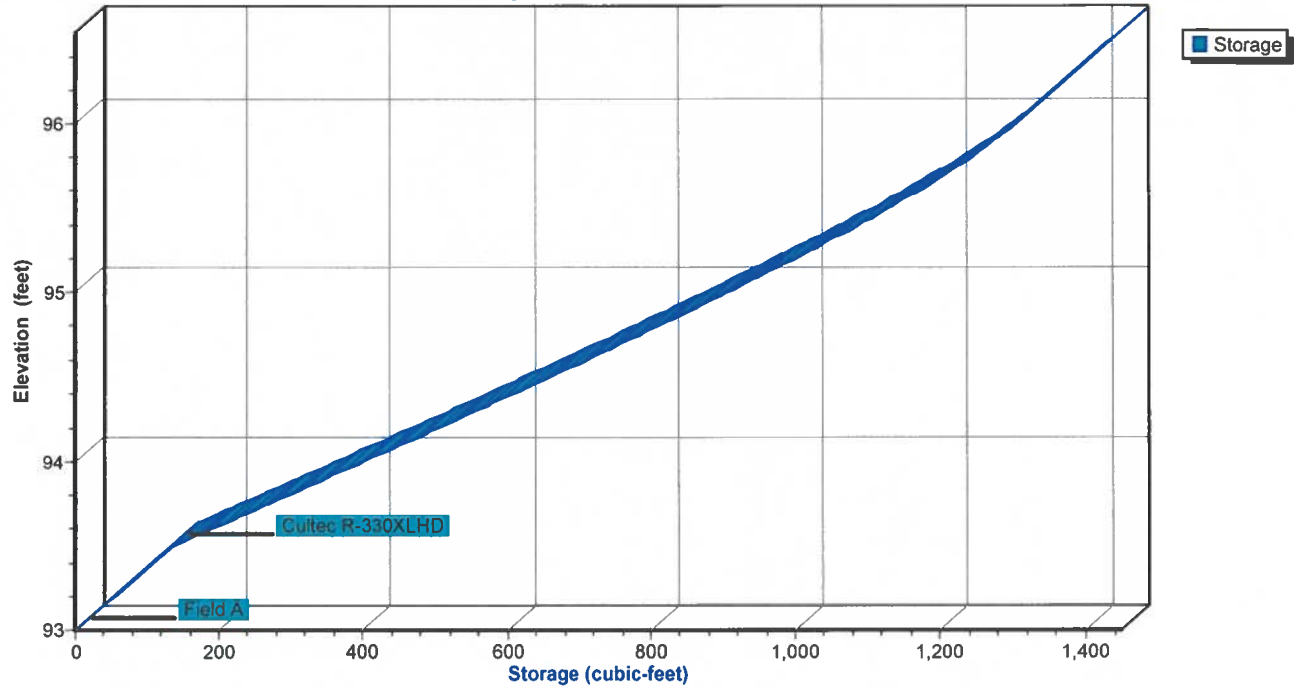
Pond P.1: Cultec

Stage-Discharge



Pond P.1: Cultec

Stage-Area-Storage



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Type III 24-hr 50-YEAR Rainfall=7.60"

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Stage-Area-Storage for Pond P.1: Cultec

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
93.00	0	95.60	1,170
93.05	14	95.65	1,190
93.10	27	95.70	1,209
93.15	41	95.75	1,227
93.20	54	95.80	1,244
93.25	68	95.85	1,260
93.30	81	95.90	1,276
93.35	95	95.95	1,291
93.40	108	96.00	1,305
93.45	122	96.05	1,318
93.50	135	96.10	1,332
93.55	162	96.15	1,345
93.60	188	96.20	1,359
93.65	215	96.25	1,372
93.70	241	96.30	1,386
93.75	268	96.35	1,399
93.80	294	96.40	1,413
93.85	321	96.45	1,426
93.90	347	96.50	1,440
93.95	373		
94.00	400		
94.05	426		
94.10	452		
94.15	478		
94.20	504		
94.25	530		
94.30	555		
94.35	581		
94.40	606		
94.45	632		
94.50	657		
94.55	683		
94.60	708		
94.65	733		
94.70	759		
94.75	784		
94.80	808		
94.85	833		
94.90	857		
94.95	882		
95.00	905		
95.05	929		
95.10	953		
95.15	976		
95.20	999		
95.25	1,021		
95.30	1,044		
95.35	1,066		
95.40	1,088		
95.45	1,109		
95.50	1,130		
95.55	1,150		

Summary for Pond P.2: Raingarden

Inflow Area = 11,203 sf, 2.12% Impervious, Inflow Depth = 5.19" for 50-YEAR event
 Inflow = 1.60 cfs @ 12.07 hrs, Volume= 4,842 cf
 Outflow = 1.01 cfs @ 12.16 hrs, Volume= 4,841 cf, Atten= 37%, Lag= 5.4 min
 Primary = 0.84 cfs @ 12.16 hrs, Volume= 4,766 cf
 Secondary = 0.17 cfs @ 12.16 hrs, Volume= 75 cf
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-27.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 95.96' @ 12.16 hrs Surf.Area= 1,850 sf Storage= 606 cf

Plug-Flow detention time= 9.2 min calculated for 4,841 cf (100% of inflow)
 Center-of-Mass det. time= 9.0 min (814.2 - 805.2)

Volume	Invert	Avail.Storage	Storage Description
#1	95.45'	814 cf	Ponding (Prismatic) Listed below (Recalc)
#2	95.30'	0 cf	Mulch (Prismatic) Listed below (Recalc) 68 cf Overall x 0.2% Voids
#3	93.80'	2 cf	Soil (Prismatic) Listed below (Recalc) 675 cf Overall x 0.3% Voids
#4	91.80'	360 cf	Gravel (Prismatic) Listed below (Recalc) 900 cf Overall x 40.0% Voids
1,176 cf			Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
95.45	450	0	0
97.00	600	814	814

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
95.30	450	0	0
95.45	450	68	68

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
93.80	450	0	0
95.30	450	675	675

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.80	450	0	0
93.80	450	900	900

Device	Routing	Invert	Outlet Devices
#1	Primary	91.80'	4.0" Vert. Underdrain C= 0.600
#2	Secondary	95.80'	4.0" Horiz. Overflow Standpipe C= 0.600 Limited to weir flow at low heads
#3	Tertiary	96.80'	44.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00

Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.84 cfs @ 12.16 hrs HW=95.96' TW=0.00' (Dynamic Tailwater)

↑1=Underdrain (Orifice Controls 0.84 cfs @ 9.62 fps)

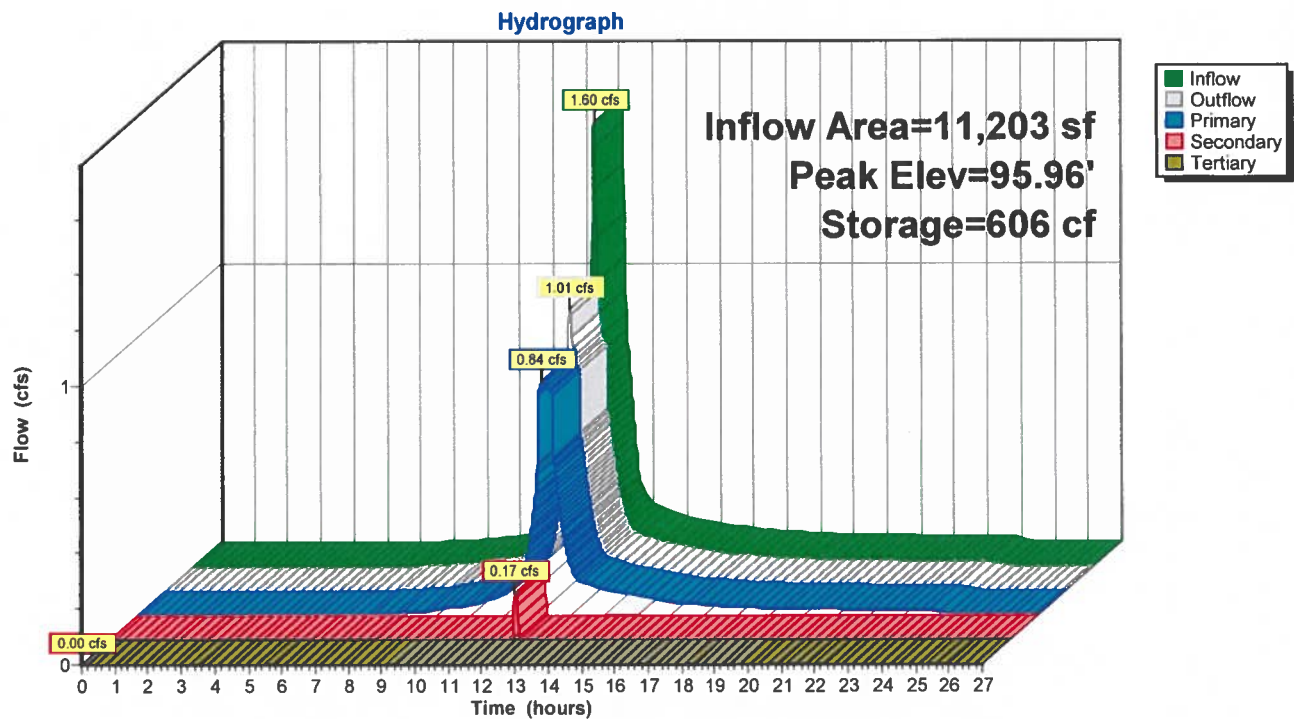
Secondary OutFlow Max=0.17 cfs @ 12.16 hrs HW=95.96' TW=0.00' (Dynamic Tailwater)

↑2=Overflow Standpipe (Orifice Controls 0.17 cfs @ 1.93 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=91.80' TW=0.00' (Dynamic Tailwater)

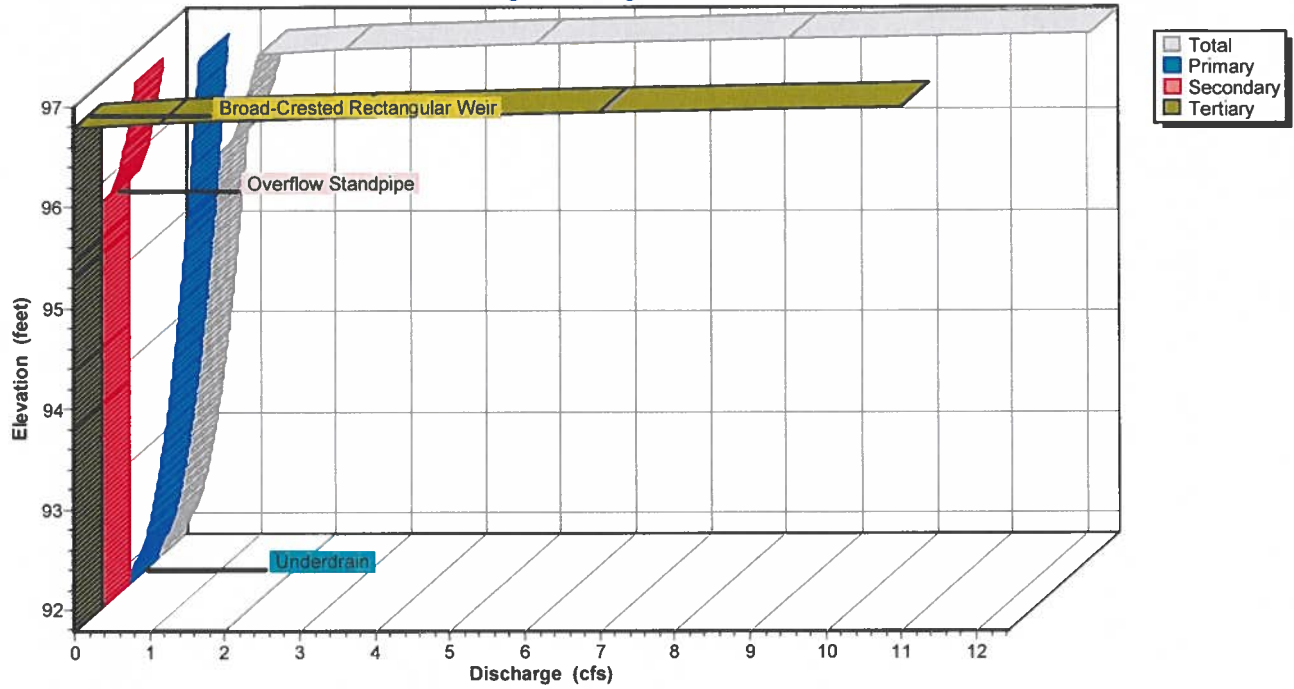
↑3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond P.2: Raingarden



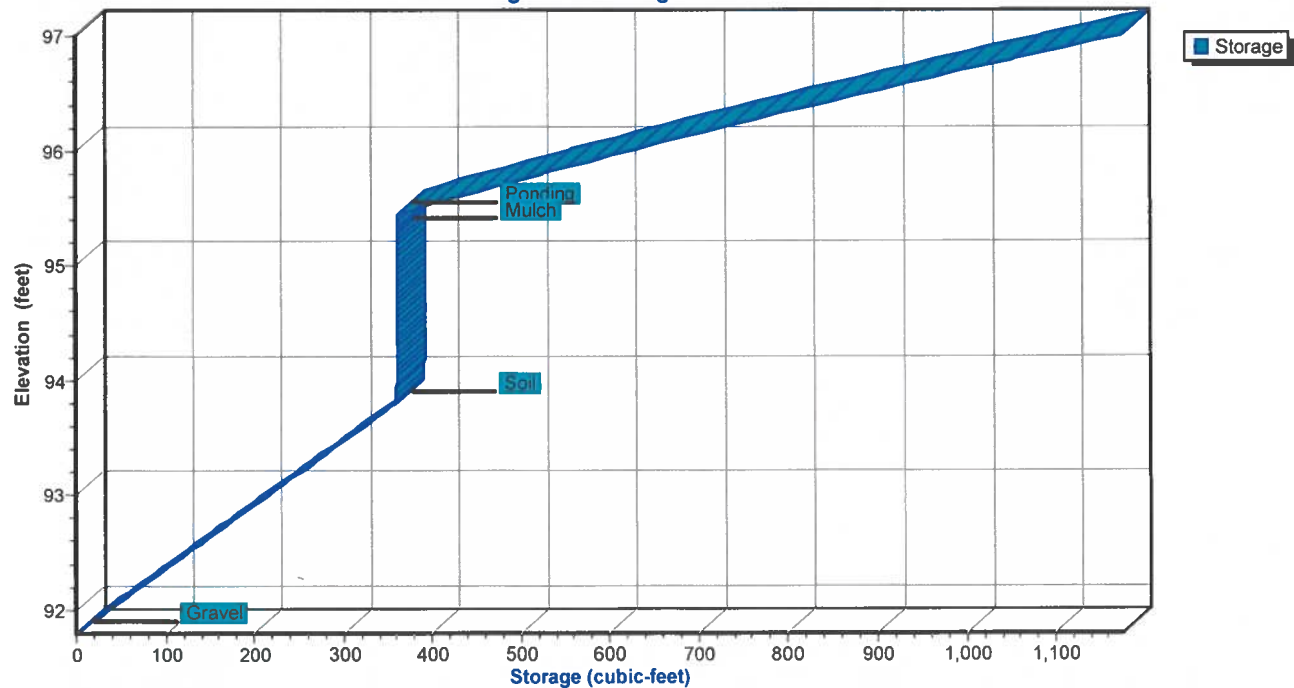
Pond P.2: Raingarden

Stage-Discharge



Pond P.2: Raingarden

Stage-Area-Storage



Stage-Area-Storage for Pond P.2: Raingarden

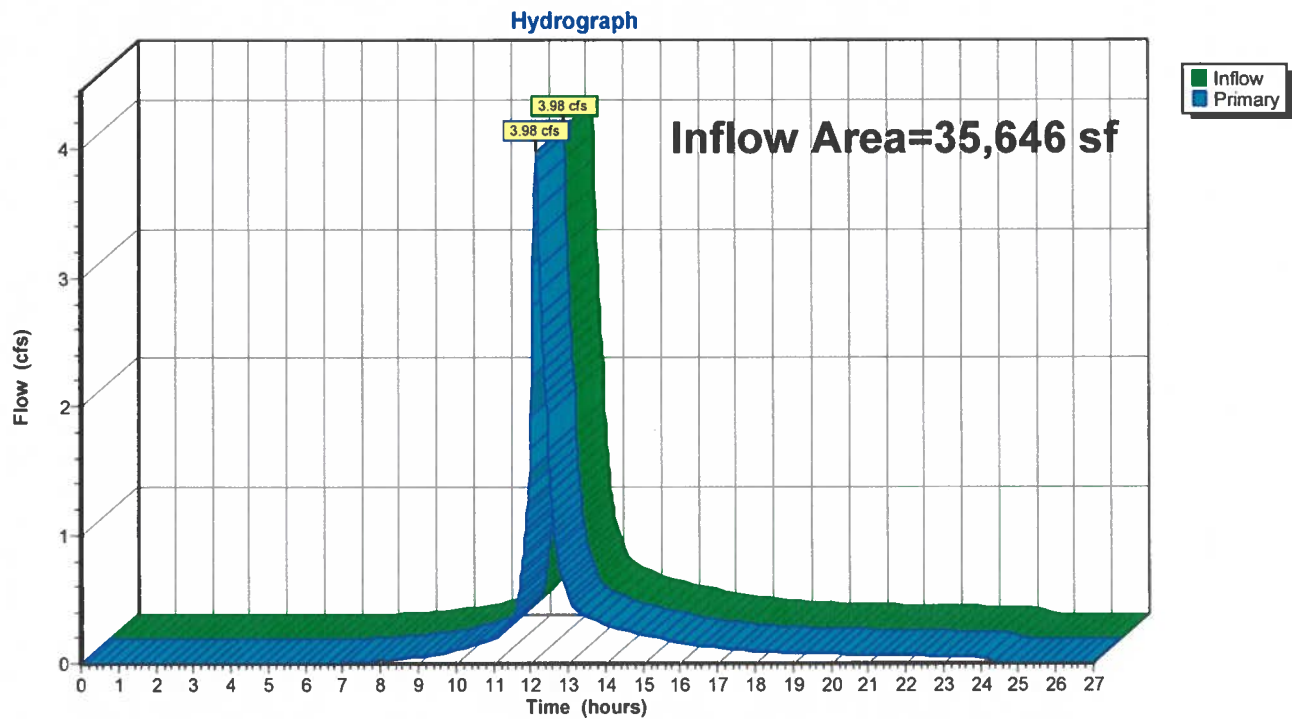
Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
91.80	0	93.88	360	95.96	604
91.84	7	93.92	360	96.00	624
91.88	14	93.96	360	96.04	645
91.92	22	94.00	360	96.08	665
91.96	29	94.04	360	96.12	685
92.00	36	94.08	360	96.16	706
92.04	43	94.12	360	96.20	727
92.08	50	94.16	360	96.24	748
92.12	58	94.20	361	96.28	769
92.16	65	94.24	361	96.32	790
92.20	72	94.28	361	96.36	812
92.24	79	94.32	361	96.40	833
92.28	86	94.36	361	96.44	855
92.32	94	94.40	361	96.48	877
92.36	101	94.44	361	96.52	899
92.40	108	94.48	361	96.56	921
92.44	115	94.52	361	96.60	944
92.48	122	94.56	361	96.64	966
92.52	130	94.60	361	96.68	989
92.56	137	94.64	361	96.72	1,012
92.60	144	94.68	361	96.76	1,035
92.64	151	94.72	361	96.80	1,058
92.68	158	94.76	361	96.84	1,081
92.72	166	94.80	361	96.88	1,105
92.76	173	94.84	361	96.92	1,128
92.80	180	94.88	361	96.96	1,152
92.84	187	94.92	362	97.00	1,176
92.88	194	94.96	362		
92.92	202	95.00	362		
92.96	209	95.04	362		
93.00	216	95.08	362		
93.04	223	95.12	362		
93.08	230	95.16	362		
93.12	238	95.20	362		
93.16	245	95.24	362		
93.20	252	95.28	362		
93.24	259	95.32	362		
93.28	266	95.36	362		
93.32	274	95.40	362		
93.36	281	95.44	362		
93.40	288	95.48	376		
93.44	295	95.52	394		
93.48	302	95.56	412		
93.52	310	95.60	431		
93.56	317	95.64	449		
93.60	324	95.68	468		
93.64	331	95.72	487		
93.68	338	95.76	506		
93.72	346	95.80	526		
93.76	353	95.84	545		
93.80	360	95.88	565		
93.84	360	95.92	584		

Summary for Link 1.PR: Wetlands

Inflow Area = 35,646 sf, 14.83% Impervious, Inflow Depth > 5.03" for 50-YEAR event
 Inflow = 3.98 cfs @ 12.14 hrs, Volume= 14,954 cf
 Primary = 3.98 cfs @ 12.14 hrs, Volume= 14,954 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-27.00 hrs, dt= 0.02 hrs

Link 1.PR: Wetlands



DCIA TRACKING WORKSHEET

9

Directly Connected Impervious Area Tracking Worksheet
City of Stamford Drainage Manual



Note to user: complete all cells of this color only, as indicated by section headings

Part 1: General Information (All Projects)

Project Name	Aglietti Residence
Project Address	13 South Brook Drive
Project Applicant	Adam Aglietti
Title of Plan	Proposed Site Development Plan on Property of Adam Aglietti
Revision Date of Plan	November 12, 2024
Tax Account Number	004-0002

Part 2: Project Details (All Projects)

1. What type of development is this? (choose from dropdown)	New Development	
2. What is the total area of the project site?	88,304	ft ²
3. What is the total area of land disturbance for this project?	21,000	ft ²
4. Does project site drain to High Quality Waters, a Direct Waterfront, or within 500 ft. of Tidal Wetlands? (Yes/No)	No	
Does Standard 1 apply based on information above?	No	

Part 3: Water Quality Target Total (Only for Standard 1 Projects)

5. What is the <u>current (pre-development) DCIA</u> for the site?	0	ft ²
6. Will the proposed development increase <u>DCIA</u> (without consideration of proposed stormwater management)? (Yes/No)	0	
7. What is the <u>proposed-development total impervious area</u> for the site?	5,287	ft ²
Water Quality Volume (WQV)	588	ft ³
Standard 1 requirement		
Required treatment/retention volume	938	ft ³
Provided treatment/retention volume for proposed development	1,123	ft ³

Part 4: Proposed DCIA Tracking (Only for Standard 1 Projects)

Pre-development <u>total impervious area</u>	0	ft ²
Current <u>DCIA</u>	0	ft ²
Proposed-development <u>total impervious area</u>	5,287	ft ²
Proposed-development <u>DCIA</u> (after stormwater management)	0	ft ²
Net change in <u>DCIA</u> from <u>current</u> to <u>proposed-development</u>	0	ft ²

Part 5: Post-Development (As-Built Certified) DCIA Tracking (Only for Standard 1 Projects)

Post-development (per as-built) <u>total impervious area</u>		ft ²
Post-development (per as-built) <u>DCIA</u> (after stormwater management)		ft ²
Net change in <u>DCIA</u> from <u>current</u> to <u>post-development</u>		ft ²

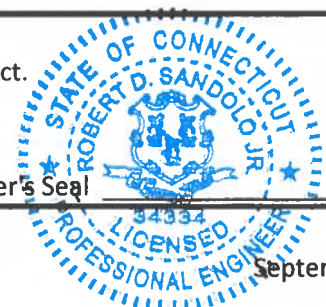
Certification Statement

I hereby certify that the information contained in this worksheet is true and correct.

Engineer's Signature 

Date 11/12/2021

Engineer's Seal



Block _____

AGREEMENT COVENANT

AGREEMENT made this _____ by and between
_____ and the **CITY OF STAMFORD**,
a municipal corporation lying within the County of Fairfield and State of
Connecticut, acting herein by its duly authorized Mayor, Caroline Simmons
(hereinafter referred to as the "City"), and the **ENVIRONMENTAL PROTECTION
BOARD OF THE CITY OF STAMFORD**, acting herein by its duly authorized
Chairman, Gary H. Stone (hereinafter referred to as the "EPB").

WITNESSETH:

WHEREAS, OWNER has commenced the planning and construction of

on a parcel of land owned by them and as more particularly described on
Schedule "A", attached hereto and made a part hereof (the "Property").

WHEREAS, certain drainage facilities ("Drainage Facilities"),
including but not limited to _____ as more
particularly described on Schedule "B" attached (the "Construction Plans")
shall be installed in connection with the aforesaid construction and in
accordance with the Construction Plans and _____
issued therefore, (the "Permit") and;

WHEREAS, OWNER, the CITY and EPB share a joint concern that the
Drainage Facilities be maintained in a functioning condition so as to avoid
pollution of surface and groundwaters, flooding and/or improper drainage.

NOW, THEREFORE, in consideration of ten dollars and other good and valuable consideration receipt of which is hereby acknowledged by the OWNER, it is hereby agreed as follows:

- 1) OWNER shall clean the drainage facilities or cause such facilities to be cleaned by periodic removal of accumulated sediment and debris in a good and workman-like manner, at least two (2) times during every twelve (12) month period, which times shall be in the period between April and June and between October and December and more often as the City may determine to be necessary.
- 2) OWNER shall sweep, or cause to be swept, garage facilities, driveways and roadway surfaces located on the Property at least once per calendar quarter.
- 3) OWNER shall utilize only sand or calcium chloride in connection with the de-icing of areas within the Property meaning and intending that road salt (Sodium Chloride) shall not be used for said purpose.
- 4) OWNER shall repair or replace any defects or defective drainage facilities so as to maintain the drainage facilities, at all times, in a fully functional capacity.
- 5) OWNER shall file as-built drainage plans with the EPB immediately upon the completion of work. Said plans shall be prepared by a professional engineer/surveyor registered in the State of Connecticut.

- 6) OWNER grants the CITY and/or EPB, its agents, and employees, the right to enter the Property at all reasonable times upon twenty-four (24) hours notice to the OWNER for the purpose of inspecting the Property to determine if OWNER is complying with the requirements hereunder. A representative of the Owner shall have the right to accompany the City and/or EPB on their inspection of the Property.
- 7) If, after an inspection is made pursuant to Paragraph Six (6) hereof, the CITY and/or EPB determines that the owner has failed to comply with the aforesaid undertakings, then the CITY and/or EPB shall give written notice of said determination to the then OWNER of the Property which notice shall also specify the said failure. Said notice shall be sent by registered or certified mail to the last known address of said Owner. If the Owner disputes the claim, he shall give written notice thereof to City and/or EPB within ten (10) days of receipt of said notice, and the EPB shall hold a hearing as promptly as possible to decide the merits of the disputed claim. If the claim is not disputed within said ten (10) days, the OWNER shall have thirty (30) days from the receipt of said notice to correct said failure, unless it is impossible to cure said defect within said time, in which case, the necessary repairs shall be immediately commenced and diligently pursued to completion within a reasonable time.
- 8) If the said failure is not remedied within the time frame herein stated, the CITY and/or EPB may proceed to cure the same and charge the actual cost thereof to the OWNER of the Property.

- 9) OWNER agrees to reimburse the CITY and/or EPB for reasonable legal fees and court costs if it becomes necessary for the CITY and/or EPB to sue for reimbursement of sums expended by the CITY and/or EPB in performance of OWNER'S obligation.
- 10) OWNER agrees and covenants to indemnify and save harmless the CITY and the EPB against any and all claims, suits, actions or judgments arising out of the delay in the performance of any of their obligations pursuant to this Agreement.
- 11) OWNER agrees that this covenant and restriction shall apply to and run with the land. It shall be binding on all future owners, administrators, executors, successors and assigns.
- 12) The OWNER hereby represents to the CITY and EPB that he/she is the owner, in fee simple, of all of the property described in "Schedule A" attached hereto and made a part hereof.
- 13) OWNER agrees that this Agreement and restrictive covenant upon execution of the same, shall be recorded on the land records at the OWNER'S expense at the time that a permit is issued for the Property herein and while the OWNER is in title.
- 14) OWNER agrees not to assert the invalidity of this document.
- 15) OWNER agrees that nothing herein shall be construed to be a limitation upon the right of the EPB to assert and enforce any rights it may have under federal, state or City statute, ordinance or regulation.

16) This agreement shall be governed by the laws of the State of Connecticut.

IN WITNESS WHEREOF, the said parties hereto have hereunto set their hands and seals, the day and year first above written.

WITNESSED:

THE CITY OF STAMFORD

BY: _____

Caroline Simmons

Its duly authorized Mayor

**THE ENVIRONMENTAL PROTECTION
BOARD**

BY: _____

Gary H. Stone

Its duly authorized Chairman

OWNER

BY: _____

(Owner's Name)

(Acknowledgement on the Following Page)

STATE OF CONNECTICUT}

} ss: STAMFORD Date: _____

COUNTY OF FAIRFIELD }

Personally appeared Caroline Simmons, Mayor of the City of Stamford, signer and sealer of the foregoing Instrument, and acknowledged the same to be his free act and deed and the free act and deed of said City, before me.

Commissioner of the Superior
Court or Notary Public

STATE OF CONNECTICUT}

} ss: STAMFORD Date: _____

COUNTY OF FAIRFIELD }

Personally appeared Gary H. Stone, Chairman of the Environmental Protection Board of the City of Stamford, signer and sealer of the foregoing Instrument, and acknowledged the same to be his free act and deed and the free act and deed of said Commission, before me.

Commissioner of the Superior Court
or Notary Public

STATE OF CONNECTICUT}

} ss: STAMFORD Date: _____

COUNTY OF FAIRFIELD }

Personally appeared _____ signer and sealer of the foregoing instrument, and acknowledged the same to be _____ free act and deed, before me.

Commissioner of the Superior Court
or Notary Public

SCHEDULE "A"

SCHEDULE "B"



S.E. MINOR & CO.

EST. 1887 • GREENWICH, CT

S. E. MINOR & CO., INC.
Consulting Engineers & Surveyors
33 West Elm Street
Greenwich, CT 06830

Exhibit A
Operations and Maintenance Plan

13 South Brook Drive
11/11/2024

Scope:

The purpose of the Operations and Maintenance Plan is to ensure that the existing and proposed stormwater components installed at *13 South Brook Drive* are maintained in operational condition throughout the life of the project. The service procedures associated with this plan shall be performed as required by the parties legally responsible for their maintenance.

Recommended Frequency of Service:

As further defined below, all stormwater components should be checked on a periodic basis and kept in full working order. Ultimately, the required frequency of inspection and service will depend on runoff quantities, pollutant loading, and clogging due to debris. At a minimum, we recommend that all stormwater components be inspected and serviced twice per year, once before winter begins and once during spring cleanup.

Qualified Inspector:

The inspections must be completed by an individual experienced in the construction and maintenance of stormwater drainage systems. Once every five years the inspections must be completed by a professional engineer.

Service Procedures:

1. Catch Basins & Drainage Inlets:

- a. Catch basins and drainage inlets shall be completely cleaned of accumulated debris and sediments at the completion of construction.
- b. For the first year, catch basins and drainage inlets shall be inspected on a quarterly basis.
- c. Any accumulated debris within the catch basins/inlets shall be removed and any repairs as required.
- d. From the second year onward, visual inspections shall occur twice per year, once in the spring and once in the fall, after fall cleanup of leaves has occurred.
- e. Accumulated debris within the catch basins/inlets shall be removed and repairs made as required.
- f. Accumulated sediments shall be removed at which time they are within 12 inches of the invert of the outlet pipe.

- g. Any additional maintenance required per the manufacturer's specifications shall also be completed.

2. Storm Drainage Piping and Manholes/Junction Boxes:

- a. All storm drainage piping shall be completely flushed of debris and accumulated sediment at the completion of construction.
- b. Manholes/Junction Boxes shall be inspected and repaired on an annual basis.
- c. Unless system performance indicates degradation of piping, comprehensive video inspection of storm drainage piping shall occur once every ten years.
- d. Any additional maintenance required per the manufacturer's specifications shall also be completed.

3. Stormwater Control Structures:

- a. All control structures (orifice, weir, etc.) shall be completely cleaned of accumulated debris and sediments at the completion of construction. Any repairs shall be performed.
- b. For the first year, control structures (orifice, weir, etc.) shall be inspected on a quarterly basis.
- c. Any accumulated debris shall be removed and any repairs made to the control structures (orifice, weir, etc.) as required.
- d. From the second year onward, visual inspections shall occur twice per year, once in the spring and once in the fall, after fall cleanup of leaves has occurred.
- e. Accumulated debris shall be removed and repairs made as required.
- f. Any additional maintenance required per the manufacturer's specifications shall also be completed.

4. Drainage Outfalls/Splash Pads/Scour Holes/Level Spreaders:

- a. All outfalls shall be completely cleaned of accumulated debris and sediments at the completion of construction. Any repairs to outlet protection material (rip rap) shall be performed.
- b. For the first year, outfalls shall be inspected on a quarterly basis.
- c. Any accumulated debris shall be removed and any repairs made to the outfalls as required.
- d. From the second year onward, visual inspections shall occur twice per year, once in the spring and once in the fall, after fall cleanup of leaves has occurred.
- e. Accumulated debris shall be removed and repairs made as required.
- f. Any erosion shall be promptly repaired and the cause of the erosion shall be identified and corrected.
- g. Any additional maintenance required per the manufacturer's specifications shall also be completed.

5. Bioretention/Biofiltration Basins and Rain Gardens:

- a. Bioretention/Biofiltration basins and rain gardens shall be cleaned of debris and sediments upon the completion of construction. Any filter media (bioretention soil) impacted by the construction activities shall be removed and replaced at this time.
- b. The filter media (bioretention soil) shall be visually inspected on a monthly basis for the first 6 months. Any erosion or displacement of the filter media (bioretention soil) shall be promptly repaired and the cause of the problem shall be identified and corrected.

Monthly inspections shall continue until successful operation of the system is confirmed.

- c. Bioretention/Biofiltration areas and rain gardens with grass shall not be mowed more than twice during the growing season, preferably only in late October. More frequent mowing will eliminate native forbs and sedges from the meadow cover.
- d. Bioretention/Biofiltration areas and rain gardens with mulch and plantings shall be inspected during spring cleanup and one just prior to the winter season.
- e. All dead plants and missing mulch shall be replaced and any necessary pruning of vegetation shall be completed.
- f. The surface of these structures shall be inspected on a quarterly basis after the first six months of successful operation and after heavy runoff events (e.g. >3.0" in a 24-hour period). One inspection shall occur immediately following the completion of winter sanding and subsequent sweeping operations, and one shall occur just prior to the winter season. Any accumulated debris and sediments shall be removed.
- g. Check draining time of bioretention/biofiltration areas and rain gardens annually. Check within 72 hours after a minimum one inch rain event. If there is no standing water, infiltration is acceptable. If draining time is excessive, quantitatively determine infiltration rate. Use a double ring infiltrometer or monitor drop in water level after a significant storm. If infiltration rate <0.5 in. /hour, remedial action shall be taken.
- h. A soil-core investigation may be used to identify the clogged portion of stormwater facility and depth of clogging. Remedial measures may include removal of clogged soil layer and replacement with suitable media, aeration, and mixing upper strata with lower soil strata. After corrective measures have been implemented, infiltration rate and draining time shall be retested.

6. Drywells and Infiltration Systems:

- a. All drywells/infiltrators shall be completely cleaned of accumulated debris and sediments upon the completion of construction.
- b. For the first year, the drywells/infiltrators shall be inspected on a quarterly basis.
- c. Any accumulated debris within the drywells/infiltrators shall be removed and any repairs made to the units as required.
- d. From the second year onward, visual inspection shall occur twice per year, once in the spring and once in the fall, after fall cleanup of leaves has occurred.
- e. Accumulated debris within the units shall be removed and repairs made as required.
- f. Any additional maintenance required per the manufacturer's specifications shall also be completed.

7. Roof Gutters:

- a. Remove accumulated debris and inspect for damage. Any damage should be repaired as required.

Disposal of Debris and Sediment:

All debris and sediment removed from the stormwater structures and bioretention/biofiltration basins shall be disposed of legally. There shall be no dumping of silt or debris into or in proximity to any inland or tidal wetlands.

Maintenance Records:

The Owners(s) must maintain all records (logs, invoices, reports, data, etc.) and have them readily available for inspection at all times.

Operations and Maintenance Log (Page 1 of 3)

13 South Brook Drive

11/11/2024

Type of Inspection: ☐ Spring ☐ Fall ☐ Other

Inspector's Name: _____ Date of Inspection: _____

Affiliation: _____ Phone #: _____

Catch Basins & Drainage Inlets:

- Has accumulated debris been removed from grates? ☐ Yes ☐ No ☐ N/A
- Do any basins require additional repair? (identify below): ☐ Yes ☐ No ☐ N/A
- Have sumps been cleaned of sediment? ☐ Yes ☐ No ☐ N/A

Notes:

Storm Drainage Piping and Manholes/Junction Boxes:

- Has accumulated debris been removed? ☐ Yes ☐ No ☐ N/A
- Do any manholes require additional repair? (identify below): ☐ Yes ☐ No ☐ N/A
- Is there any evidence of stormwater piping failure? ☐ Yes ☐ No ☐ N/A
- Has a comprehensive video inspection been completed? ☐ Yes ☐ No ☐ N/A

Notes:

Stormwater Control Structures:

- Has accumulated debris been removed? ☐ Yes ☐ No ☐ N/A
- Are any repairs required? (identify below): ☐ Yes ☐ No ☐ N/A
- Have orifices and weirs been cleaned of debris? ☐ Yes ☐ No ☐ N/A

Notes:

Operations and Maintenance Log (Page 2 of 3)

13 South Brook Drive

11/11/2024

Drainage Outfalls/Splash Pads/Scour Holes/Level Spreaders:

- | | |
|---|---|
| • Have all drainage outlets been cleared of debris? | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A |
| • Have all outlet protections been inspected/repared? | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A |
| • Have all erosion issues been repaired? | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A |

Notes:

Bioretention/Biofiltration Basins/Rain Gardens:

- | | |
|---|---|
| • Have basins been cleared of debris/sediments? | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A |
| • Have draining times of basins been verified? | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A |
| • Has vegetation been mowed (twice/year max.)? | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A |
| • Has plantings and mulch been replaced (twice/year)? | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A |

Notes:

Drywells and Infiltration Systems:

- | | |
|---|---|
| • Have units been cleared of debris/sediments? | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A |
| • Do units require additional repair? (identify below): | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A |
| • Has draining times of system been verified? | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A |

Notes:

Operations and Maintenance Log (Page 3 of 3)

13 South Brook Drive

11/11/2024

Roof Gutters:

- Has accumulated debris been removed from gutters? ☐ Yes ☐ No ☐ N/A
- Do any gutters require additional repair? (identify below): ☐ Yes ☐ No ☐ N/A

Notes:

Please make additional notes/observations and particular concerns below. Also record any additional maintenance that has been performed:

Signature of Inspector:

Date: