Stormwater Management Report

Proposed Day Care Center
188 East Main Street
Georgetown, Massachusetts

July 12, 2023

Prepared for:

Tremblay Properties, LLC
13 East Meadow Lane
Middleton, MA

Prepared By:

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Stormwater Management Report

- Stormwater Checklist
- Introduction & Background
- Compliance with Massachusetts Stormwater Standards
  - Standard 1: No New Untreated Discharges
  - Standard 2: Peak Rate Attenuation
  - Standard 3: Recharge
  - Standard 4: Water Quality
  - Standard 5: LUHPPLs
  - Standard 6: Critical Areas
  - Standard 7: Redevelopment Projects
  - Standard 8: Construction Period Pollution Plan
  - Standard 9: Operation and Maintenance Plan
  - Standard 10: Prohibition of Illicit Discharges
  - Construction Pollution Prevention Plan
  - Long-term Pollution Prevention Plan
  - Appendix A: NRCS Soil Mapping and Data
  - Appendix B: Drainage Calculations
  - Watershed Maps

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

RE: 188 E. MAIN ST GEORGETOWN

[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature

PE 7/12/23

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☐ New development

☐ Redevelopment

☒ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- ☒ No disturbance to any Wetland Resource Areas
- ☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- ☐ Reduced Impervious Area (Redevelopment Only)
- ☐ Minimizing disturbance to existing trees and shrubs
- ☐ LID Site Design Credit Requested:
  - ☐ Credit 1
  - ☐ Credit 2
  - ☐ Credit 3
- ☐ Use of "country drainage" versus curb and gutter conveyance and pipe
- ☐ Bioretention Cells (includes Rain Gardens)
- ☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- ☐ Treebox Filter
- ☐ Water Quality Swale
- ☐ Grass Channel
- ☐ Green Roof
- ☐ Other (describe): _____

Standard 1: No New Untreated Discharges

- ☒ No new untreated discharges
- ☒ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- ☒ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☒ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☐ Static ☒ Simple Dynamic ☐ Dynamic Field[1]

☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☒ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☒ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☐ is near or to other critical areas
- ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☐ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☒ The BMP is sized (and calculations provided) based on:

- ☐ The ½" or 1" Water Quality Volume or
- ☒ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☐ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☒ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☐ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☐ Redevelopment Project
- ☒ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☒ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☐ The project is ***not*** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☒ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☒ Name of the stormwater management system owners;
- ☒ Party responsible for operation and maintenance;
- ☒ Schedule for implementation of routine and non-routine maintenance tasks;
- ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☐ Description and delineation of public safety features;
- ☐ Estimated operation and maintenance budget; and
- ☒ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☒ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☐ An Illicit Discharge Compliance Statement is attached;

☒ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

Introduction and Background

The site consists of approximately 70,924-sf in land area located on the Northerly side of East Main Street, bounded by East Main Street on the south, land of Lawrence H. Ogden & Kathleen L. Lee Ogden and land of First Baptist Church, Inc. on the north, land of First Baptist Church, Inc. on the west, and land of Lawrence H. Ogden & Kathleen L. Lee Ogden and land of Sean V. Sexton and Paula M. Eggleston to the east. The front portion of the site is currently comprised of an approximately 2,340-sf abandoned single family residential dwelling with a paved driveway, an existing pool, a concrete slab to the east and wooded land to the west. The back portion of the site is entirely wooded excluding an abandoned concrete foundation slab. The front portion slopes southerly towards East Main Street. The back portion of the site slopes northerly towards land of Lawrence H. Ogden & Kathleen L. Lee Ogden.

The Project consists of the construction of a proposed 1-story building approximately 8,054±s.f. in area, parking areas, walkways, walls, a riprap slope, an infiltration pond, a stone infiltration trench, and providing an underground drainage system. The Project, as proposed, represents a new and redevelopment project and results in a net increase of 14,278s.f.± of impervious surface.

This Storm Water Management Report evaluates the Project's hydrologic impacts and compliance with the Massachusetts Stormwater Management Standards as identified in the Massachusetts Stormwater Handbook (MSH) for the proposed improvements described above.

Methodology

This study evaluates the Site hydrology in accordance with the National Resource Conservation Service (NRCS), formerly the Soil Conservation Service (SCS), methodology outlined in Technical Release 55 and Technical Release 20. Precipitation volumes are summarized in Table 1, below:

Table 0: Design Storm Events
NRCC – Georgetown, Massachusetts

Recurrence Interval	Precipitation
2-year, 24-hour	3.16-inches
10-year, 24-hour	4.86-inches
25-year, 24-hour	6.22-inches
100-year, 24-hour	9.04-inches

Modelling was performed using HydroCAD™ software and model parameters based on pre- and post-development hydrologic soil group, land cover conditions, and topography.

Analysis

The selected design points of comparison for this analysis are the closed drainage system in East Main Street and land of Lawrence H. Ogden & Kathleen L. Lee Ogden. Peak rates of runoff were evaluated in both the existing and proposed conditions using the cumulative rainfall depths for the 2, 10, 25 and 100-year, Type III, 24-hour storm events as identified above. As previously stated, the Project is a new and redevelopment project.

Compliance with Stormwater Management Standards

Standard 1: No New Untreated Discharges

The Project, as proposed, will not create new untreated discharges of stormwater runoff. The project proposes no new point source discharges of stormwater.

Standard 2: Peak Rate Attenuation

The Project, as proposed, does not increase peak rate of runoff or volume in 2, 10, 25 and 100-year, Type III, 24-hour storm events to the selected design point. HydroCAD™ calculations accompany this report as Appendix A. The following tables summarize the calculated peak rate of runoff to the Design Points for the project in the existing and proposed conditions:

Table 1: Peak Rate and Volume
Tributary to DP1 East Main Street

Storm Event	Existing Condition	Proposed Condition
2-year, 24-hour, Type III	0.13 cfs	0.05 cfs
(3.16-inches)	1,061 cf	293 cf
10-year, 24-hour, Type III	0.93 cfs	0.86 cfs
(4.86-inches)	3,854 cf	3,326 cf
25-year, 24-hour, Type III	1.91 cfs	1.56 cfs
(6.22-inches)	6,863 cf	6,397 cf
100-year, 24-hour, Type III	4.32 cfs	2.69 cfs
(9.04-inches)	14,456 cf	13,666 cf

Table 2: Peak Rate and Volume (no pond)
Tributary to DP2 Abutter

Storm Event	Existing Condition	Proposed Condition
2-year, 24-hour, Type III	0.00 cfs	0.00 cfs
(3.16-inches)	0 cf	0 cf
10-year, 24-hour, Type III	0.00 cfs	0.00 cfs
(4.86-inches)	36 cf	25 cf
25-year, 24-hour, Type III	0.01 cfs	0.01 cfs
(6.22-inches)	356 cf	241 cf
100-year, 24-hour, Type III	0.24 cfs	0.16 cfs
(9.04-inches)	1,879 cf	1,524 cf

Standard 3: Recharge

The Natural Resource Conservation Service (NRCS) classifies the soils as Hinkley Loamy Sand Hydrologic Soil Group (HSG) "A", Canton Fine Sandy Loam HSG "A", and Canton Fine Sandy Loam HSG "B". The results of on-site soil testing performed by a competent soils professional reveal the soils properties were consistent with the classifications above. Percolation tests

revealed a rate closer to that of a B soil in the parent material. Projects in Georgetown are required to infiltrate the required recharge volume equivalent to 2-inches of runoff over the proposed impervious surfaces. Compliance with this standard is documented below:

Required Recharge Volume

$$R_v = F \times A_{impervious}$$

Where:

R_v is the Required Recharge Volume
F is the Target Depth Factor associated with each Hydrologic Soil Group
$A_{impervious}$ is the proposed increase in impervious area to design point

Note: Georgetown requires a Target Depth Factor of 2"

POND1 – Infiltration Basin:

= 2" x (1'/12") x 7,069 sf = 1,180 cf. required recharge volume
Pond Volume Provided= 4,724 cf.

INF – Subsurface Infiltration Chambers:

= 2" x (1'/12") x 7,209 sf = 1,202 cf. required recharge volume
Chamber System Volume Provided= 3,633 cf.

72-hour Drawdown Analysis:
Static Method:

$$Time_{drawdown} = \frac{Rv}{(K)(Bottom\ Area)}$$

Where:

R_v is the Required Recharge Volume
K is the Saturated Hydraulic Conductivity (for "Static" Method, use Rawls Rate)
Bottom Area is the Bottom Area of Recharge Structure

POND1 – Infiltration Basin:

1,180cf. / ((2.41in/hr)(1ft/12")(225sf)) = 26.1 hours

INF – Subsurface Infiltration Chambers:

1,202cf. / ((2.41in/hr)(1ft/12")(1,710sf)) = 3.5 hours

Runoff volumes in the existing and proposed conditions are summarized in Tables 1-3, above.

Standard 4: Water Quality

Stormwater runoff for Design Point 1 (East Main Street) from the impervious surfaces is collected with deep-sump and hooded catch basins, subsequently treated through the use of a swirl particle separator (ADS Barracuda S3 Max, or equal) and a sedimentation forebay. The presumptive TSS removal rate for the project is as follows:

BMP	TSS Removal	Cum. TSS Removal
Deep Sump Catch Basins	25%	25%
Particle Separator	77%	83%
Infiltration Basin	80%	97%

The proposed treatment chain provides in excess of 90% presumptive TSS removal at the point of discharge. There is also a sedimentation forebay that will provided additional TSS removal that we are not taking credit for.

Forebay Sizing Calculation:

Impervious Area to forebay: 13,639 sf.

Required Volume = 0.1" (1'/12")x 13,639 sf. = 114 cf required.

Volume Provided = 122 cf

Standard 5: Land Uses with Higher Potential Pollutant Loads (LUHPPLs)

The Project is not associated with a LUHPPL. Standard 5 is not applicable to this project.

Standard 6: Critical Areas

The Site is not tributary to an Outstanding Resource Water (ORW) or other Critical Areas.

Standard 7: Projects Subject to the Standards only to the maximum extent practicable

The Project is a redevelopment and has been designed to meet the applicable Standards to the maximum extent practicable.

Standard 8: Construction Period Pollution Prevention & Sedimentation Control

A construction period pollution prevention plan accompanies this report. The Project is also subject to a NPDES Construction General Permit. A SWPPP will be submitted prior to the commencement of construction activities.

Standard 9: Operations and Maintenance Plan

A post-construction Operation and Maintenance Plan (Long-Term Pollution Prevention Plan) accompanies this report.

Standard 10: Prohibition of Illicit Discharges

The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges. An illicit discharge statement is also included in the plan.

Construction Period Pollution Prevention Plan

Project Name: 188 East Main Street

Owner's Name: Tremblay Properties, LLC

Applicant's Name: Tremblay Properties, LLC

Party Responsible for Maintenance: Tremblay Properties, LLC

Project Description:

The Applicant seeks to construct a 1-story building with associated parking, walkways, and utilities.

Erosion and Sedimentation Control Measures During Construction Activities:

Storm Drain Inlet Protection

A temporary storm inlet protection filter will be placed in all catch basin units. The purpose of the filter is to prevent the inflow of sediment into the closed drainage system(s). The filters shall remain in place until a permanent vegetative cover is established and the transport of sediment is no longer visibly apparent. The filter shall be inspected and maintained on a weekly basis and after significant storm events. Significant storm events are those having greater than one-quarter (1/4) inch of precipitation in a 24-hour period.

Surface Stabilization

The surface of all disturbed areas shall be stabilized during and after construction. Temporary measures shall be taken during construction to prevent erosion and sedimentation. No construction sediment shall be allowed to enter infiltration areas. All disturbed slopes shall be stabilized with a permanent vegetative cover. Some or all of the following measures can be used on the Project as conditions may warrant:

- Temporary Seeding
- Temporary Mulching
- Placement of Hay
- Placement of Geo-Synthetic Fabrics
- Hydroseeding
- Permanent Seeding
- Placement of Sod

Surface and Subsurface Infiltration Facilities

No construction period runoff should be directed toward infiltration facilities. The performance of these facilities shall be checked weekly and after significant storm events throughout construction.

INSPECTION SCHEDULE and EVALUATION CHECKLIST

To be completed weekly and within 24-hours of significant rainfall events (greater than 1/4-inches in a 24-hour period).

Inspector's Name: _____ Date: _____

Qualifications: _____

_____

Days since last rainfall: _____ days Amount of last rainfall: _____inches

Stabilization Measures

Sub-Catchment	Date of Last Disturbance	Date of Next Disturbance	Stabilized (Yes or No)	Stabilized With:	Condition

Stabilization required: _____

_____

_____

_____

_____

_____

_____

To be performed by: _____ on or before: _____

PERIMETER CONTROLS

Date of Inspection: _____

Silt Fence and Hay Bales:

To Study Area:	Has sediment reached 1/3 height of silt fence? (Yes or No)	Depth of Silt (inches)	Is fence secure? (Yes or No)	Is there evidence of bypass or overtopping? (Yes or No)	Describe location of Problem(s), if any.

Maintenance required for silt fence and hay bales: _____

_____

_____

To be performed by: _____ on or before: _____

Stabilized Construction Entrance:

Location	Does much sediment get tracked onto roadway? (Yes or No)	Is gravel clean or full of sediment?	Is all traffic using the entrance to access/exit the site? (Yes or No)	Is the culvert beneath the entrance working? (Yes or No)

Maintenance required for stabilized construction entrance: _____

_____

_____

To be performed by: _____ on or before: _____

Other Best Management Practices:

BMP	In use? (Yes or No)	Maintenance Required? (Yes or No)	Describe location of Problem(s), if any.

Maintenance required: _____

_____

_____

To be performed by: _____ on or before: _____

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Signature: _____ Date: _____

Long-Term Pollution Prevention Plan

Project Name: 188 East Main Street

Owner's Name: Tremblay Properties, LLC

Applicant's Name: Tremblay Properties, LLC

Party Responsible for Maintenance: Tremblay Properties, LLC

Project Description:

The Applicant seeks to construct a 1-story building with associated parking, walkways, and utilities.

Acknowledgement: _____ Date: _____

Post-Construction Inspection and Maintenance Measures:

Erosion Control

Sedimentation caused from erosion of soils can adversely affect the performance of the storm water management system. The site should be inspected annually for areas that are barren and/or showing signs of erosion and should be stabilized through immediate re-vegetation.

Debris and Litter Removal

Litter and other debris may collect in storm water best management practices (BMPs), potentially causing clogging of facilities. All debris and litter shall be removed as necessary, at a minimum of four (4) times per year in the spring, summer, fall and winter.

Deep Sump and Hooded Catch Basins
In accordance with Volume 2, Chapter 2 of the MassDEP Storm Water Handbook as summarized below:
Inspect or clean deep sump catch basins at least four (4) times per year and at the end of the foliage and snow-removal seasons. Sediments must also be removed four (4) times per year or whenever the depth of deposits is greater than or equal to one-half (1/2) the depth from the invert of the lowest pipe in the basin to the bottom of the basin (the sump). If handling runoff from land uses with higher potential pollutant loads (LUHPPLs) or discharging near or to a critical area, more frequent cleaning may be necessary.
Deep sump and hooded catch basins should be cleaned with vacuum trucks only. Clamshell buckets shall not be used to clean hooded catch basins. Vacuum trucks remove more sediment and supernatant and are less likely to snap the hood within the deep sump basin.
Always consider the safety of the staff cleaning deep sump catch basins. Cleaning a deep sump catch basin within a road with active traffic or even within a parking lot is dangerous, and a police detail may be necessary to safeguard workers.

Although catch basin debris often contains concentrations of oil and hazardous materials such as petroleum hydrocarbons and metals, MassDEP classifies them as solid waste. Unless there is evidence that they have been contaminated by a spill or other means, MassDEP does not routinely require catch basin cleanings to be tested before disposal. Contaminated catch basin cleanings must be evaluated in accordance with the Hazardous Waste Regulations, 310 CMR 30.000, and handled as hazardous waste.

In the absence of evidence of contamination, catch basin cleanings may be taken to a landfill or other facility permitted by MassDEP to accept solid waste, without any prior approval by MassDEP. However, some landfills require catch basin cleanings to be tested before they are accepted.

With prior MassDEP approval, catch basin cleanings may be used as grading and shaping materials at landfills undergoing closure (see Revised Guidelines for Determining Closure Activities at Inactive Unlined Landfill Sites) or as daily cover at active landfills. MassDEP also encourages the beneficial reuse of catch basin cleanings whenever possible. A Beneficial Reuse Determination is required for such use.

Sediment Forebay

In accordance with Volume 2, Chapter 2 of the MassDEP Storm Water Handbook as summarized below:

Sediments and associated pollutants are removed only when sediment forebays are actually cleaned out, so regular maintenance is essential. Frequently removing accumulated sediments will make it less likely that sediments will be resuspended. At a minimum, inspect sediment forebays monthly and clean them out at least four times per year. Stabilize the floor and sidewalls of the sediment forebay before making it operational, otherwise the practice will discharge excess amounts of suspended sediments. When mowing grasses, keep the grass height no greater than 6 inches. Set mower blades no lower than 3 to 4 inches. Check for signs of rilling and gullying and repair as needed. After removing the sediment, replace any vegetation damaged during the clean-out by either reseeding or re-sodding. When reseeding, incorporate practices such as hydroseeding with a tackifier, blanket, or similar practice to ensure that no scour occurs in the forebay, while the seeds germinate and develop roots.

Particle Separators

The Barracuda MAX requires periodic maintenance to continue operating at design efficiency. The maintenance process is comprised of the cleaning of the manhole with a vacuum truck. The system needs to be cleaned, when necessary, to ensure optimum performance, typically every 12-18 months. The rate at which the system collects pollutants will depend more upon site activities than the size of the unit. Since stormwater solids loads can be variable, it is possible that the maintenance cycle could be more or less than the projected duration for a given O&M cycle.

Inspection

Inspection is the key to effective maintenance, and it is easily performed. The ADS Water Quality Team recommends the Barracuda MAX be inspected every six (6) months for the first year, and then on an annual basis. Sediment accumulation may be especially variable during the first year after installation as construction disturbances and landscaping stabilizes. Inspections may need to be performed more often in the winter months in climates where sanding operations may lead to rapid accumulations or in other areas with heavy sediment loading. It is particularly useful to keep a record of each inspection.

NJDEP requires that sediment be removed when the sediment depth reaches 50% of the MTD's maximum sediment storage capacity. The Barracuda MAX should be cleaned when inspection reveals that 10 inches or more of sediment is accumulated at the bottom of the manhole or when visual inspection shows a large accumulation of debris or oil. This determination of sediment depth can be made by lowering a stadia rod into the manhole until it hits the sediment and measuring the distance from the bottom of the pole to the water line mark on the stadia rod. Note: To avoid underestimating the volume of sediment in the manholes, the measuring device must be lowered to the top of the sediment pile carefully. Finer, silty particles at the top of the pile may offer less resistance to the end of the rod than larger particles toward the bottom of the pile.

Maintenance frequency can be determined by adhering to the initial sizing frequency given by the initial sizing of the system. Once actual sediment loading on-site is determined, a modified maintenance frequency can be proposed to the site owner. Please contact the ADS Water Quality Engineering Team for maintenance cycle estimations or assistance at 1.800.229.7283.

Maintenance Procedures

1. Remove the manhole cover to provide access to the pollutant storage. Pollutants are stored in the sump, below the cone assembly visible from the surface. Access to this area is through the opening at the bottom of the cone.
2. Use a vacuum truck to remove all water, debris, oils, and sediment from both the top cone area and the bottom sump compartment area of the Barracuda MAX unit.
3. Use a high-pressure hose to clean the manhole of all remaining sediment and debris (recommended but optional). Then, use the vacuum truck to remove this water.
4. Fill the cleaned Barracuda MAX unit with water to the invert of the outlet pipe.
5. Replace the manhole cover/close the hatch (if applicable).
6. Dispose of polluted water, oils, sediment, and trash at an approved facility.
7. Local regulations prohibit the discharge of solid material into the sanitary system. Check with the local sewer authority for authority to discharge the liquid.

Stormtech SC-740 Subsurface Chambers

In accordance with Volume 2, Chapter 2 of the MassDEP Storm Water Handbook and Manufacturer's recommendations as summarized below:

Inspect inlets at least twice per year including the outlet structure. Remove any debris that might clog the system. Inspect level of sediment and observe any standing water from the inspection ports. StormTech Maintenance guidelines can be found from the manufacturer at:
https://assets.adspipe.com/m/770e887b972da86f/original/SC-160LP-SC-310-SC-740-DC-780-StormTech-Design-Manual.pdf
and as copied below:

12.0 Inspection and Maintenance

12.1 Isolator Row Plus Inspection

Regular inspection and maintenance are essential to assure a properly functioning stormwater system. Inspection is easily accomplished through the manhole or optional inspection ports of an Isolator Row PLUS. Please follow local and OSHA rules for a confined space entry.

Inspection ports can allow inspection to be accomplished completely from the surface without the need for a confined space entry. Inspection ports provide visual access to the system with the use of a flashlight. A stadia rod may be inserted to determine the depth of sediment. If upon visual inspection it is found that sediment has accumulated to an average depth exceeding 3 (76 mm), cleanout is required.

A StormTech Isolator Row PLUS should initially be inspected immediately after completion of the site's construction. While every effort should be made to prevent sediment from entering the system during construction, it is during this time that excess amounts of sediments are most likely to enter any stormwater system. Inspection and maintenance, if necessary, should be performed prior to passing responsibility over to the site's owner. Once in normal service, a StormTech Isolator Row PLUS should be inspected bi-annually until an understanding of the sites characteristics is developed. The site's maintenance manager can then revise the inspection schedule based on experience or local requirements.

12.2 Isolator Row Plus Maintenance

JetVac maintenance is recommended if sediment has been collected to an average depth of 3 (76 mm) inside the Isolator Row PLUS. More frequent maintenance may be required to maintain minimum flow rates through the Isolator Row PLUS. The JetVac process utilizes a high pressure water nozzle to propel itself down the Isolator Row PLUS while scouring and suspending sediments. As the nozzle is retrieved, a wave of suspended sediments is flushed back into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/ JetVac combination vehicles. Fixed nozzles designed for culverts or large diameter pipe cleaning are preferable. Rear facing jets with an effective spread of at least 45 (1143 mm) are best. StormTech recommends a maximum nozzle pressure of 2000 psi be utilized during cleaning. The JetVac process shall only be performed on StormTech Rows that have ADS PLUS fabric over the foundation stone.

Looking down the Isolator Row PLUS

A typical JetVac truck (This is not a StormTech product.)

Examples of culvert cleaning nozzles appropriate for Isolator Row PLUS maintenance. (These are not StormTech products).

12.0 Inspection & Maintenance

StormTech Isolator Row Plus - Step-by-Step Maintenance Procedures

Step 1: Inspect Isolator Row PLUS for sediment

A) Inspection ports (if present)
   i. Remove lid from floor box frame
   ii. Remove cap from inspection riser
   iii. Using a flashlight and stadia rod, measure depth of sediment
   iv. If sediment is at, or above, 3" (76 mm) depth proceed to Step 2. If not proceed to Step 3.

B) All Isolator Plus Rows
   i. Remove cover from manhole at upstream end of Isolator Row PLUS
   ii. Using a flashlight, inspect down Isolator Row PLUS through outlet pipe
      1. Follow OSHA regulations for confined space entry if entering manhole
      2. Mirrors on poles or cameras may be used to avoid a confined space entry
   iii. If sediment is at or above the lower row of sidewall holes [approximately 3" (76 mm)]proceed to Step 2. If not proceed to Step 3.

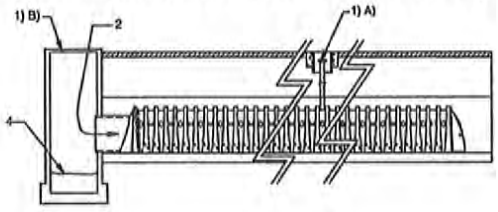
Step 2: Clean out Isolator Row PLUS using the JetVac process

A) A fixed floor cleaning nozzle with rear facing nozzle spread of 45 (1143 mm) or more is preferable
B) Apply multiple passes of JetVac until backflush water is clean
C) Vacuum manhole sump as required during jetting

Step 3: Replace all caps, lids and covers

Step 4: Inspect and clean catch basins and manholes upstream of the StormTech system following local guidelines.

Figure 20 - StormTech Isolator Row Plus (not to scale)



12.3 Eccentric Pipe Header Inspection

Theses guidelines do not supercede a pipe manufacturer's recommended I&M procedures. Consult with the manufacturer of the pipe header system for specific I&M procedures. Inspection of the header system should be carried out quarterly. On sites which generate higher levels of sediment more frequent inspections may be necessary. Headers may be accessed through risers, access ports or manholes. Measurement of sediment may be taken with a stadia rod or similar device. Cleanout of sediment should occur when the sediment volume has reduced the storage area by 25% or the depth of sediment has reached approximately 25% of the diameter of the structure.

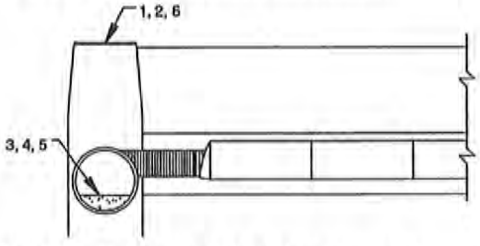
12.4 Eccentric Pipe Manifold Maintenance

Cleanout of accumulated material should be accomplished by vacuum pumping the material from the header. Cleanout should be accomplished during dry weather. Care should be taken to avoid flushing sediments out through the outlet pipes and into the chamber rows.

Eccentric Header Step-by-Step Maintenance Procedures

1. Locate manholes connected to the manifold system
2. Remove grates or covers
3. Using a stadia rod, measure the depth of sediment
4. If sediment is at a depth of about 25% pipe volume or 25% pipe diameter proceed to step 5. If not proceed to step 6.
5. Vacuum pump the sediment. Do not flush sediment out inlet pipes.
6. Replace grates and covers
7. Record depth and date and schedule next inspection

Figure 21 - Eccentric Manifold Maintenance



Please contact StormTech's Technical Services Department at 888-892-2894 for a spreadsheet to estimate cleaning intervals.

One of the advantages of the Barracuda is the ease of maintenance. Like any system that collects pollutants, the Barracuda must be maintained for continued effectiveness. Maintenance is a simple procedure performed using a vacuum truck or similar equipment. The systems were designed to minimize the volume of water removed during routine maintenance, reducing disposal costs.

Contractors can access the pollutants stored in the manhole through the manhole cover. This allows them to gain vacuum hose access to the bottom of the manhole to remove sediment and trash. There is no confined space entry necessary for inspection or maintenance. The entire maintenance procedure typically takes from 2 to 4 hours, depending on the size of the system, the captured material, and the capacity of the vacuum truck.

Local regulations may apply to the maintenance procedure. Safe and legal disposal of pollutants is the responsibility of the maintenance contractor. Maintenance should be performed only by a qualified contractor. Please refer to the section on catch basin cleaning for disposal requirements.

Periodic inspection is needed to determine the need for and frequency of maintenance. You should begin inspecting as soon as construction is complete and thereafter on an annual basis. Typically, the system needs to be cleaned every 1-3 years.

Excessive oils, fuels or sediments may reduce the maintenance cycle. Periodic inspection is important.

To determine the sediment depth, the maintenance contractor should lower a stadia rod into the manhole until it contacts the top of the captured sediment and mark that spot on the rod. Then push the probe through to the bottom of the sump and mark that spot to determine sediment depth.

Maintenance should occur when the sediment has reached the levels indicated in the Storage Capacity Chart.

Model	Manhole Diameter	Treatment Chamber Capacity	Standard Sediment Capacity (20" depth)	NJDEP Sediment Capacity (50% of standard depth)
S3	36"	212 gallons	0.44 cubic yards	0.22 cubic yards
S4	48"	564 gallons	0.78 cubic yards	0.39 cubic yards
S5	60"	881 gallons	1.21 cubic yards	0.61 cubic yards
S6	72"	1269 gallons	1.75 cubic yards	0.88 cubic yards
S8	96"	3835 gallons	3.10 cubic yards	1.55 cubic yards
S10	120"	7496 gallons	4.85 cubic yards	2.43 cubic yards

Maintenance Instructions

1. Remove the manhole cover to provide access to the pollutant storage. Pollutants are stored in the sump, below the bowl assembly visible from the surface. You'll access this area through the 10" diameter access cylinder.
2. Use a vacuum truck or other similar equipment to remove all water, debris, oils and sediment. See figure 1, below.

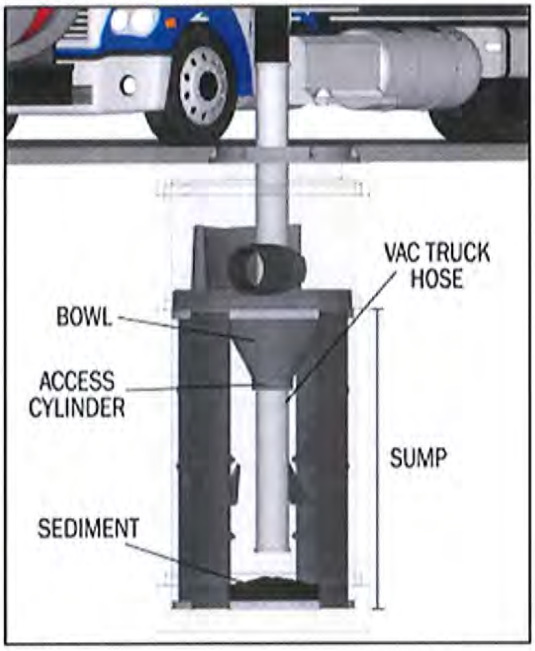


Figure 1

3. Use a high pressure hose to clean the manhole of all the remaining sediment and debris. Then, use the vacuum truck to remove the water.
4. Fill the cleaned manhole with water until the level reaches the invert of the outlet pipe.
5. Replace the manhole cover.
6. Dispose of the polluted water, oils, sediment and trash at an approved facility.

Good Housekeeping Practices:

Provisions for storing paints, cleaners, automotive waste and other potentially hazardous household waste products inside or under cover:

- All materials stored on-site shall be in a neat, orderly manner in their appropriate containers with original manufacturer's label(s);
- Only store enough material as needed; whenever possible, all of a product shall be used prior to disposing of container;
- Manufacturer, federal, state and local recommendations for proper use and disposal shall be followed.

Vehicle Washing Controls:

- Use commercial car washes whenever possible. Car washes treat and/or recycle wash water;
- Cars shall be washed on gravel, grass or other permeable surfaces to allow filtration to occur;
- Use biodegradable soaps only;
- Use hose nozzles that automatically turn off when unattended.

Routine Inspection and Maintenance of Storm Water BMPs

- Previously addressed.

Spill Prevention and Response Plans

- Spill control practices shall be in conformance with the guidelines set forth in the National Pollutant Discharge Elimination System (NPDES) Storm Water Pollution Prevention Plan (SWPPP).

Maintenance of Lawns, Gardens and Other Landscaped Areas:

- Grass shall not be cut shorter than two (2) to three (3) inches and mulch clipping should be left on lawns as a natural fertilizer;
- Use low volume water approaches for irrigation such as drip-type or sprinkler systems. Water plants only when needed to enhance root growth and avoid runoff problems;
- Mulch shall be used wherever practicable. Mulch helps retain water and prevents erosion.

Storage and Use of Fertilizers, Herbicides and Pesticides:

- Fertilizers shall be applied in the minimum amounts recommended by the manufacturer. Once applied, fertilizer shall be worked into the soil to limit exposure to storm water. Storage will be in covered areas only. Contents of partially used bags shall be transferred into sealable plastic containers to avoid spills;
- Do not fertilize before or during rain events;
- Consider the use of organic fertilizers;
- Pesticides shall be applied only when necessary and only in the minimum amounts recommended by the manufacturer.

Pet Waste Management

- Scoop up and seal pet waste in plastic bags. Dispose of in garbage.

Solid Waste Management

- All solid waste shall be disposed of or recycled in accordance with all federal, state and local regulations.

List of Emergency Contacts for Plan Implementation

To be determined by Owner.

Illicit Discharges

As required by Standard 10 of the Massachusetts Stormwater Standards, I, the undersigned, being the authorized owner/responsible party of the above referenced property do hereby certify that no illicit discharges exist on the site and that the stormwater management system, as shown on the above referenced plan, does not contain or permit any illicit discharges to enter the stormwater management system. Furthermore, discharges from interior building drains or plumbing within the buildings are prohibited.

Illicit discharges do not include discharges from the following activities or facilities: firefighting, water line flushing, landscape irrigation, uncontaminated groundwater, potable water sources, foundation drains, air conditioning condensation, footing drains, individual resident car washing, flows from riparian habitats and wetlands, dechlorinated water from swimming pools, water used for street washing and water used to clean residential buildings without detergents.

The pollution prevention plan measures in this project to prevent illicit discharges to the stormwater management system, include wastewater discharges and discharges of stormwater contaminated by contact with process wastes, raw materials, toxic pollutants, hazardous substances, oil, or grease, include:

1. Identifying the responsible personnel for the implementation of an effective Illicit Discharge Detection and Elimination [IDDE] program.
2. Identify potential sources of Illicit Discharges.
3. Implement the Spill Prevention and Control Plan contained in the property Stormwater Pollution Prevention Plan [SWPPP].

Further, I certify that the stormwater management system ass shown on the referenced plan will be maintained in accordance with the conditions of the Long-Term Pollution Prevention Plan.

_____ _____

Signature Date

POST-CONSTRUCTION
OPERATION AND MAINTENANCE LOG

Inspector's Name: _____ Date: _____
Qualifications: _____

_____

Inspection Type: ☐ Routine ☐ Spill ☐ Other: _____
☐ Post-Rainfall (Precipitation in Inches: _____)

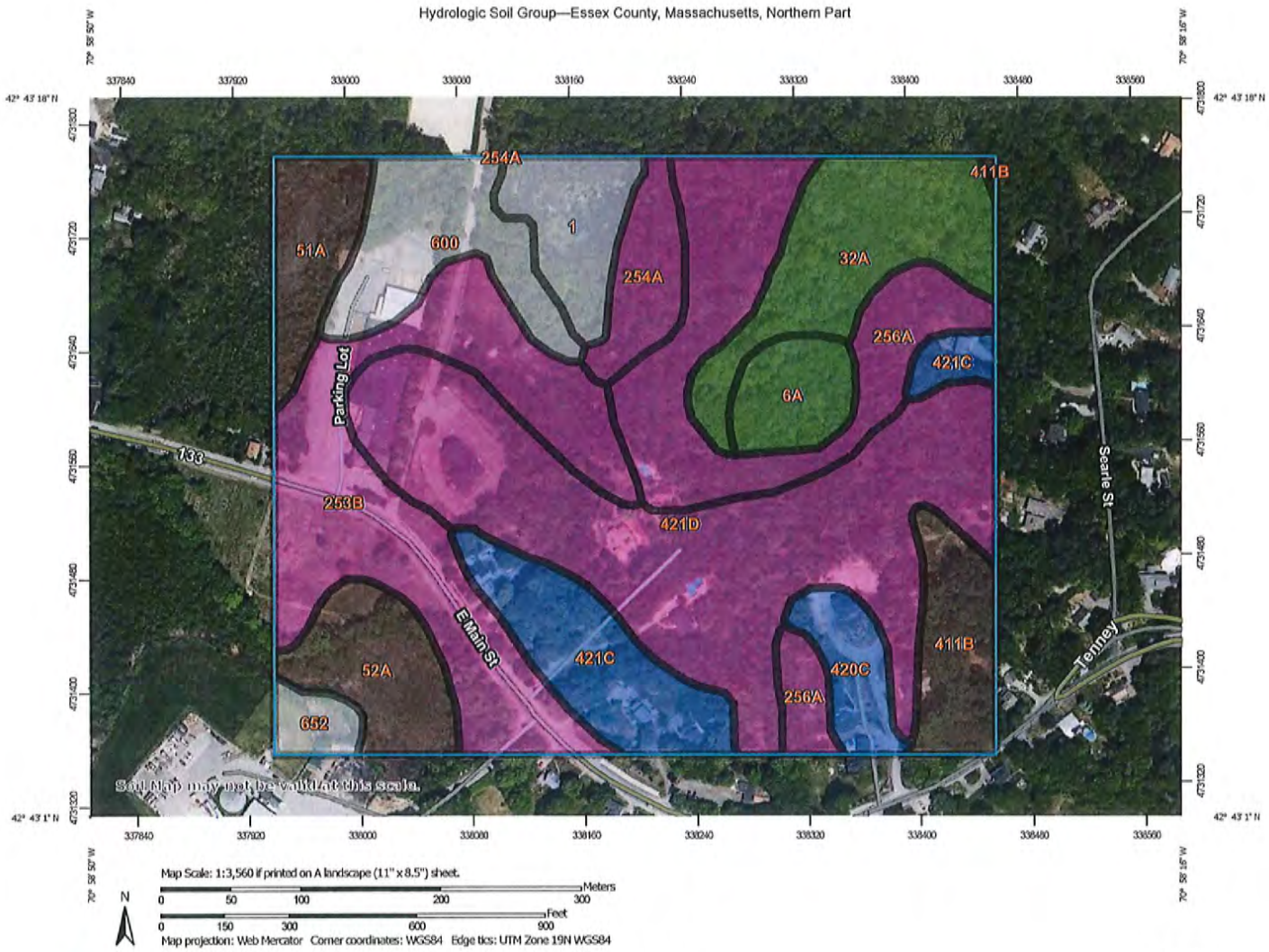
BMP	Frequency	Date Last Performed	Comments
Litter and Debris Removal	After Significant Rain Events		
Deep Sump and Hooded Catch Basins	Inspect four (4) times per year Maintenance as necessary		
Particle Separators	Inspect two (2) times per year Maintenance as necessary		
Subsurface Infiltration	Inspect two (2) times per year		
Sediment Forebay	Inspect Monthly/ Clean Quarterly		
Vegetated Areas	Inspect as necessary for erosion		

Notes: _____
_____
_____
_____
_____
_____

Appendix A:

NRCS Soil Mapping and Data

Hydrologic Soil Group—Essex County, Massachusetts, Northern Part



Map Scale: 1:3,560 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0, 50, 100, 200, 300

Feet: 0, 150, 300, 600, 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Essex County, Massachusetts, Northern Part
Survey Area Data: Version 18, Sep 9, 2022

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

Date(s) aerial images were photographed: May 22, 2022—Jun 5, 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
1	Water		2.1	3.8%
6A	Scarboro mucky fine sandy loam, 0 to 3 percent slopes	A/D	1.6	2.9%
32A	Wareham loamy sand, 0 to 3 percent slopes	A/D	4.4	8.2%
51A	Swansea muck, 0 to 1 percent slopes	B/D	2.0	3.7%
52A	Freetown muck, 0 to 1 percent slopes	B/D	2.5	4.7%
253B	Hinckley loamy sand, 3 to 8 percent slopes	A	8.7	16.2%
254A	Merrimac fine sandy loam, 0 to 3 percent slopes	A	1.6	3.0%
256A	Deerfield loamy fine sand, 0 to 3 percent slopes	A	6.9	12.7%
411B	Sutton fine sandy loam, 0 to 8 percent slopes, very stony	B/D	2.2	4.1%
420C	Canton fine sandy loam, 8 to 15 percent slopes	B	1.4	2.6%
421C	Canton fine sandy loam, 8 to 15 percent slopes, very stony	B	3.8	7.1%
421D	Canton fine sandy loam, 15 to 25 percent slopes, very stony	A	12.7	23.6%
600	Pits, gravel		3.3	6.0%
652	Udorthents, refuse substratum		0.7	1.3%
Totals for Area of Interest			**53.8**	**100.0%**

Description

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

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

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

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

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

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

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

Rating Options

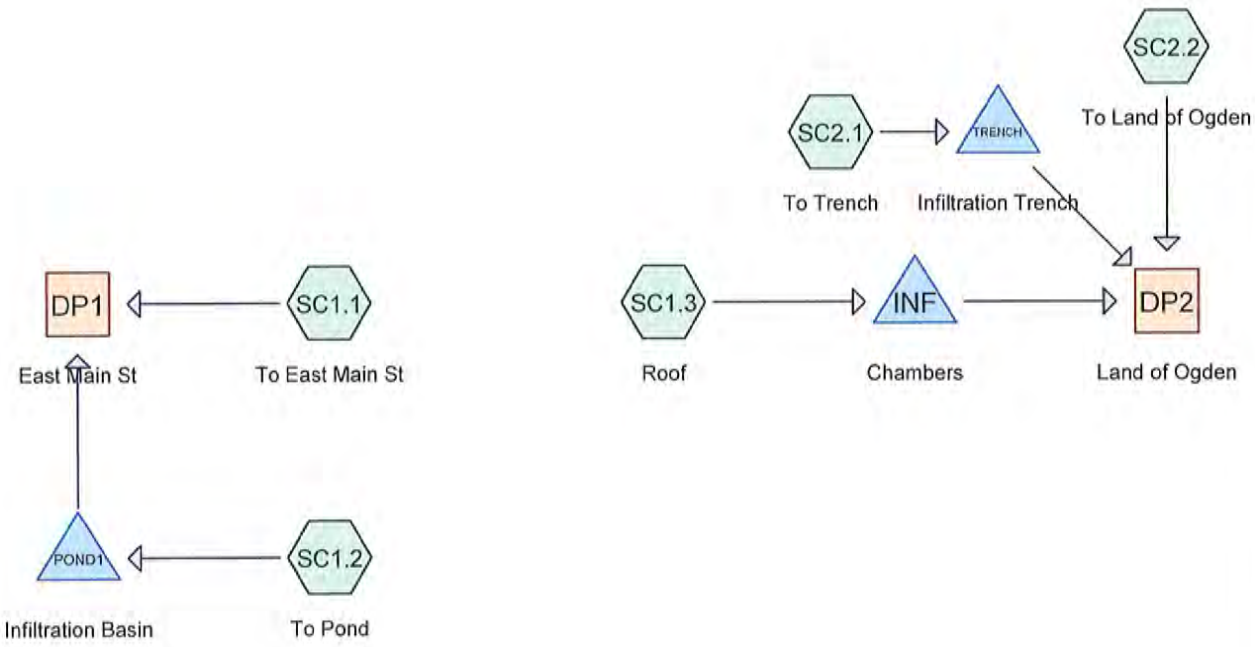
Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Appendix B:

Drainage Calculations



Subcat Reach Pond Link

Routing Diagram for GEO-0069 PROP
Prepared by Hayes Engineers, Inc, Printed 7/12/2023

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-yr	Type III 24-hr		Default	24.00	1	3.16	2
2	10-yr	Type III 24-hr		Default	24.00	1	4.86	2
3	25-yr	Type III 24-hr		Default	24.00	1	6.22	2
4	100-yr	Type III 24-hr		Default	24.00	1	9.04	2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
15,425	39	>75% Grass cover, Good, HSG A (SC1.1, SC1.2, SC2.1, SC2.2)
12,301	61	>75% Grass cover, Good, HSG B (SC1.1, SC1.2)
939	98	Concrete (SC1.1, SC1.2, SC2.2)
14,366	98	Pavement (SC1.1, SC1.2)
3,391	77	Riprap Slope, HSG A (SC1.2, SC2.2)
1,141	86	Riprap Slope, HSG B (SC1.2)
3,010	77	Riprap Slope/Stone Trench, HSG A (SC2.1)
8,054	98	Roof (SC1.3)
14,622	30	Woods, Good, HSG A (SC2.2)
73,249	**64**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
36,448	HSG A	SC1.1, SC1.2, SC2.1, SC2.2
13,442	HSG B	SC1.1, SC1.2
0	HSG C	
0	HSG D	
23,359	Other	SC1.1, SC1.2, SC1.3, SC2.2
73,249		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
15,425	12,301	0	0	0	27,726	>75% Grass cover, Good
0	0	0	0	939	939	Concrete
0	0	0	0	14,366	14,366	Pavement
3,391	1,141	0	0	0	4,532	Riprap Slope
3,010	0	0	0	0	3,010	Riprap Slope/Stone Trench
0	0	0	0	8,054	8,054	Roof
14,622	0	0	0	0	14,622	Woods, Good
36,448	**13,442**	**0**	**0**	**23,359**	**73,249**	**TOTAL AREA**

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Nam
1	INF	99.04	95.50	67.0	0.0528	0.011	0.0	6.0	0.0	
2	POND1	95.70	88.00	104.0	0.0740	0.011	0.0	8.0	0.0	

Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment SC1.1: To East Main St Runoff Area=8,811 sf 17.90% Impervious Runoff Depth=0.39"
Tc=6.0 min CN=60 Runoff=0.05 cfs 288 cf

Subcatchment SC1.2: To Pond Runoff Area=31,685 sf 43.05% Impervious Runoff Depth=1.12"
Tc=6.0 min CN=76 Runoff=0.91 cfs 2,969 cf

Subcatchment SC1.3: Roof Runoff Area=8,054 sf 100.00% Impervious Runoff Depth=2.93"
Tc=6.0 min CN=98 Runoff=0.55 cfs 1,965 cf

Subcatchment SC2.1: To Trench Runoff Area=7,371 sf 0.00% Impervious Runoff Depth=0.24"
Tc=6.0 min CN=55 Runoff=0.02 cfs 147 cf

Subcatchment SC2.2: To Land of Ogden Runoff Area=17,328 sf 0.51% Impervious Runoff Depth=0.00"
Flow Length=136' Tc=8.8 min CN=32 Runoff=0.00 cfs 0 cf

Reach DP1: East Main St Inflow=0.05 cfs 293 cf
Outflow=0.05 cfs 293 cf

Reach DP2: Land of Ogden Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond INF: Chambers Peak Elev=97.61' Storage=501 cf Inflow=0.55 cfs 1,965 cf
Discarded=0.10 cfs 1,970 cf Primary=0.00 cfs 0 cf Outflow=0.10 cfs 1,970 cf

Pond POND1: Infiltration Basin Peak Elev=95.72' Storage=1,334 cf Inflow=0.91 cfs 2,969 cf
Discarded=0.07 cfs 2,965 cf Primary=0.00 cfs 4 cf Outflow=0.08 cfs 2,969 cf

Pond TRENCH: Infiltration Trench Peak Elev=100.00' Storage=0 cf Inflow=0.02 cfs 147 cf
Discarded=0.02 cfs 147 cf Primary=0.00 cfs 0 cf Outflow=0.02 cfs 147 cf

Total Runoff Area = 73,249 sf Runoff Volume = 5,369 cf Average Runoff Depth = 0.88"
68.11% Pervious = 49,890 sf 31.89% Impervious = 23,359 sf

Summary for Subcatchment SC1.1: To East Main St

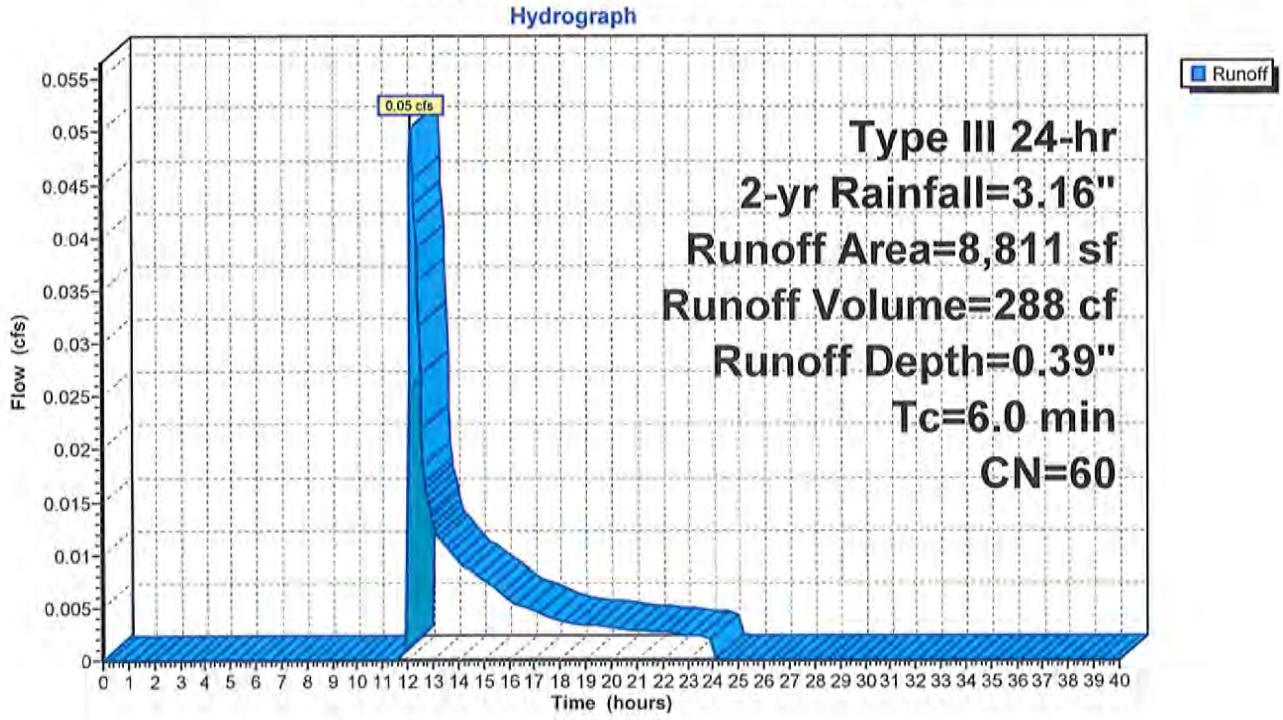
Runoff = 0.05 cfs @ 12.14 hrs, Volume= 288 cf, Depth= 0.39"
Routed to Reach DP1 : East Main St

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.16"

	Area (sf)	CN	Description
	3,218	39	>75% Grass cover, Good, HSG A
	4,016	61	>75% Grass cover, Good, HSG B
*	1,546	98	Pavement
*	31	98	Concrete
	8,811	60	Weighted Average
	7,234		82.10% Pervious Area
	1,577		17.90% Impervious Area

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

Subcatchment SC1.1: To East Main St



Summary for Subcatchment SC1.2: To Pond

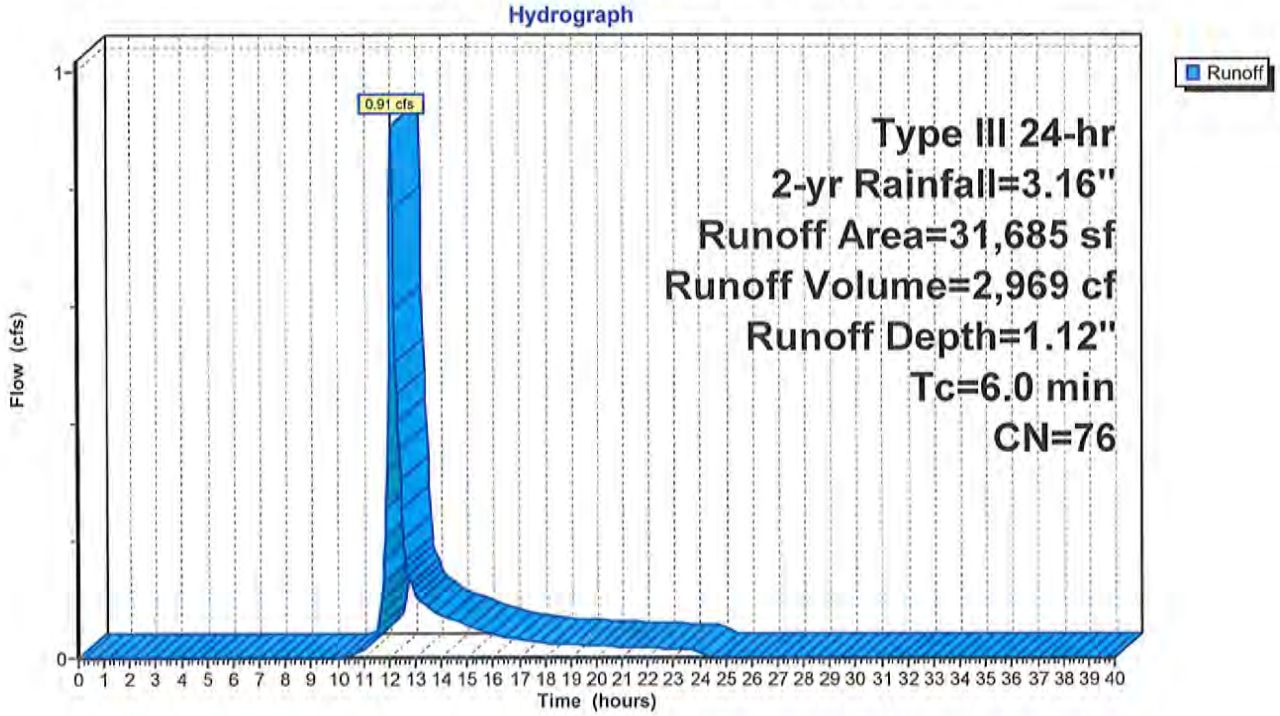
Runoff = 0.91 cfs @ 12.10 hrs, Volume= 2,969 cf, Depth= 1.12"
Routed to Pond POND1 : Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.16"

	Area (sf)	CN	Description
	5,309	39	>75% Grass cover, Good, HSG A
	8,285	61	>75% Grass cover, Good, HSG B
*	3,311	77	Riprap Slope, HSG A
	1,141	86	Riprap Slope, HSG B
*	12,820	98	Pavement
*	819	98	Concrete
	31,685	76	Weighted Average
	18,046		56.95% Pervious Area
	13,639		43.05% Impervious Area

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

Subcatchment SC1.2: To Pond



Summary for Subcatchment SC1.3: Roof

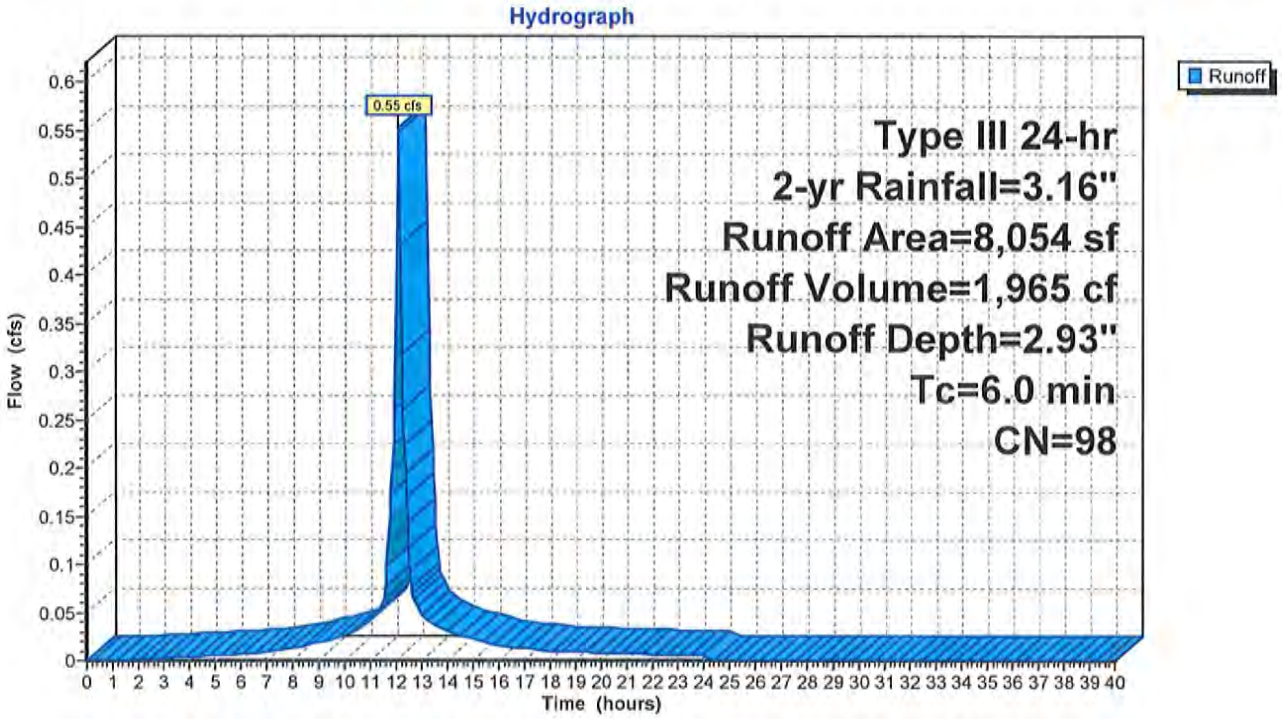
Runoff = 0.55 cfs @ 12.09 hrs, Volume= 1,965 cf, Depth= 2.93"
Routed to Pond INF : Chambers

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.16"

	Area (sf)	CN	Description
*	8,054	98	Roof
	8,054		100.00% Impervious Area

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

Subcatchment SC1.3: Roof



Summary for Subcatchment SC2.1: To Trench

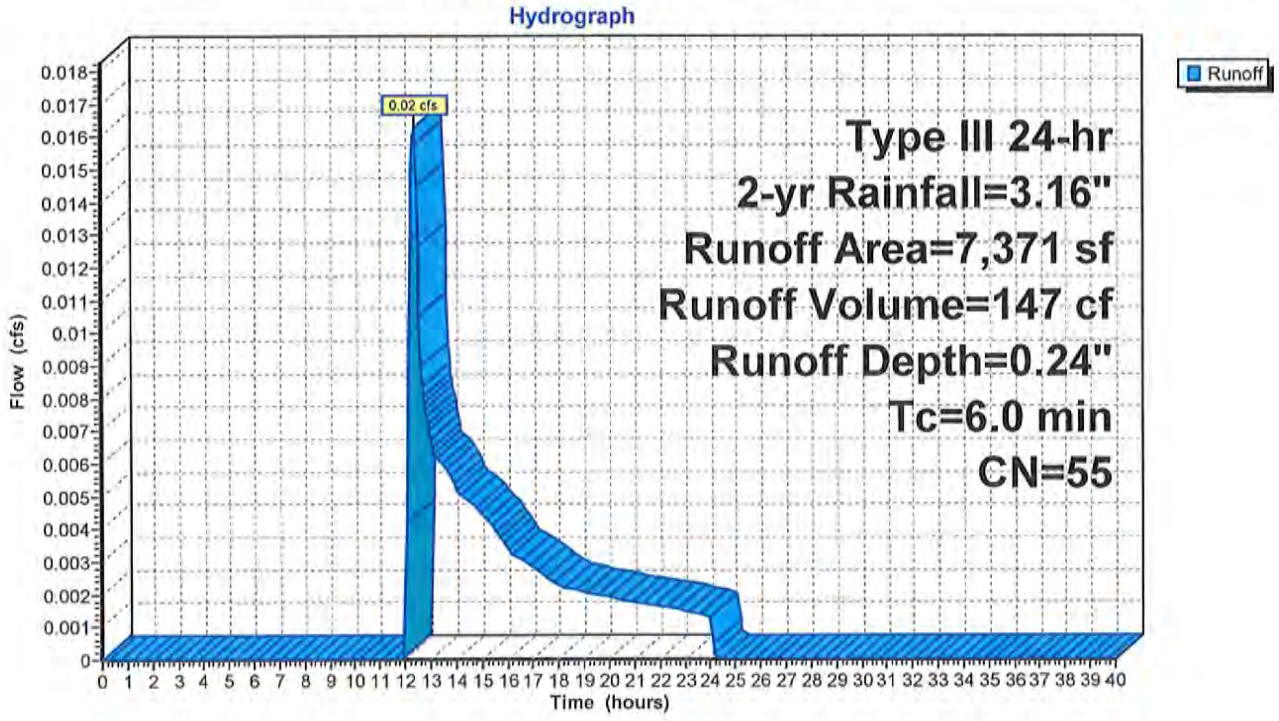
Runoff = 0.02 cfs @ 12.34 hrs, Volume= 147 cf, Depth= 0.24"
Routed to Pond TRENCH : Infiltration Trench

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.16"

	Area (sf)	CN	Description
	4,361	39	>75% Grass cover, Good, HSG A
*	3,010	77	Riprap Slope/Stone Trench, HSG A
	7,371	55	Weighted Average
	7,371		100.00% Pervious Area

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

Subcatchment SC2.1: To Trench



Summary for Subcatchment SC2.2: To Land of Ogden

[45] Hint: Runoff=Zero

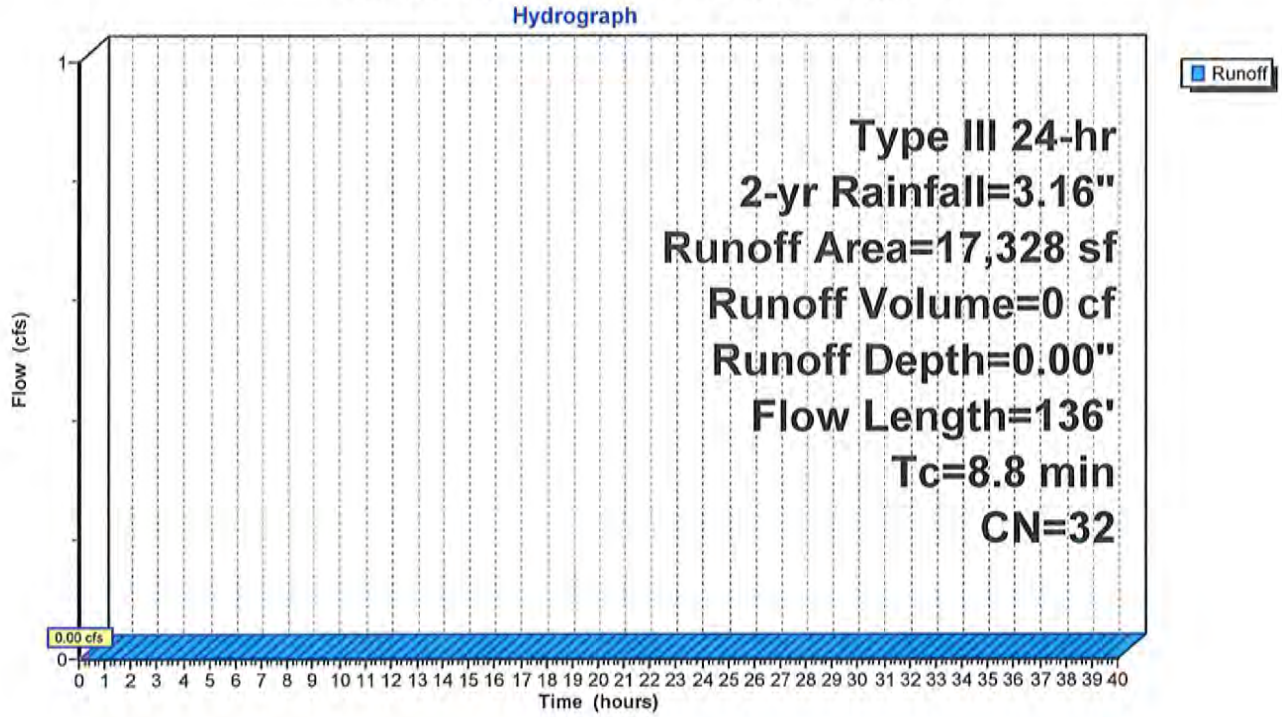
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Reach DP2 : Land of Ogden

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.16"

	Area (sf)	CN	Description
	2,537	39	>75% Grass cover, Good, HSG A
*	80	77	Riprap Slope, HSG A
	14,622	30	Woods, Good, HSG A
*	89	98	Concrete
	17,328	32	Weighted Average
	17,239		99.49% Pervious Area
	89		0.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0100	0.11		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.16"
0.1	16	0.1000	2.21		**Shallow Concentrated Flow, Shallow Conc. Flow #1** Short Grass Pasture Kv= 7.0 fps
1.2	70	0.0400	1.00		**Shallow Concentrated Flow, Shallow Conc. Flow #2** Woodland Kv= 5.0 fps
8.8	136	Total			

Subcatchment SC2.2: To Land of Ogden



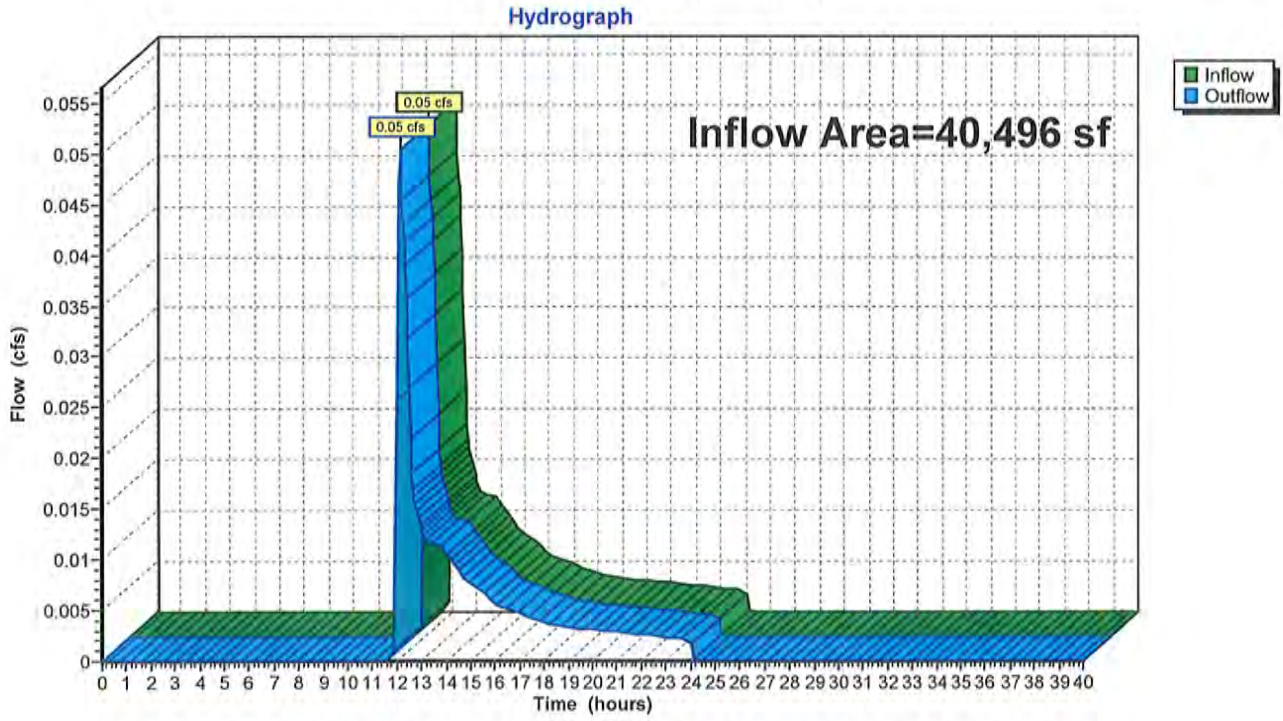
Summary for Reach DP1: East Main St

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 40,496 sf, 37.57% Impervious, Inflow Depth = 0.09" for 2-yr event
Inflow = 0.05 cfs @ 12.14 hrs, Volume= 293 cf
Outflow = 0.05 cfs @ 12.14 hrs, Volume= 293 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

Reach DP1: East Main St



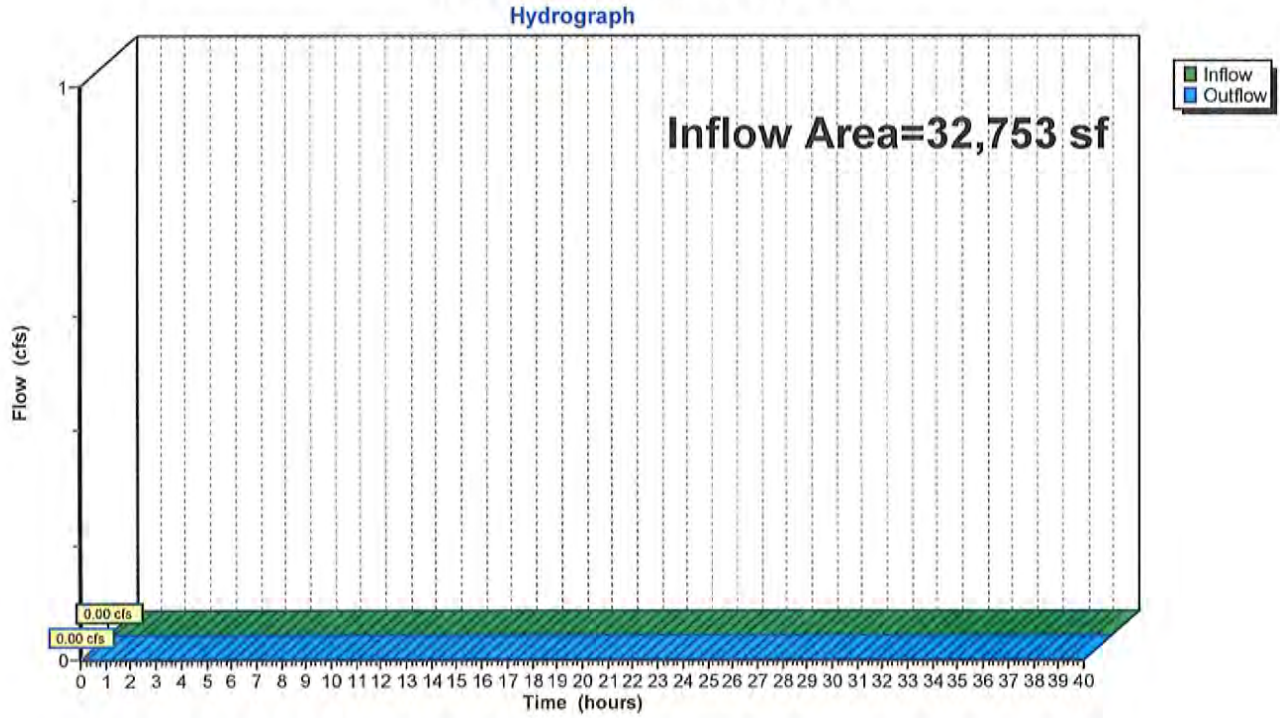
Summary for Reach DP2: Land of Ogden

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 32,753 sf, 24.86% Impervious, Inflow Depth = 0.00" for 2-yr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

Reach DP2: Land of Ogden



Summary for Pond INF: Chambers

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=90)

Inflow Area = 8,054 sf,100.00% Impervious, Inflow Depth = 2.93" for 2-yr event
Inflow = 0.55 cfs @ 12.09 hrs, Volume= 1,965 cf
Outflow = 0.10 cfs @ 11.85 hrs, Volume= 1,970 cf, Atten= 83%, Lag= 0.0 min
Discarded = 0.10 cfs @ 11.85 hrs, Volume= 1,970 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Reach DP2 : Land of Ogden

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 97.61' @ 12.55 hrs Surf.Area= 1,709 sf Storage= 501 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 28.2 min (784.9 - 756.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	97.00'	1,566 cf	**25.25'W x 67.70'L x 3.50'H Field A** 5,983 cf Overall - 2,067 cf Embedded = 3,915 cf x 40.0% Voids
#2A	97.50'	2,067 cf	**ADS_StormTech SC-740 +Cap** x 45 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 45 Chambers in 5 Rows
		3,633 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	97.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	99.04'	**6.0" Round Culvert** L= 67.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 99.04' / 95.50' S= 0.0528 '/' Cc= 0.900 n= 0.011, Flow Area= 0.20 sf

Discarded OutFlow Max=0.10 cfs @ 11.85 hrs HW=97.06' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=97.00' TW=0.00' (Dynamic Tailwater)
↑—**2=Culvert** (Controls 0.00 cfs)

Pond INF: Chambers - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

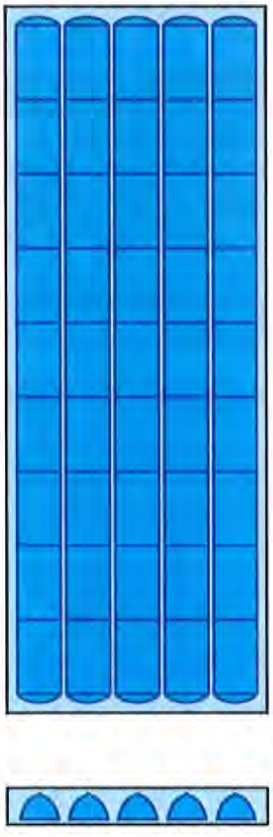
9 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 65.70' Row Length +12.0" End Stone x 2 = 67.70' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

45 Chambers x 45.9 cf = 2,067.3 cf Chamber Storage

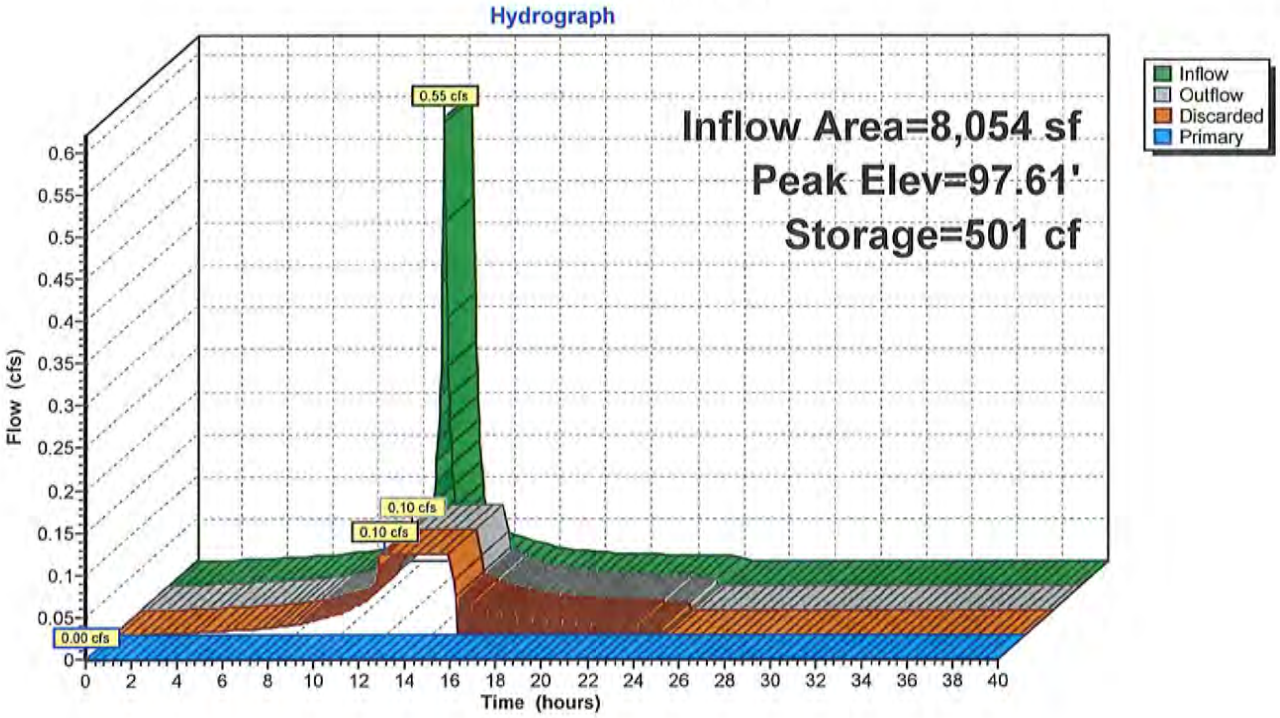
5,982.7 cf Field - 2,067.3 cf Chambers = 3,915.4 cf Stone x 40.0% Voids = 1,566.2 cf Stone Storage

Chamber Storage + Stone Storage = 3,633.5 cf = 0.083 af
Overall Storage Efficiency = 60.7%
Overall System Size = 67.70' x 25.25' x 3.50'

45 Chambers
221.6 cy Field
145.0 cy Stone



Pond INF: Chambers



Summary for Pond POND1: Infiltration Basin

Inflow Area = 31,685 sf, 43.05% Impervious, Inflow Depth = 1.12" for 2-yr event
Inflow = 0.91 cfs @ 12.10 hrs, Volume= 2,969 cf
Outflow = 0.08 cfs @ 13.91 hrs, Volume= 2,969 cf, Atten= 92%, Lag= 108.8 min
Discarded = 0.07 cfs @ 13.91 hrs, Volume= 2,965 cf
Primary = 0.00 cfs @ 13.91 hrs, Volume= 4 cf
Routed to Reach DP1 : East Main St

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 95.72' @ 13.91 hrs Surf.Area= 1,326 sf Storage= 1,334 cf

Plug-Flow detention time= 226.4 min calculated for 2,966 cf (100% of inflow)
Center-of-Mass det. time= 226.5 min (1,082.8 - 856.3)

Volume	Invert	Avail.Storage	Storage Description
#1	94.00'	7,611 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

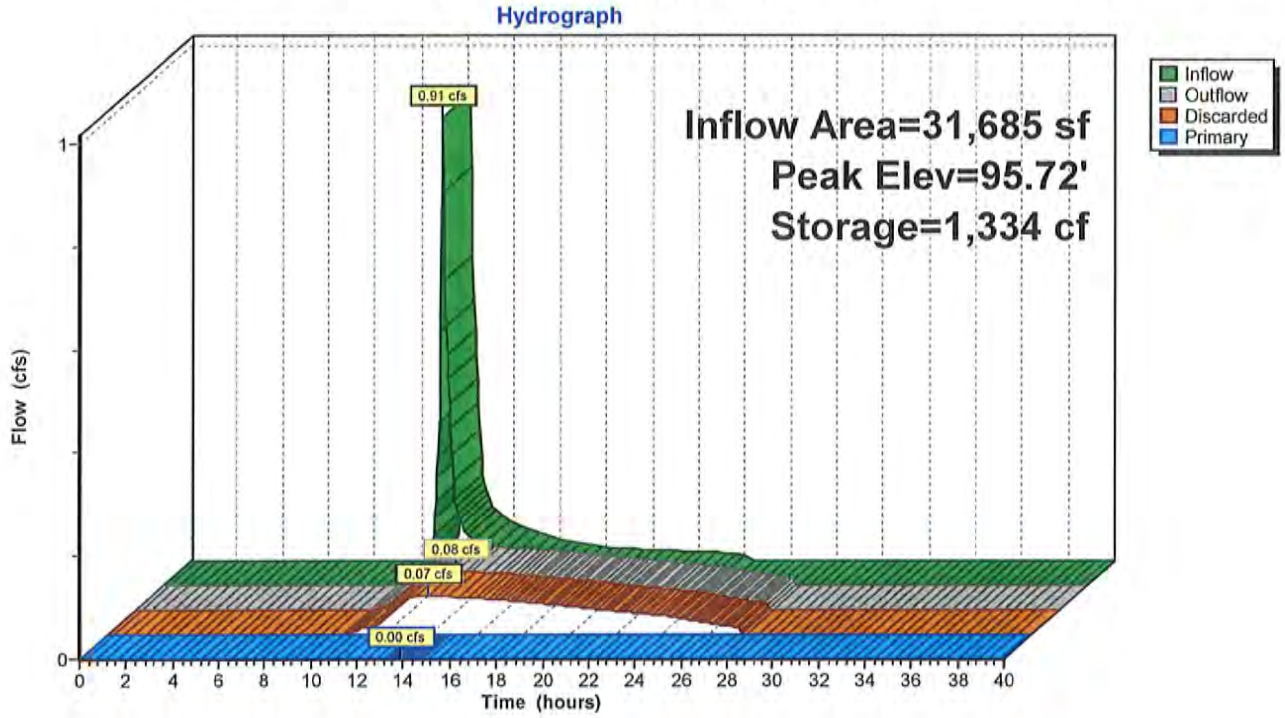
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
94.00	225	0	0
96.00	1,505	1,730	1,730
98.00	2,815	4,320	6,050
98.50	3,430	1,561	7,611

Device	Routing	Invert	Outlet Devices
#1	Discarded	94.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	97.50'	**10.0' 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
#3	Primary	95.70'	**8.0" Round Culvert** L= 104.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 95.70' / 88.00' S= 0.0740 '/' Cc= 0.900 n= 0.011, Flow Area= 0.35 sf

Discarded OutFlow Max=0.07 cfs @ 13.91 hrs HW=95.72' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.00 cfs @ 13.91 hrs HW=95.72' TW=0.00' (Dynamic Tailwater)
├**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└**3=Culvert** (Inlet Controls 0.00 cfs @ 0.48 fps)

Pond POND1: Infiltration Basin



Summary for Pond TRENCH: Infiltration Trench

Inflow Area = 7,371 sf, 0.00% Impervious, Inflow Depth = 0.24" for 2-yr event
Inflow = 0.02 cfs @ 12.34 hrs, Volume= 147 cf
Outflow = 0.02 cfs @ 12.34 hrs, Volume= 147 cf, Atten= 0%, Lag= 0.0 min
Discarded = 0.02 cfs @ 12.34 hrs, Volume= 147 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Reach DP2 : Land of Ogden

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 100.00' @ 12.34 hrs Surf.Area= 560 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (958.1 - 958.1)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	896 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 2,240 cf Overall x 40.0% Voids

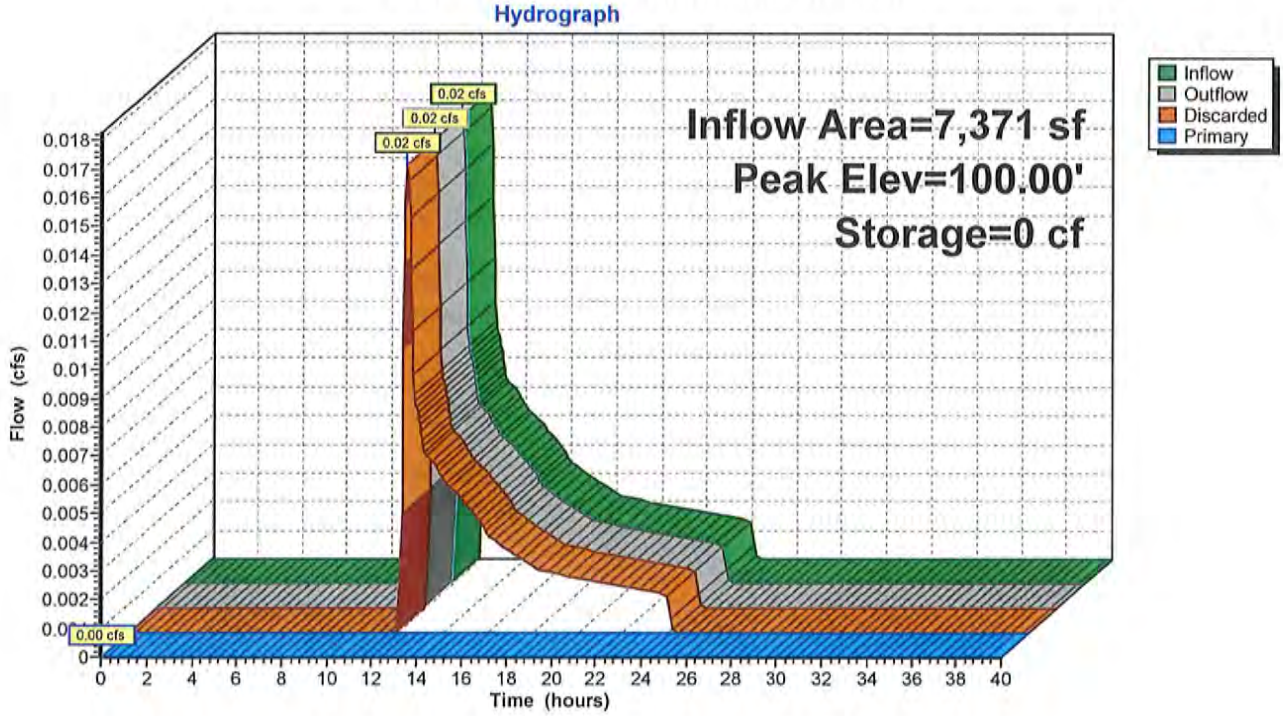
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	560	0	0
101.00	560	560	560
102.00	560	560	1,120
103.00	560	560	1,680
104.00	560	560	2,240

Device	Routing	Invert	Outlet Devices
#1	Discarded	100.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	103.99'	**115.0' 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

Discarded OutFlow Max=0.03 cfs @ 12.34 hrs HW=100.00' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=100.00' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond TRENCH: Infiltration Trench



Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment SC1.1: To East Main St Runoff Area=8,811 sf 17.90% Impervious Runoff Depth=1.22"
Tc=6.0 min CN=60 Runoff=0.25 cfs 896 cf

Subcatchment SC1.2: To Pond Runoff Area=31,685 sf 43.05% Impervious Runoff Depth=2.42"
Tc=6.0 min CN=76 Runoff=2.02 cfs 6,391 cf

Subcatchment SC1.3: Roof Runoff Area=8,054 sf 100.00% Impervious Runoff Depth=4.62"
Tc=6.0 min CN=98 Runoff=0.86 cfs 3,103 cf

Subcatchment SC2.1: To Trench Runoff Area=7,371 sf 0.00% Impervious Runoff Depth=0.91"
Tc=6.0 min CN=55 Runoff=0.14 cfs 560 cf

Subcatchment SC2.2: To Land of Ogden Runoff Area=17,328 sf 0.51% Impervious Runoff Depth=0.02"
Flow Length=136' Tc=8.8 min CN=32 Runoff=0.00 cfs 25 cf

Reach DP1: East Main St Inflow=0.86 cfs 3,326 cf
Outflow=0.86 cfs 3,326 cf

Reach DP2: Land of Ogden Inflow=0.00 cfs 25 cf
Outflow=0.00 cfs 25 cf

Pond INF: Chambers Peak Elev=97.95' Storage=970 cf Inflow=0.86 cfs 3,103 cf
Discarded=0.10 cfs 3,109 cf Primary=0.00 cfs 0 cf Outflow=0.10 cfs 3,109 cf

Pond POND1: Infiltration Basin Peak Elev=96.23' Storage=2,087 cf Inflow=2.02 cfs 6,391 cf
Discarded=0.09 cfs 3,961 cf Primary=0.73 cfs 2,431 cf Outflow=0.82 cfs 6,392 cf

Pond TRENCH: Infiltration Trench Peak Elev=100.51' Storage=115 cf Inflow=0.14 cfs 560 cf
Discarded=0.03 cfs 561 cf Primary=0.00 cfs 0 cf Outflow=0.03 cfs 561 cf

Total Runoff Area = 73,249 sf Runoff Volume = 10,975 cf Average Runoff Depth = 1.80"
68.11% Pervious = 49,890 sf 31.89% Impervious = 23,359 sf

Summary for Subcatchment SC1.1: To East Main St

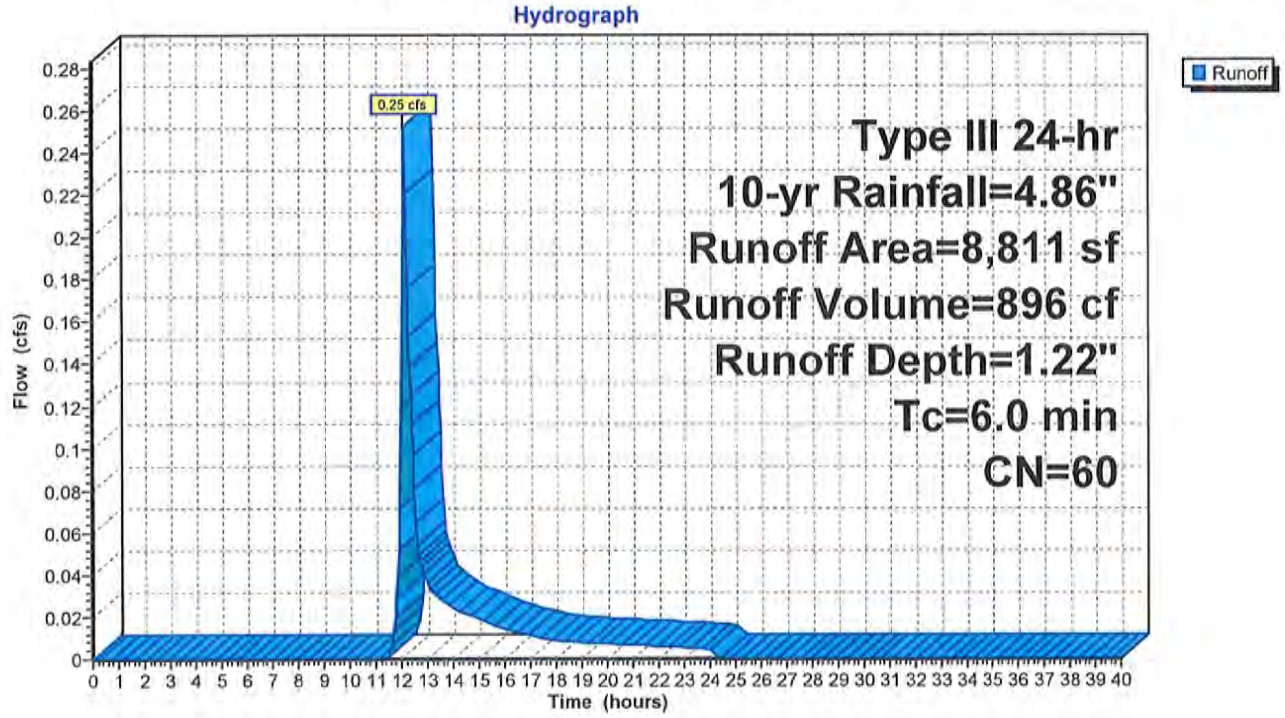
Runoff = 0.25 cfs @ 12.11 hrs, Volume= 896 cf, Depth= 1.22"
Routed to Reach DP1 : East Main St

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.86"

	Area (sf)	CN	Description
	3,218	39	>75% Grass cover, Good, HSG A
	4,016	61	>75% Grass cover, Good, HSG B
*	1,546	98	Pavement
*	31	98	Concrete
	8,811	60	Weighted Average
	7,234		82.10% Pervious Area
	1,577		17.90% Impervious Area

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

Subcatchment SC1.1: To East Main St



Summary for Subcatchment SC1.2: To Pond

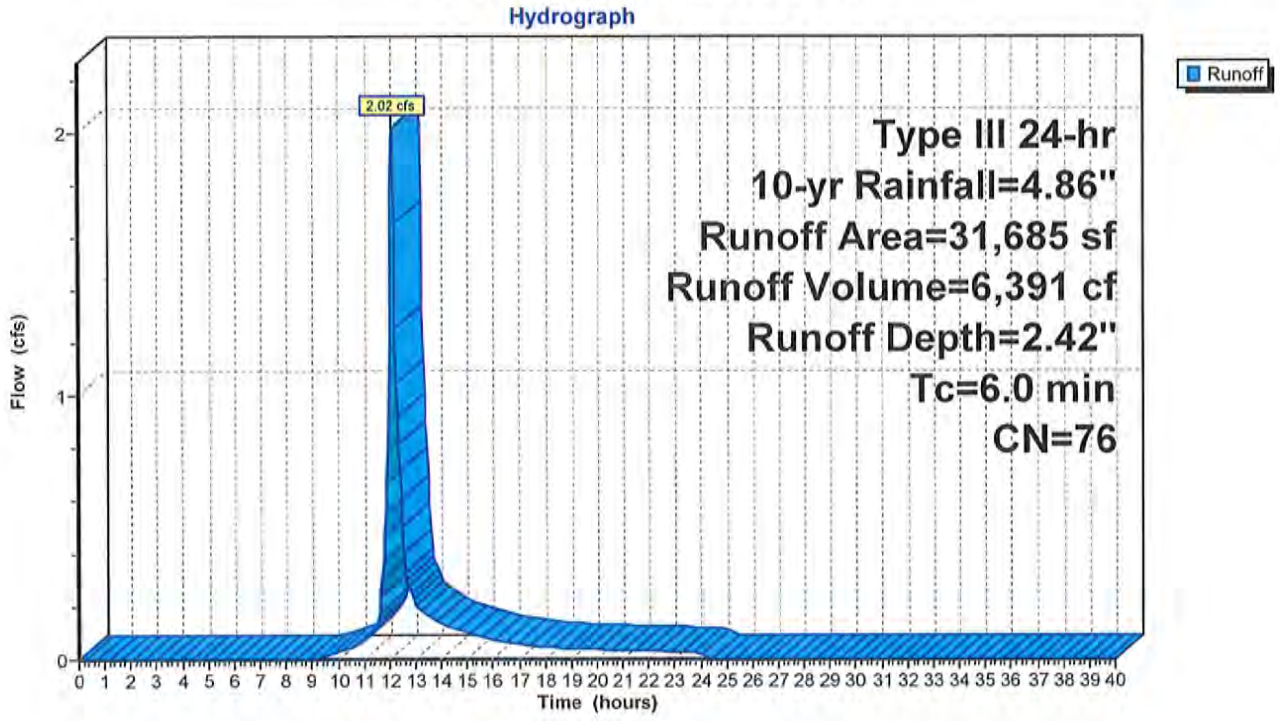
Runoff = 2.02 cfs @ 12.09 hrs, Volume= 6,391 cf, Depth= 2.42"
Routed to Pond POND1 : Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.86"

	Area (sf)	CN	Description
	5,309	39	>75% Grass cover, Good, HSG A
	8,285	61	>75% Grass cover, Good, HSG B
*	3,311	77	Riprap Slope, HSG A
	1,141	86	Riprap Slope, HSG B
*	12,820	98	Pavement
*	819	98	Concrete
	31,685	76	Weighted Average
	18,046		56.95% Pervious Area
	13,639		43.05% Impervious Area

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

Subcatchment SC1.2: To Pond



Summary for Subcatchment SC1.3: Roof

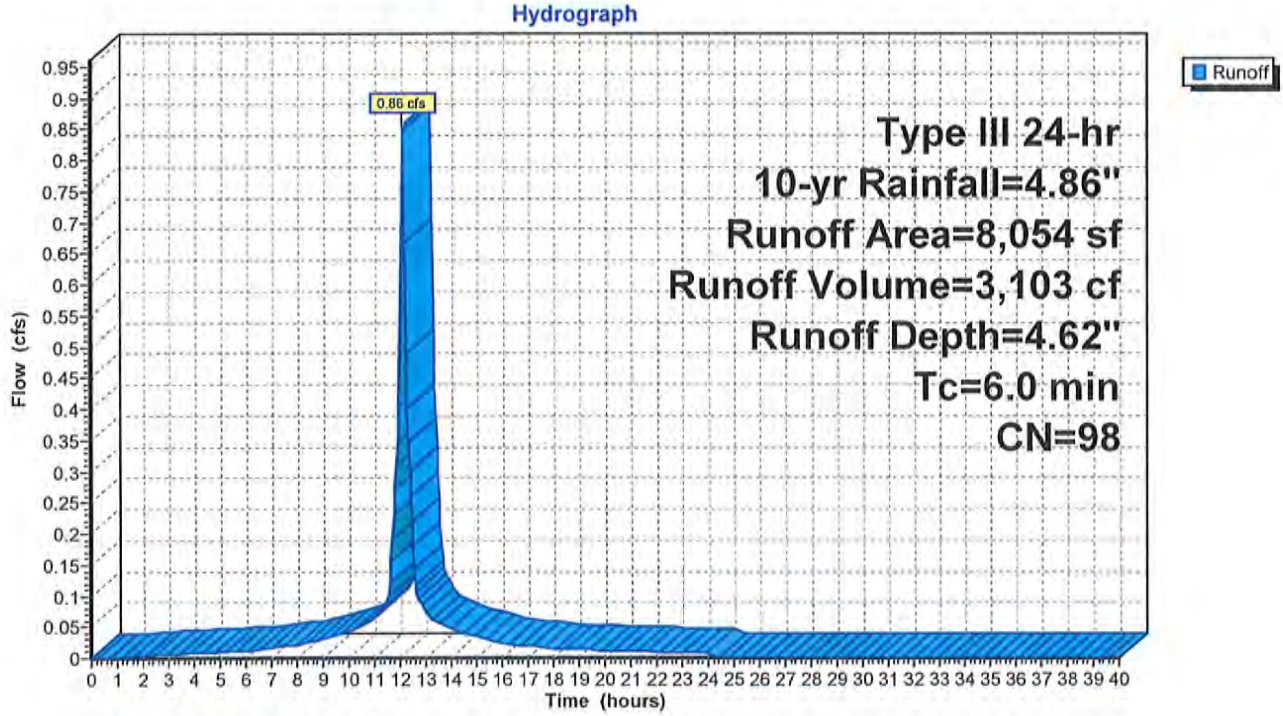
Runoff = 0.86 cfs @ 12.09 hrs, Volume= 3,103 cf, Depth= 4.62"
Routed to Pond INF : Chambers

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.86"

	Area (sf)	CN	Description
*	8,054	98	Roof
	8,054		100.00% Impervious Area

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

Subcatchment SC1.3: Roof



Summary for Subcatchment SC2.1: To Trench

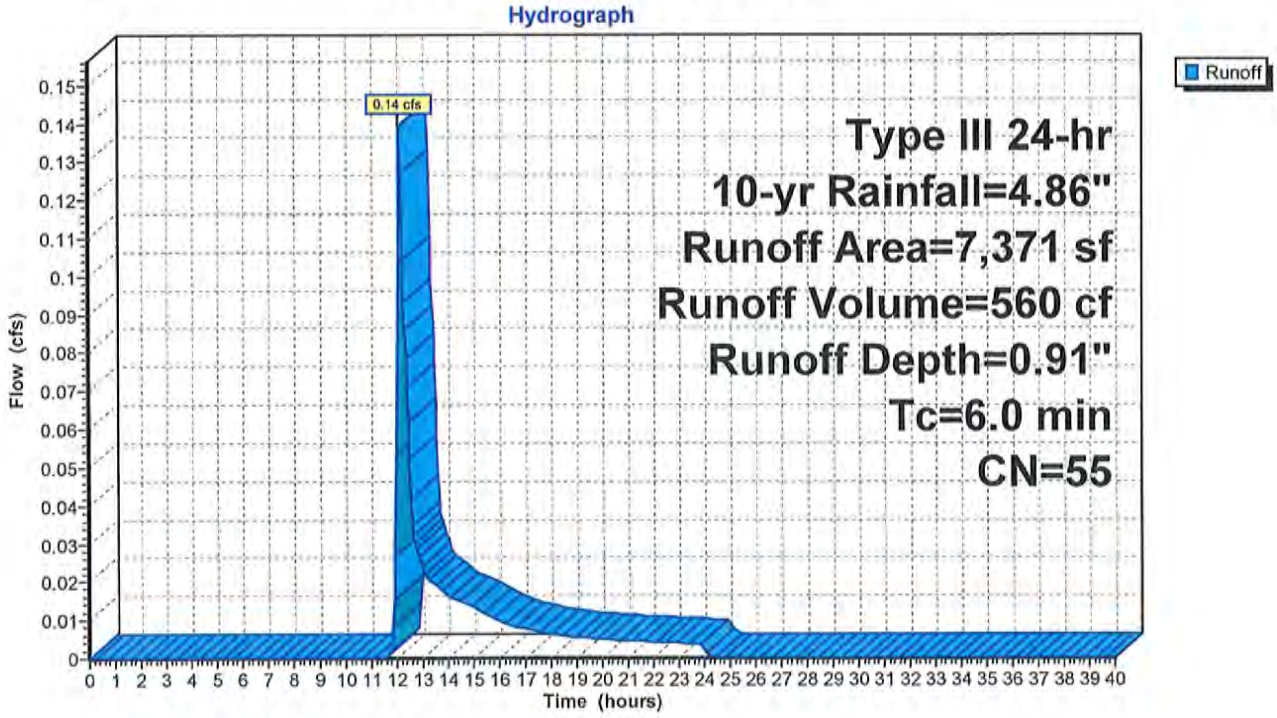
Runoff = 0.14 cfs @ 12.11 hrs, Volume= 560 cf, Depth= 0.91"
Routed to Pond TRENCH : Infiltration Trench

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.86"

	Area (sf)	CN	Description
	4,361	39	>75% Grass cover, Good, HSG A
*	3,010	77	Riprap Slope/Stone Trench, HSG A
	7,371	55	Weighted Average
	7,371		100.00% Pervious Area

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

Subcatchment SC2.1: To Trench



Summary for Subcatchment SC2.2: To Land of Ogden

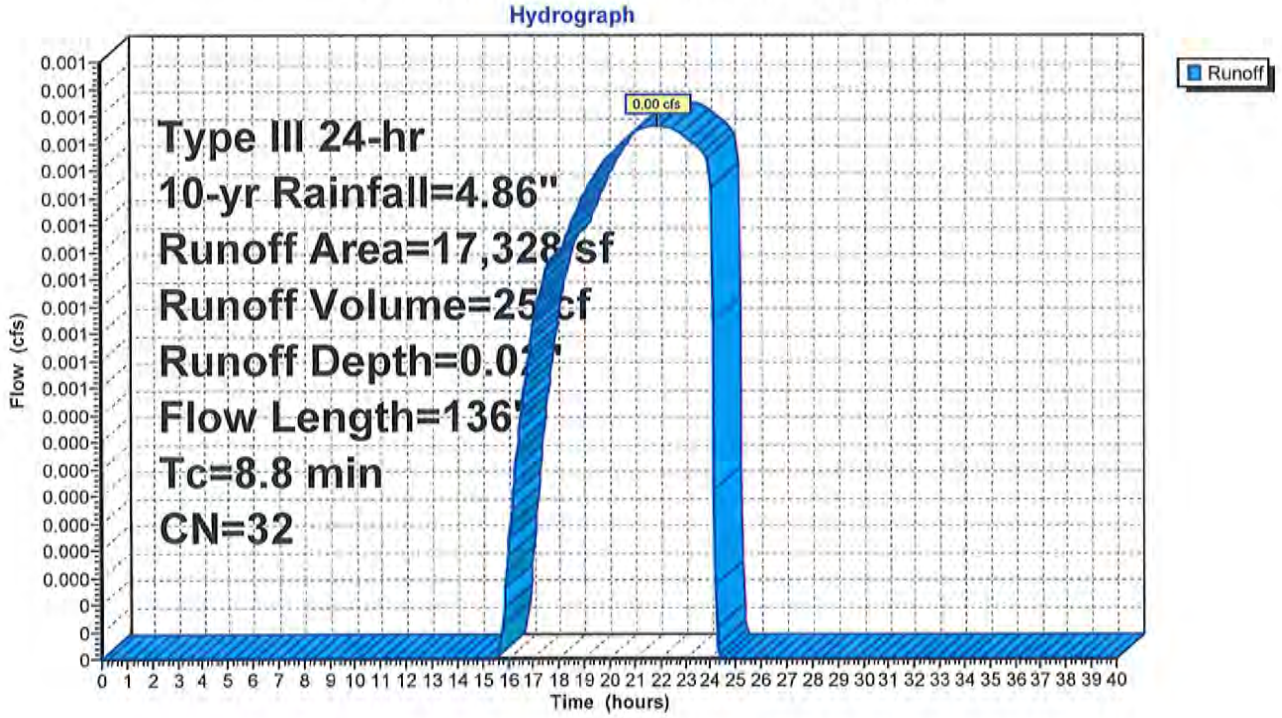
Runoff = 0.00 cfs @ 21.94 hrs, Volume= 25 cf, Depth= 0.02"
Routed to Reach DP2 : Land of Ogden

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.86"

	Area (sf)	CN	Description
	2,537	39	>75% Grass cover, Good, HSG A
*	80	77	Riprap Slope, HSG A
	14,622	30	Woods, Good, HSG A
*	89	98	Concrete
	17,328	32	Weighted Average
	17,239		99.49% Pervious Area
	89		0.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0100	0.11		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.16"
0.1	16	0.1000	2.21		**Shallow Concentrated Flow, Shallow Conc. Flow #1** Short Grass Pasture Kv= 7.0 fps
1.2	70	0.0400	1.00		**Shallow Concentrated Flow, Shallow Conc. Flow #2** Woodland Kv= 5.0 fps
8.8	136	Total			

Subcatchment SC2.2: To Land of Ogden



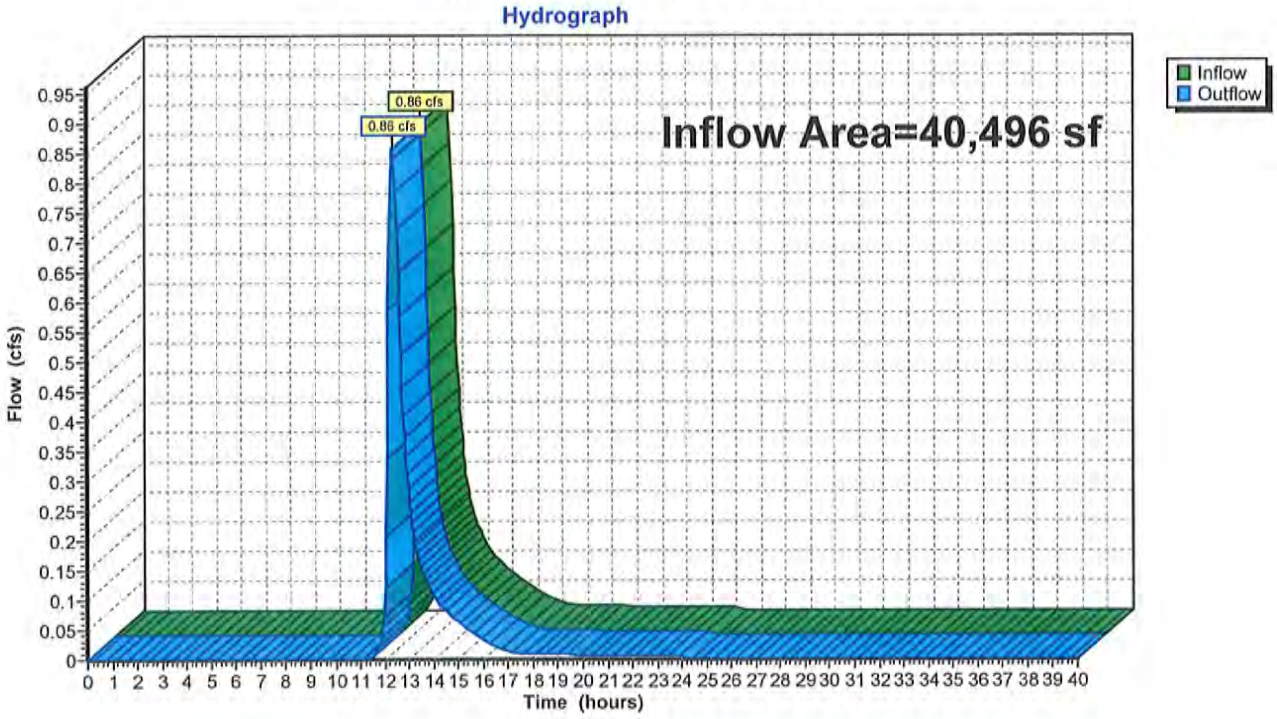
Summary for Reach DP1: East Main St

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 40,496 sf, 37.57% Impervious, Inflow Depth = 0.99" for 10-yr event
Inflow = 0.86 cfs @ 12.32 hrs, Volume= 3,326 cf
Outflow = 0.86 cfs @ 12.32 hrs, Volume= 3,326 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

Reach DP1: East Main St



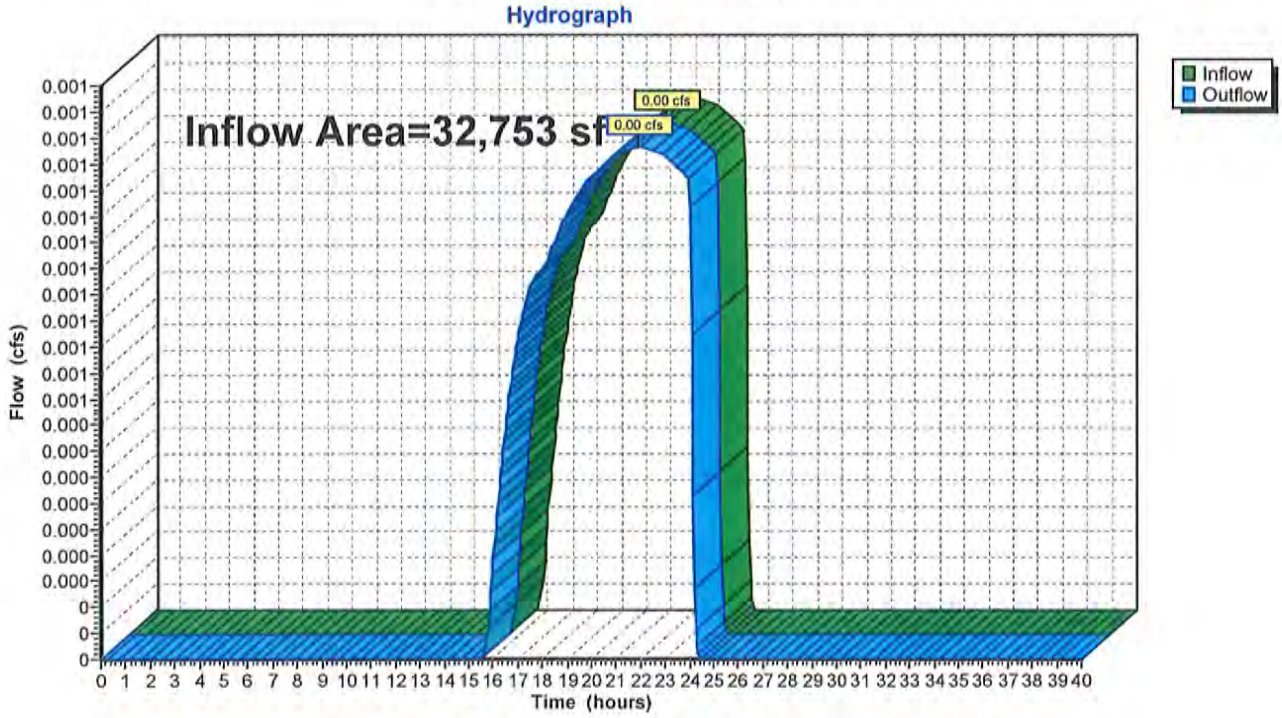
Summary for Reach DP2: Land of Ogden

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 32,753 sf, 24.86% Impervious, Inflow Depth = 0.01" for 10-yr event
Inflow = 0.00 cfs @ 21.94 hrs, Volume= 25 cf
Outflow = 0.00 cfs @ 21.94 hrs, Volume= 25 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

Reach DP2: Land of Ogden



Summary for Pond INF: Chambers

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=65)

Inflow Area = 8,054 sf,100.00% Impervious, Inflow Depth = 4.62" for 10-yr event
Inflow = 0.86 cfs @ 12.09 hrs, Volume= 3,103 cf
Outflow = 0.10 cfs @ 11.70 hrs, Volume= 3,109 cf, Atten= 89%, Lag= 0.0 min
Discarded = 0.10 cfs @ 11.70 hrs, Volume= 3,109 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Reach DP2 : Land of Ogden

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 97.95' @ 12.74 hrs Surf.Area= 1,709 sf Storage= 970 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 64.4 min (812.9 - 748.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	97.00'	1,566 cf	**25.25'W x 67.70'L x 3.50'H Field A** 5,983 cf Overall - 2,067 cf Embedded = 3,915 cf x 40.0% Voids
#2A	97.50'	2,067 cf	**ADS_StormTech SC-740 +Cap** x 45 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 45 Chambers in 5 Rows
		3,633 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	97.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	99.04'	**6.0" Round Culvert** L= 67.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 99.04' / 95.50' S= 0.0528 '/' Cc= 0.900 n= 0.011, Flow Area= 0.20 sf

Discarded OutFlow Max=0.10 cfs @ 11.70 hrs HW=97.04' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=97.00' TW=0.00' (Dynamic Tailwater)
↑—**2=Culvert** (Controls 0.00 cfs)

Pond INF: Chambers - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

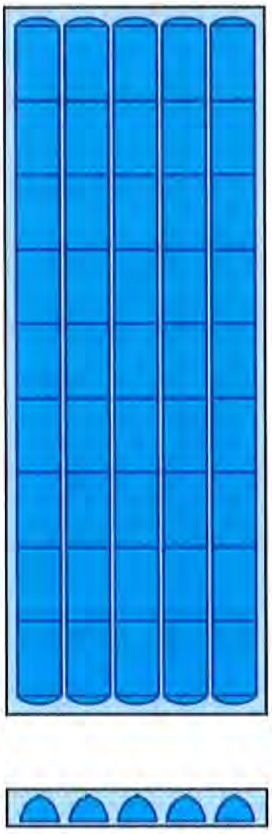
9 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 65.70' Row Length +12.0" End Stone x 2 = 67.70' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

45 Chambers x 45.9 cf = 2,067.3 cf Chamber Storage

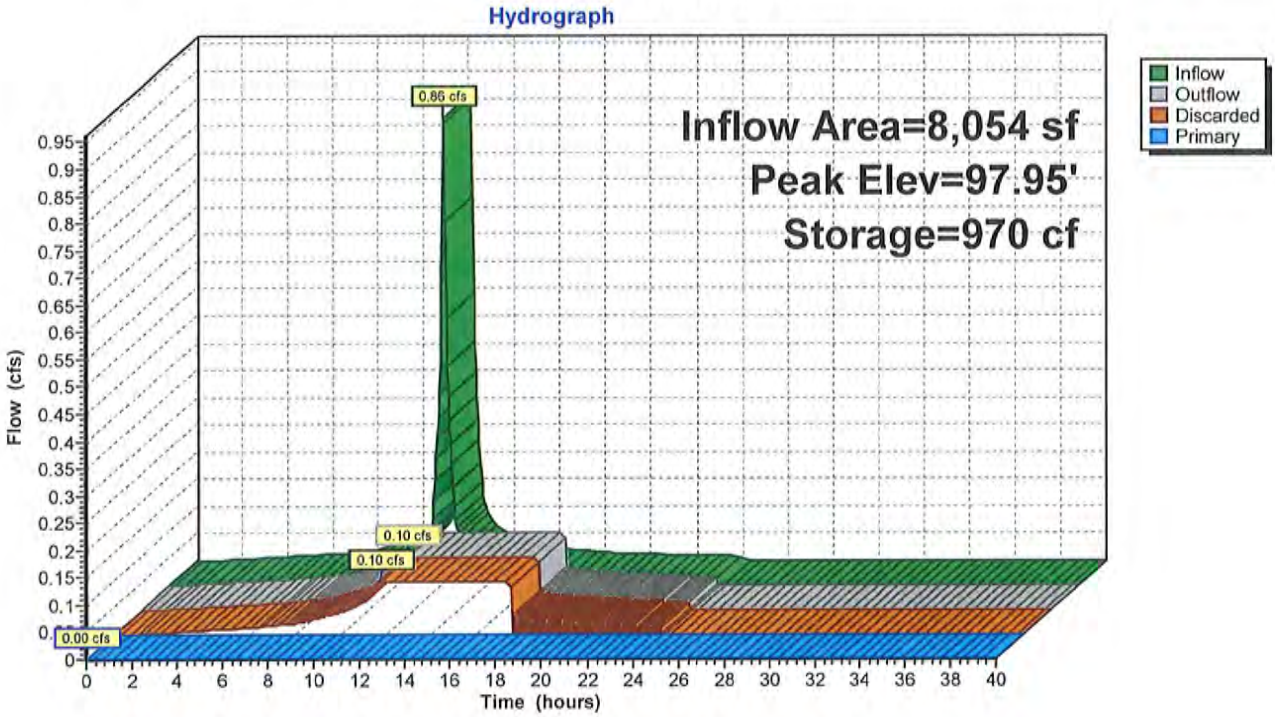
5,982.7 cf Field - 2,067.3 cf Chambers = 3,915.4 cf Stone x 40.0% Voids = 1,566.2 cf Stone Storage

Chamber Storage + Stone Storage = 3,633.5 cf = 0.083 af
Overall Storage Efficiency = 60.7%
Overall System Size = 67.70' x 25.25' x 3.50'

45 Chambers
221.6 cy Field
145.0 cy Stone



Pond INF: Chambers



Summary for Pond POND1: Infiltration Basin

Inflow Area = 31,685 sf, 43.05% Impervious, Inflow Depth = 2.42" for 10-yr event
Inflow = 2.02 cfs @ 12.09 hrs, Volume= 6,391 cf
Outflow = 0.82 cfs @ 12.35 hrs, Volume= 6,392 cf, Atten= 59%, Lag= 15.5 min
Discarded = 0.09 cfs @ 12.35 hrs, Volume= 3,961 cf
Primary = 0.73 cfs @ 12.35 hrs, Volume= 2,431 cf
Routed to Reach DP1 : East Main St

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 96.23' @ 12.35 hrs Surf.Area= 1,653 sf Storage= 2,087 cf

Plug-Flow detention time= 156.4 min calculated for 6,384 cf (100% of inflow)
Center-of-Mass det. time= 156.6 min (990.3 - 833.6)

Volume	Invert	Avail.Storage	Storage Description
#1	94.00'	7,611 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

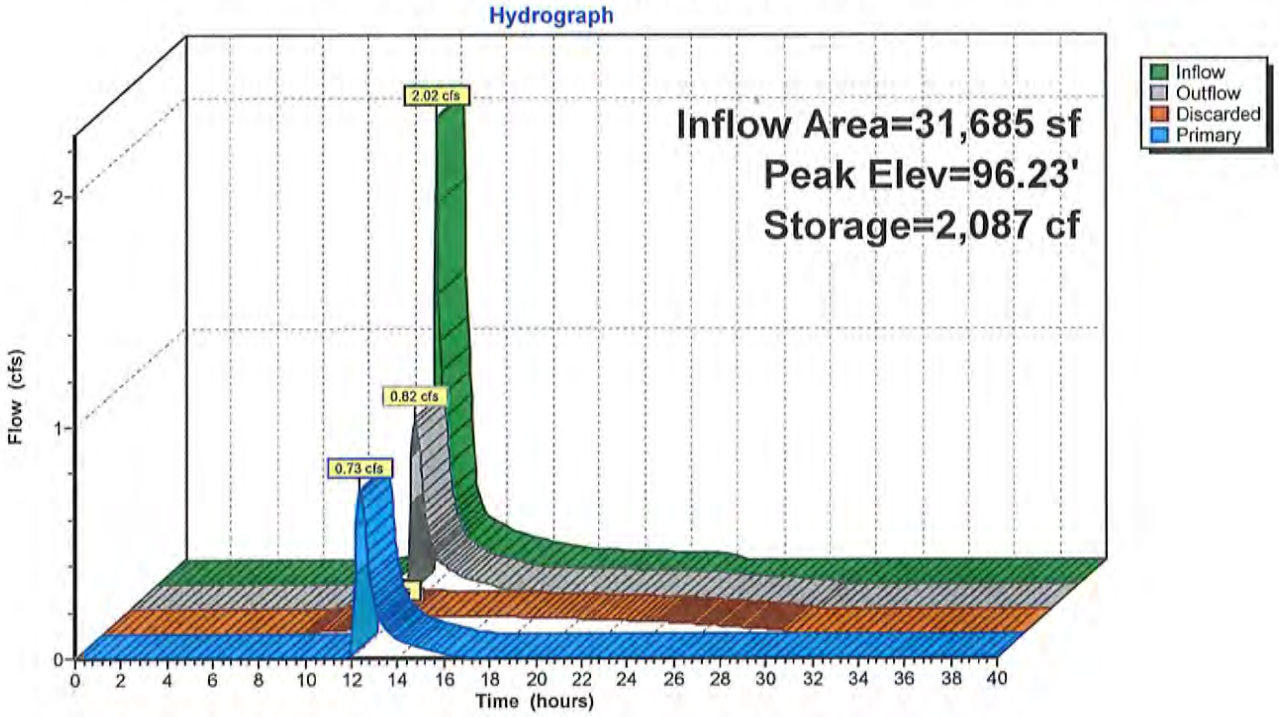
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
94.00	225	0	0
96.00	1,505	1,730	1,730
98.00	2,815	4,320	6,050
98.50	3,430	1,561	7,611

Device	Routing	Invert	Outlet Devices
#1	Discarded	94.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	97.50'	**10.0' 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
#3	Primary	95.70'	**8.0" Round Culvert** L= 104.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 95.70' / 88.00' S= 0.0740 '/' Cc= 0.900 n= 0.011, Flow Area= 0.35 sf

Discarded OutFlow Max=0.09 cfs @ 12.35 hrs HW=96.23' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=0.73 cfs @ 12.35 hrs HW=96.23' TW=0.00' (Dynamic Tailwater)
├**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└**3=Culvert** (Inlet Controls 0.73 cfs @ 2.47 fps)

Pond POND1: Infiltration Basin



Summary for Pond TRENCH: Infiltration Trench

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=88)

Inflow Area = 7,371 sf, 0.00% Impervious, Inflow Depth = 0.91" for 10-yr event
Inflow = 0.14 cfs @ 12.11 hrs, Volume= 560 cf
Outflow = 0.03 cfs @ 12.05 hrs, Volume= 561 cf, Atten= 78%, Lag= 0.0 min
Discarded = 0.03 cfs @ 12.05 hrs, Volume= 561 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Reach DP2 : Land of Ogden

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 100.51' @ 12.67 hrs Surf.Area= 560 sf Storage= 115 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 24.2 min (919.6 - 895.4)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	896 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 2,240 cf Overall x 40.0% Voids

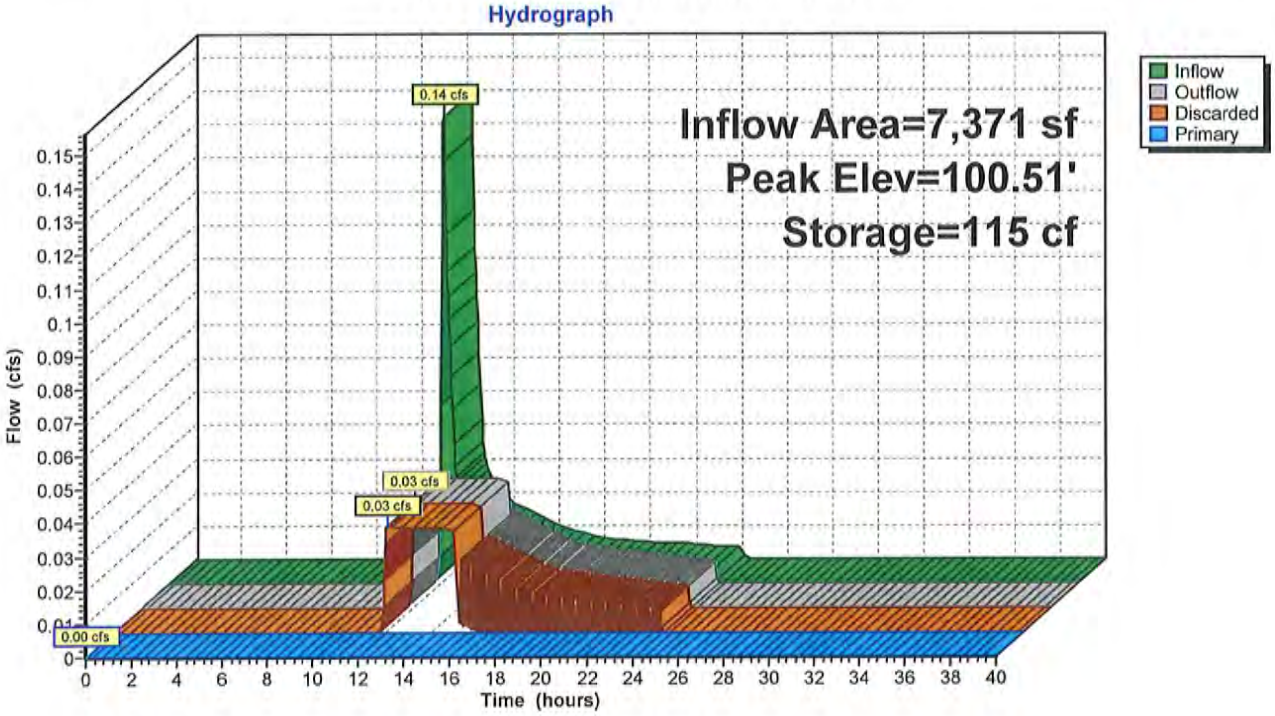
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	560	0	0
101.00	560	560	560
102.00	560	560	1,120
103.00	560	560	1,680
104.00	560	560	2,240

Device	Routing	Invert	Outlet Devices
#1	Discarded	100.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	103.99'	**115.0' 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

Discarded OutFlow Max=0.03 cfs @ 12.05 hrs HW=100.05' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=100.00' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond TRENCH: Infiltration Trench



Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment SC1.1: To East Main St Runoff Area=8,811 sf 17.90% Impervious Runoff Depth=2.07"
Tc=6.0 min CN=60 Runoff=0.46 cfs 1,518 cf

Subcatchment SC1.2: To Pond Runoff Area=31,685 sf 43.05% Impervious Runoff Depth=3.57"
Tc=6.0 min CN=76 Runoff=2.98 cfs 9,428 cf

Subcatchment SC1.3: Roof Runoff Area=8,054 sf 100.00% Impervious Runoff Depth=5.98"
Tc=6.0 min CN=98 Runoff=1.10 cfs 4,015 cf

Subcatchment SC2.1: To Trench Runoff Area=7,371 sf 0.00% Impervious Runoff Depth=1.65"
Tc=6.0 min CN=55 Runoff=0.29 cfs 1,011 cf

Subcatchment SC2.2: To Land of Ogden Runoff Area=17,328 sf 0.51% Impervious Runoff Depth=0.17"
Flow Length=136' Tc=8.8 min CN=32 Runoff=0.01 cfs 241 cf

Reach DP1: East Main St Inflow=1.56 cfs 6,397 cf
Outflow=1.56 cfs 6,397 cf

Reach DP2: Land of Ogden Inflow=0.01 cfs 241 cf
Outflow=0.01 cfs 241 cf

Pond INF: Chambers Peak Elev=98.27' Storage=1,394 cf Inflow=1.10 cfs 4,015 cf
Discarded=0.10 cfs 4,016 cf Primary=0.00 cfs 0 cf Outflow=0.10 cfs 4,016 cf

Pond POND1: Infiltration Basin Peak Elev=96.62' Storage=2,798 cf Inflow=2.98 cfs 9,428 cf
Discarded=0.11 cfs 4,549 cf Primary=1.29 cfs 4,880 cf Outflow=1.40 cfs 9,428 cf

Pond TRENCH: Infiltration Trench Peak Elev=101.54' Storage=345 cf Inflow=0.29 cfs 1,011 cf
Discarded=0.03 cfs 1,011 cf Primary=0.00 cfs 0 cf Outflow=0.03 cfs 1,011 cf

Total Runoff Area = 73,249 sf Runoff Volume = 16,213 cf Average Runoff Depth = 2.66"
68.11% Pervious = 49,890 sf 31.89% Impervious = 23,359 sf

Summary for Subcatchment SC1.1: To East Main St

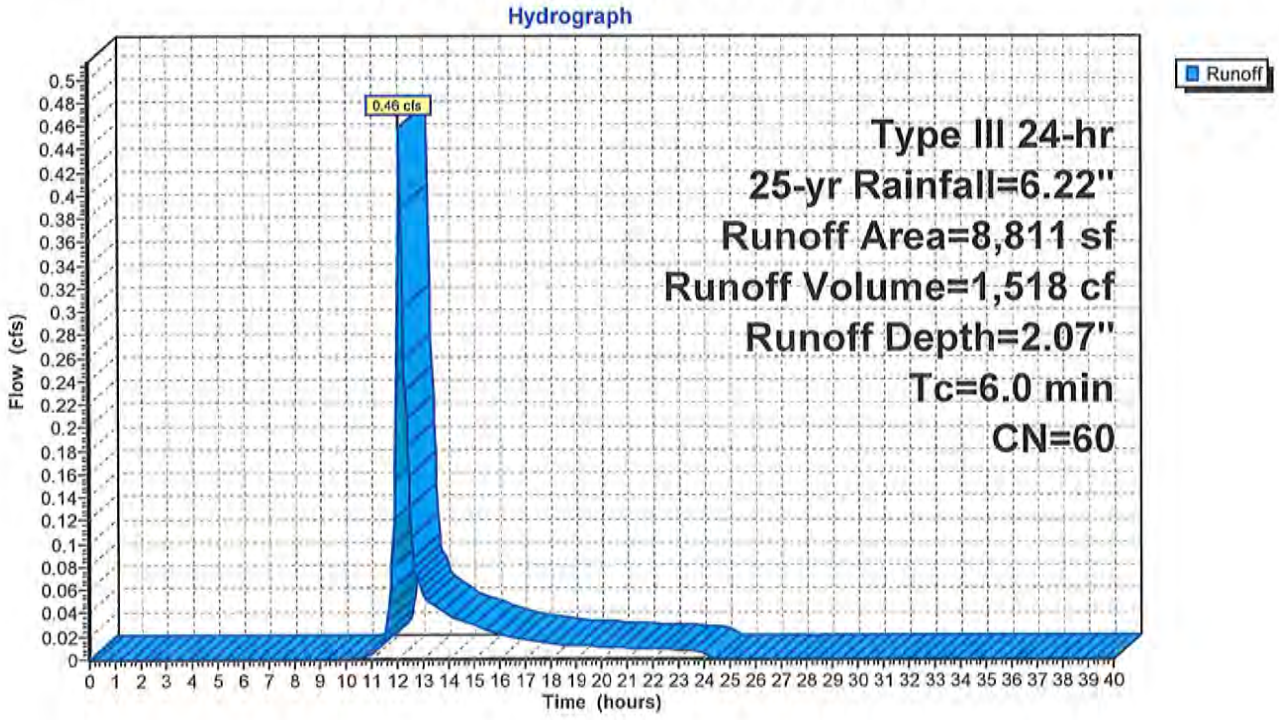
Runoff = 0.46 cfs @ 12.10 hrs, Volume= 1,518 cf, Depth= 2.07"
Routed to Reach DP1 : East Main St

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=6.22"

	Area (sf)	CN	Description
	3,218	39	>75% Grass cover, Good, HSG A
	4,016	61	>75% Grass cover, Good, HSG B
*	1,546	98	Pavement
*	31	98	Concrete
	8,811	60	Weighted Average
	7,234		82.10% Pervious Area
	1,577		17.90% Impervious Area

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

Subcatchment SC1.1: To East Main St



Summary for Subcatchment SC1.2: To Pond

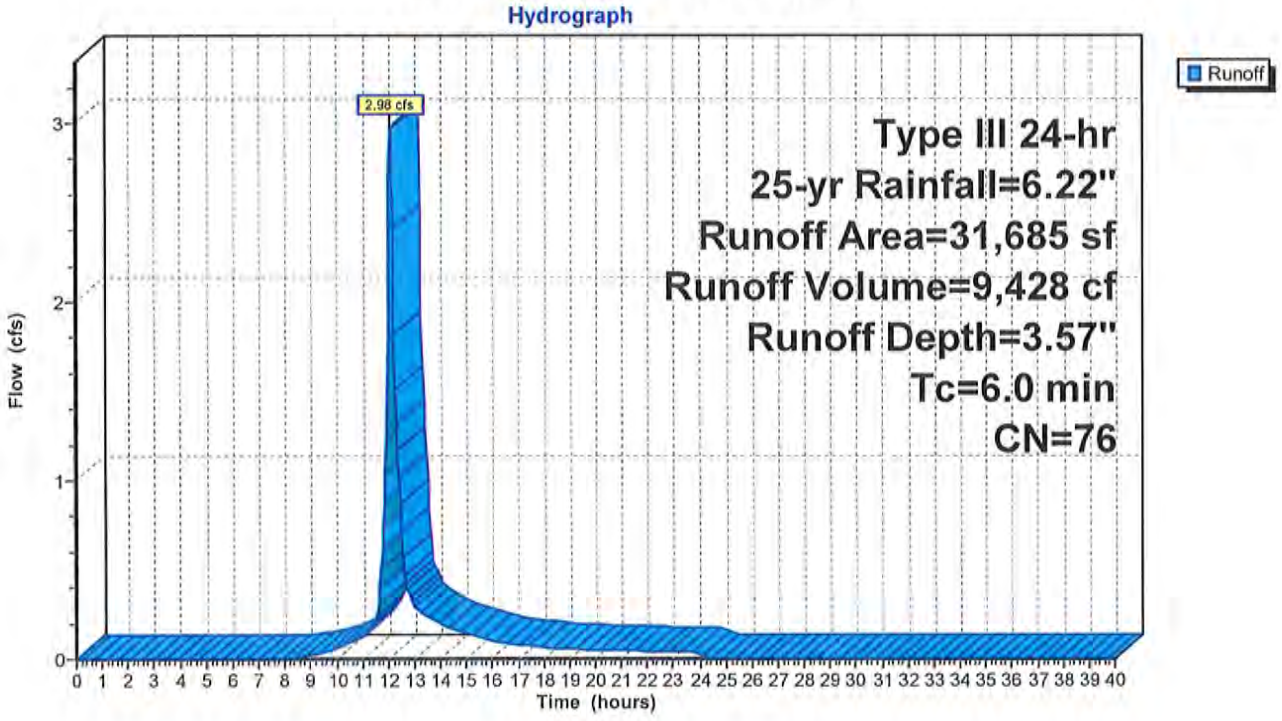
Runoff = 2.98 cfs @ 12.09 hrs, Volume= 9,428 cf, Depth= 3.57"
Routed to Pond POND1 : Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=6.22"

	Area (sf)	CN	Description
	5,309	39	>75% Grass cover, Good, HSG A
	8,285	61	>75% Grass cover, Good, HSG B
*	3,311	77	Riprap Slope, HSG A
	1,141	86	Riprap Slope, HSG B
*	12,820	98	Pavement
*	819	98	Concrete
	31,685	76	Weighted Average
	18,046		56.95% Pervious Area
	13,639		43.05% Impervious Area

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

Subcatchment SC1.2: To Pond



Summary for Subcatchment SC1.3: Roof

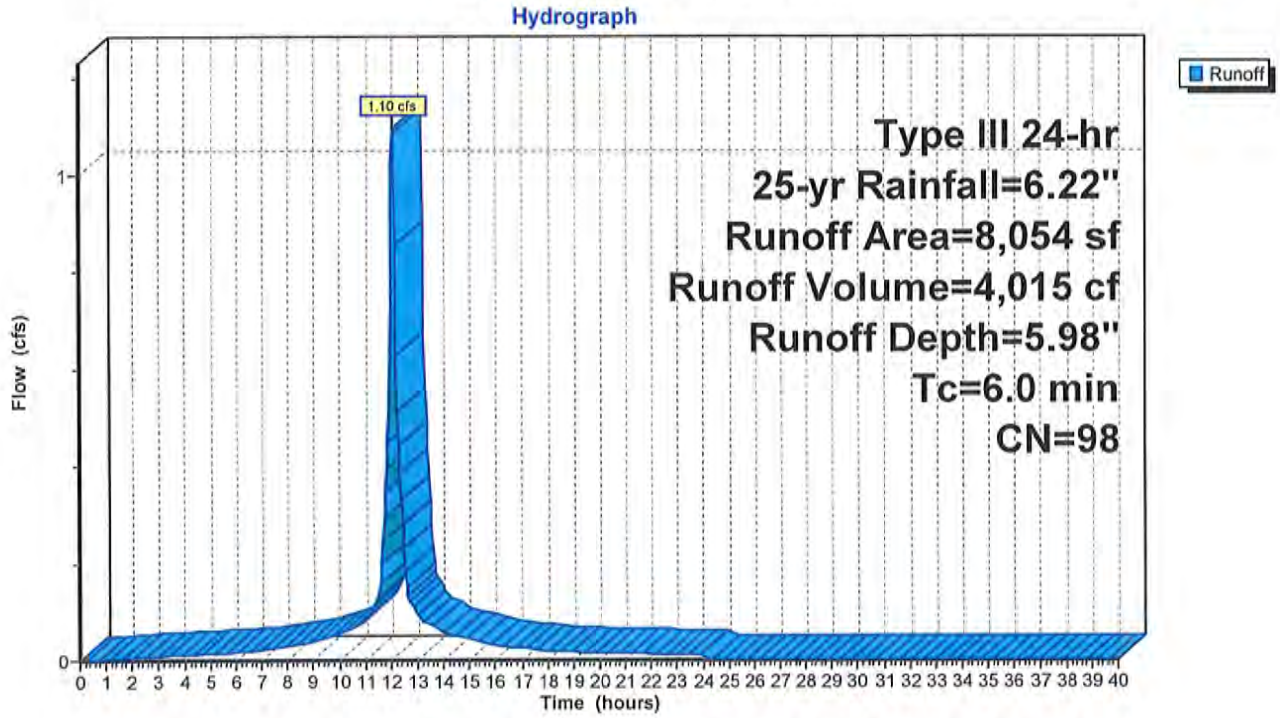
Runoff = 1.10 cfs @ 12.09 hrs, Volume= 4,015 cf, Depth= 5.98"
Routed to Pond INF : Chambers

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=6.22"

	Area (sf)	CN	Description
*	8,054	98	Roof
	8,054		100.00% Impervious Area

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

Subcatchment SC1.3: Roof



Summary for Subcatchment SC2.1: To Trench

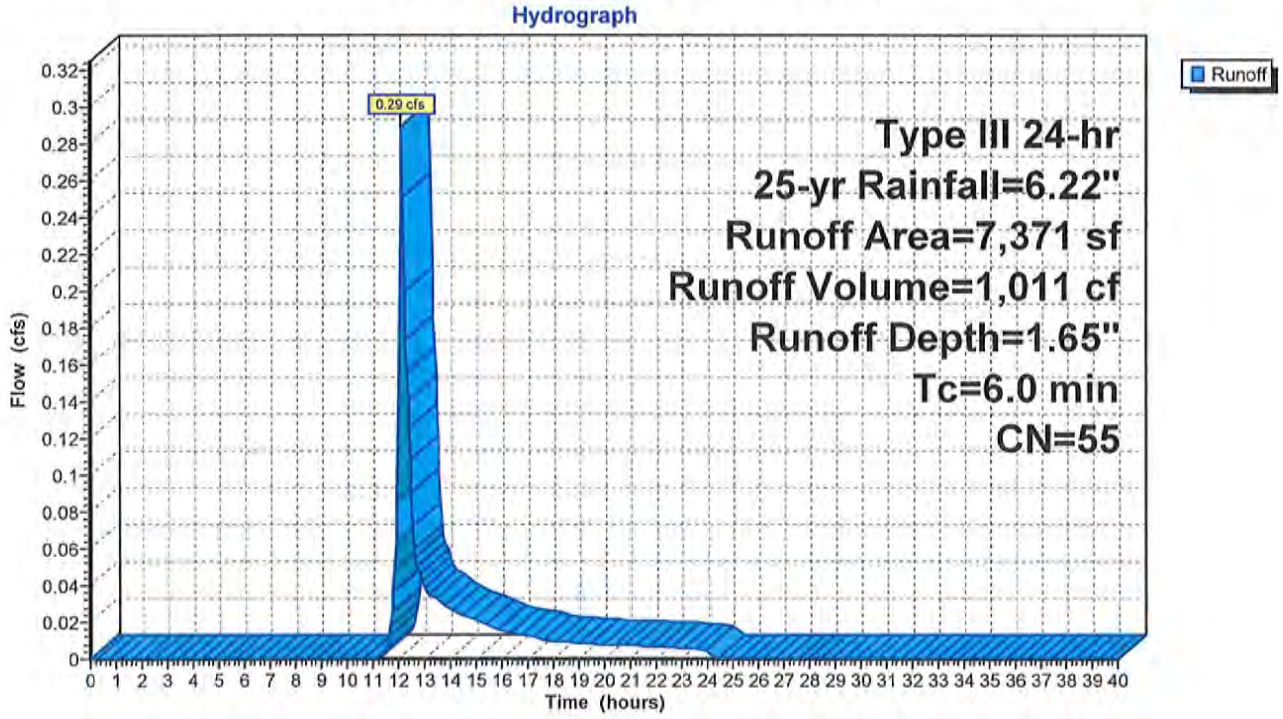
Runoff = 0.29 cfs @ 12.10 hrs, Volume= 1,011 cf, Depth= 1.65"
Routed to Pond TRENCH : Infiltration Trench

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=6.22"

	Area (sf)	CN	Description
	4,361	39	>75% Grass cover, Good, HSG A
*	3,010	77	Riprap Slope/Stone Trench, HSG A
	7,371	55	Weighted Average
	7,371		100.00% Pervious Area

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

Subcatchment SC2.1: To Trench



Summary for Subcatchment SC2.2: To Land of Ogden

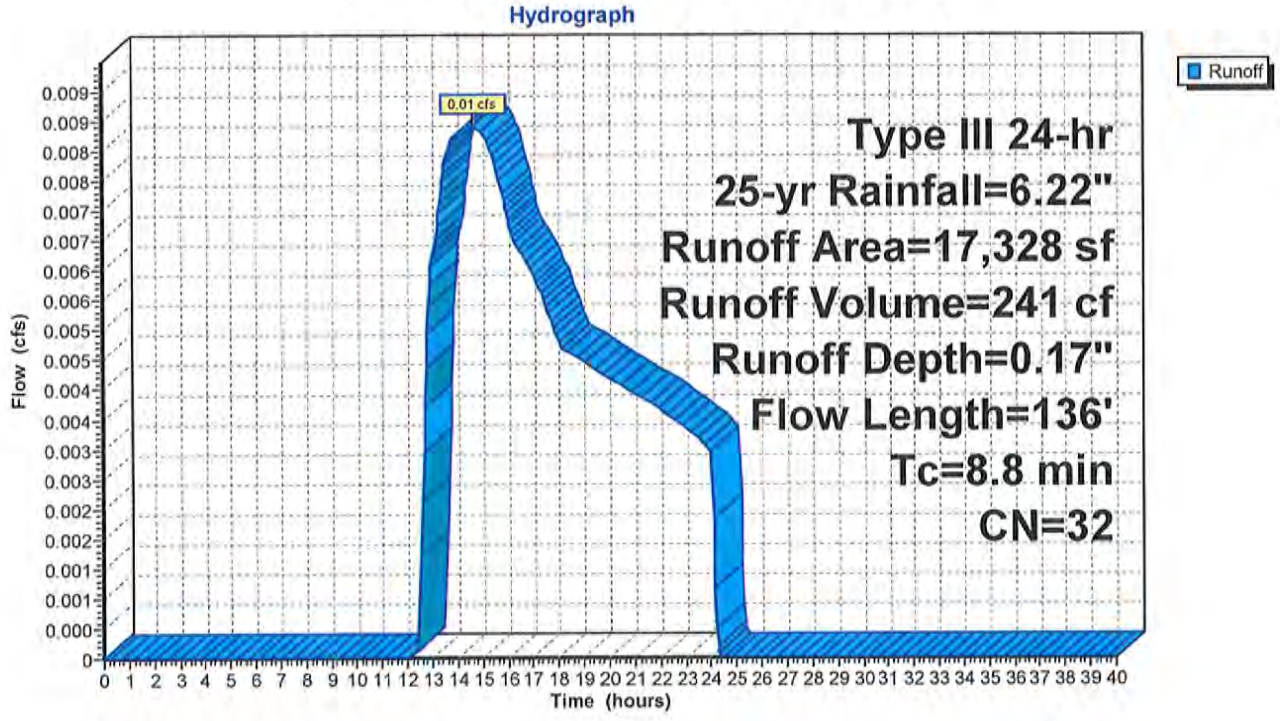
Runoff = 0.01 cfs @ 14.65 hrs, Volume= 241 cf, Depth= 0.17"
Routed to Reach DP2 : Land of Ogden

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=6.22"

	Area (sf)	CN	Description
	2,537	39	>75% Grass cover, Good, HSG A
*	80	77	Riprap Slope, HSG A
	14,622	30	Woods, Good, HSG A
*	89	98	Concrete
	17,328	32	Weighted Average
	17,239		99.49% Pervious Area
	89		0.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0100	0.11		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.16"
0.1	16	0.1000	2.21		**Shallow Concentrated Flow, Shallow Conc. Flow #1** Short Grass Pasture Kv= 7.0 fps
1.2	70	0.0400	1.00		**Shallow Concentrated Flow, Shallow Conc. Flow #2** Woodland Kv= 5.0 fps
8.8	136	Total			

Subcatchment SC2.2: To Land of Ogden



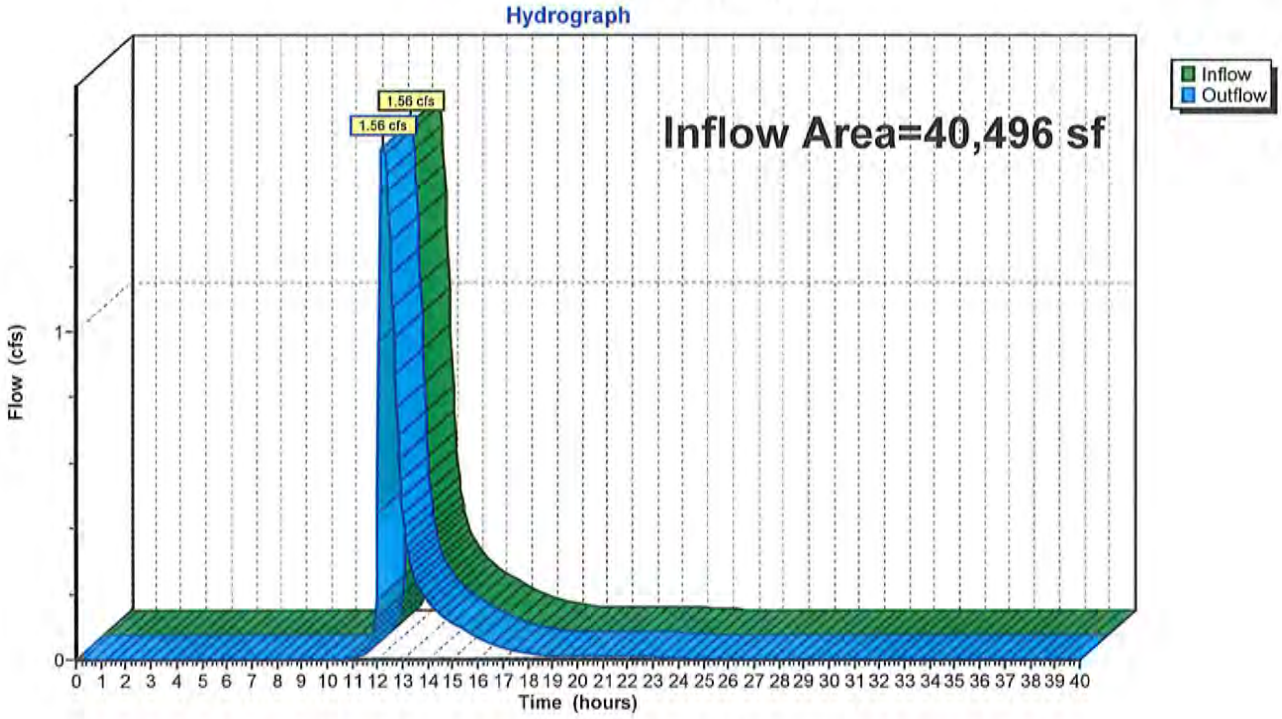
Summary for Reach DP1: East Main St

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 40,496 sf, 37.57% Impervious, Inflow Depth = 1.90" for 25-yr event
Inflow = 1.56 cfs @ 12.18 hrs, Volume= 6,397 cf
Outflow = 1.56 cfs @ 12.18 hrs, Volume= 6,397 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

Reach DP1: East Main St



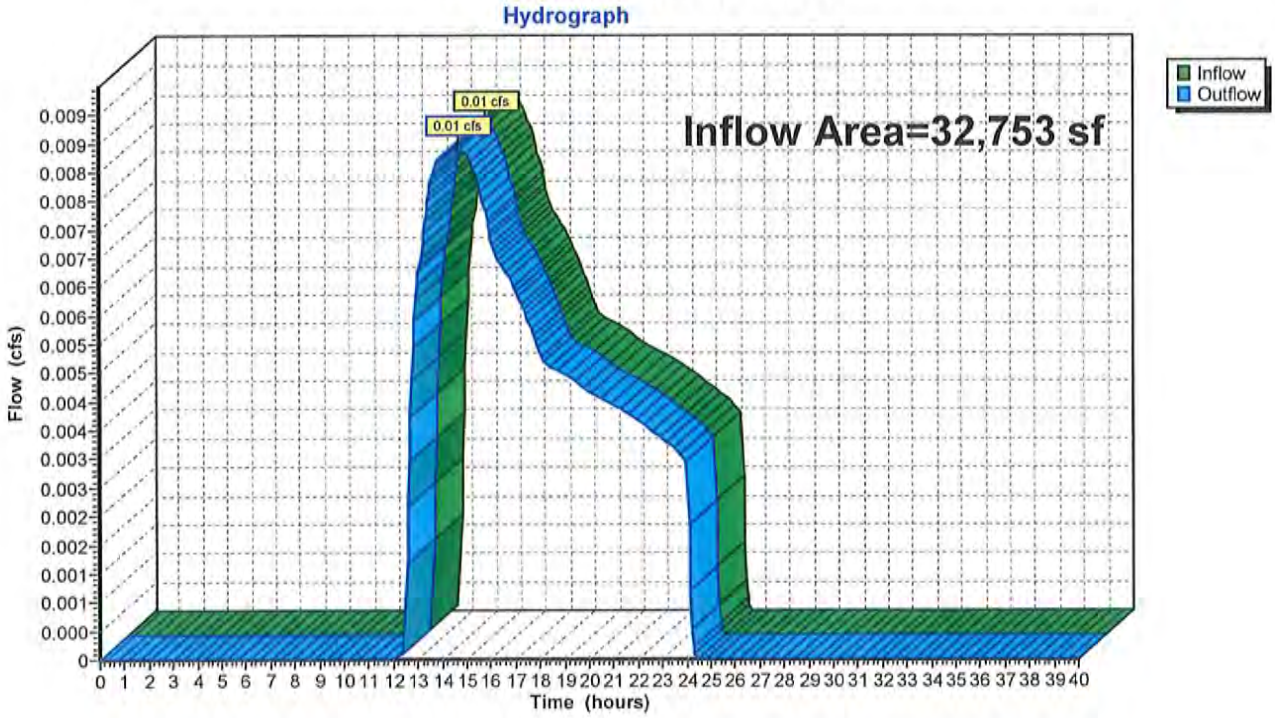
Summary for Reach DP2: Land of Ogden

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 32,753 sf, 24.86% Impervious, Inflow Depth = 0.09" for 25-yr event
Inflow = 0.01 cfs @ 14.65 hrs, Volume= 241 cf
Outflow = 0.01 cfs @ 14.65 hrs, Volume= 241 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

Reach DP2: Land of Ogden



Summary for Pond INF: Chambers

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=44)

Inflow Area = 8,054 sf,100.00% Impervious, Inflow Depth = 5.98" for 25-yr event
Inflow = 1.10 cfs @ 12.09 hrs, Volume= 4,015 cf
Outflow = 0.10 cfs @ 11.60 hrs, Volume= 4,016 cf, Atten= 91%, Lag= 0.0 min
Discarded = 0.10 cfs @ 11.60 hrs, Volume= 4,016 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Reach DP2 : Land of Ogden

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 98.27' @ 12.99 hrs Surf.Area= 1,709 sf Storage= 1,394 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 100.2 min (844.8 - 744.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	97.00'	1,566 cf	**25.25'W x 67.70'L x 3.50'H Field A** 5,983 cf Overall - 2,067 cf Embedded = 3,915 cf x 40.0% Voids
#2A	97.50'	2,067 cf	**ADS_StormTech SC-740 +Cap** x 45 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 45 Chambers in 5 Rows
		3,633 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	97.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	99.04'	**6.0" Round Culvert** L= 67.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 99.04' / 95.50' S= 0.0528 '/' Cc= 0.900 n= 0.011, Flow Area= 0.20 sf

Discarded OutFlow Max=0.10 cfs @ 11.60 hrs HW=97.05' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=97.00' TW=0.00' (Dynamic Tailwater)
↑—**2=Culvert** (Controls 0.00 cfs)

Pond INF: Chambers - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

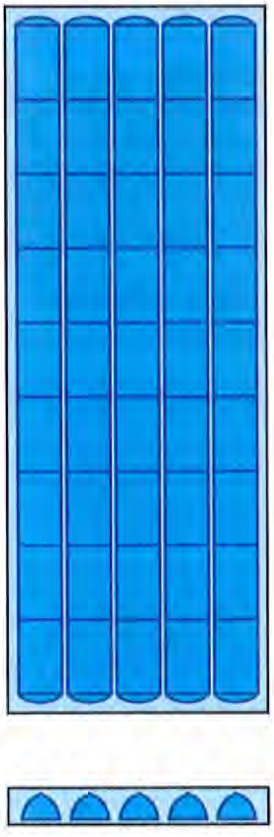
9 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 65.70' Row Length +12.0" End Stone x 2 = 67.70' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

45 Chambers x 45.9 cf = 2,067.3 cf Chamber Storage

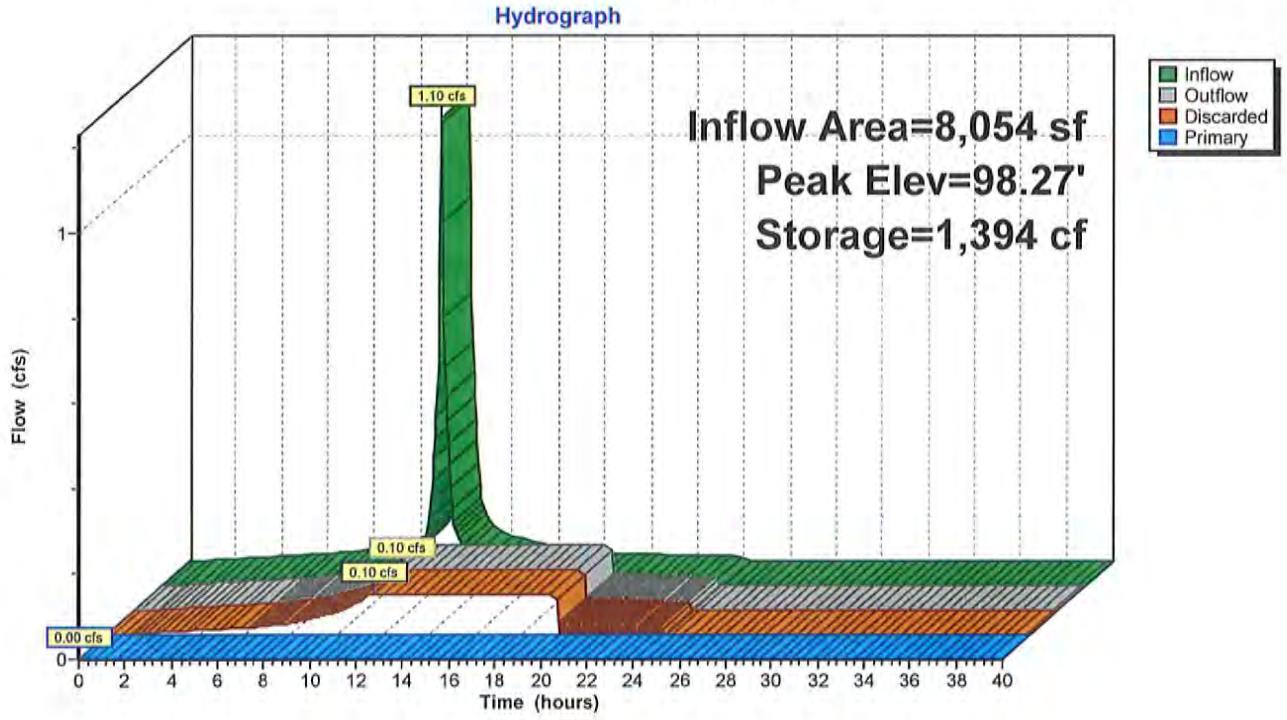
5,982.7 cf Field - 2,067.3 cf Chambers = 3,915.4 cf Stone x 40.0% Voids = 1,566.2 cf Stone Storage

Chamber Storage + Stone Storage = 3,633.5 cf = 0.083 af
Overall Storage Efficiency = 60.7%
Overall System Size = 67.70' x 25.25' x 3.50'

45 Chambers
221.6 cy Field
145.0 cy Stone



Pond INF: Chambers



Summary for Pond POND1: Infiltration Basin

Inflow Area = 31,685 sf, 43.05% Impervious, Inflow Depth = 3.57" for 25-yr event
Inflow = 2.98 cfs @ 12.09 hrs, Volume= 9,428 cf
Outflow = 1.40 cfs @ 12.28 hrs, Volume= 9,428 cf, Atten= 53%, Lag= 11.3 min
Discarded = 0.11 cfs @ 12.28 hrs, Volume= 4,549 cf
Primary = 1.29 cfs @ 12.28 hrs, Volume= 4,880 cf
Routed to Reach DP1 : East Main St

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 96.62' @ 12.28 hrs Surf.Area= 1,914 sf Storage= 2,798 cf

Plug-Flow detention time= 127.3 min calculated for 9,417 cf (100% of inflow)
Center-of-Mass det. time= 127.6 min (950.1 - 822.5)

Volume	Invert	Avail.Storage	Storage Description
#1	94.00'	7,611 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

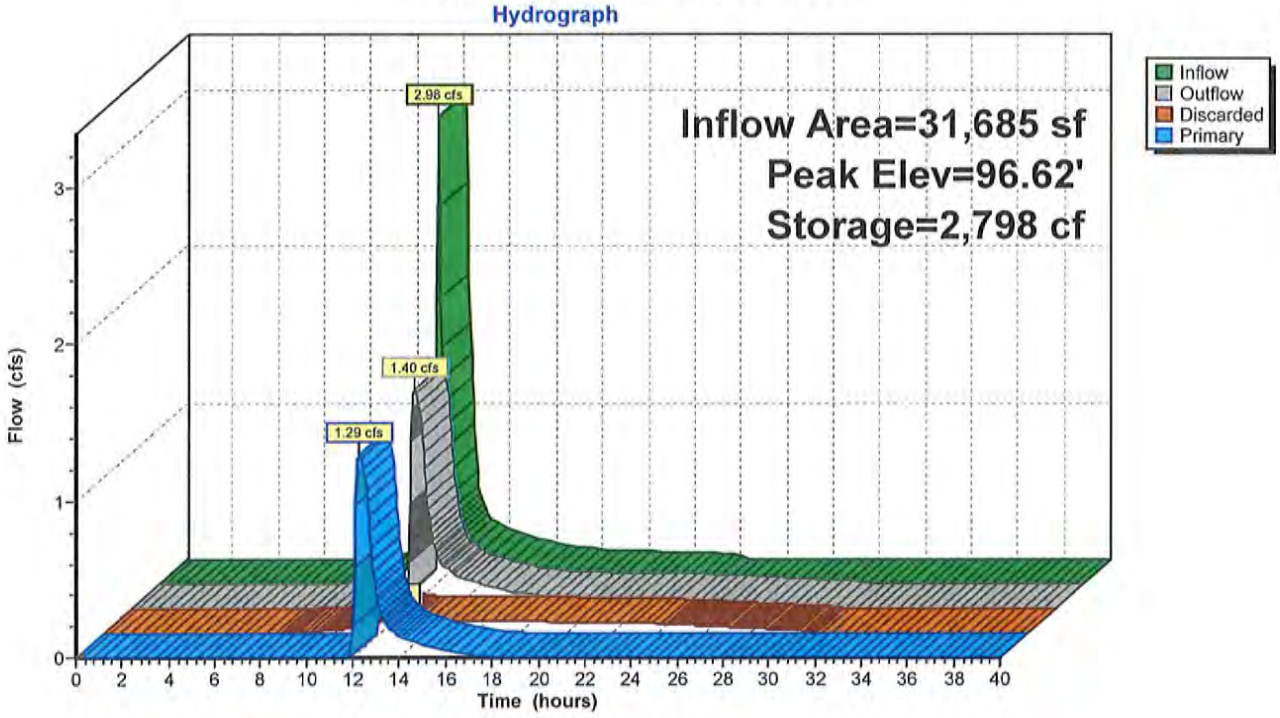
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
94.00	225	0	0
96.00	1,505	1,730	1,730
98.00	2,815	4,320	6,050
98.50	3,430	1,561	7,611

Device	Routing	Invert	Outlet Devices
#1	Discarded	94.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	97.50'	**10.0' 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
#3	Primary	95.70'	**8.0" Round Culvert** L= 104.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 95.70' / 88.00' S= 0.0740 '/' Cc= 0.900 n= 0.011, Flow Area= 0.35 sf

Discarded OutFlow Max=0.11 cfs @ 12.28 hrs HW=96.62' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=1.29 cfs @ 12.28 hrs HW=96.62' TW=0.00' (Dynamic Tailwater)
├**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└**3=Culvert** (Inlet Controls 1.29 cfs @ 3.70 fps)

Pond POND1: Infiltration Basin



Summary for Pond TRENCH: Infiltration Trench

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=43)

Inflow Area = 7,371 sf, 0.00% Impervious, Inflow Depth = 1.65" for 25-yr event
Inflow = 0.29 cfs @ 12.10 hrs, Volume= 1,011 cf
Outflow = 0.03 cfs @ 11.95 hrs, Volume= 1,011 cf, Atten= 89%, Lag= 0.0 min
Discarded = 0.03 cfs @ 11.95 hrs, Volume= 1,011 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Reach DP2 : Land of Ogden

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 101.54' @ 13.62 hrs Surf.Area= 560 sf Storage= 345 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 104.1 min (978.5 - 874.4)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	896 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 2,240 cf Overall x 40.0% Voids

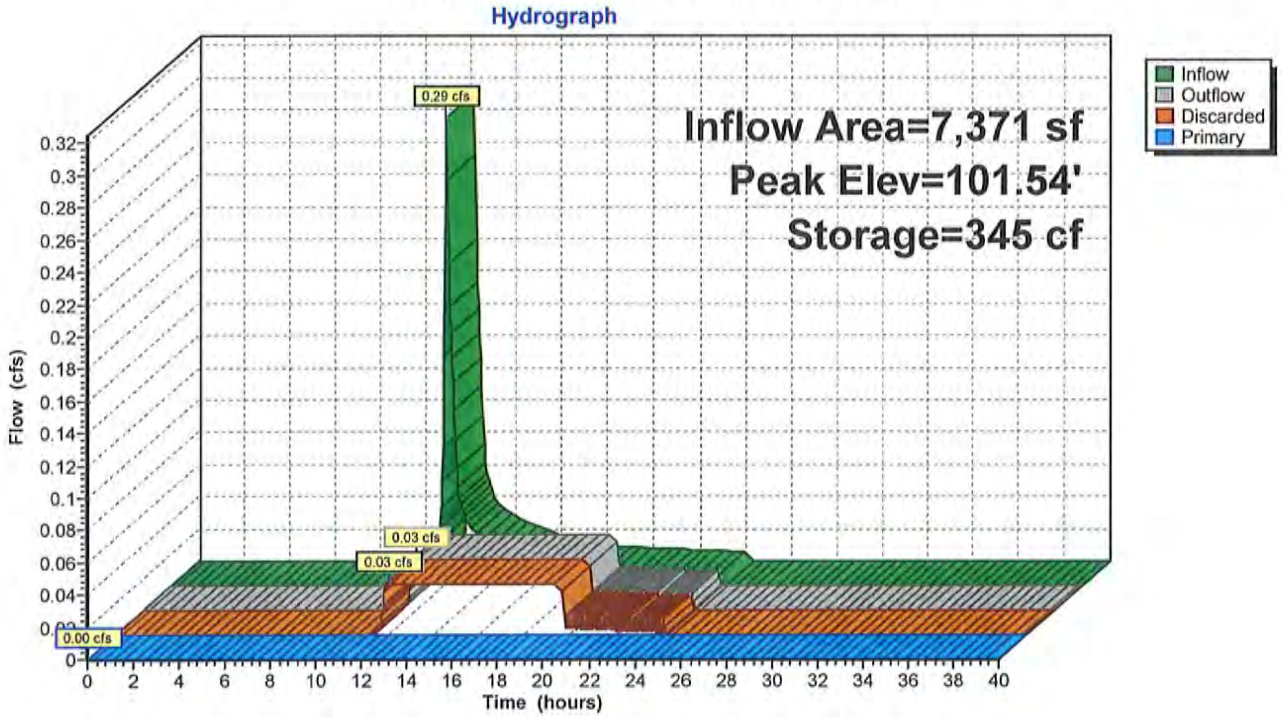
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	560	0	0
101.00	560	560	560
102.00	560	560	1,120
103.00	560	560	1,680
104.00	560	560	2,240

Device	Routing	Invert	Outlet Devices
#1	Discarded	100.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	103.99'	**115.0' 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

Discarded OutFlow Max=0.03 cfs @ 11.95 hrs HW=100.07' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=100.00' TW=0.00' (Dynamic Tailwater)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond TRENCH: Infiltration Trench



Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment SC1.1: To East Main St Runoff Area=8,811 sf 17.90% Impervious Runoff Depth=4.13"
Tc=6.0 min CN=60 Runoff=0.96 cfs 3,034 cf

Subcatchment SC1.2: To Pond Runoff Area=31,685 sf 43.05% Impervious Runoff Depth=6.11"
Tc=6.0 min CN=76 Runoff=5.05 cfs 16,140 cf

Subcatchment SC1.3: Roof Runoff Area=8,054 sf 100.00% Impervious Runoff Depth=8.80"
Tc=6.0 min CN=98 Runoff=1.60 cfs 5,906 cf

Subcatchment SC2.1: To Trench Runoff Area=7,371 sf 0.00% Impervious Runoff Depth=3.52"
Tc=6.0 min CN=55 Runoff=0.67 cfs 2,160 cf

Subcatchment SC2.2: To Land of Ogden Runoff Area=17,328 sf 0.51% Impervious Runoff Depth=0.88"
Flow Length=136' Tc=8.8 min CN=32 Runoff=0.16 cfs 1,272 cf

Reach DP1: East Main St Inflow=2.69 cfs 13,666 cf
Outflow=2.69 cfs 13,666 cf

Reach DP2: Land of Ogden Inflow=0.16 cfs 1,524 cf
Outflow=0.16 cfs 1,524 cf

Pond INF: Chambers Peak Elev=99.07' Storage=2,401 cf Inflow=1.60 cfs 5,906 cf
Discarded=0.10 cfs 5,905 cf Primary=0.00 cfs 8 cf Outflow=0.10 cfs 5,913 cf

Pond POND1: Infiltration Basin Peak Elev=97.43' Storage=4,555 cf Inflow=5.05 cfs 16,140 cf
Discarded=0.14 cfs 5,509 cf Primary=1.99 cfs 10,632 cf Outflow=2.12 cfs 16,141 cf

Pond TRENCH: Infiltration Trench Peak Elev=103.99' Storage=895 cf Inflow=0.67 cfs 2,160 cf
Discarded=0.03 cfs 1,918 cf Primary=0.07 cfs 244 cf Outflow=0.10 cfs 2,162 cf

Total Runoff Area = 73,249 sf Runoff Volume = 28,513 cf Average Runoff Depth = 4.67"
68.11% Pervious = 49,890 sf 31.89% Impervious = 23,359 sf

Summary for Subcatchment SC1.1: To East Main St

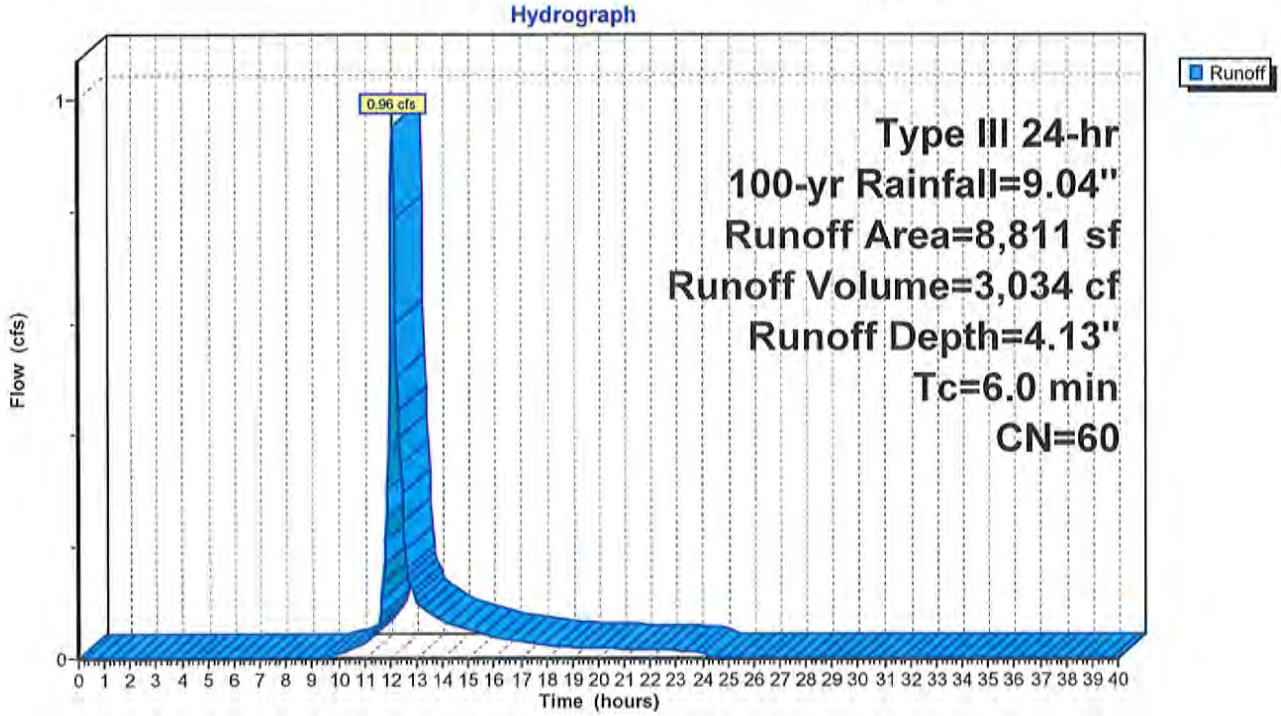
Runoff = 0.96 cfs @ 12.10 hrs, Volume= 3,034 cf, Depth= 4.13"
Routed to Reach DP1 : East Main St

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=9.04"

	Area (sf)	CN	Description
	3,218	39	>75% Grass cover, Good, HSG A
	4,016	61	>75% Grass cover, Good, HSG B
*	1,546	98	Pavement
*	31	98	Concrete
	8,811	60	Weighted Average
	7,234		82.10% Pervious Area
	1,577		17.90% Impervious Area

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

Subcatchment SC1.1: To East Main St



Summary for Subcatchment SC1.2: To Pond

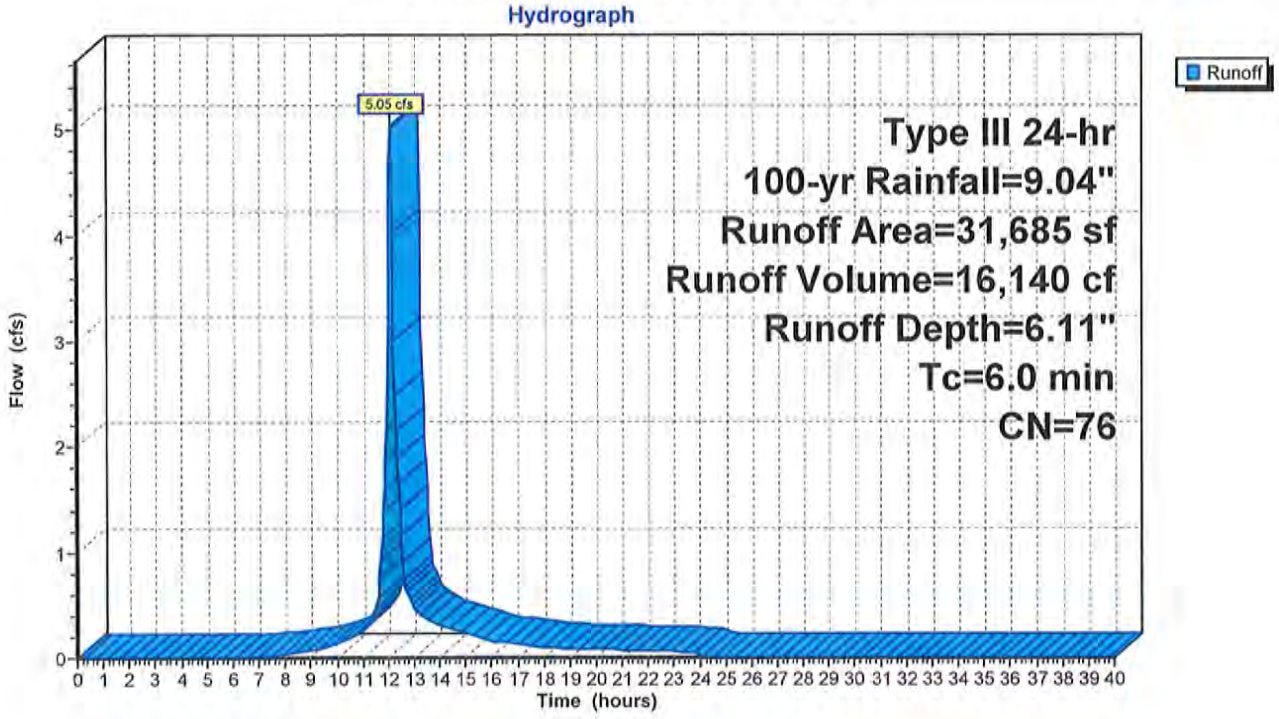
Runoff = 5.05 cfs @ 12.09 hrs, Volume= 16,140 cf, Depth= 6.11"
Routed to Pond POND1 : Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=9.04"

	Area (sf)	CN	Description
	5,309	39	>75% Grass cover, Good, HSG A
	8,285	61	>75% Grass cover, Good, HSG B
*	3,311	77	Riprap Slope, HSG A
	1,141	86	Riprap Slope, HSG B
*	12,820	98	Pavement
*	819	98	Concrete
	31,685	76	Weighted Average
	18,046		56.95% Pervious Area
	13,639		43.05% Impervious Area

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

Subcatchment SC1.2: To Pond



Summary for Subcatchment SC1.3: Roof

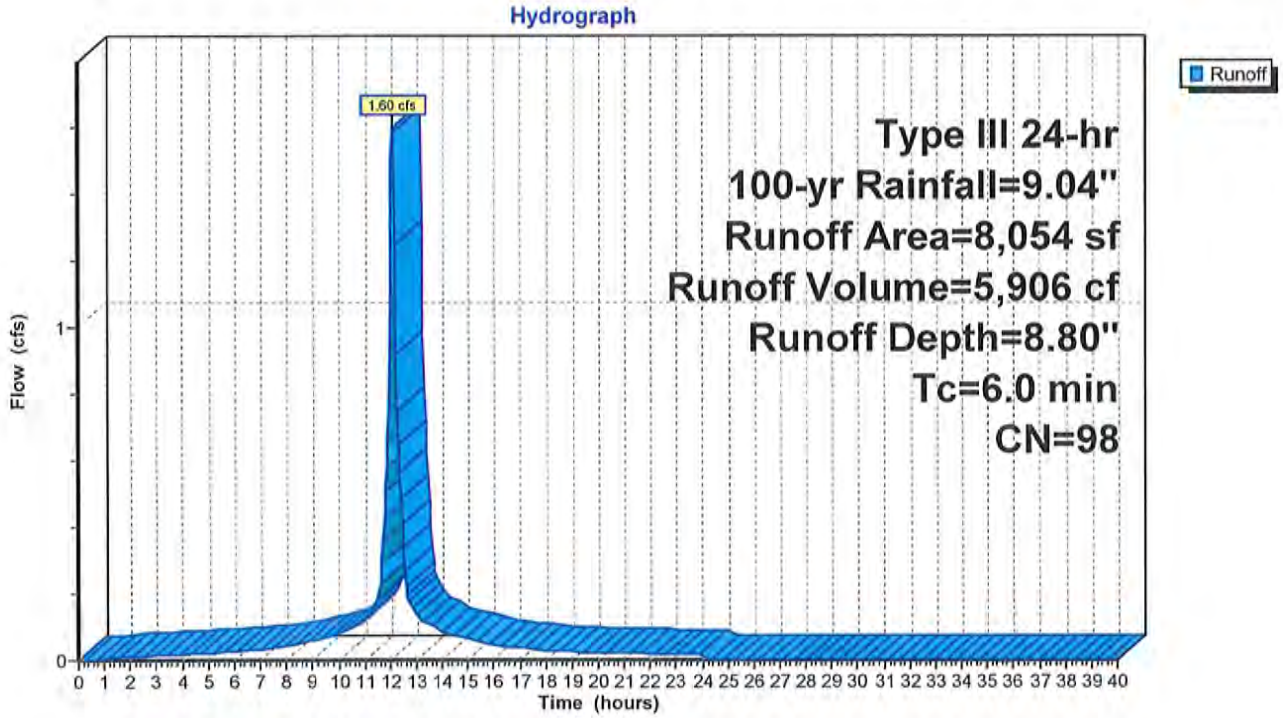
Runoff = 1.60 cfs @ 12.09 hrs, Volume= 5,906 cf, Depth= 8.80"
Routed to Pond INF : Chambers

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=9.04"

	Area (sf)	CN	Description
*	8,054	98	Roof
	8,054		100.00% Impervious Area

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

Subcatchment SC1.3: Roof



Summary for Subcatchment SC2.1: To Trench

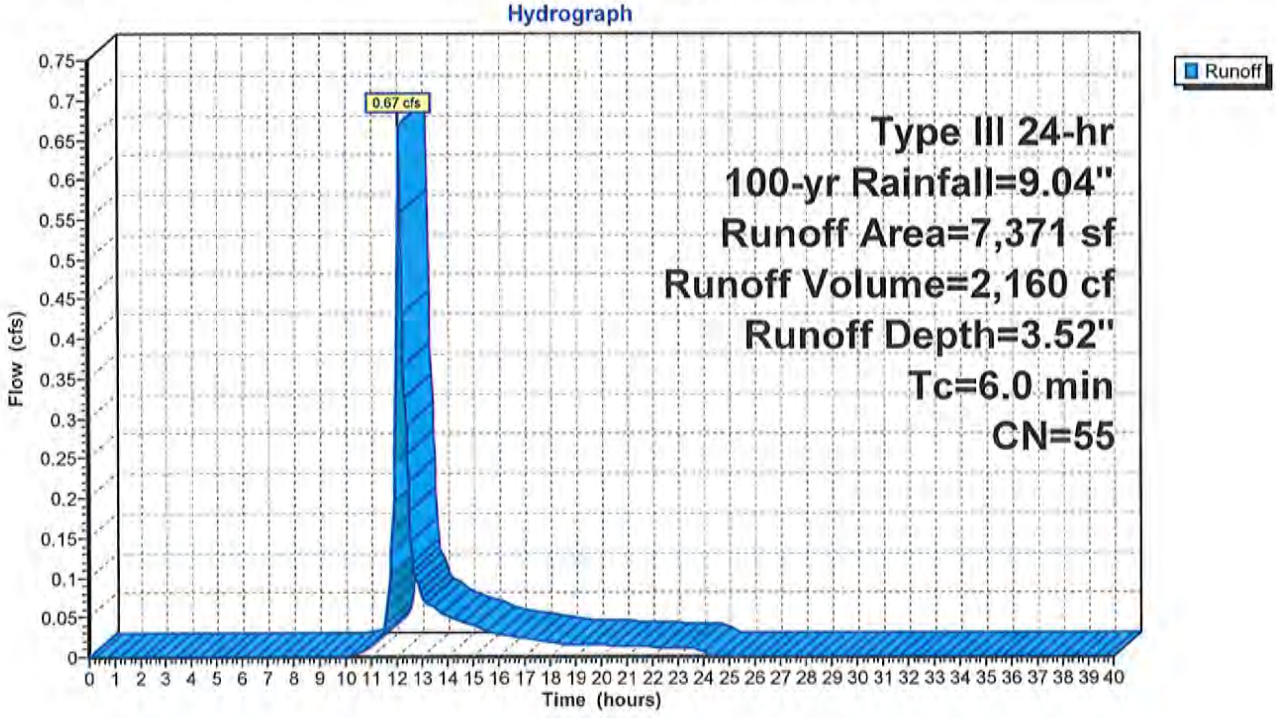
Runoff = 0.67 cfs @ 12.10 hrs, Volume= 2,160 cf, Depth= 3.52"
Routed to Pond TRENCH : Infiltration Trench

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=9.04"

	Area (sf)	CN	Description
	4,361	39	>75% Grass cover, Good, HSG A
*	3,010	77	Riprap Slope/Stone Trench, HSG A
	7,371	55	Weighted Average
	7,371		100.00% Pervious Area

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

Subcatchment SC2.1: To Trench



Summary for Subcatchment SC2.2: To Land of Ogden

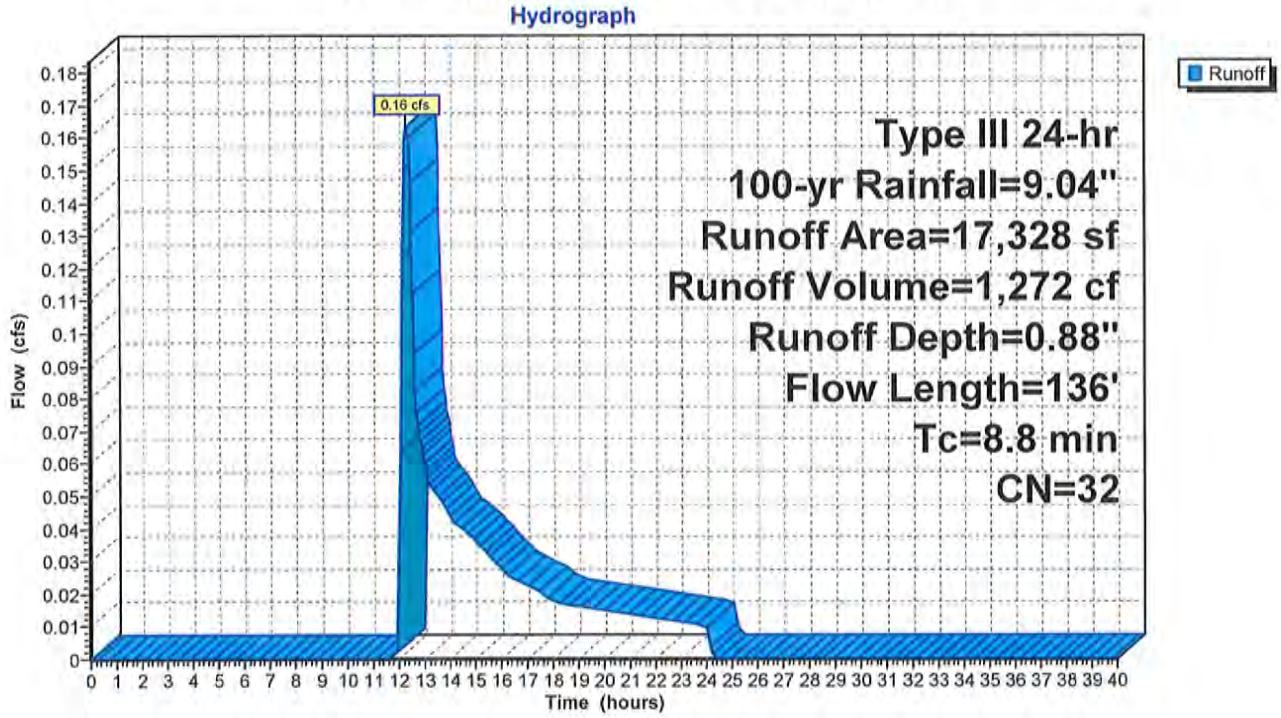
Runoff = 0.16 cfs @ 12.32 hrs, Volume= 1,272 cf, Depth= 0.88"
Routed to Reach DP2 : Land of Ogden

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=9.04"

	Area (sf)	CN	Description
	2,537	39	>75% Grass cover, Good, HSG A
*	80	77	Riprap Slope, HSG A
	14,622	30	Woods, Good, HSG A
*	89	98	Concrete
	17,328	32	Weighted Average
	17,239		99.49% Pervious Area
	89		0.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0100	0.11		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.16"
0.1	16	0.1000	2.21		**Shallow Concentrated Flow, Shallow Conc. Flow #1** Short Grass Pasture Kv= 7.0 fps
1.2	70	0.0400	1.00		**Shallow Concentrated Flow, Shallow Conc. Flow #2** Woodland Kv= 5.0 fps
8.8	136	Total			

Subcatchment SC2.2: To Land of Ogden



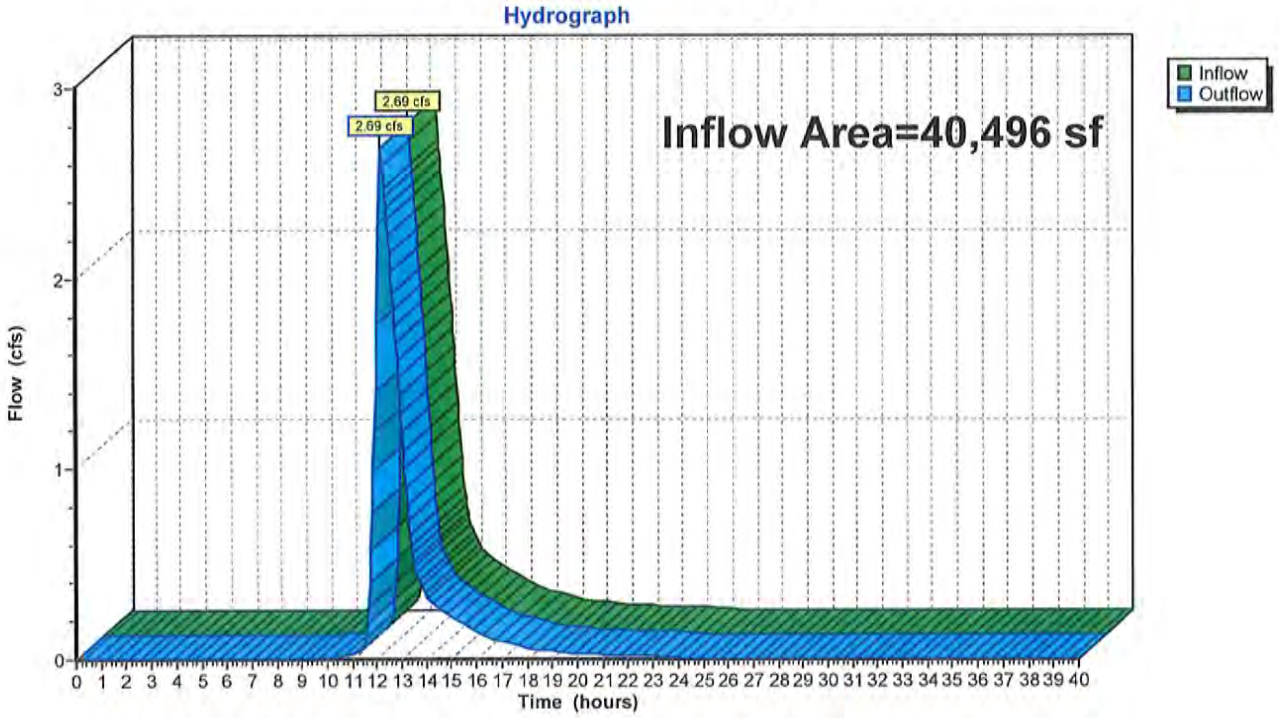
Summary for Reach DP1: East Main St

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 40,496 sf, 37.57% Impervious, Inflow Depth = 4.05" for 100-yr event
Inflow = 2.69 cfs @ 12.12 hrs, Volume= 13,666 cf
Outflow = 2.69 cfs @ 12.12 hrs, Volume= 13,666 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

Reach DP1: East Main St



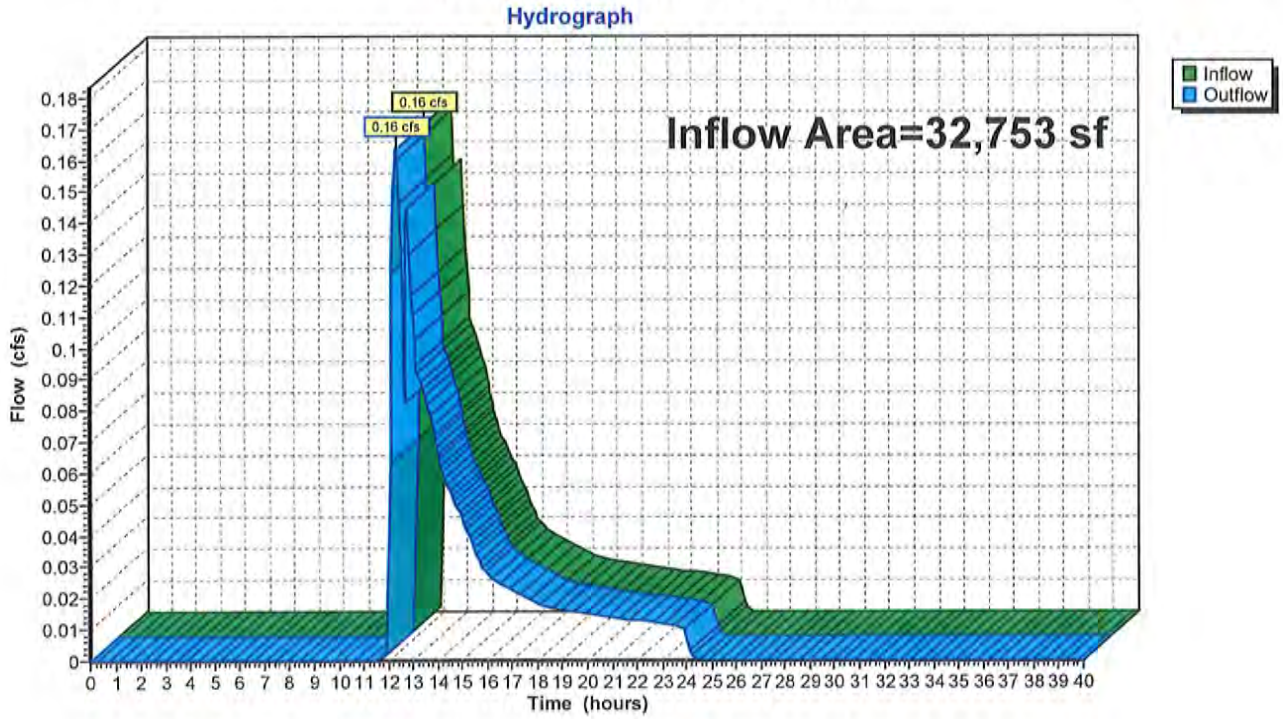
Summary for Reach DP2: Land of Ogden

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 32,753 sf, 24.86% Impervious, Inflow Depth = 0.56" for 100-yr event
Inflow = 0.16 cfs @ 12.32 hrs, Volume= 1,524 cf
Outflow = 0.16 cfs @ 12.32 hrs, Volume= 1,524 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

Reach DP2: Land of Ogden



Summary for Pond INF: Chambers

Inflow Area = 8,054 sf,100.00% Impervious, Inflow Depth = 8.80" for 100-yr event
Inflow = 1.60 cfs @ 12.09 hrs, Volume= 5,906 cf
Outflow = 0.10 cfs @ 13.70 hrs, Volume= 5,913 cf, Atten= 94%, Lag= 97.0 min
Discarded = 0.10 cfs @ 11.00 hrs, Volume= 5,905 cf
Primary = 0.00 cfs @ 13.70 hrs, Volume= 8 cf
Routed to Reach DP2 : Land of Ogden

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 99.07' @ 13.70 hrs Surf.Area= 1,709 sf Storage= 2,401 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 193.1 min (932.8 - 739.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	97.00'	1,566 cf	**25.25'W x 67.70'L x 3.50'H Field A** 5,983 cf Overall - 2,067 cf Embedded = 3,915 cf x 40.0% Voids
#2A	97.50'	2,067 cf	**ADS_StormTech SC-740 +Cap** x 45 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 45 Chambers in 5 Rows
		3,633 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	97.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	99.04'	**6.0" Round Culvert** L= 67.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 99.04' / 95.50' S= 0.0528 '/' Cc= 0.900 n= 0.011, Flow Area= 0.20 sf

Discarded OutFlow Max=0.10 cfs @ 11.00 hrs HW=97.04' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=0.00 cfs @ 13.70 hrs HW=99.07' TW=0.00' (Dynamic Tailwater)
↑—**2=Culvert** (Inlet Controls 0.00 cfs @ 0.59 fps)

Pond INF: Chambers - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

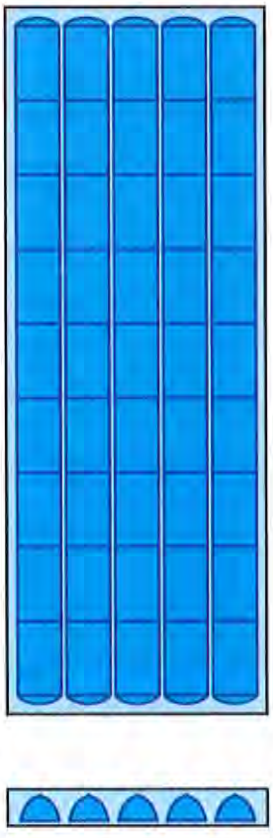
9 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 65.70' Row Length +12.0" End Stone x 2 = 67.70' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

45 Chambers x 45.9 cf = 2,067.3 cf Chamber Storage

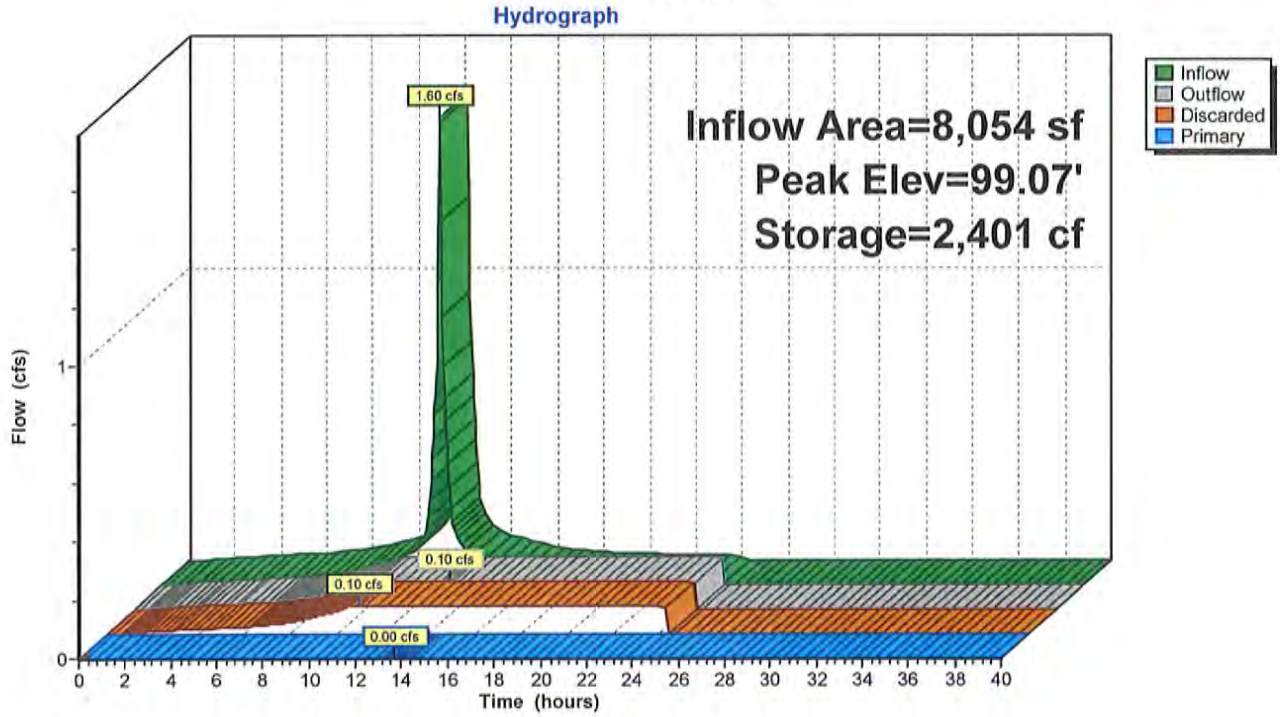
5,982.7 cf Field - 2,067.3 cf Chambers = 3,915.4 cf Stone x 40.0% Voids = 1,566.2 cf Stone Storage

Chamber Storage + Stone Storage = 3,633.5 cf = 0.083 af
Overall Storage Efficiency = 60.7%
Overall System Size = 67.70' x 25.25' x 3.50'

45 Chambers
221.6 cy Field
145.0 cy Stone



Pond INF: Chambers



Summary for Pond POND1: Infiltration Basin

Inflow Area = 31,685 sf, 43.05% Impervious, Inflow Depth = 6.11" for 100-yr event
Inflow = 5.05 cfs @ 12.09 hrs, Volume= 16,140 cf
Outflow = 2.12 cfs @ 12.31 hrs, Volume= 16,141 cf, Atten= 58%, Lag= 13.2 min
Discarded = 0.14 cfs @ 12.31 hrs, Volume= 5,509 cf
Primary = 1.99 cfs @ 12.31 hrs, Volume= 10,632 cf
Routed to Reach DP1 : East Main St

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 97.43' @ 12.31 hrs Surf.Area= 2,443 sf Storage= 4,555 cf

Plug-Flow detention time= 97.8 min calculated for 16,121 cf (100% of inflow)
Center-of-Mass det. time= 98.3 min (905.4 - 807.1)

Volume	Invert	Avail.Storage	Storage Description
#1	94.00'	7,611 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

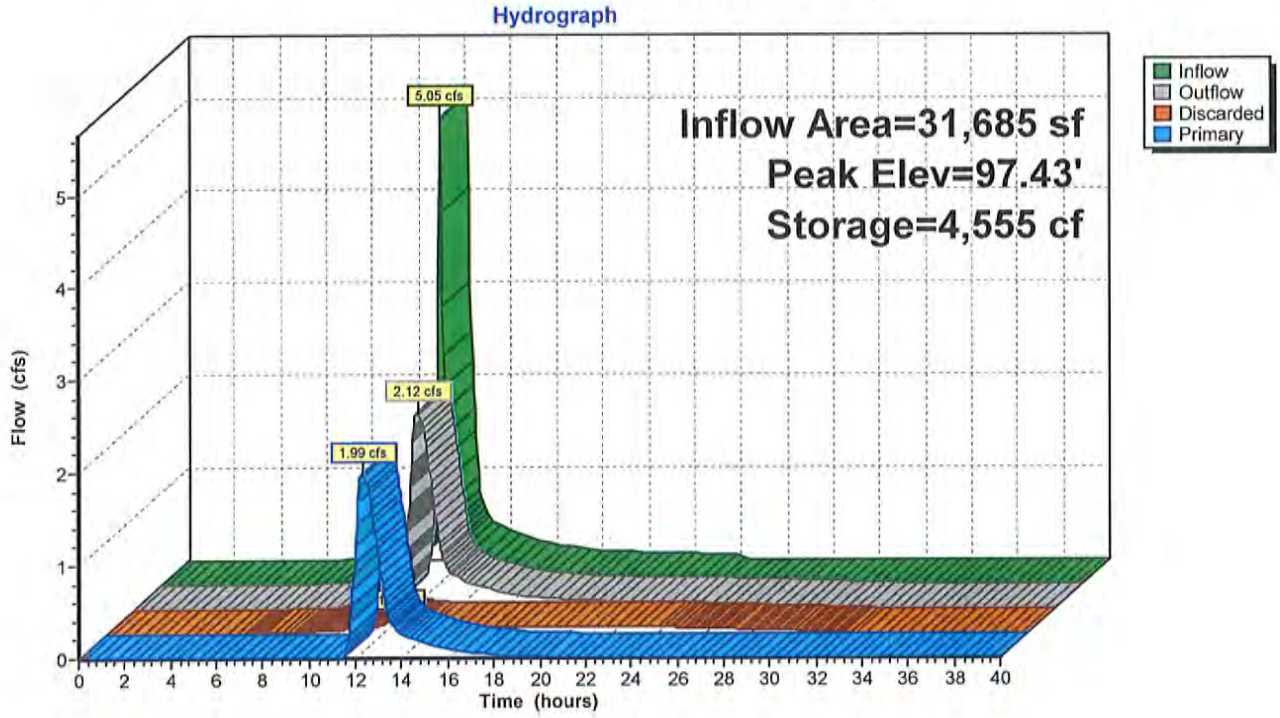
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
94.00	225	0	0
96.00	1,505	1,730	1,730
98.00	2,815	4,320	6,050
98.50	3,430	1,561	7,611

Device	Routing	Invert	Outlet Devices
#1	Discarded	94.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	97.50'	**10.0' 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
#3	Primary	95.70'	**8.0" Round Culvert** L= 104.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 95.70' / 88.00' S= 0.0740 '/' Cc= 0.900 n= 0.011, Flow Area= 0.35 sf

Discarded OutFlow Max=0.14 cfs @ 12.31 hrs HW=97.43' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.14 cfs)

Primary OutFlow Max=1.99 cfs @ 12.31 hrs HW=97.43' TW=0.00' (Dynamic Tailwater)
├**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└**3=Culvert** (Inlet Controls 1.99 cfs @ 5.69 fps)

Pond POND1: Infiltration Basin



Summary for Pond TRENCH: Infiltration Trench

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=2)

Inflow Area = 7,371 sf, 0.00% Impervious, Inflow Depth = 3.52" for 100-yr event
Inflow = 0.67 cfs @ 12.10 hrs, Volume= 2,160 cf
Outflow = 0.10 cfs @ 12.74 hrs, Volume= 2,162 cf, Atten= 84%, Lag= 38.7 min
Discarded = 0.03 cfs @ 11.70 hrs, Volume= 1,918 cf
Primary = 0.07 cfs @ 12.74 hrs, Volume= 244 cf
Routed to Reach DP2 : Land of Ogden

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 103.99' @ 12.75 hrs Surf.Area= 560 sf Storage= 895 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 277.5 min (1,128.2 - 850.6)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	896 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 2,240 cf Overall x 40.0% Voids

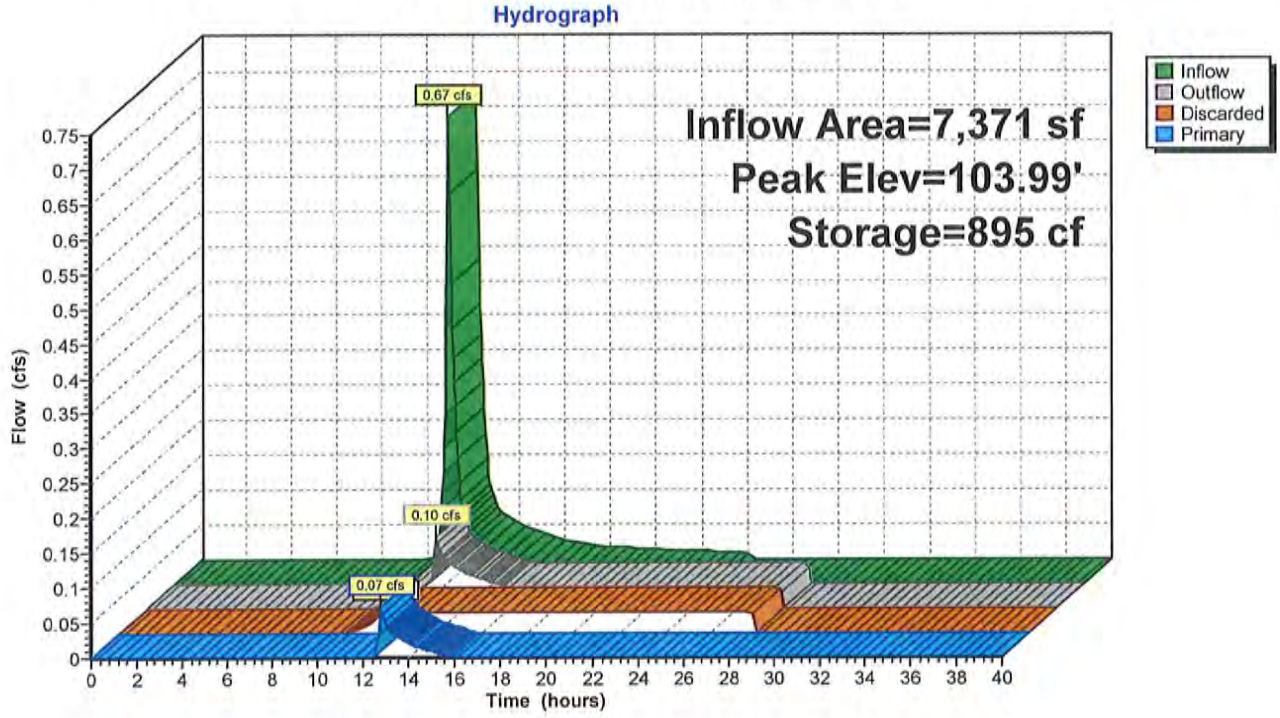
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	560	0	0
101.00	560	560	560
102.00	560	560	1,120
103.00	560	560	1,680
104.00	560	560	2,240

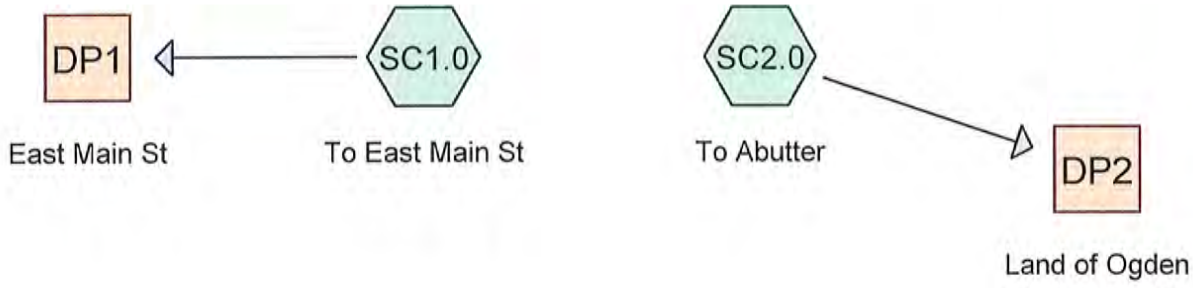
Device	Routing	Invert	Outlet Devices
#1	Discarded	100.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	103.99'	**115.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.03 cfs @ 11.70 hrs HW=100.06' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.07 cfs @ 12.74 hrs HW=103.99' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.07 cfs @ 0.17 fps)

Pond TRENCH: Infiltration Trench





Subcat Reach Pond Link

Routing Diagram for GEO-0069 EXIST
Prepared by Hayes Engineers, Inc, Printed 7/12/2023

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-yr	Type III 24-hr		Default	24.00	1	3.16	2
2	10-yr	Type III 24-hr		Default	24.00	1	4.86	2
3	25-yr	Type III 24-hr		Default	24.00	1	6.22	2
4	100-yr	Type III 24-hr		Default	24.00	1	9.04	2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
10,660	39	>75% Grass cover, Good, HSG A (SC1.0)
17,445	61	>75% Grass cover, Good, HSG B (SC1.0)
4,032	98	Concrete (SC1.0, SC2.0)
2,204	98	Pavement (SC1.0)
505	98	Pool (SC1.0)
2,340	98	Roof (SC1.0)
34,355	30	Woods, Good, HSG A (SC1.0, SC2.0)
1,708	55	Woods, Good, HSG B (SC1.0)
73,249	**48**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
45,015	HSG A	SC1.0, SC2.0
19,153	HSG B	SC1.0
0	HSG C	
0	HSG D	
9,081	Other	SC1.0, SC2.0
73,249		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
10,660	17,445	0	0	0	28,105	>75% Grass cover, Good
0	0	0	0	4,032	4,032	Concrete
0	0	0	0	2,204	2,204	Pavement
0	0	0	0	505	505	Pool
0	0	0	0	2,340	2,340	Roof
34,355	1,708	0	0	0	36,063	Woods, Good
45,015	**19,153**	**0**	**0**	**9,081**	**73,249**	**TOTAL AREA**

Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment SC1.0: To East Main St Runoff Area=47,661 sf 17.28% Impervious Runoff Depth=0.27"
Flow Length=291' Tc=7.3 min CN=56 Runoff=0.13 cfs 1,061 cf

Subcatchment SC2.0: To Abutter Runoff Area=25,588 sf 3.30% Impervious Runoff Depth=0.00"
Flow Length=177' Tc=10.6 min CN=32 Runoff=0.00 cfs 0 cf

Reach DP1: East Main St Inflow=0.13 cfs 1,061 cf
Outflow=0.13 cfs 1,061 cf

Reach DP2: Land of Ogden Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Total Runoff Area = 73,249 sf Runoff Volume = 1,061 cf Average Runoff Depth = 0.17"
87.60% Pervious = 64,168 sf 12.40% Impervious = 9,081 sf

Summary for Subcatchment SC1.0: To East Main St

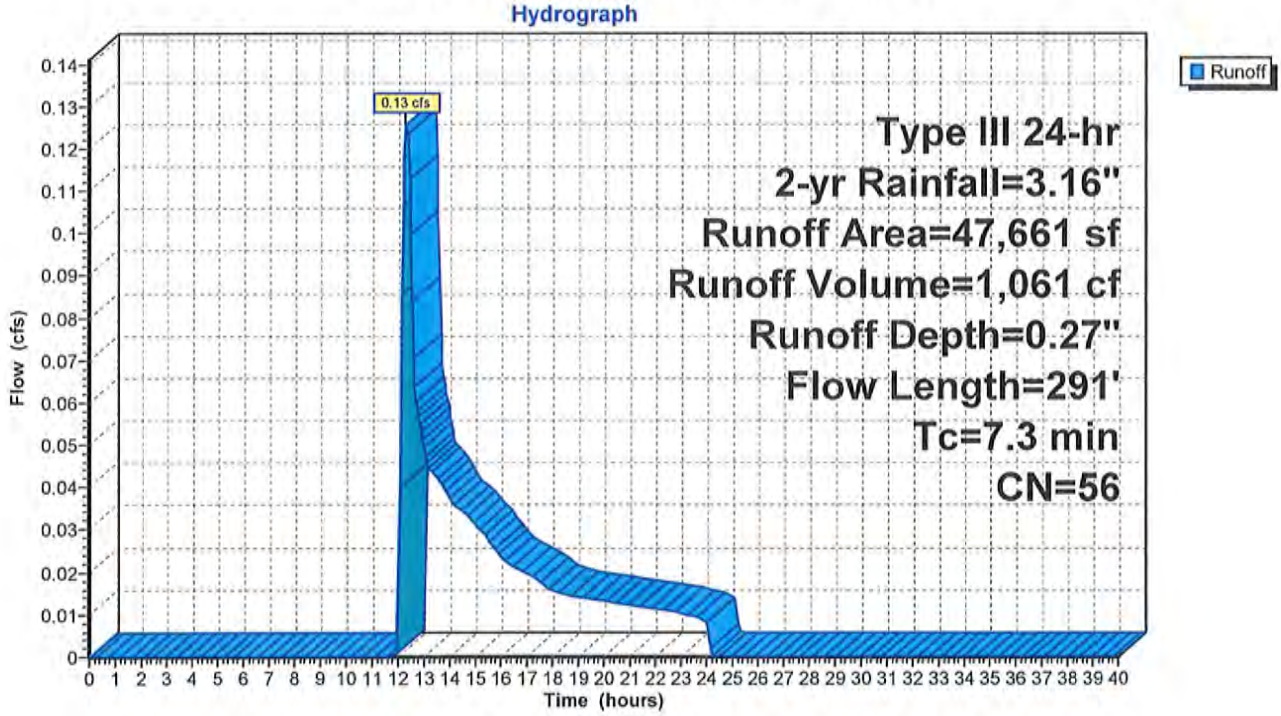
Runoff = 0.13 cfs @ 12.34 hrs, Volume= 1,061 cf, Depth= 0.27"
Routed to Reach DP1 : East Main St

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.16"

	Area (sf)	CN	Description
	10,660	39	>75% Grass cover, Good, HSG A
	17,445	61	>75% Grass cover, Good, HSG B
	9,612	30	Woods, Good, HSG A
	1,708	55	Woods, Good, HSG B
*	505	98	Pool
*	2,204	98	Pavement
*	3,187	98	Concrete
*	2,340	98	Roof
	47,661	56	Weighted Average
	39,425		82.72% Pervious Area
	8,236		17.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	50	0.1300	0.14		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 3.16"
0.8	117	0.1200	2.42		**Shallow Concentrated Flow, Shallow Conc Flow #1** Short Grass Pasture Kv= 7.0 fps
0.2	66	0.0500	4.54		**Shallow Concentrated Flow, Shallow Conc Flow #2** Paved Kv= 20.3 fps
0.4	58	0.1100	2.32		**Shallow Concentrated Flow, Shallow Conc Flow #3** Short Grass Pasture Kv= 7.0 fps
7.3	291	Total			

Subcatchment SC1.0: To East Main St



Summary for Subcatchment SC2.0: To Abutter

[45] Hint: Runoff=Zero

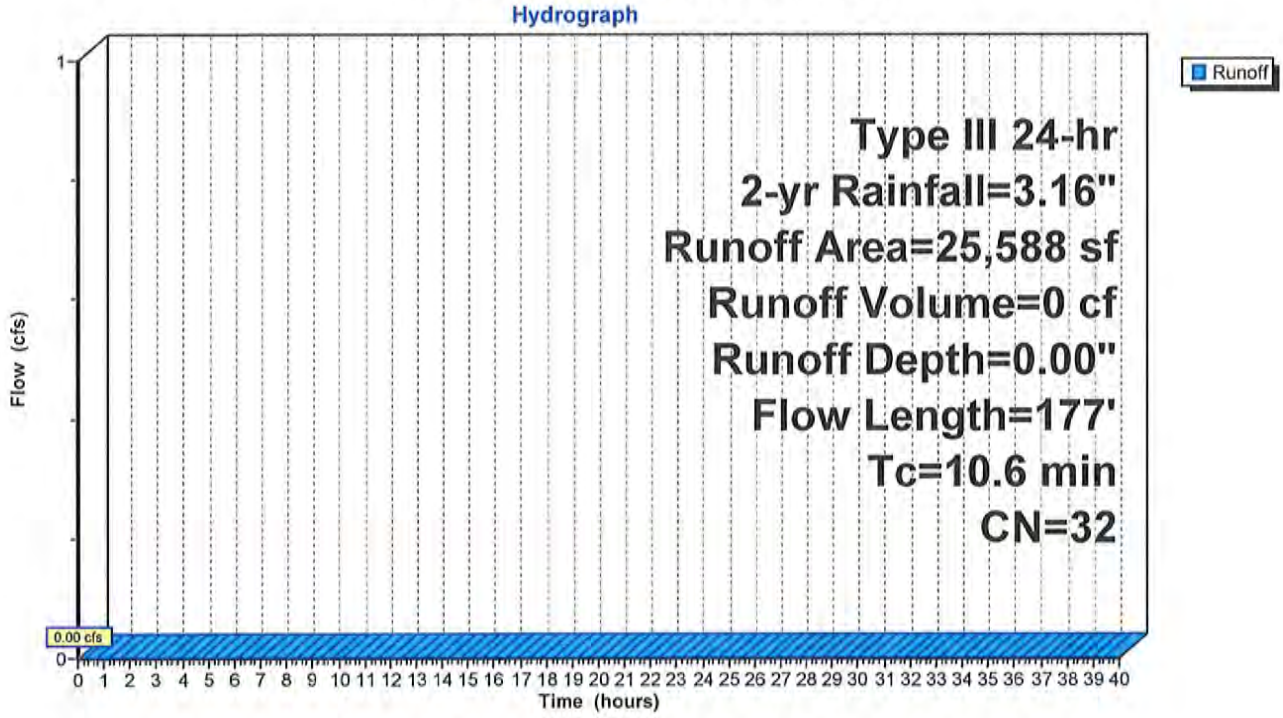
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Reach DP2 : Land of Ogden

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.16"

	Area (sf)	CN	Description
	24,743	30	Woods, Good, HSG A
*	845	98	Concrete
	25,588	32	Weighted Average
	24,743		96.70% Pervious Area
	845		3.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	50	0.0400	0.09		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.16"
0.2	43	0.3500	2.96		**Shallow Concentrated Flow, Shallow Conc Flow #1** Woodland Kv= 5.0 fps
0.2	23	0.2300	2.40		**Shallow Concentrated Flow, Shallow Conc Flow #2** Woodland Kv= 5.0 fps
0.8	61	0.0600	1.22		**Shallow Concentrated Flow, Shallow Conc Flow #3** Woodland Kv= 5.0 fps
10.6	177	Total			

Subcatchment SC2.0: To Abutter



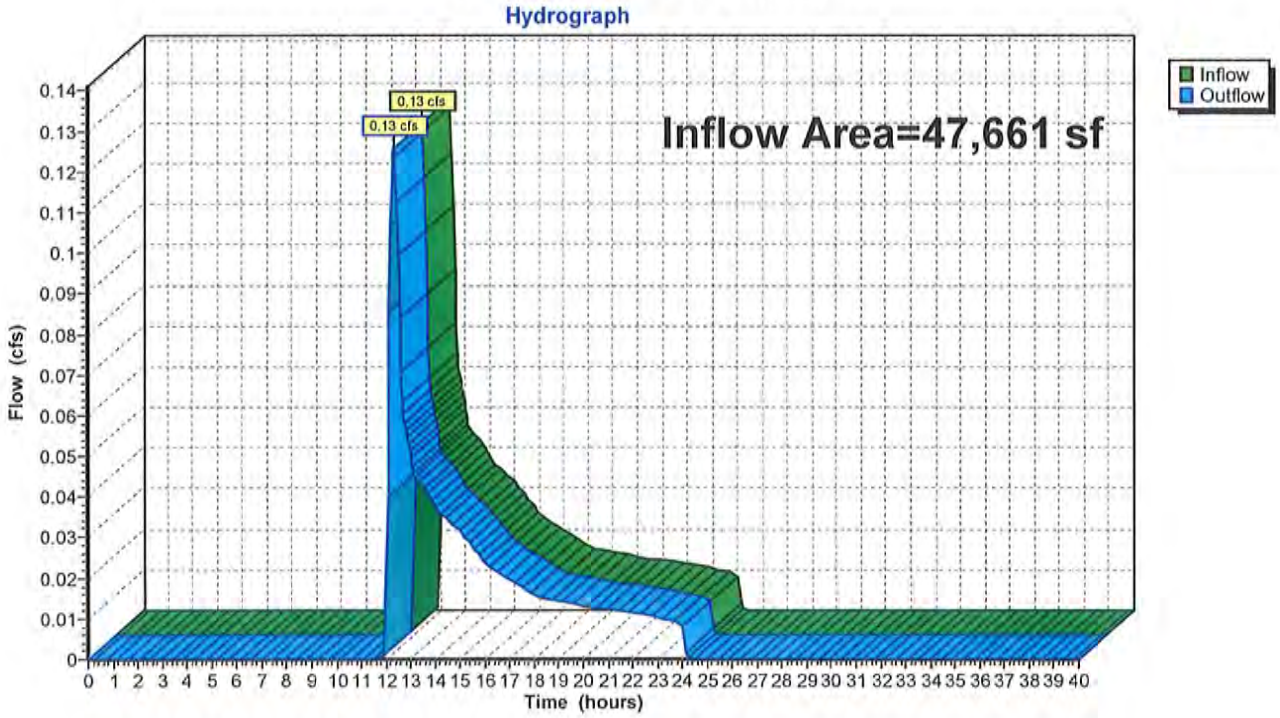
Summary for Reach DP1: East Main St

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 47,661 sf, 17.28% Impervious, Inflow Depth = 0.27" for 2-yr event
Inflow = 0.13 cfs @ 12.34 hrs, Volume= 1,061 cf
Outflow = 0.13 cfs @ 12.34 hrs, Volume= 1,061 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

Reach DP1: East Main St



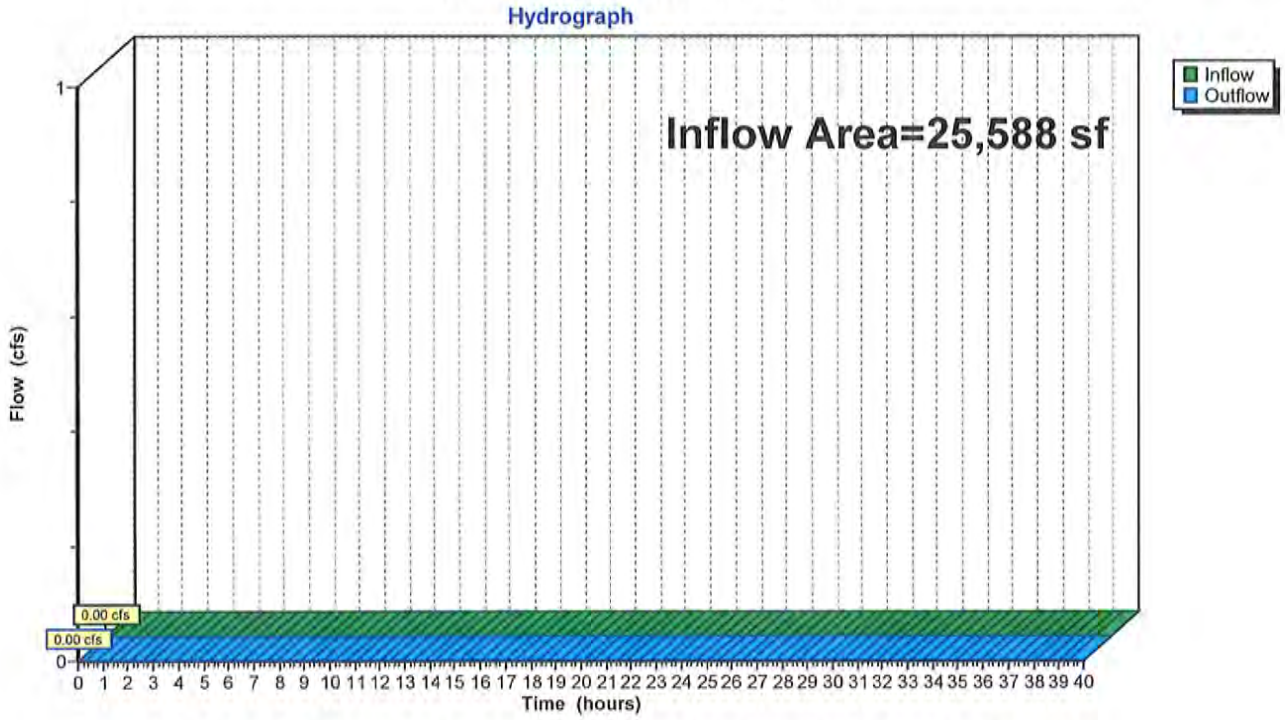
Summary for Reach DP2: Land of Ogden

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 25,588 sf, 3.30% Impervious, Inflow Depth = 0.00" for 2-yr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

Reach DP2: Land of Ogden



Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment SC1.0: To East Main St Runoff Area=47,661 sf 17.28% Impervious Runoff Depth=0.97"
Flow Length=291' Tc=7.3 min CN=56 Runoff=0.93 cfs 3,854 cf

Subcatchment SC2.0: To Abutter Runoff Area=25,588 sf 3.30% Impervious Runoff Depth=0.02"
Flow Length=177' Tc=10.6 min CN=32 Runoff=0.00 cfs 36 cf

Reach DP1: East Main St Inflow=0.93 cfs 3,854 cf
Outflow=0.93 cfs 3,854 cf

Reach DP2: Land of Ogden Inflow=0.00 cfs 36 cf
Outflow=0.00 cfs 36 cf

Total Runoff Area = 73,249 sf Runoff Volume = 3,890 cf Average Runoff Depth = 0.64"
87.60% Pervious = 64,168 sf 12.40% Impervious = 9,081 sf

Summary for Subcatchment SC1.0: To East Main St

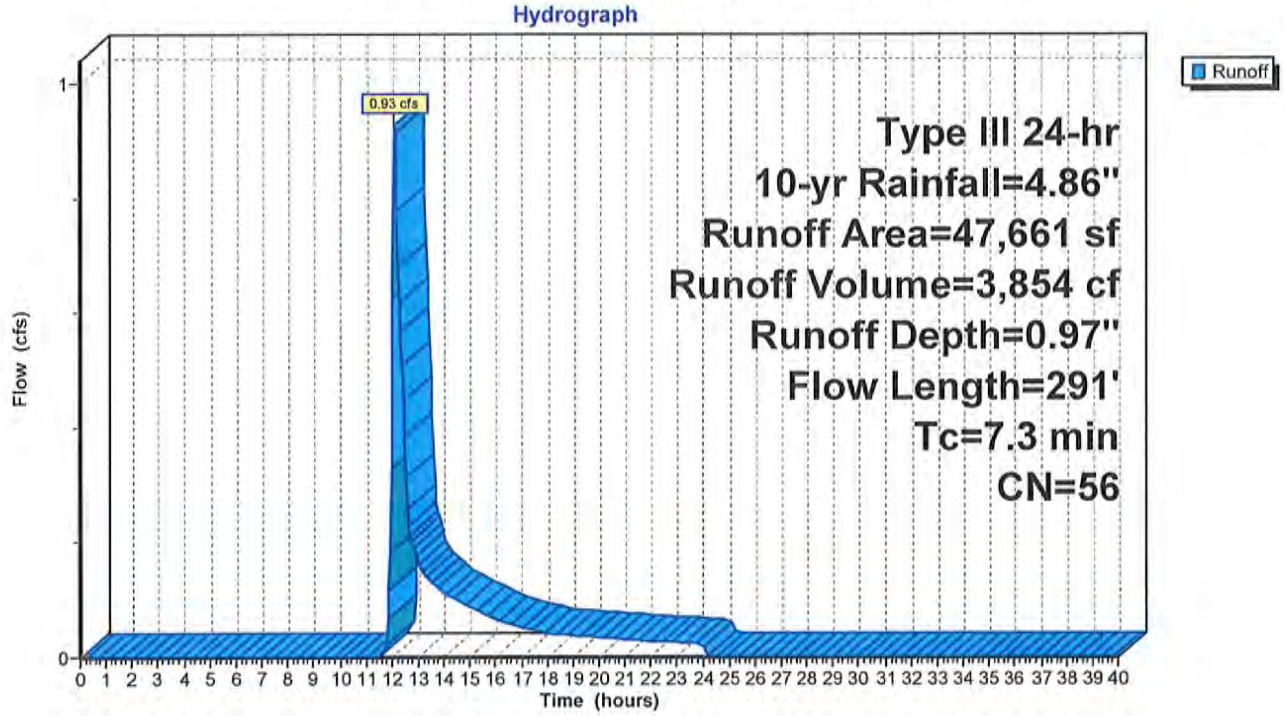
Runoff = 0.93 cfs @ 12.13 hrs, Volume= 3,854 cf, Depth= 0.97"
Routed to Reach DP1 : East Main St

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.86"

	Area (sf)	CN	Description
	10,660	39	>75% Grass cover, Good, HSG A
	17,445	61	>75% Grass cover, Good, HSG B
	9,612	30	Woods, Good, HSG A
	1,708	55	Woods, Good, HSG B
*	505	98	Pool
*	2,204	98	Pavement
*	3,187	98	Concrete
*	2,340	98	Roof
	47,661	56	Weighted Average
	39,425		82.72% Pervious Area
	8,236		17.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	50	0.1300	0.14		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 3.16"
0.8	117	0.1200	2.42		**Shallow Concentrated Flow, Shallow Conc Flow #1** Short Grass Pasture Kv= 7.0 fps
0.2	66	0.0500	4.54		**Shallow Concentrated Flow, Shallow Conc Flow #2** Paved Kv= 20.3 fps
0.4	58	0.1100	2.32		**Shallow Concentrated Flow, Shallow Conc Flow #3** Short Grass Pasture Kv= 7.0 fps
7.3	291	Total			

Subcatchment SC1.0: To East Main St



Summary for Subcatchment SC2.0: To Abutter

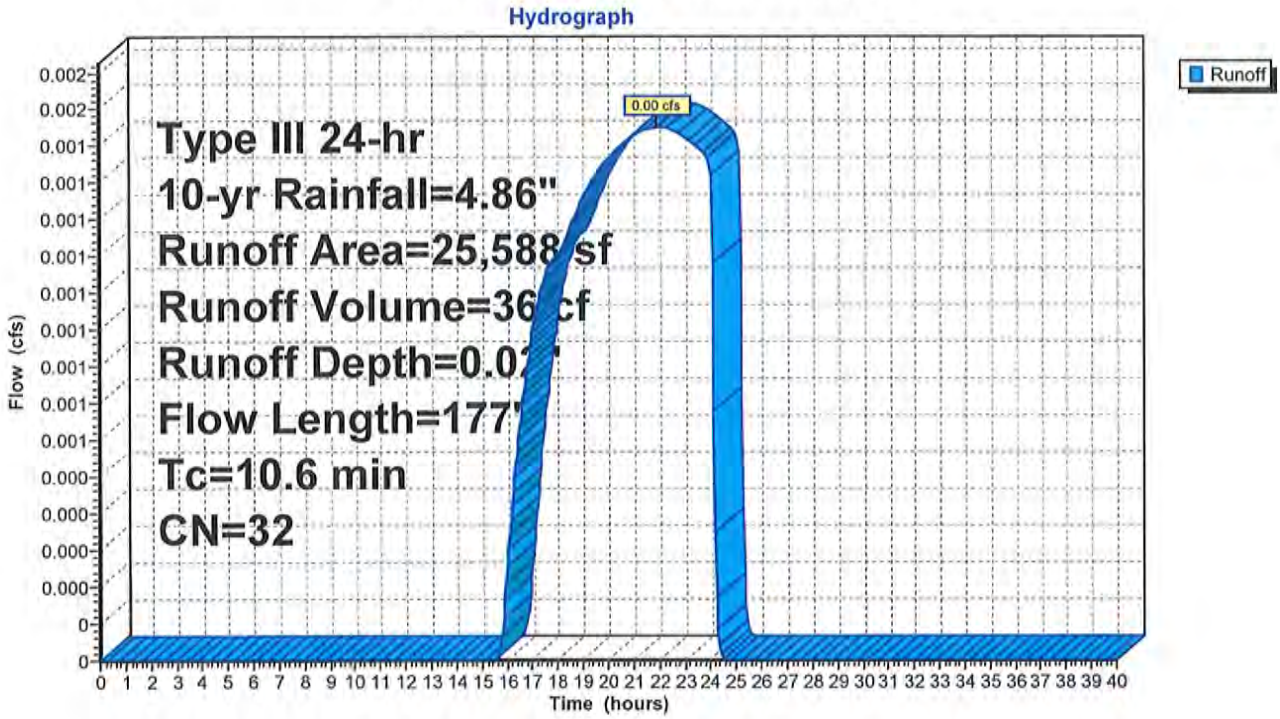
Runoff = 0.00 cfs @ 21.93 hrs, Volume= 36 cf, Depth= 0.02"
Routed to Reach DP2 : Land of Ogden

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.86"

	Area (sf)	CN	Description
	24,743	30	Woods, Good, HSG A
*	845	98	Concrete
	25,588	32	Weighted Average
	24,743		96.70% Pervious Area
	845		3.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	50	0.0400	0.09		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.16"
0.2	43	0.3500	2.96		**Shallow Concentrated Flow, Shallow Conc Flow #1** Woodland Kv= 5.0 fps
0.2	23	0.2300	2.40		**Shallow Concentrated Flow, Shallow Conc Flow #2** Woodland Kv= 5.0 fps
0.8	61	0.0600	1.22		**Shallow Concentrated Flow, Shallow Conc Flow #3** Woodland Kv= 5.0 fps
10.6	177	Total			

Subcatchment SC2.0: To Abutter



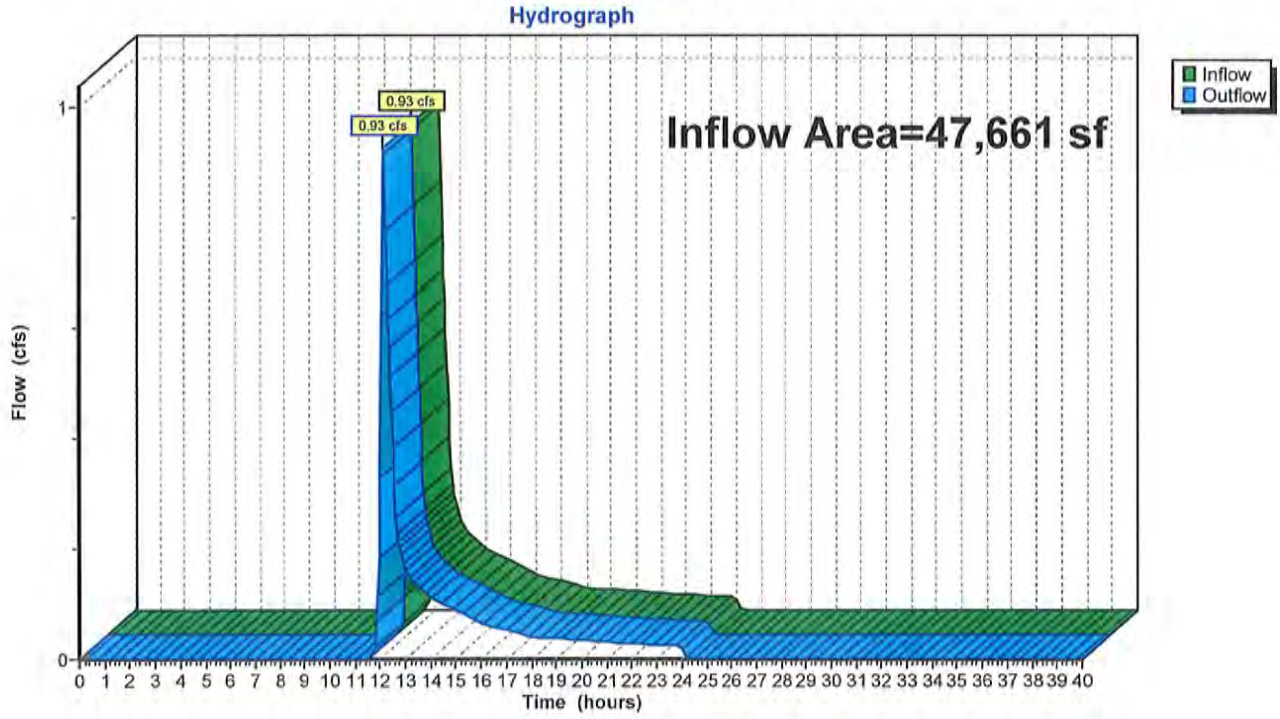
Summary for Reach DP1: East Main St

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 47,661 sf, 17.28% Impervious, Inflow Depth = 0.97" for 10-yr event
Inflow = 0.93 cfs @ 12.13 hrs, Volume= 3,854 cf
Outflow = 0.93 cfs @ 12.13 hrs, Volume= 3,854 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

Reach DP1: East Main St



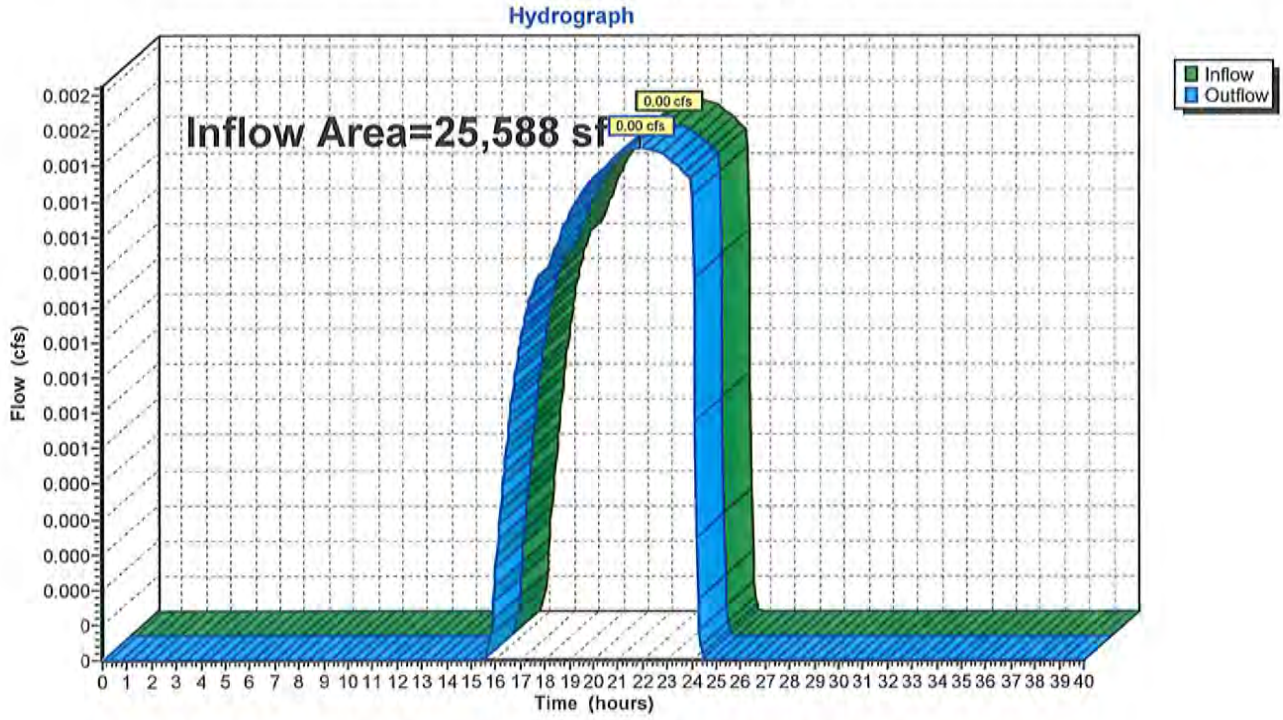
Summary for Reach DP2: Land of Ogden

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 25,588 sf, 3.30% Impervious, Inflow Depth = 0.02" for 10-yr event
Inflow = 0.00 cfs @ 21.93 hrs, Volume= 36 cf
Outflow = 0.00 cfs @ 21.93 hrs, Volume= 36 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

Reach DP2: Land of Ogden



Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment SC1.0: To East Main St Runoff Area=47,661 sf 17.28% Impervious Runoff Depth=1.73"
Flow Length=291' Tc=7.3 min CN=56 Runoff=1.91 cfs 6,863 cf

Subcatchment SC2.0: To Abutter Runoff Area=25,588 sf 3.30% Impervious Runoff Depth=0.17"
Flow Length=177' Tc=10.6 min CN=32 Runoff=0.01 cfs 356 cf

Reach DP1: East Main St Inflow=1.91 cfs 6,863 cf
Outflow=1.91 cfs 6,863 cf

Reach DP2: Land of Ogden Inflow=0.01 cfs 356 cf
Outflow=0.01 cfs 356 cf

Total Runoff Area = 73,249 sf Runoff Volume = 7,219 cf Average Runoff Depth = 1.18"
87.60% Pervious = 64,168 sf 12.40% Impervious = 9,081 sf

Summary for Subcatchment SC1.0: To East Main St

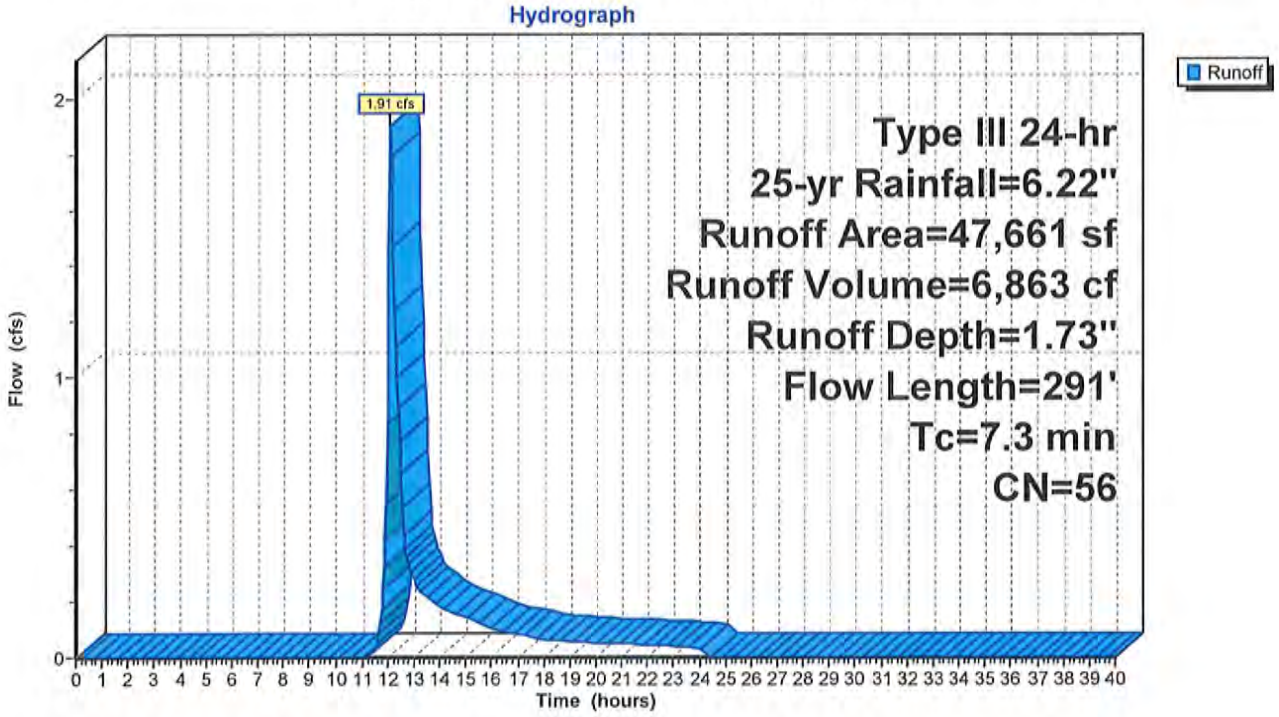
Runoff = 1.91 cfs @ 12.12 hrs, Volume= 6,863 cf, Depth= 1.73"
Routed to Reach DP1 : East Main St

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=6.22"

	Area (sf)	CN	Description
	10,660	39	>75% Grass cover, Good, HSG A
	17,445	61	>75% Grass cover, Good, HSG B
	9,612	30	Woods, Good, HSG A
	1,708	55	Woods, Good, HSG B
*	505	98	Pool
*	2,204	98	Pavement
*	3,187	98	Concrete
*	2,340	98	Roof
	47,661	56	Weighted Average
	39,425		82.72% Pervious Area
	8,236		17.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	50	0.1300	0.14		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 3.16"
0.8	117	0.1200	2.42		**Shallow Concentrated Flow, Shallow Conc Flow #1** Short Grass Pasture Kv= 7.0 fps
0.2	66	0.0500	4.54		**Shallow Concentrated Flow, Shallow Conc Flow #2** Paved Kv= 20.3 fps
0.4	58	0.1100	2.32		**Shallow Concentrated Flow, Shallow Conc Flow #3** Short Grass Pasture Kv= 7.0 fps
7.3	291	Total			

Subcatchment SC1.0: To East Main St



Summary for Subcatchment SC2.0: To Abutter

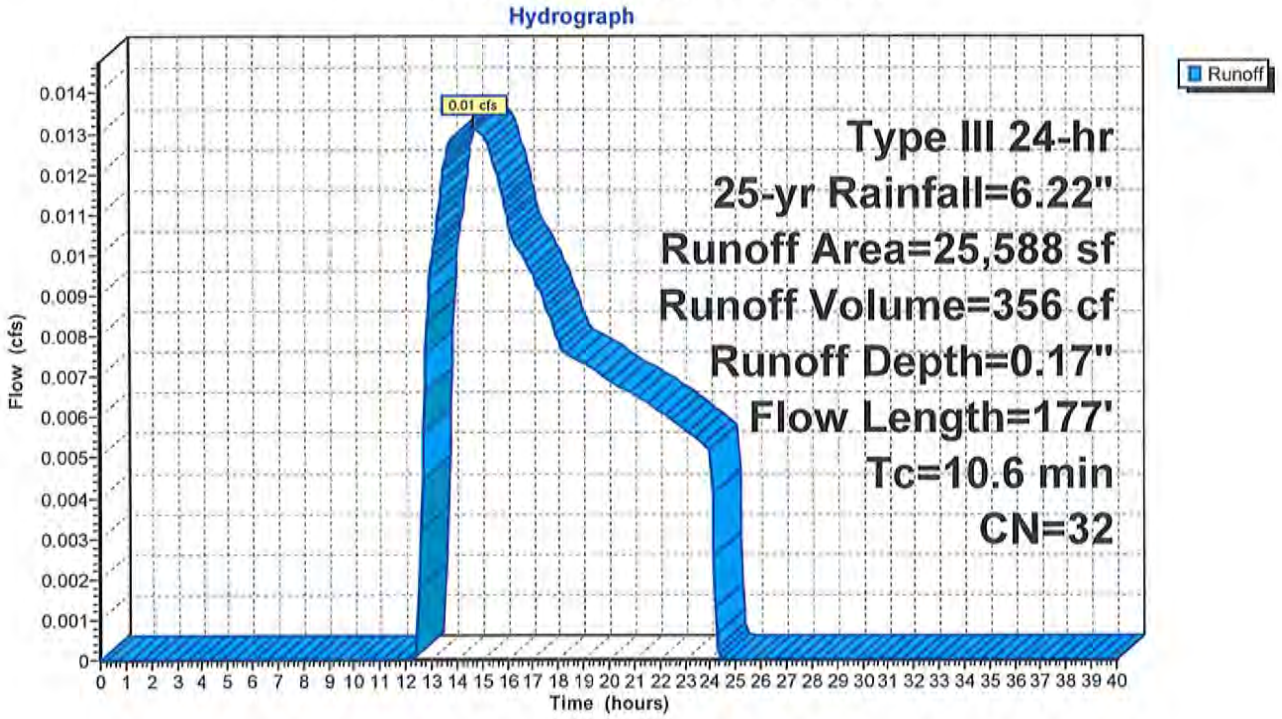
Runoff = 0.01 cfs @ 14.68 hrs, Volume= 356 cf, Depth= 0.17"
Routed to Reach DP2 : Land of Ogden

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=6.22"

	Area (sf)	CN	Description
	24,743	30	Woods, Good, HSG A
*	845	98	Concrete
	25,588	32	Weighted Average
	24,743		96.70% Pervious Area
	845		3.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	50	0.0400	0.09		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.16"
0.2	43	0.3500	2.96		**Shallow Concentrated Flow, Shallow Conc Flow #1** Woodland Kv= 5.0 fps
0.2	23	0.2300	2.40		**Shallow Concentrated Flow, Shallow Conc Flow #2** Woodland Kv= 5.0 fps
0.8	61	0.0600	1.22		**Shallow Concentrated Flow, Shallow Conc Flow #3** Woodland Kv= 5.0 fps
10.6	177	Total			

Subcatchment SC2.0: To Abutter



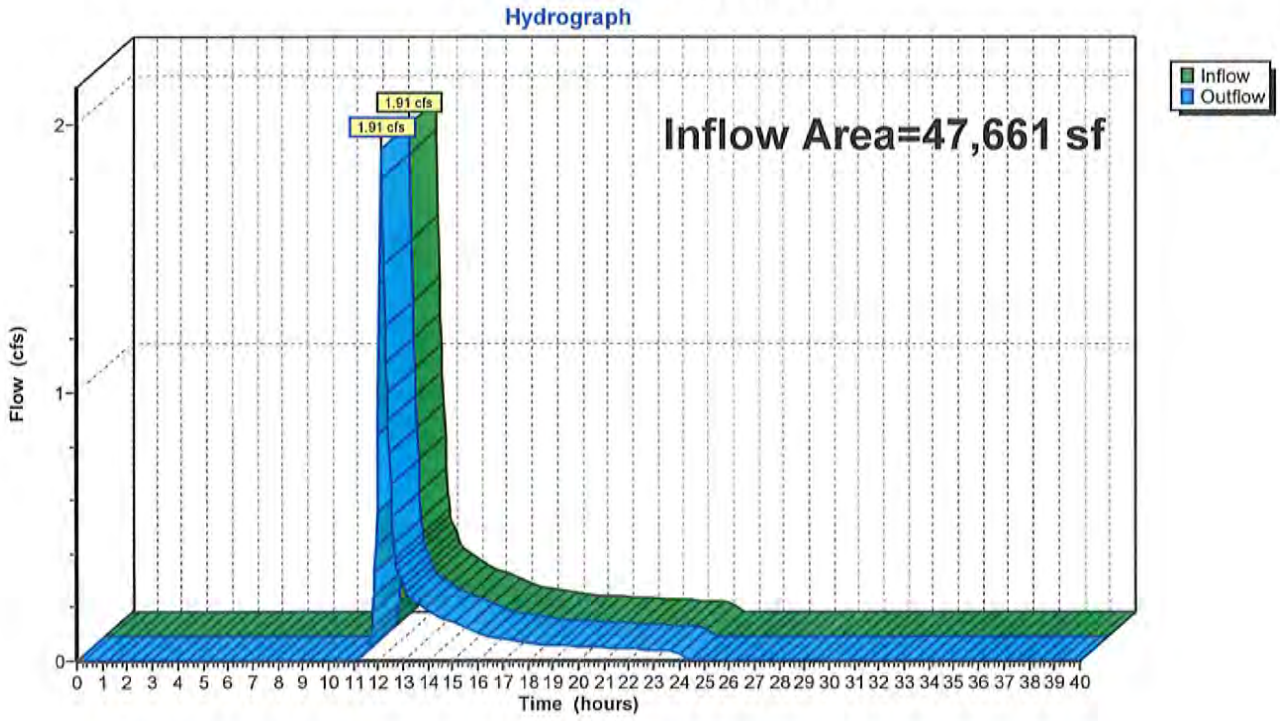
Summary for Reach DP1: East Main St

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 47,661 sf, 17.28% Impervious, Inflow Depth = 1.73" for 25-yr event
Inflow = 1.91 cfs @ 12.12 hrs, Volume= 6,863 cf
Outflow = 1.91 cfs @ 12.12 hrs, Volume= 6,863 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

Reach DP1: East Main St



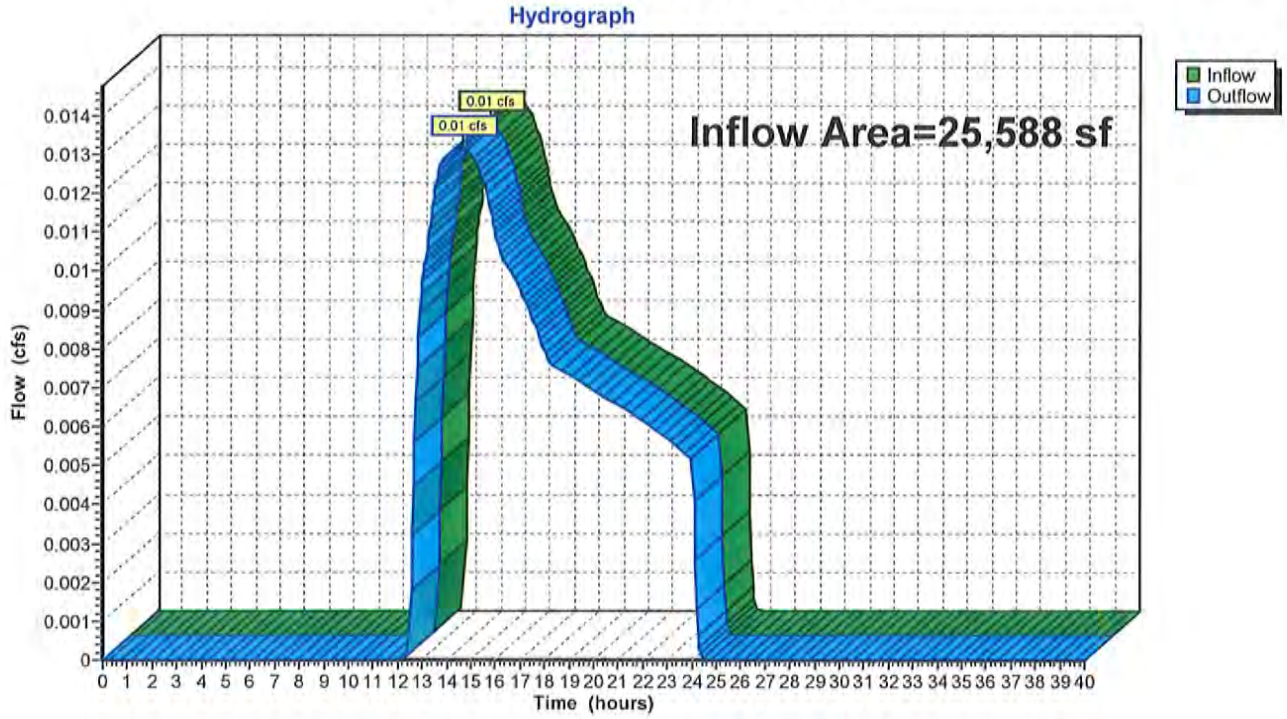
Summary for Reach DP2: Land of Ogden

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 25,588 sf, 3.30% Impervious, Inflow Depth = 0.17" for 25-yr event
Inflow = 0.01 cfs @ 14.68 hrs, Volume= 356 cf
Outflow = 0.01 cfs @ 14.68 hrs, Volume= 356 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

Reach DP2: Land of Ogden



Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment SC1.0: To East Main St Runoff Area=47,661 sf 17.28% Impervious Runoff Depth=3.64"
Flow Length=291' Tc=7.3 min CN=56 Runoff=4.32 cfs 14,456 cf

Subcatchment SC2.0: To Abutter Runoff Area=25,588 sf 3.30% Impervious Runoff Depth=0.88"
Flow Length=177' Tc=10.6 min CN=32 Runoff=0.24 cfs 1,879 cf

Reach DP1: East Main St Inflow=4.32 cfs 14,456 cf
Outflow=4.32 cfs 14,456 cf

Reach DP2: Land of Ogden Inflow=0.24 cfs 1,879 cf
Outflow=0.24 cfs 1,879 cf

Total Runoff Area = 73,249 sf Runoff Volume = 16,334 cf Average Runoff Depth = 2.68"
87.60% Pervious = 64,168 sf 12.40% Impervious = 9,081 sf

Summary for Subcatchment SC1.0: To East Main St

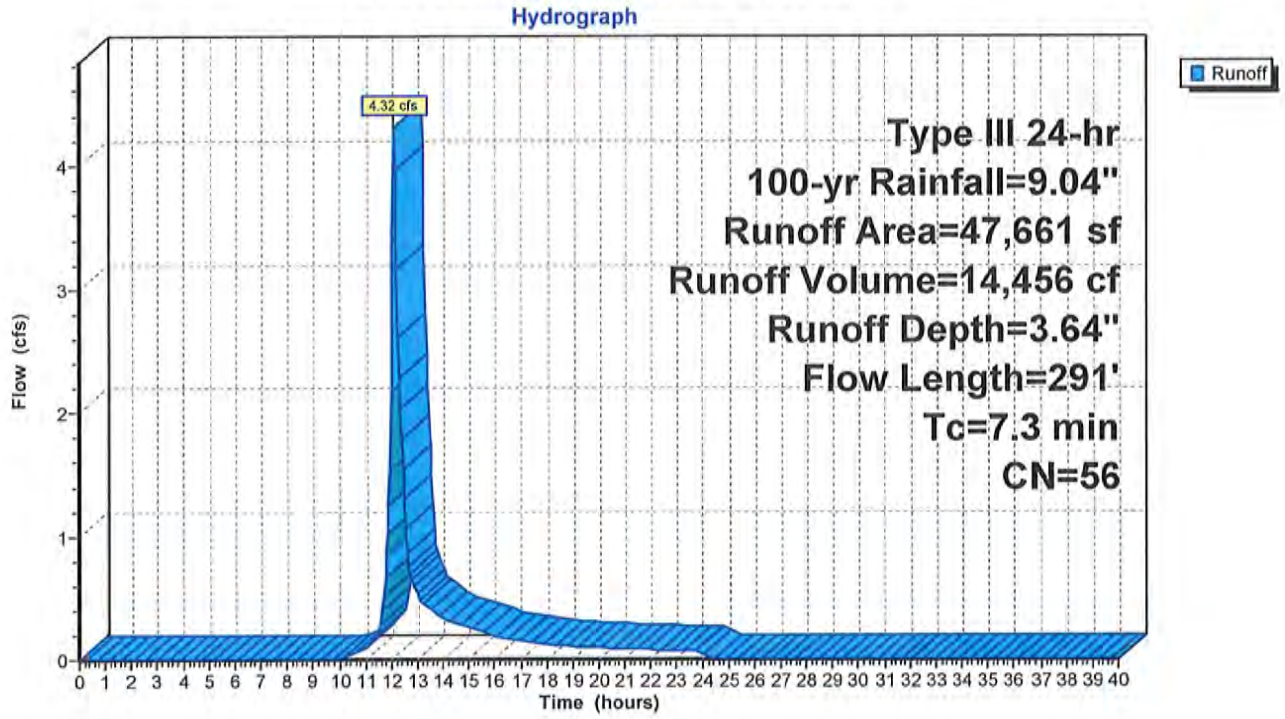
Runoff = 4.32 cfs @ 12.11 hrs, Volume= 14,456 cf, Depth= 3.64"
Routed to Reach DP1 : East Main St

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=9.04"

	Area (sf)	CN	Description
	10,660	39	>75% Grass cover, Good, HSG A
	17,445	61	>75% Grass cover, Good, HSG B
	9,612	30	Woods, Good, HSG A
	1,708	55	Woods, Good, HSG B
*	505	98	Pool
*	2,204	98	Pavement
*	3,187	98	Concrete
*	2,340	98	Roof
	47,661	56	Weighted Average
	39,425		82.72% Pervious Area
	8,236		17.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	50	0.1300	0.14		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 3.16"
0.8	117	0.1200	2.42		**Shallow Concentrated Flow, Shallow Conc Flow #1** Short Grass Pasture Kv= 7.0 fps
0.2	66	0.0500	4.54		**Shallow Concentrated Flow, Shallow Conc Flow #2** Paved Kv= 20.3 fps
0.4	58	0.1100	2.32		**Shallow Concentrated Flow, Shallow Conc Flow #3** Short Grass Pasture Kv= 7.0 fps
7.3	291	Total			

Subcatchment SC1.0: To East Main St



Summary for Subcatchment SC2.0: To Abutter

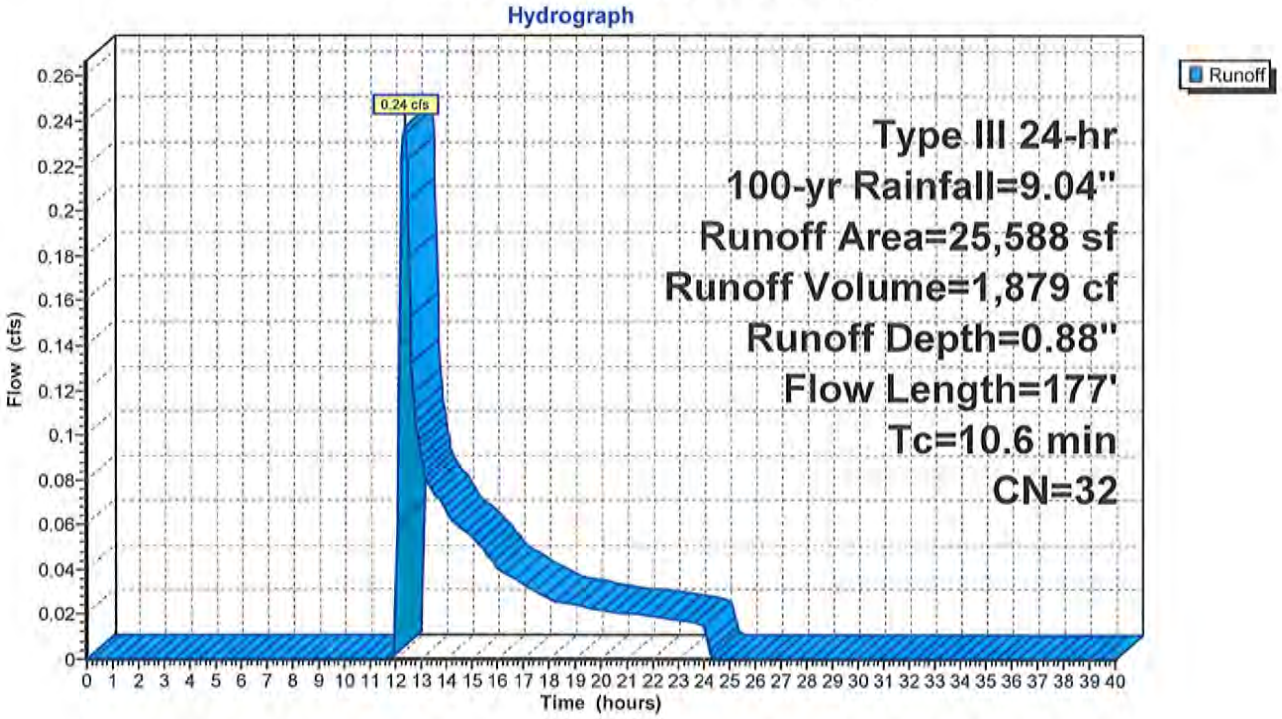
Runoff = 0.24 cfs @ 12.35 hrs, Volume= 1,879 cf, Depth= 0.88"
Routed to Reach DP2 : Land of Ogden

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=9.04"

	Area (sf)	CN	Description
	24,743	30	Woods, Good, HSG A
*	845	98	Concrete
	25,588	32	Weighted Average
	24,743		96.70% Pervious Area
	845		3.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	50	0.0400	0.09		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.16"
0.2	43	0.3500	2.96		**Shallow Concentrated Flow, Shallow Conc Flow #1** Woodland Kv= 5.0 fps
0.2	23	0.2300	2.40		**Shallow Concentrated Flow, Shallow Conc Flow #2** Woodland Kv= 5.0 fps
0.8	61	0.0600	1.22		**Shallow Concentrated Flow, Shallow Conc Flow #3** Woodland Kv= 5.0 fps
10.6	177	Total			

Subcatchment SC2.0: To Abutter



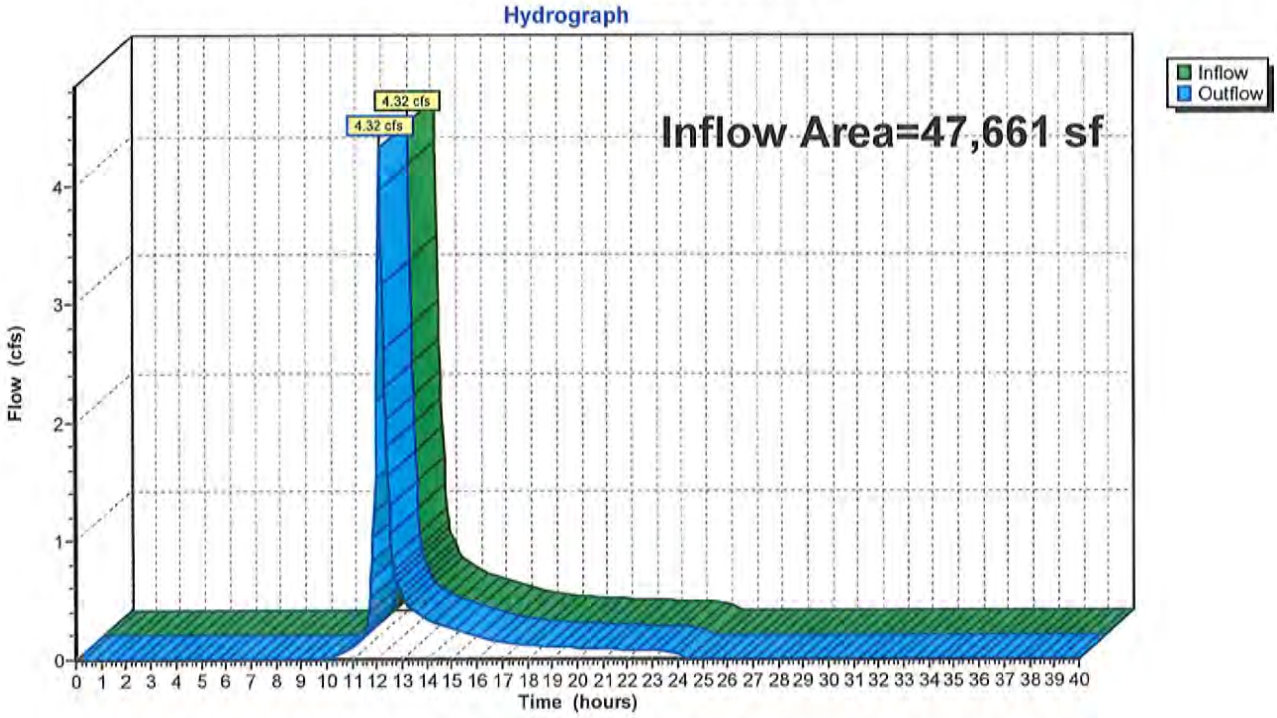
Summary for Reach DP1: East Main St

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 47,661 sf, 17.28% Impervious, Inflow Depth = 3.64" for 100-yr event
Inflow = 4.32 cfs @ 12.11 hrs, Volume= 14,456 cf
Outflow = 4.32 cfs @ 12.11 hrs, Volume= 14,456 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

Reach DP1: East Main St



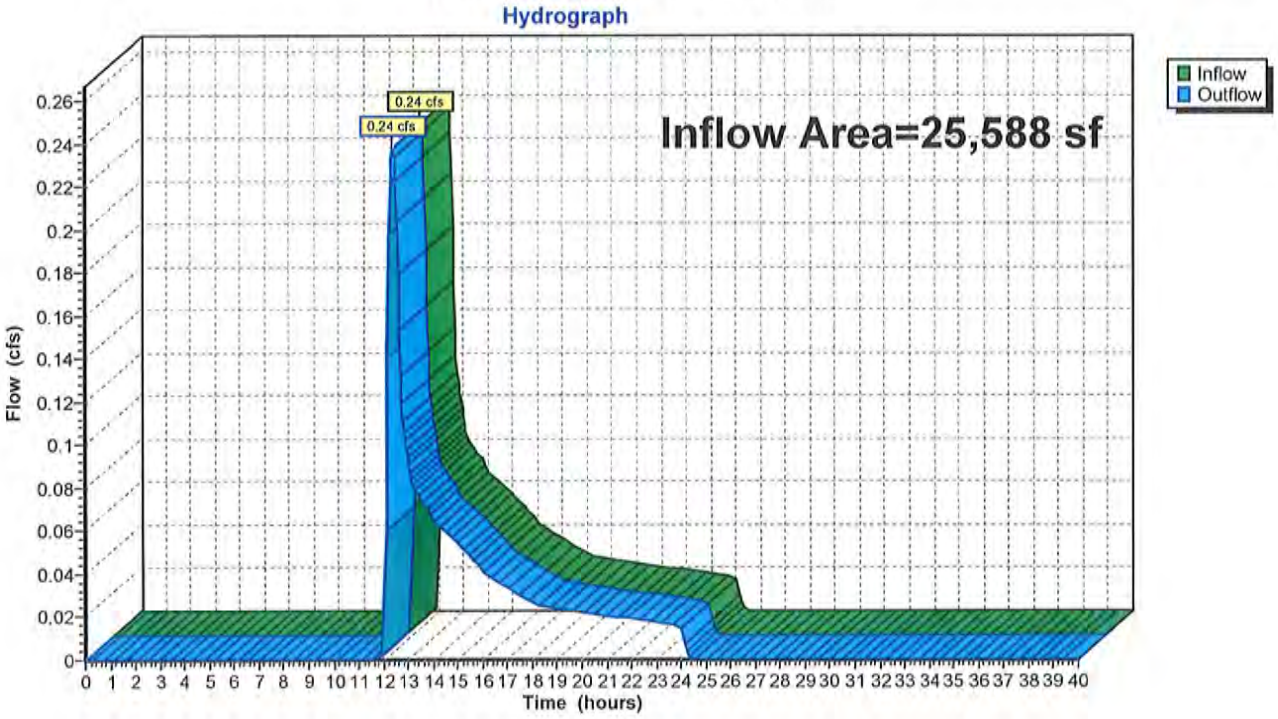
Summary for Reach DP2: Land of Ogden

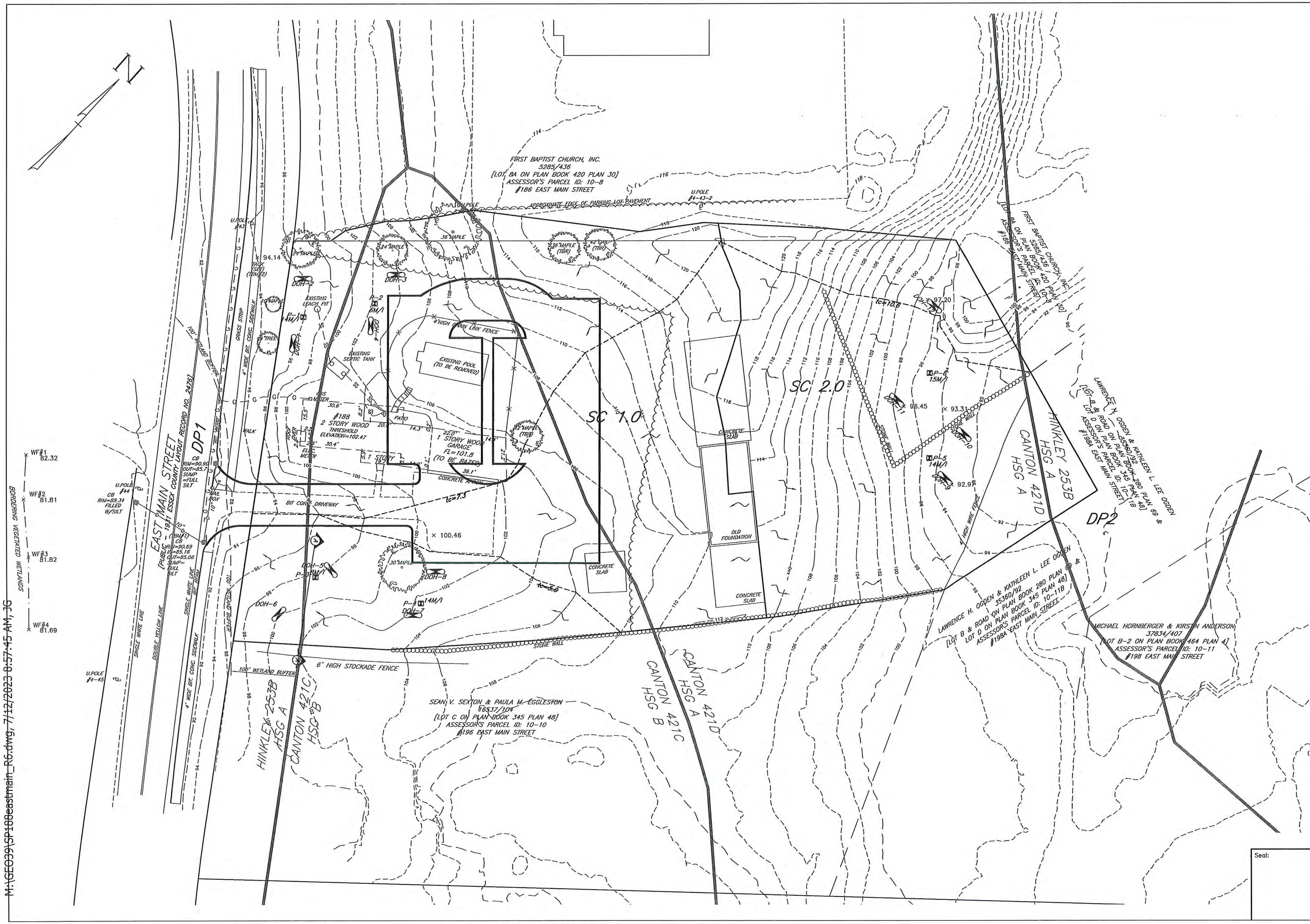
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 25,588 sf, 3.30% Impervious, Inflow Depth = 0.88" for 100-yr event
Inflow = 0.24 cfs @ 12.35 hrs, Volume= 1,879 cf
Outflow = 0.24 cfs @ 12.35 hrs, Volume= 1,879 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

Reach DP2: Land of Ogden





N
FIRST BAPTIST CHURCH, INC.
5285/436
[LOT 8A ON PLAN BOOK 420 PLAN 30]
ASSESSOR'S PARCEL ID: 10-8
#186 EAST MAIN STREET
APPROXIMATE EDGE OF PARKING LOT PAVEMENT
EAST MAIN STREET
[PUBLIC - 1931 ESSEX COUNTY LAYOUT RECORD NO. 2476]
DP1
DP2
SC 1.0
SC 2.0
EXISTING POOL (TO BE REMOVED)
#188
2 STORY WOOD
THRESHOLD ELEVATION=102.47
1 STORY WOOD GARAGE
FL=101.8
(TO BE RAZED)
EXISTING LEACH PIT
EXISTING SEPTIC TANK
4' HIGH CHAIN LINK FENCE
BIT CONC. DRIVEWAY
CONCRETE SLAB
OLD FOUNDATION
STONE WALL
6' HIGH STOCKADE FENCE
100' WETLAND BUFFER
BORDERING VEGETATED WETLANDS
HINKLEY 253B
HSG A
CANTON 421C
HSG B
CANTON 421D
HSG A
LAWRENCE H. OGDEN & KATHLEEN L. LEE OGDEN
35360/92
[LOT B & ROAD ON PLAN BOOK 280 PLAN 69 & LOT D ON PLAN BOOK 345 PLAN 48]
ASSESSOR'S PARCEL ID: 10-11B
#198A EAST MAIN STREET
MICHAEL HORNBERGER & KIRSTIN ANDERSON
37834/407
[LOT B-2 ON PLAN BOOK 464 PLAN 4]
ASSESSOR'S PARCEL ID: 10-11
#198 EAST MAIN STREET
SEAN V. SEXTON & PAULA M. EGGLESTON
16537/104
[LOT C ON PLAN BOOK 345 PLAN 48]
ASSESSOR'S PARCEL ID: 10-10
#196 EAST MAIN STREET
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Prepared For:

Owner / Applicant
J. David Trambley
13 East Meadow Lane
Middleton, Ma. 01949

Prepared By:

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Fax: 781.246.7596
www.hayeseng.com

Design By: gr
Drawn By: gr
Checked By: pjo
Project File: GEO-0069
Comp. No: GEO39

☒ Issued For Permit
☐ Issued For Review
☐ Issued For Bid
☐ Issued For Construction
☒ Not For Construction

No.	Revision	Date
10		
9		
8		
7		
6		
5		
4		
3		
2		
1		

Scale: 1"=N.T.S.

0'

Date: July 12, 2023

Drawing Title:

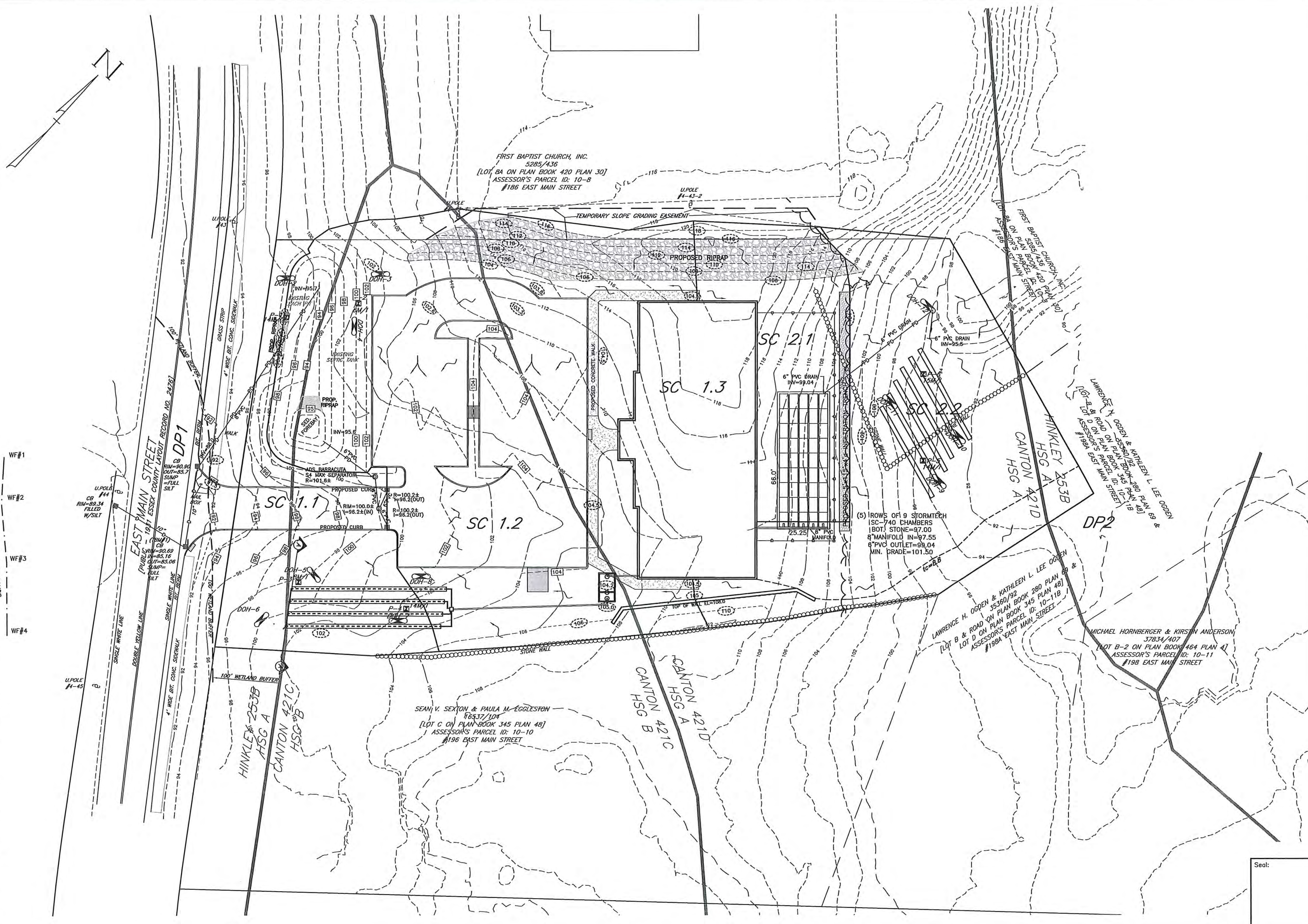
Existing Watershed Plan
Day Care Center
188 East Main Street
Georgetown, Mass.

Seal:

Drawing No.:

WS

SHEET 1 OF 2



N
FIRST BAPTIST CHURCH, INC.
5285/436
[LOT 8A ON PLAN BOOK 420 PLAN 30]
ASSESSOR'S PARCEL ID: 10-8
#186 EAST MAIN STREET
TEMPORARY SLOPE GRADING EASEMENT
PROPOSED RIPRAP
SC 1.1
SC 1.2
SC 1.3
SC 2.1
SC 2.2
DP1
DP2
EAST MAIN STREET
[PUBLIC - 1911 ESSEX COUNTY LAYOUT RECORD NO. 2476]
100' WETLAND BUFFER
BORDERING VEGETATED WETLANDS
WF#1
WF#2
WF#3
WF#4
SINGLE WHITE LINE
DOUBLE YELLOW LINE
4' WIDE BIT. CONC. SIDEWALK
GRASS STRIP
PROPOSED CONCRETE WALK
PROPOSED CURB
ADS BARRACUDA
S4 MAX SEPARATOR
R=101.6±
SED. FOREBAY
PROP. RIPRAP
EXISTING SEPTIC TANK
EXISTING LEACH PIT
6" PVC DRAIN
INV=99.04
6" PVC DRAIN
INV=95.5
(5) ROWS OF 9 STORMTECH
ISC-740 CHAMBERS
BOT. STONE=97.00
8" MANIFOLD IN=97.55
6" PVC OUTLET=99.04
MIN. GRADE=101.50
TOP OF WALL EL=108.0
STONE WALL
LAWRENCE H. OGDEN & KATHLEEN L. LEE OGDEN
35360/92
[LOT B & ROAD ON PLAN BOOK 280 PLAN 69 &
LOT D ON PLAN BOOK 345 PLAN 48]
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16537/104
[LOT C ON PLAN BOOK 345 PLAN 48]
ASSESSOR'S PARCEL ID: 10-10
#196 EAST MAIN STREET
HINKLEY 253B
HSG A
CANTON 421C
HSG B
CANTON 421D
HSG A

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Prepared For:

Owner / Applicant
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13 East Meadow Lane
Middleton, Ma. 01949

Prepared By:

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Fax: 781.246.7596
www.hayeseng.com

Design By: gr
Drawn By: gr
Checked By: pjo
Project File: GEO-0069
Comp. No: GEO39

- ☒ Issued For Permit
- ☐ Issued For Review
- ☐ Issued For Bid
- ☐ Issued For Construction
- ☒ Not For Construction

No.	Revision	Date
1		
2		
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7		
8		
9		
10		

Scale: 1"=N.T.S.

Date: July 12, 2023

Drawing Title:

Proposed Watershed Plan
Day Care Center
188 East Main Street
Georgetown, Mass.

Seal:

Drawing No.:

WS

SHEET 2 OF 2